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14. ABSTRACT The purpose of this study was to examine associations among family functioning, spouse and child mental health symptoms, treatment engagement, and Soldier job satisfaction in active duty Soldiers with PTSD. The specific aim was to identify facilitators of Soldier treatment engagement for PTSD. Two rounds of recruiting were completed, one at Fort Bragg and one at Fort Jackson, yielding 47 Soldier+spouse pairs who completed a survey via telephone. The survey included standardized instruments covering demographics, Soldier and spouse mental health service use, family functioning, spouse depression, spouse anxiety, child mental health symptoms and service use, and Soldier job satisfaction. Spouse depression was the strongest correlate of family functioning, and spouse treatment engagement was the strongest correlate of Soldier treatment engagement. An unexpected finding was that Soldiers were highly engaged in treatment, completing more than 50 treatment sessions, on average, with a mental health professional, yet they still met PTSD criteria. Family functioning was positively and significantly correlated with military job satisfaction.

15. SUBJECT TERMS
Family functioning, mental health treatment, Soldier job satisfaction

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1. INTRODUCTION: Narrative that briefly (one paragraph) describes the subject, purpose and scope of the research.

The purpose of this study was to identify family-level facilitators of mental health treatment engagement among Soldiers screening positive for post-traumatic stress disorder (PTSD) upon return from deployment to Iraq or Afghanistan. Research has shown that, even among service members with PTSD who access treatment, engagement is low, with the average person completing 3-4 sessions. The current study was based on the premise that combat-related PTSD is a family problem. This notion stems from past research findings that clearly and consistently show negative effects of PTSD on children, spouses, marital relationships, and family functioning. In the same way that mental health symptoms can echo throughout a family, there is emerging evidence that seeking and engaging with mental health treatment can also reverberate among family members. The goal of this study was to recruit 100 Soldier+spouse pairs to complete telephone interviews using standardized instruments to study the associations among family functioning, spouse and child mental health, familial treatment engagement, and Soldier job satisfaction. The study hypothesized that family functioning and spouse and child mental health variables would be significantly associated with Soldier treatment engagement, and that this would in turn be associated with Soldier job satisfaction.

2. KEYWORDS: Provide a brief list of keywords (limit to 20 words).

Soldier PTSD, Family functioning, job satisfaction, spouse mental health, child mental health, service use

3. ACCOMPLISHMENTS: The PI is reminded that the recipient organization is required to obtain prior written approval from the awarding agency Grants Officer whenever there are significant changes in the project or its direction.

What were the major goals of the project?
List the major goals of the project as stated in the approved SOW. If the application listed milestones/target dates for important activities or phases of the project, identify these dates and show actual completion dates or the percentage of completion.

This list of tasks is based on the Statement of Work in the No Cost Time Extension Contract dated 5/13/2014, shown below.

Task	Target Completion Date	Status of Task
1. Complete clearance process	7/13/13	• Received letter of Command Support on 3/12/13 • Obtained RTI IRB approval on 12/18/12 • Obtained ORP clearance on 4/29/13
2. Data collection (Target n=100 couples)	5/13/14	• Began recruiting Soldiers at Fort Jackson on May 31, 2014 • Stopped recruiting at Fort Jackson on July 31, 2014 • Ended data collection at RTI on September 12, 2014 • Obtained 80 interviews from 40 Soldier+spouse pairs.
3. Data analysis	(5/14/14 – 11/13/14	• Data preparation and analyses were completed by July 14, 2015.

Task	Target Completion Date	Status of Task
4. Dissemination of results	11/14/14 – 5/13/15	• Preliminary findings were presented at Fort Jackson, SC, on March 14, 2014 • A poster was presented at the annual meeting of the International Society on Traumatic Stress Studies, on November 6, 2014 • One paper on correlates of family functioning was submitted to *Family Process* and is currently under review • Two additional papers on service engagement and military retention are currently being reviewed by internal colleagues and our study partners at Fort Jackson prior to journal submission

What was accomplished under these goals?

Initially, the project's goal was to recruit 150 Soldier+spouse pairs for interviews, and to conduct structure equation modeling on the resulting data. This would have enabled a more in-depth analysis of relationships among study variables than what we ultimately accomplished. As described in Section 5. Changes/Problems, below, the study encountered many difficulties recruiting Soldiers. This was in spite of several strategic, methodological adaptations made along the way to increase participation. Once recruiting began at Fort Jackson, the monthly caseflow was less than expected, and it took one year to identify 60 eligible Soldiers, of which 40 were successfully recruited into the study. Recruiting was cut off after a year due to resource and time constraints on the grant. The results of the study, described below and in manuscripts appended to this report, are thus based on a small sample and mostly focus on descriptive analyses with some very limited inferential statistics. Results are described for three Research Topics, following the topics of three manuscripts that resulted from the study. Prior to describing the results, however, sample descriptives are given in Exhibit 1, covering the Fort Bragg and Fort Jackson samples separately and combined.

Exhibit 1. Sample Descriptives

	Fort Jackson n=40	Fort Bragg n=7	Total n=47
Mean Age	37.2	26.3	35.6
% Male	92.5	100	94
Race/Ethnicity[1] (%)			
Hispanic	12.5	29.0	15.0
White	40.0	57.0	43.0
African American	30.0	14.0	28.0
Other	20.0	29.0	21.0
Multi-racial	10.0	0.0	8.5
Mean # Years in the Army	16.4	5.6	14.8
Mean # months since last deployment	28.0	2.1	24.1
Education (%)			
GED	25.0	14.3	34.0
High school diploma	5.0	85.7	6.4
Some college	32.5	0.0	27.7
Associates degree	17.5	0.0	14.9
Bachelors degree	10.0	0.0	8.5
Graduate or Professional degree	10.0	0.0	8.5

Mean # years married	9.8	5.1	9.1
Mean # deployments	3.3	1.9	3.1
Mean age of spouse	36.1	25.7	34.6
% Spouses who work outside home	50.0	28.6	46.8
Mean # children	1.8	1.5	1.8
Mean age of index child[2] (in years)	8.6	4.0	8.1

[1]Respondents were asked to choose from the following racial categories: white, African American, Asian/Pacific Islander, American Indian/Alaska Native, Other, and Multi-racial. Categories with no respondents are not included in the table.

[2]The index child was the child reported on by the spouse, and defined as the youngest preschool or school-age child in the household (age 3-17 years).

Among 60 eligible Soldiers who were recruited, 40 completed the survey. Data on non-participants was not available, without breaking confidentiality around having PTSD, the main inclusion criteria for the study. However, the demographics of our sample were compared to the Army as a whole (described later). Sample descriptives are shown in Table 1. Soldiers were mostly male, with an average age of 35.6 years. The self-reported racial distribution was 43 percent White, 28 percent African American, 8.5 percent multi-racial and 8.5 'Other'. Soldiers had been in the Army for an average of 14.8 years, and had been back from their most recent deployment for an average of 24.1 months. In terms of educational attainment, the most commonly endorsed categories were GED (34%), "some college" (27.7%) and Associate's degree (14.9%). Participating couples had been married or living together for an average of 9.1 years. Spouses were 34.6 years old, on average, and about half worked outside the home. On average, couples had 1.8 children. The average age of children selected for the spouse survey was 8.1 years. Out of 47 couples, 30 had a study-eligible child.

The demographics of our sample were in line with those for the Active Component of the Army (Defense Manpower Data Center [DMDC], 2013). Active duty Soldiers are 85.1 percent male. Among married Soldiers, their average age is 32.1 years, while that of their spouses is 31.2 years. Active duty Soldiers are 68.5% White, and 77.8% have a GED, some college, or an Associate's degree. Among Army spouses, 38% are employed. Finally, across all branches of active duty military, the average number of children in families with children is 2.0.

Research Topic 1. Correlates of family functioning in active duty Soldiers with PTSD (see Appendix 1 for full manuscript)

One of the first aims of the study was to examine, descriptively, perceptions of family functioning in Soldiers with PTSD and their spouses, and also to describe rates of spouse depression and anxiety, as well as child mental health problems. The data showed that 59.6% of Soldiers and 46.8% of spouses had family functioning scores in the clinical range. 48% of spouses scored in the clinical range for depression, and 35% scored in the clinical range for generalized anxiety. Almost a third of children scored in the clinical range on the Pediatric Symptoms Checklist. These prevalence rates are unsurprisingly high and fit with a large literature around the negative effects of combat PTSD on families.

Separately, a goal was to examine which variables in the study were significantly associated with family functioning, from both the Soldier's and the spouse's perspective. This was examined via simultaneous, linear regression using SPSS version 21. Results are shown in Exhibit 2 below. Significant correlates of Soldier ratings of family functioning included spouse depression and Soldier job satisfaction. Significant correlates of spouse ratings of family functioning included spouse depression and spouse service engagement. Length of marriage and number of times deployed were not correlated with Soldier or spouse ratings of family functioning.

Exhibit 2. Regression analysis of factors related to family functioning.

	Model 1 Soldier family functioning		Model 2 Spouse family functioning	
	β	SE	β	SE
Spouse depression	0.34*	0.02	0.31*	0.02
Spouse anxiety	0.17	0.22	0.16	0.18
Soldier job satisfaction	-0.35*	0.07	0.08	0.06
Service engagement[1]	0.04	0.03	0.37**	0.04

[1]Data on soldier service engagement were entered for Model 1; data on spouse service engagement were entered for Model 2.
*p<.05; **p<.01

An in-depth discussion of these findings is provided in the manuscript attached as Appendix 1. Briefly, the finding that spouse depression was the only variable significantly associated with both Soldier and spouse ratings of family functioning was not surprising and fits with much research showing that maternal depression is a robust predictor of familial stress, child mental health, and marital relationships. Our findings linking spouse mental health and family functioning underscore the idea of reciprocity of emotional and behavioral functioning within families (Fals-Stewart & Kelley, 2005). Given this reciprocity, providing help to the Soldier may not be enough to improve the whole family, or to have lasting impact on the Soldier himself. In fact, recent research suggests that marital conflict can exacerbate veteran PTSD (Interian et al, 2014). A depressed or highly anxious spouse may be unable to provide the emotional support that a service member with PTSD needs (Park, 2011; Tsai et al, 2012). Treatments for Soldier PTSD are most likely to be effective if the whole family is involved.

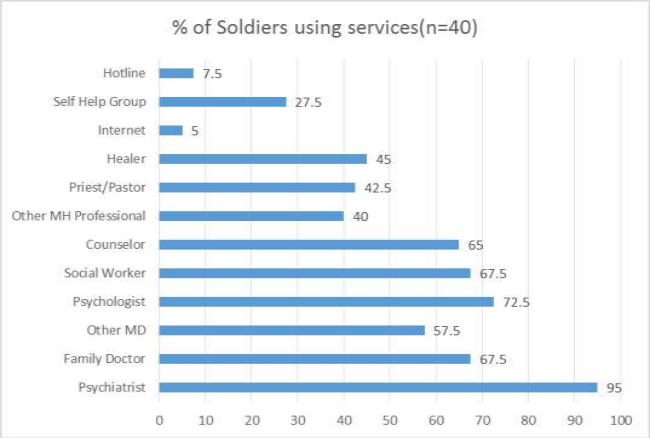
The study also found a significant relationship between family functioning and Soldier job satisfaction. It has long been known that poor family adjustment can impact a military member's job performance (e.g., Burnam, Meredith, Sherbourne, Valdez & Vernez, 1992). Furthermore, the family unit, and particularly, positive spouse attitudes and support reduce employee turnover behavior (see Huffman, Casper, & Payne, 2014 for review). The importance of providing support for military families to boost the service member's ability to focus on their duties was in part the rationale for developing family support systems on military bases worldwide. Despite increased effort to support military families in recent years, there has been little empirical research on the efficacy of family programs for post-9/11 families, and the degree to which they enable the service member to stay in the military. Especially in light of the recent toil on military families, and for some branches in particular (e.g., Army, Marines), workplace support for service members should be a priority (Huist et al, 2010).

Spouse mental health service engagement, defined as the total number of providers seen since the Soldier returned from his or her last deployment, was strongly associated with negative spouse ratings of family functioning. This finding may simply be confirmation that spouses in families who need the most help are more likely to engage in mental health services. It may also reflect higher mental health need among spouses who perceive negative familial functioning in their home; that is, negative day-to-day familial interactions may lead to spouse mental health symptoms, motivating them to seek treatment. The role of service engagement in family functioning and spouse and child mental health is an important area for future research.

Research Topic 2: Familial correlates of Soldier mental health treatment engagement for PTSD (see Appendix 2 for full manuscript)

A second aim of the grant was to assess family-level and military correlates of Soldier engagement in PTSD treatment. For this set of analyses, only data from the Fort Jackson sample were used, because service use is naturally confounded with site. That is, patterns and correlates of service use may differ between the two sites due to differences in workforce, service capacity, and other system-level factors. As shown in Figure 3 below, Soldiers reported using a wide array of providers. On average, Soldiers used 6 different providers since their last return from deployment, and on average attended more than 50 sessions. Nearly all Soldiers (90%) received a level of services that would be considered minimally adequate based on APA guidelines. A more in-depth discussion of service use in the sample is provided in Appendix 2.

Exhibit 3. Percent of Soldiers using professional and non-professional mental health services



We also examined correlates of Soldier mental health service use, focusing specifically on the number of sessions attended with a mental health professional (psychiatrist, psychologist, social worker, counselor, or other mental health professional). Results of this analysis are shown in Exhibit 4. Confirming our main study hypothesis, spouse mental health service engagement was significantly associated with Soldier mental health service engagement. Contrary to expectations, neither Soldier-rated family functioning or spouse depression scores were significantly associated with Soldier treatment engagement. Number of deployments, however, emerged as a significant predictor.

Exhibit 4. Regression analysis of factors related to Soldier mental health treatment engagement

	# visits to MH professionals		
	β	SE	p
Family functioning[a]	-0.18	26.72	0.256
# deployments	0.41	4.55	0.010
Spouse depression	0.05	1.32	0.776
Spouse # visits to MH professionals	0.58	0.26	0.001

[a]Rated by Soldiers using the Family Assessment Device

Much has been written about barriers to mental health treatment seeking by veterans with mental health needs. Other recent work has suggested a distinction between barriers to accessing care versus barriers to engaging in care; specifically, Elbogen and colleagues (2013) found that veterans with mental health problems not accessing treatment were more likely to believe they needed to solve problems on their own and medications would not help.[50] Their counterparts who had utilized care were more likely to endorse stigma beliefs related to treatment and not wanting to talk about war experiences. Our preliminary findings suggest that spouses may act as a facilitator in getting service members (and veterans) with PTSD to feel more comfortable talking about their experiences and fully engaging in the treatment process. Moreover, other emerging research suggests that spouses may be critical for treatment effectiveness. In a study of post 9/11 veterans, spouses provided key social support, which in turn mediated the association between veteran PTSD and social functioning.[51] Engaging spouses in treatment may not only bring more combat veterans through the door, but it may also aide in keeping them engaged and ultimately contribute to treatment effectiveness.

Total number of deployments also predicted Soldier treatment engagement. Soldiers in our study had been deployed anywhere from one to seven times, with an average of 3.3 times for the sample. Deployment is a critical variable in mental health research with service members because it implies familial separation, combat exposure in many cases, and the cumulative, negative effects of multiple deployments are becoming well-documented.[30,52-53] As a

factor in mental health service engagement, deployment may function in two important ways. First, multiple deployments may lead to higher severity of mental illnesses such as PTSD through the accumulation of multiple traumas. Mental health need is one of the strongest predictors of service access.[46] Second, multiple deployments yield multiple opportunities for system engagement by way of the required post-deployment health assessments (PDHA) which screen for health and mental health problems immediately upon return from deployment. Being subjected to multiple PDHAs increases the number of opportunities for a mental health referral. The role of deployment in mental health symptoms and treatment seeking is a subject of much research, and its predictive power in our sample gives the study some degree of validity, even though it does not in itself raise new research questions.

Research Topic 3: Family functioning and military job satisfaction in Soldiers with PTSD (see Appendix 3 for draft of a Brief Report)

Our final study topic was military job satisfaction, which we expected to ultimately relate to both family functioning and familial mental health service engagement. For this sub-study, the combined n=47 sample was used since the outcome of interest was not service use. The results are presented in a correlation table (Exhibit 5) and will be submitted as a Brief Report to *Military Medicine*.

As shown in past studies (Hidelang, Schwerin & Farmer, 2004; Wilcove, Schwerin & Wolosin, 2003; Vinokur et al, 2011) soldiers who were satisfied with life in the Army were more likely to remain in the Army at their next decision point. Contrary to previous findings (Pierce, 2014; Wilcove, Schwerin & Wolosin, 2003) family functioning did not predict reenlistment intentions. However, poor family functioning was related to decreased satisfaction with Army life. Treatment engagement was not related to satisfaction with life in the Army but Soldiers who had greater levels of treatment engagement were less likely to remain in the Army at their next decision point. If treatment engagement is an indicator of the severity of mental health impairment it may relate more directly to the Soldier's ability to perform their job functions and duties and thus weigh more heavily on their decision to leave the Army. Poor family functioning may cause the Soldier stress but it may not directly interfere with their ability to perform their job effectively. Although family functioning did not appear to directly impact intention to remain in the Army it may have an indirect impact on intention to remain as it decreases satisfaction with Army life which does relate directly to intention to remain.

Surprisingly, number of deployments or total number of months deployed were not related to satisfaction with Army life, intent to remain in the Army, or family functioning. However, soldiers were more likely to say their decision to leave the Army was the result of their last deployment. Soldiers who said their plans to stay or leave the Army had changed because of their last deployment were also involved in greater levels of treatment which may indicate that the trauma experienced in their last deployment has influenced their decision to leave the Army. Additionally, soldiers who had been back from their last deployment longer exhibited greater levels of treatment engagement and were less likely to remain in the Army at their next decision point. These findings may also indicate that the prolonged effects of trauma are weighing more heavily on Soldiers' decision to leave the Army than the stresses of Army life, in general.

Exhibit 5. Bivariate correlations among military job satisfaction variables and family and mental health treatment variables.

	Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Satisfaction with Army Life	3.20	1.31	-												
2.	Army Experience	3.62	.95	0.74**	-											
3.	Intent to Remain in Army	2.26	1.33	0.64**	0.50**	-										
4.	Change in Plans Because of Last Deployment	.60	.50	-0.45**	-0.20	-0.67**	-									
5.	FAD Total	2.17	.63	-0.32*	-0.20	-0.27	0.32*	-								
6.	FAD Agreement	.57	.50	0.30*	0.25	-0.06	-0.18	-0.13	-							
7.	Soldier or Spouse in FAD Clinical Range	.74	.44	-0.29*	-0.08	-0.08	0.41**	0.71**	0.50**	-						
8.	Soldier Number of Providers	4.87	2.92	-0.22	-0.14	-0.37*	0.40**	0.15	0.07	0.30*	-					
9.	Soldier Total Visits	85.54	72.69	-0.23	-0.23	-0.48**	0.37*	0.18	0.15	0.18	0.82**	-				
10.	Total number of Deployments	3.01	1.52													
11.	Total length of deployments (years)	2.69	1.24													
12.	Length of time since last deployment (years)	2.01	1.31	-0.21	-0.10	-0.47**	0.25	0.21	0.08	0.22	0.44**			0.54**		
13.	Time in Army	14.75	6.08	-0.07	0.10	-0.33	0.32*	0.10	0.29*	0.02	0.46**			0.47**	0.45**	-

*p<0.05 (two-sided); **p<0.01 (two-sided). Change in plans because of last deployment and FAD agreement are coded as 1 = Yes and 2 = No.

What opportunities for training and professional development has the project provided?
If the project was not intended to provide training and professional development opportunities or there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe opportunities for training and professional development provided to anyone who worked on the project or anyone who was involved in the activities supported by the project. "Training" activities are those in which individuals with advanced professional skills and experience assist others in attaining greater proficiency. Training activities may include, for example, courses or one-on-one work with a mentor. "Professional development" activities result in increased knowledge or skill in one's area of expertise and may include workshops, conferences, seminars, study groups, and individual study. Include participation in conferences, workshops, and seminars not listed under major activities.

This project has provided important professional development opportunities for the PI, most key of which is the relationship that has been cultivated between Dr. Stambaugh at RTI and Drs. Valentin and Cooper at Fort Jackson. This partnership may yield new proposal opportunities building from the findings of the study. Also, Dr. Stambaugh has presented the study results at ISTSS where she made contacts with other trauma researchers focused on military families. One paper has been submitted to a journal (*Family Process*), a second paper is awaiting internal approvals for submission to *Journal of Behavioral Health Services and Research*, and a third paper is in the final stages of completion after which it will be submitted as a Brief Report to *Military Medicine*. Finally, this project has enabled Dr. Stambaugh to forge relationships with her Co-Investigators, Drs. Kelley and Hourani, with whom she has now worked on several research proposals and papers.

How were the results disseminated to communities of interest?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Study results were presented at Fort Jackson while data were still being collected. Dr. Stambaugh spent a day there meeting with behavioral health clinicians to hear their thoughts about the preliminary results and help trouble-shoot recruiting issues. The research partners at Fort Jackson have reviewed the family functioning manuscript and are now reviewing the services paper before it is submitted to a journal. They have been offered the opportunity to edit and comment for co-authorship if they wish. Some of the findings from the services paper have led to fruitful discussions between the RTI project team and the Ft Jackson clinical staff who have better insight into the study sample and the service environment where the study took place. They have offered their full support for future research if the right opportunity arises.

Describe briefly what you plan to do during the next reporting period to accomplish the goals and objectives.

Nothing to report.

4. IMPACT: Describe distinctive contributions, major accomplishments, innovations, successes, or any change in practice or behavior that has come about as a result of the project relative to:

What was the impact on the development of the principal discipline(s) of the project?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe how findings, results, techniques that were developed or extended, or other products from the project made an impact or are likely to make an impact on the base of knowledge, theory, and research in the principal disciplinary field(s) of the project. Summarize using language that an intelligent lay audience can understand (Scientific American style).

The impact of the study is difficult to gauge with the findings not yet accepted for publication. If the papers are accepted, we anticipate that the most impactful finding may be the impact of spouse service engagement on Soldier service engagement. This finding has a direct clinical implication – that bases should provide outreach to spouses living with Soldiers who have or are at risk for PTSD. Moreover, the finding that spouse depression was a strong predictor of perceptions of family functioning gives added strength to emerging research showing that the mental health and functioning of military families is important for service members' fitness for duty. In this sense, the study met its goal of demonstrating the importance of families for addressing the issue of Soldier PTSD.

What was the impact on other disciplines?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe how the findings, results, or techniques that were developed or improved, or other products from the project made an impact or are likely to make an impact on other disciplines.

Nothing to Report

What was the impact on technology transfer?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe ways in which the project made an impact, or is likely to make an impact, on commercial technology or public use, including:

- *transfer of results to entities in government or industry;*
- *instances where the research has led to the initiation of a start-up company; or*
- *adoption of new practices.*

What was the impact on society beyond science and technology?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe how results from the project made an impact, or are likely to make an impact, beyond the bounds of science, engineering, and the academic world on areas such as:

- *improving public knowledge, attitudes, skills, and abilities;*
- *changing behavior, practices, decision making, policies (including regulatory policies), or social actions; or*
- *improving social, economic, civic, or environmental conditions.*

Nothing to Report.

5. CHANGES/PROBLEMS: The Project Director/Principal Investigator (PD/PI) is reminded that the recipient organization is required to obtain prior written approval from the awarding agency Grants Officer whenever there are significant changes in the project or its direction. If not previously reported in writing, provide the following additional information or state, "Nothing to Report," if applicable:

Changes in approach and reasons for change

Describe any changes in approach during the reporting period and reasons for these changes. Remember that significant changes in objectives and scope require prior approval of the agency.

This study began in 2008 with a plan to conduct an anonymous, call-in survey of Soldiers returning to Fort Bragg, NC from deployment to Iraq or Afghanistan. The HRPO officer assigned to the study at that time felt the study had to be anonymous, or else Soldiers would likely not participate. We devised a complex recruiting strategy that allowed Soldiers and spouses to call in anonymously to complete the survey, using numeric identifiers to link couples. We attempted four rounds of recruiting at Fort Bragg in Year 2 of the project, over an approximately 1-year span. When recruiting was slow, eligibility criteria were relaxed at each recruiting round, in hopes that would yield more participants. In that time, out of more than 2,000 Soldiers who were told about the study either by a provider at the time of their PDHA, or by a study associate in a group gathering, only 7 called in and completed the survey. At that point, we determined, in coordination with the DoD Project Officer, that a better strategy would be to obtain a list sample from DMDC. We filled out an application, working with multiple liaisons at DMDC over a 1-year period, yet never received a list sample due to staff turnover at DMDC and non-responsiveness on their part. At that point, we were entering Year 4, and Fort Jackson expressed an interest in the study. Given their relatively low caseflow and the remaining budget for the project, we scaled down our target sample size and analysis plan, again in coordination with the DoD Project Officer. In the final 3 years of the project, we obtained approvals from Fort Jackson, HRPO, and RTI to conduct a call-out survey with Soldiers at Fort Jackson; collected data over a one-year period; and analyzed and disseminated results in the final year of the project. The sample was smaller in the end than we originally anticipated when the grant was funded. The aims thus became more exploratory and analyses more descriptive. We believe the study generated important findings that will spark more and larger studies in the area of military families and mental health treatment engagement. Further, as a professional development activity, the grant served its purpose and more, connecting the PI with two local military bases, and exposing her to the field of researchers at conferences, meetings, and through submission of peer-review manuscripts.

Actual or anticipated problems or delays and actions or plans to resolve them
Describe problems or delays encountered during the reporting period and actions or plans to resolve them.

The recruiting problems described in the section above led to several delays in the project schedule. Two No-Cost Time Extensions were granted in Years 3 and 5 to attempt new recruiting strategies. When recruiting took longer than expected at Fort Jackson due to monthly caseflow, a brief 2-month extension was granted at the end of the project to complete data analyses.

Changes that had a significant impact on expenditures
Describe changes during the reporting period that may have had a significant impact on expenditures, for example, delays in hiring staff or favorable developments that enable meeting objectives at less cost than anticipated.

Because RTI operates on total time accounting, no monies were spent when work was slow or not being conducted (e.g., while waiting for DMDC). This enabled us to continue with the study and try different recruiting methods when the original method failed.

Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents
Describe significant deviations, unexpected outcomes, or changes in approved protocols for the use or care of human subjects, vertebrate animals, biohazards, and/or select agents during the reporting period. If required, were these changes approved by the applicable institution committee (or equivalent) and reported to the agency? Also specify the applicable Institutional Review Board/Institutional Animal Care and Use Committee approval dates.

Significant changes in use or care of human subjects

Nothing to Report.

Significant changes in use of biohazards and/or select agents

Nothing to Report.

6. PRODUCTS: List any products resulting from the project during the reporting period. If there is nothing to report under a particular item, state "Nothing to Report."

- **Publications, conference papers, and presentations**

Report only the major publication(s) resulting from the work under this award.

Journal publications. *List peer-reviewed articles or papers appearing in scientific, technical, or professional journals. Identify for each publication: Author(s); title; journal; volume: year; page numbers; status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).*

Stambaugh, L., Kelley, M.L., Ohse, D., & Hourani, L. (under review). Correlates of Family Functioning in Active Duty Soldiers with PTSD and their Spouses. *Family Process.* [Appendix 1]

Stambaugh, L., Kelley, ML, & Ohse, D.. (in preparation). Familial correlates of mental health service engagement in a sample of active duty Soldiers with PTSD. *Journal of Behavioral Health Services Research*. [Appendix 2]

Ohse, D., Stambaugh, L., Kelley, M.L. (in preparation). Factors influencing reenlistment intentions of Soldiers with PTSD. *Military Medicine*. [Appendix 3]

Stambaugh, L.F., Hourani, L.L., & Stockdale, J.D. (2009, August). *Family functioning and soldier treatment engagement for post traumatic stress disorder*. Presented at Congressionally Directed Medical Research Programs Military Health Research Forum, Kansas City, MO.

Stambaugh, L. F., Ohse, D. M., Hourani, L. L., Kelley, M., & Valentin, M. (2014, November). *Family functioning and soldier PTSD: Correlates of treatment engagement.* Poster presented at 30th annual meeting of the International Society of Traumatic Stress Studies, Miami, FL.

Books or other non-periodical, one-time publications. *Report any book, monograph, dissertation, abstract, or the like published as or in a separate publication, rather than a periodical or series. Include any significant publication in the proceedings of a one-time conference or in the report of a one-time study, commission, or the like. Identify for each one-time publication: Author(s); title; editor; title of collection,*

if applicable; bibliographic information; year; type of publication (e.g., book, thesis or dissertation); status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).

Nothing to Report.

Other publications, conference papers, and presentations. *Identify any other publications, conference papers and/or presentations not reported above. Specify the status of the publication as noted above. List presentations made during the last year (international, national, local societies, military meetings, etc.). Use an asterisk (*) if presentation produced a manuscript.*

Stambaugh, L.F. & Ohse, D. (March, 2014). *Family Functioning and Soldier PTSD: Correlations of treatment engagement and military job satisfaction*. Preliminary findings presented at Department of Psychiatry In-Service Meeting, Moncrief Army Community Hospital, Fort Jackson, SC.

- **Website(s) or other Internet site(s)**

List the URL for any Internet site(s) that disseminates the results of the research activities. A short description of each site should be provided. It is not necessary to include the publications already specified above in this section.

Nothing to Report.

- **Technologies or techniques**

Identify technologies or techniques that resulted from the research activities. In addition to a description of the technologies or techniques, describe how they will be shared.

Nothing to Report.

- **Inventions, patent applications, and/or licenses**

  Identify inventions, patent applications with date, and/or licenses that have resulted from the research. State whether an application is provisional or non-provisional and indicate the application number. Submission of this information as part of an interim research performance progress report is not a substitute for any other invention reporting required under the terms and conditions of an award.

Nothing to Report.

- **Other Products**

  Identify any other reportable outcomes that were developed under this project. Reportable outcomes are defined as a research result that is or relates to a product, scientific advance, or research tool that makes a meaningful contribution toward the understanding, prevention, diagnosis, prognosis, treatment, and/or rehabilitation of a disease, injury or condition, or to improve the quality of life. Examples include:

  - *data or databases;*
  - *biospecimen collections;*
  - *audio or video products;*
  - *software;*
  - *models;*
  - *educational aids or curricula;*
  - *instruments or equipment;*
  - *research material (e.g., Germplasm; cell lines, DNA probes, animal models);*
  - *clinical interventions;*
  - *new business creation; and*
  - *other.*

Nothing to Report.

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

What individuals have worked on the project?
Provide the following information for: (1) PDs/PIs; and (2) each person who has worked at least one person month per year on the project during the reporting period, regardless of the source of compensation (a person month equals approximately 160 hours of effort). If information is unchanged from a previous submission, provide the name only and indicate "no change."

Example:

Name: *Mary Smith*
Project Role: *Graduate Student*
Researcher Identifier (e.g. ORCID ID): 1234567
Nearest person month worked: *5*

Contribution to Project: *Ms. Smith has performed work in the area of combined error-control and constrained coding.*
Funding Support: *The Ford Foundation (Complete only if the funding support is provided from other than this award).*

Name:	Dawn Ohse
Project Role:	Data Collection Task Leader
Nearest person month worked:	6
Contribution to Project:	Ms. Ohse is a Survey Methodologist at RTI who led the day-to-day data collection operations. She oversaw the recruitment database and giftcard distribution list. She is lead author for the brief report on family functioning and military retention.
Name:	Jason Stockdale, M.S.
Project Role:	Data Collection Task Leader
Nearest person month worked:	6
Contribution to Project:	Mr. Stockdale oversaw data collection in Year 2 of the project when we were recruiting Soldiers at Fort Bragg, NC.

Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

If the active support has changed for the PD/PI(s) or senior/key personnel, then describe what the change has been. Changes may occur, for example, if a previously active grant has closed and/or if a previously pending grant is now active. Annotate this information so it is clear what has changed from the previous submission. Submission of other support information is not necessary for pending changes or for changes in the level of effort for active support reported previously. The awarding agency may require prior written approval if a change in active other support significantly impacts the effort on the project that is the subject of the project report.

Nothing to report.

What other organizations were involved as partners?
If there is nothing significant to report during this reporting period, state "Nothing to Report."

Describe partner organizations – academic institutions, other nonprofits, industrial or commercial firms, state or local governments, schools or school systems, or other organizations (foreign or domestic) – that were involved with the project. Partner organizations may have provided financial or in-kind support, supplied facilities or equipment, collaborated in the research, exchanged personnel, or otherwise contributed.
Provide the following information for each partnership:
Organization Name:
Location of Organization: (if foreign location list country)
Partner's contribution to the project (identify one or more)

- *Financial support;*
- *In-kind support (e.g., partner makes software, computers, equipment, etc., available to project staff);*
- *Facilities (e.g., project staff use the partner's facilities for project activities);*
- *Collaboration (e.g., partner's staff work with project staff on the project);*
- *Personnel exchanges (e.g., project staff and/or partner's staff use each other's facilities, work at each other's site); and*
- *Other.*

Moncrief Army Community Hospital in Fort Jackson, SC, participated as an in-kind partner in screening eligible Soldiers for the study. They were technically classified as non-engaged by their IRB because they did not recruit participants.

Dr. Michelle Kelley at Old Dominion University in Norfolk, VA, participated as a consultant throughout the life of the project. She obtained consultant compensation as originally budgeted for the project and co-authored all manuscripts resulting from the study. She advised on instrumentation around military job satisfaction, and gave input on strategies for recruiting Soldiers during every iteration of the study.

8. SPECIAL REPORTING REQUIREMENTS

COLLABORATIVE AWARDS: For collaborative awards, independent reports are required from BOTH the Initiating PI and the Collaborating/Partnering PI. A duplicative report is acceptable; however, tasks shall be clearly marked with the responsible PI and research site. A report shall be submitted to **https://ers.amedd.army.mil** for each unique award.

QUAD CHARTS: If applicable, the Quad Chart (available on https://www.usamraa.army.mil) should be updated and submitted with attachments.

9. APPENDICES: Attach all appendices that contain information that supplements, clarifies or supports the text. Examples include original copies of journal articles, reprints of manuscripts and abstracts, a curriculum vitae, patent applications, study questionnaires, and surveys, etc.

Appendix 1: Manuscript under review:

Stambaugh, L., Kelley, M.L., Ohse, D., & Hourani, L. (submitted). Correlates of Family Functioning in Active Duty Soldiers with PTSD and their Spouses. *Family Process.*

Correlates of Family Functioning in Active Duty Soldiers with PTSD and their Spouses

Leyla F. Stambaugh, Ph.D.

RTI International

Michelle L. Kelley, Ph.D.

Old Dominion University

Dawn Ohse, Ph.D.

RTI International

Laurel Hourani, Ph.D.

RTI International

Abstract

This study surveyed 47 active duty Soldiers with post traumatic stress disorder following deployment to Iraq and Afghanistan, and their spouses (n=94 total respondents) to analyze family functioning, mental health service engagement, and mental health symptoms of spouses and their youngest school age child. **Results:** 59.6% of Soldiers and 46.8% of spouses had family functioning scores in the clinical range. 48% of spouses scored in the clinical range for depression, and 35% scored in the clinical range for generalized anxiety. Almost a third of children scored in the clinical range on the Pediatric Symptoms Checklist. Significant correlates of Soldier ratings of family functioning included spouse depression and Soldier job satisfaction. Significant correlates of spouse ratings of family functioning included spouse depression and spouse service engagement. Length of marriage and number of times deployed were not correlated with Soldier or spouse ratings of family functioning. **Conclusions:** Soldiers and spouses have different perspectives on family functioning and should be studied independently. That said, among Soldiers with PTSD, many Soldiers and their spouses perceived high levels of familial dysfunction. Spouse depression may negatively impact family functioning as viewed by both Soldiers and spouses. The association between Soldier job satisfaction and family functioning is important and in need of further study. Finally, the relationships between familial mental health service engagement and overall family functioning in military families is a key area for further study, especially in light of the known gap between mental health needs and receipt of effective services.

More than 2.5 million U.S. service members have been deployed to conflict zones in Iraq and Afghanistan since 2001, with the Army providing the bulk of deployments (Baiocchi, 2013). Alarmingly, a significant minority of service members deployed to conflict zones develop posttraumatic stress disorder (PTSD) during deployment or in the post-deployment readjustment period. Although rates vary, studies have shown that among U.S. veterans of the conflicts in Iraq and Afghanistan, anywhere from 4 percent to 22 percent will develop PTSD (Milliken, Auchterlonie, & Hoge, 2007; Seal et al, 2007; Richardson, Frueh & Acierno, 2010). Combat-related PTSD is associated with substance abuse (Fetzner & Abrams, 2013; Kelley et al., 2013), unemployment (Kulka et al, 1990), divorce (Riggs, Byrne, Weathers, & Litz, 1998), intimate partner violence (Wolf, Harrington, Reardon, Castillo, Taft, & Miller, 2013), and spouse depression and anxiety (Galovsky & Lyons, 2004).

Veterans of OIF/OEF/OND are parents to more than two million children (Chartrand et al, 2008), and emerging research has focused on the impact of military deployment on families. (Blow et al., 2013; Card et al., 2011; Erbes et al., 2012; Everson et al., 2013; Flake et al., 2009; Lester et al., 2010). Given the duration of the conflicts in Iraq and Afghanistan, there have been many calls for research on the impact of deployment related disorders on family functioning and the psychological health of military spouses/partners and children (Department of Defense, Department of Veterans Affairs & Department of Health and Human Services, 2013; Lester et al, 2010; Maholmes, 2012). The current study addresses these calls by focusing on family functioning and mental health of spouses/partners and children of recent-era Soldiers with PTSD.

Veteran PTSD and spouse/partner mental health

Spouses of service members with PTSD frequently experience depression, anxiety, loneliness, hostility, and decreased optimism about the future (see Galovsky & Lyons, 2004, for review of 100 studies). Westerink and Giarratano (1999) suggest that wives often act as a buffer between the service member and the rest of the world. In a study of post 9/11 veterans, spouses provided key social support, which in turn mediated the association between veteran PTSD and social functioning (Tsai et al, 2012). When partner support is compromised due to a mental health disorder, the effects reverberate throughout the family. Given the liaison that spouses may play between the family and the larger community, understanding the psychological functioning of spouses is essential for effectively treating combat-related PTSD (Calhoun, Beckham, & Bosworth, 2002; Manguno-Mire et al, 2007; Norris, Byrne, Diaz, & Kaniasty, 2007).

Veteran PTSD and spouse/partner relationship

Numerous studies involving Vietnam and Gulf War veterans have demonstrated that PTSD is associated with relationship conflict (Beckham, Lytle, & Feldman, 1996; Cook et al, 2004; Evans, McHugh, Hopwood, & Watt, 2003). For instance, among Vietnam veterans, reports of relationship distress were significantly higher for couples in which the veteran had PTSD than for couples in which the veteran did not have PTSD (Riggs et al, 1998). More recent research focusing on post-9/11 veterans and their intimate partners has shown that combat-related PTSD can damage relationship functioning over time (Erbes et al 2012). A growing body of literature has implicated that PTSD plays a role in intimate partner violence among post-9/11 veterans (Monson, Taft & Fredman, 2009; Wolf et al., 2013). Such negative interactions between spouses can not only erode their relationship, but can impact other family members as well.

Veteran PTSD and child mental health

The impact of PTSD and its effects on family functioning may also extend to greater risk for psychopathology among children in military families. Among children of Vietnam and Gulf War veterans, several large-scale studies have found that combat-related PTSD predicts child depression, stress, and behavior problems (Caselli & Motta, 1995; Ruscio, Weathers, King, & King, 2002). Other studies with small samples (n=7 to 24) or relying on retrospective, historical accounts of adult offspring who grew up in families affected by veteran PTSD have reported similar findings (Davidson, Smith & Kudler, 1989; Jacobsen, Sweeney, & Racusin, 1993). In one of the few studies of recent-era veterans, a small-scale study (n = 54 couples), trauma symptoms among post-9/11 veterans were correlated with both veterans' and their partners' independent reports of their children's internalizing (i.e., depression, anxiety, somatic complaints) symptoms. Further, partners' reports of secondary trauma were correlated with Soldiers' reports of children's internalizing scores, and partners' reports of both internalizing and externalizing (e.g., aggression, noncompliance) symptoms in children (Herzog, Everson, & Whitworth, 2011). Conversely, maternal support has been shown to protect against mental health problems in military youth (Morris & Age, 2009). The importance of maternal functioning is heightened in families struggling with veteran PTSD, because spouses of these veterans are at risk for mental health problems themselves, which can negatively impact parenting (Oyserman et al, 2002) and related child mental health.

Applying Family Systems Theory to the issue of veteran PTSD

Given what is known about the reverberating effects of combat-related PTSD within families, the issue of PTSD in Soldiers returning from war should be viewed through the lens of family systems theory. Family systems theory posits that families function as working systems in

which no member of the system exists in isolation (Minuchin, 1974). All family members, or parts of the system, are interdependent. In the context of combat-related PTSD, Fals-Stewart and Kelley (2005) discussed the notion of reciprocal causality wherein psychological symptoms within a family unit are bi-directional, leading to a 'vicious cycle' of escalating malfunction within the family system. This argument is supported by findings showing that stressful family environments are negatively associated with PTSD treatment outcomes (Tarrier, Sommerfield, & Pilgrim, 1999). The conceptualization of PTSD in military research has begun to make an important shift to thinking about these issues as family issues, not just military personnel issues.

The family issues discussed here and prioritized by the DoD are further important for Soldier job satisfaction as demonstrated by Wilcove's conceptual model in which family factors, specifically the marital relationship and parent-child relationships, predict perceived quality of life in the military as well as organizational commitment and re-enlistment intentions. This model has been validated in the Air Force (Wilcove, Schwerin, & Wolosin, 2003) and the Marine Corps (Hindelang, Schwerin, & Farmer, 2004). Ultimately, Soldiers who engage in effective mental health treatment stand to increase their day-to-day family functioning, job satisfaction, and overall quality of life.

The present study uses a systemic framework to study family functioning, family mental health, service engagement, and job satisfaction among families of Soldiers with PTSD (Dirkzwager, Bramsen, Adèr, & van der Ploeg, 2005; Norris et al, 2007). The purpose of this study was to examine family functioning, spouse and child mental health, and Soldiers' job satisfaction in families of recent-era military members with PTSD. The goals were to identify correlates of family functioning in our sample and generate hypotheses for new areas of research

on the unique needs of military families impacted by mental health sequelae of multiple deployments and associated combat duty.

Methods

Recruiting

Active duty Soldiers were recruited at Fort Jackson, SC, following approval from HRPO and all relevant IRBs. All Soldiers presenting to the Behavioral Health Clinic at Moncrief Army Community Hospital were screened for eligibility on-site and those meeting all inclusion criteria were asked for permission to be contacted about the study. Soldiers were eligible if they had current PTSD (assessed by their clinician using the PTSD Checklist – Military version), had served in Iraq or Afghanistan in the last five years, spoke English, and had a spouse or domestic partner who also spoke English. Spouses and domestic partners were recruited only if their Soldier consented and gave contact information. Among Soldiers who participated (n=40), 100% of spouses completed the study, yielding questionnaire data and interviews with 40 Soldier-spouse dyads. Spouses who completed the survey were compensated with $50 giftcards.

In addition, active duty Soldiers were recruited at Fort Bragg, NC at the time of their 6-month post deployment health reassessment (PDHRA). Soldiers endorsing two or more symptoms of PTSD were given a flyer with a toll-free number to call in and complete the study. Approximately 40 flyers were distributed by PDHRA clinic staff over a 9-month period. Each flyer had a unique, numeric identifier, which was used to link Soldiers with their spouses. Seven Soldiers and their spouses called in to complete the survey. These participants are included in our analyses because they add important demographic variation to the study and increase power to detect significant associations. For example, the Fort Bragg participants were younger (average

age 26.3 years versus 37.2 years) and married for fewer years (5.1 years versus 9.8 years). Descriptive data for the Fort Bragg sample is shown separately in Table 1.

Although the Fort Bragg sample size is very small, and they differ from the Fort Jackson sample in some demographics and the method used to recruit them, they are included in the study because they provide critical variation on some of the key study variables. For example, they extend the age and education distributions downward, making the total sample more in line with Army demographics. In addition, because none of the Fort Bragg participants accessed mental health services (based on self report), they provided critical zeroes to the service engagement variable. Because the Fort Jackson participants were recruited from behavioral health clinics, they were by definition engaged in services. Overall, the decision to include the Fort Bragg participants was based on our assessment that their contributions to external validity outweighed their threat to internal validity; moreover they provide additional statistical power to the small sample size.

Survey Methodology

The study was conducted via Computer Assisted Telephone Interview, using trained lay interviewers. Standardized instruments were programmed into a Blaise interview and data were recorded by interviewers in real-time. Interviews were conducted over a 14-month period from June 2013 to August 2014. Soldiers were interviewed about their military background, job satisfaction, family functioning, and use of mental health services. Spouses were asked about family functioning, depression and anxiety symptoms, and use of mental health services. In addition, in couples that had at least one child age 3-17 years, spouses were asked questions about mental health and service use in their youngest preschool or school-age child.

Instrumentation

Family functioning. Each partner completed the Family Assessment Device (FAD; Epstein, Baldwin, & Bishop, 1983), a 60-item, self-report questionnaire that assesses global family functioning, as well as six subdomains: *Problem Solving*, *Communication*, *Family Roles*, *Affective Responsiveness*, *Affective Involvement*, and *Behavior Control*. The FAD, used widely in research on child development, marital relationships, and family therapy, has been shown to distinguish between families with and without psychopathology (Kabacoff, Miller, Bishop, Epstein, & Keitner, 1990; Stevenson-Hinde & Akister, 1995). All items are rated on a scale from 1 to 4, and and average score greater than 2 is considered in the clinical range, or in need of referral for family counseling.

Spouse psychological distress. Spouses completed measures of current depression and anxiety. Current depression was measured using the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The CES-D includes cut-off scores that indicate high risk for clinical depression. The CES-D has demonstrated acceptable sensitivity and specificity and high internal consistency (Lewinsohn, Seeley, Roberts, & Allen, 1997). The CES-D has been used successfully across wide age ranges (Lewinsohn et al., 1997), and in Canadian military service members (e.g., Lapierre, Schwegler, & LaBauve, 2007), and military partners (Dolphin, Steinhardt, & Cance, 2015). Current anxiety symptoms were measured using the M.I.N.I. International Neuropsychiatric Interview (M.I.N.I. 6.0), a short, structured diagnostic interview that includes separate modules for the most common DSM-IV and ICD-10 psychiatric disorders (Sheehan et al., 1997). The M.I.N.I. has been validated against the Composite International Diagnostic Interview and the Structured Clinical Interview for DSM-IV in clinical populations

(Lecrubier et al., 1997). The M.I.N.I. is the most widely used psychiatric structured diagnostic interview instrument in the world, employed by mental health professionals and health organizations in more than 100 countries (http://www.medical-outcomes.com/index/mini).

Child psychological distress. Spouses completed the Pediatric Symptom Checklist (PSC; Jellinek & Murphy, 1990), a 17-item, questionnaire designed as a brief screening inventory for physicians and mental health providers to assess emotional and behavioral functioning of children between the ages of 3 and 16. Items are scored "never," "sometimes," or "often." An overall score is obtained by assigning a 0, 1, or 2, respectively to each item and summing the total number of points. Higher scores indicate greater impairment. A score of 28 has been empirically established as a clinical cut-off score for children 6 and older; for children age 3 to 5 four items are not scored and a cut-off of 24 reflects meaningful levels of impairment. The validity of the PSC has been demonstrated in over 100 studies published in pediatric, psychology, education, and psychiatry journals with two-thirds of children with scores above the cut-off identified as impaired by clinicians (Jellinek et al., 1999).

Soldier and spouse mental health service use and engagement. The Composite International Diagnostic Interview (CIDI) was developed by the World Health Organization to assess adult psychiatric diagnoses and mental health service use. The CIDI is administered by lay interviewers, and has been used in large population studies such as the National Comorbidity Study-Replication (Kessler, Olfson, & Berglund, 2003). The services component of the CIDI, administered to both Soldiers and their spouses in this study, asks respondents about a variety of professional and non-professional services they have used in relation to a mental health problem. For the current study, the time period for recall was "since you (your spouse) returned from your

(his/her) most recent deployment. The treatment engagement variable for this study was derived as total number of providers seen since returning from the most recent deployment.1

Child mental health service use and engagement. The Child and Adolescent Service Assessment (CASA; Burns, Angold, Magruder-Habib, Costello & Patrick, 1996) is a structured interview administered to parents of children age 4-18 years. Respondents indicate whether their child, over a given time period, has used special services in the following settings: school, Department of Social Services, Juvenile Justice, outpatient health, specialty Mental Health, a minister or priest, a crisis center, a residential treatment center, or inpatient hospitalization. Respondents are then asked how many visits/sessions were completed. The CASA has demonstrated acceptable test-retest reliability in clinical samples and concurrent validity with administrative data on service use (Ascher, Farmer, Burns, & Angold, 1996; Farmer, Angold, Burns, & Costello, 1996). Spouses were asked about child service use in the period since the Soldier returned home from deployment.

Soldier job satisfaction. The research literature on quality of life in the military was reviewed to identify a measure of job satisfaction. The instrument chosen assesses satisfaction with military service and the likelihood of re-enlistment at the Soldier's next Expiration of Active Obligated Service. A third item probes about the reasons for the Soldier's re-enlistment plans or, alternatively, the reasons for their indecision in cases where Soldiers report they are undecided. Studies using these types of questions have identified associations between both family- and job-related factors and military job satisfaction and re-enlistment plans (Hindelang, Schwerin, & Farmer, 2004; Kelley et al., 2001; Kelley, Schwerin, Farrar, & Lane, 2005). For the

1 The full list of providers was as follows: psychiatrist, psychologist, social worker, family doctor, other medical

current study, Soldier job satisfaction was derived from the item about satisfaction with military service, scored on a 5-point likert scale.

Study participants

Among 60 eligible Soldiers who were recruited at Fort Jackson, 40 completed the survey. At Fort Bragg, seven Soldiers completed the survey out of a total of approximately 40 who endorsed two or more symptoms of PTSD at the PDHRA and received a study flyer. Data on non-participants was not available from either base, without breaking confidentiality around having PTSD, the main inclusion criteria for the study. However, the demographics of our sample were compared to the Army as a whole (described later). Sample descriptives are shown in Table 1. Soldiers were mostly male, with an average age of 35.6 years. The self-reported racial distribution was 43 percent White, 28 percent African American, 8.5 percent multi-racial and 8.5 'Other'. Soldiers had been in the Army for an average of 14.8 years, and had been back from their most recent deployment for an average of 24.1 months. In terms of educational attainment, the most commonly endorsed categories were GED (34%), "some college" (27.7%) and Associate's degree (14.9%). Participating couples had been married or living together for an average of 9.1 years. Spouses were 34.6 years old, on average, and about half worked outside the home. On average, couples had 1.8 children. The average age of children selected for the spouse survey was 8.1 years. Out of 47 couples, 30 had a study-eligible child.

[Insert Table 1 about here]

The demographics of our sample are in line with those for the Active Component of the Army (Defense Manpower Data Center [DMDC], 2013). Active duty Soldiers are 85.1 percent

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doctor, counselor, healer, priest, nurse, other mental health professional.

male. Among married Soldiers, their average age is 32.1 years, while that of their spouses is 31.2 years. Active duty Soldiers are 68.5% White, and 77.8% have a GED, some college, or an Associate's degree. Among Army spouses, 38% are employed. Finally, across all branches of active duty military, the average number of children in families with children is 2.0.2

Results

Family functioning and family mental health

More than half of Soldiers (59.6%) and 46.8 percent of spouses had family functioning scores in the clinical range. Agreement between Soldiers and spouses was 58% for scores above the clinical range. Among spouses, 48% met the clinical cut-off identifying individuals at risk for depression (i.e., 16 or higher) and 35% had anxiety scores in the clinical range, with more than half (55%) of spouses scoring in the clinical range for either depressive symptoms or anxiety. Based on parent report, 30 percent of selected children (n = 30) scored in the clinical range on the Pediatric Symptom Checklist (above 28), meaning that they displayed symptoms of psychological distress that would warrant a referral to child mental health services.

Bivariate correlations

Pearson correlations (two-sided) were run between key study variables. Results are shown in Table 2. Soldier-rated family functioning (higher scores indicate worse family functioning) was positively correlated with spouse mental health problems and negatively correlated with soldier job satisfaction. Spouse-rated family functioning scores were positively related to spouse anxiety, spouse depression, child mental health, and both soldier and spouse treatment engagement. Spouse anxiety and depression were positively correlated with each other and with

2 Data on number of children were not separated by military branch in the 2013 DMDC demographics report.

child mental health symptoms. Spouse anxiety and depressive symptoms were also positively correlated with spouse treatment engagement. Although soldier job satisfaction was associated with soldier-rated family functioning, it was not significantly related to any other variable in the study. Length of marriage and total number of months deployed were not significantly correlated with any of the family functioning, spouse and child mental health, or service engagement variables.

[Insert Table 2 about here]

Regression models

Two simultaneous regression models were run using SPSS Statistics 21 (IBM, 2012), using family functioning as the dependent variable (Soldier-rated for Model 1, spouse-rated for Model 2). Four independent variables were chosen for each model, drawing from significant correlations in the bivariate table, and using rules of thumb for adequate power in models examining relationships among variables (VanVoorhis & Morgan, 2007), specifically that a sample size of 'around 50' or ten cells per predictor are needed. Predictors entered in each model were spouse depression scores, spouse anxiety, Soldier job satisfaction, and treatment engagement (Soldiers for Model 1, spouses for Model 2). Results from both models are shown in Table 3. Spouse depression was a significant predictor in both models, with higher depression scores predicting worse ratings of family functioning. Soldier job satisfaction also predicted Soldier ratings of family functioning. That is, lower job satisfaction predicted worse (higher) family functioning scores. Spouse service engagement predicted spouse perceptions of family functioning, that is, higher service engagement predicted worse (higher) family functioning. Spouse anxiety was not a significant predictor of family functioning in either model.

[Insert Table 3 about here]

Discussion

The focus of this exploratory study was to examine inter-relationships among family functioning, spouse and child mental health symptoms and service use, and Soldier job satisfaction among active duty Soldiers with PTSD, and to provide preliminary data in an effort to advance our understanding of the unique needs of military families impacted by PTSD. In general, study findings support family systems theory and are consistent with other research showing high risk for spouse and child mental health disorders and negative familial interactions in military families in which the service member has PTSD (Caselli & Motta, 1995; Derkswager et al, 2005; Galovsky & Lyons, 2004; Lester et al, 2010). Furthermore, the study provides preliminary evidence of strong associations among familial mental health, treatment seeking, and military job satisfaction in Soldiers with PTSD.

For more than half of the couples in the study, ratings of family functioning by atleast one spouse were in the clinical range. As a group, Soldiers reported more problems in family functioning than spouses. This finding underscores the need for treatment for many families with a traumatized service member. Family Readiness Centers, initially set up by the Department of Defense on military bases to help prepare families for deployment and support them throughout deployment, are perhaps a natural home for this type of post-deployment therapeutic support and coaching. Family supports should be available during all cycles of deployment, including reintegration (Pincus, 2001; Wadsworth, 2013).

Consistent with prior research that has demonstrated spouses of service members with PTSD are at elevated risk for depression and anxiety (Galovsky & Lyons, 2004), more than half

of spouses in our sample had anxiety or depressive symptoms that fell in the clinical range. Spouse mental health was, in turn, related to child psychological stress. This finding supports prior research showing that maternal depression is a robust predictor of child mental health problems (see Oyserman, 2002, for review). Although the nature of cross-sectional data makes causal interpretations impossible, it is possible that service member PSTD may extend to spouse and child mental health and contribute to maladaptive family processes. In the case of a veteran with PTSD, spousal depression may develop or worsen in response to the Soldier's symptoms. Moreover, parenting style can be affected by mental illness (Oyserman et al, 2000). For example, a mother with depression may be less sensitive to her child's cues, and may feel less efficacious as a parent, decreasing her application of positive parenting techniques. The importance of treating spouse depression and teaching positive parenting skills thus cannot be overemphasized in military families dealing with combat-related PTSD. Outreach programs targeted at spouses and children (e.g., school screenings) may be important for engaging spouses in treatment.

Our findings linking familial mental health and family functioning underscore the idea of reciprocity of emotional and behavioral functioning within families (Fals-Stewart & Kelley, 2005). Given this reciprocity, providing help to the Soldier may not be enough to improve the whole family, or to have lasting impact on the Soldier himself. In fact, recent research suggests that marital conflict can exacerbate veteran PTSD (Interian et al, 2014). A depressed or highly anxious spouse may be unable to provide the emotional support that a service member with PTSD needs (Park, 2011; Tsai et al, 2012). Treatments for Soldier PTSD are most likely to be effective if the whole family is involved.

The study also found a significant relationship between family functioning and Soldier job satisfaction. It has long been known that poor family adjustment can impact a military member's job performance (e.g., Burnam, Meredith, Sherbourne, Valdez & Vernez, 1992). Furthermore, the family unit, and particularly, positive spouse attitudes and support reduce employee turnover behavior (see Huffman, Casper, & Payne, 2014 for review). The importance of providing support for military families to boost the service member's ability to focus on their duties was in part the rationale for developing family support systems on military bases worldwide. Despite increased effort to support military families in recent years, there has been little empirical research on the efficacy of family programs for post-9/11 families, and the degree to which they enable the service member to stay in the military. Especially in light of the recent toil on military families, and for some branches in particular (e.g., Army, Marines), workplace support for service members should be a priority (Huist et al, 2010).

Spouse mental health service engagement, defined as the total number of providers seen since the Soldier returned from his or her last deployment, was strongly associated with negative spouse ratings of family functioning. This finding may simply be confirmation that spouses in families who need the most help are more likely to engage in mental health services. It may also reflect higher mental health need among spouses who perceive negative familial functioning in their home; that is, negative day-to-day familial interactions may lead to spouse mental health symptoms, motivating them to seek treatment. The role of service engagement in family functioning and spouse and child mental health is an important area for future research. However, gathering data on families that do and do not engage in service will be challenging, given findings that Soldiers with PTSD do not typically engage in treatment (Hoge et al, 2006;

Seal et al, 2007). The extent to which spouses of Soldiers with PTSD engage in services and how this impacts theirs and the Soldiers own functioning is severely understudied.

The absence of significant associations between non-mental health variables and family functioning was surprising. Specifically, we expected total time deployed and length of marriage to be significantly associated with family functioning and familial mental health. Findings from past research are equivocal on the association between deployment and family functioning. Some have found significant associations between deployment and commission of partner violence upon return home (McCarroll, Ursano, Fan, & Newby, 2004). Others have found that this relationship exists only when the service member has substance abuse or PTSD following deployment (Orcutt, King & King 2003; Taft et al., 2011). Current PTSD was an inclusion criterion for our study; therefore, we were not able to examine associations between Soldier PTSD and familial variables. The fact that length of deployment and length of marriage were not significantly associated with spouse mental health, child mental health, family functioning, or military job satisfaction, may suggest that Soldier PTSD has a more proximate influence that drives the association between deployment and family functioning.

The study was limited by the small sample size, and inclusion of Soldiers from two different bases (Fort Jackson and Fort Bragg) may have impacted the internal validity of the study. For example, each base has its own health service system and family supports; thus, Soldier and family service engagement and ratings of job satisfaction may have been impacted by base-specific factors. However, our survey included questions about service use on and off base. By including both samples we were able to obtain more demographic diversity, which helped our sample demographics better match that of the Army as a whole. Finally, including the Fort Bragg

cases increased our sample size by 17.5 percent, increasing our power to detect significant associations. Despite the limitations of the study, the study's main strength was its inclusion of all spouses (100%) among Soldiers who completed the survey. Completed data from standardized instruments from both Soldiers and their partners is rare, and enabled us to look at family functioning from both perspectives, and to examine spouse and Soldier variables in relation to each other. This method is important for future research on military families, because every family member will not have the same perspective on important domains of familial functioning.

Future research on military families, especially those in which the service member has combat-related PTSD, should consider familial resilience as an end goal. We know from research on Vietnam veterans that combat-related PTSD is chronic and that family members are vulnerable to veterans' chronic mental health problems (Beckham, Lytle, & Feldman, 1996; Evans, McHugh, Hopwood, & Watt, 2003; Kelley et al, 1994). Strong spouses and strong families should be viewed as a key tool in the treatment of Soldier PTSD, because they provide needed social and emotional support. Cultivating strong family systems in the military should not be viewed as an ancillary goal, but as a key component of military fitness.

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Table 1. Sample Descriptives

	Fort Jackson n=40	Fort Bragg n=7	Total n=47
Mean Age	37.2	26.3	35.6
% Male	92.5	100	94
Race/Ethnicity[1] (%)			
Hispanic	12.5	29.0	15.0
White	40.0	57.0	43.0
African American	30.0	14.0	28.0
Other	20.0	29.0	21.0
Multi-racial	10.0	0.0	8.5
Mean # Years in the Army	16.4	5.6	14.8
Mean # months since last deployment	28.0	2.1	24.1
Education (%)			
GED	25.0	14.3	34.0
High school diploma	5.0	85.7	6.4
Some college	32.5	0.0	27.7
Associates degree	17.5	0.0	14.9
Bachelors degree	10.0	0.0	8.5
Graduate or Professional degree	10.0	0.0	8.5
Mean # years married	9.8	5.1	9.1
Mean # deployments	3.3	1.9	3.1
Mean age of spouse	36.1	25.7	34.6
% Spouses who work outside home	50.0	28.6	46.8
Mean # children	1.8	1.5	1.8
Mean age of index child[2] (in years)	8.6	4.0	8.1

[1]Respondents were asked to choose from the following racial categories: white, African American, Asian/Pacific Islander, American Indian/Alaska Native, Other, and Multi-racial. Categories with no respondents are not included in the table.
[2]The index child was the child reported on by the spouse, and defined as the youngest preschool or school-age child in the household (age 3-17 years).

Table 2. Bivariate correlations of family functioning, family mental health, and treatment engagement

	1	2	3	4	5	6	7	8	9	10
1. Family functioning (Soldier)	-									
2. Family functioning (spouse)	0.37*	-								
3. Soldier job satisfaction	-0.32*	0.07	-							
4. Spouse depression	0.36*	0.55**	0.17	-						
5. Spouse anxiety	0.34*	0.47**	-0.10	0.51**	-					
6. Child psychological distress	0.32	0.38*	-0.03	0.52**	0.55**	-				
7. Soldier treatment engagement	0.15	0.35*	-0.22	0.10	0.17	0.40*	-			
8. Spouse treatment engagement	0.12	0.34*	-0.14	0.40**	0.44**	0.27		-		
9. Length of marriage	-0.08	-0.02	0.20	0.03	-0.09	0.15	0.13		-	
10. Total time deployed	0.11	-0.10	-0.09	0.09	-0.04	0.32	0.21	-0.08	0.19	-

*p<0.05 (two-sided); **p<0.01 (two-sided)

Table 3. Regression analysis of factors related to family functioning.

	Model 1 Soldier family functioning		Model 2 Spouse family functioning	
	β	SE	β	SE
Spouse depression	0.34*	0.02	0.31*	0.02
Spouse anxiety	0.17	0.22	0.16	0.18
Soldier job satisfaction	-0.35*	0.07	0.08	0.06
Service engagement[1]	0.04	0.03	0.37**	0.04

[1]Data on soldier service engagement were entered for Model 1; data on spouse service engagement were entered for Model 2.
*p<.05; **p<.01

Appendix 2: Manuscript in preparation:

Stambaugh, L., Kelley, ML, & Ohse, D.. (in preparation). Familial correlates of mental health service engagement in a sample of active duty Soldiers with PTSD. *Journal of Behavioral Health Services Research*.

Familial correlates of mental health service engagement in a sample of active duty Soldiers with PTSD

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Abstract

This study examined mental health service engagement among active duty Soldiers with PTSD. 40 Soldiers with PTSD who served in Iraq or Afghanistan in the last five years, and their spouses, completed telephone interviews assessing military background, family functioning, spouse depression, and mental health service use, since the time of the Soldier's most recent deployment. Soldiers reported using a wide array of professional and non-professional services for PTSD. Using criteria from the National Comorbidity Survey, 90% of Soldiers received minimally adequate treatment, yet still met PTSD thresholds. Significant correlates of Soldier treatment engagement (number of visits with a mental health professional) were (1) number of deployments and (2) spouse mental health service engagement. Neither family functioning nor spouse depression was significantly associated with Soldier treatment engagement. Spouse mental health treatment engagement may facilitate Soldier treatment engagement; thus, outreach should specifically target military spouses.

Over the last decade, research has established high prevalence rates of debilitating psychological disorders among veterans and active duty service members who have been deployed to Iraq and/or Afghanistan. No disorder has received more attention than post traumatic stress disorder (PTSD), which affects anywhere from 4 to 22 percent of service members returning from deployment to those regions.[1-3] Identifying and engaging these Soldiers and their family members in effective mental health treatment is of immense importance given that PTSD is associated with substance abuse,[4-5] unemployment,[6] divorce,[7] domestic violence,[8] and chronic health problems.[9]

In 2006, the Department of Defense, Department of Veterans Affairs, and National Institute of Mental Health co-sponsored an initiative to fund clinical trials of innovative PTSD treatments to address the growing number of service members returning from Iraq and Afghanistan with PTSD.[10] In turn, recent clinical trials have advanced knowledge about effective strategies for treating combat-related PTSD.[11-14] In spite of this, reports suggest that between 50% and 75% of Soldiers and Marines returning from Iraq and Afghanistan who screen positive for mental health diagnoses do not receive mental health treatment in the months immediately following their return home.[2,15] Given the levels of unmet mental health need in the military, and in light of advances in clinical treatment strategies, research is needed on the issue of access to care and keeping service members engaged in treatment.

Even among those who do access services through the military screening and referral system, treatment engagement is low (3.4 sessions per year, on average), implying that treatment is unlikely to be effective.[16] The issue of mental health treatment engagement is critical for the military, in particular, given that mental health problems are a leading medical correlate of

attrition from military service.[15,17] Barriers to seeking and engaging in mental health treatment within the military include perceived stigma, logistical difficulties getting to treatment, negative attitudes about the effectiveness of mental health services, and beliefs that seeking treatment is a sign of personal weakness.[18-22] In the face of such barriers, insufficient research has focused on facilitators of treatment engagement. One such possible facilitator is support received by a service member's family.

PTSD is not just a problem for military service members themselves; rather, it affects all members of the family unit. Spouses are at increased risk for depression and anxiety;[23-25] couples are at increased risk for relationship conflict and divorce;[7,26-27] and emerging research suggests negative mental health impact on children.[28-31] In recognition of the impact on the family, the Department of Defense has taken steps to include family well-being as an important factor in the deployment cycle, where risks come into play at every stage (pre-deployment, deployment, re-integration). For example, Family Readiness Centers are now present on most bases to provide programming to spouses and children to help prepare them for the logistical and emotional challenges of deployment, and to support them when their service member returns home from deployment, not uncommonly suffering from a mental health or substance use disorder.

Given what is known about the reverberating effects of combat-related PTSD within families, the issue of PTSD in Soldiers returning from war should be viewed through the lens of family systems theory. Family systems theory posits that families function as a working system in which no member of the system exists in isolation.[32] All family members, or parts of the system, are interdependent. The literature on family therapy shows that including the whole family in treatment is often the most effective approach for improving family functioning.[33] Following

from this systemic approach to thinking about the family effects of combat-related PTSD, the current study hypothesized that treatment engagement is also a family issue.

Some preliminary findings from mental services research support this hypothesis. First, family functioning problems may provide added impetus beyond Soldier symptoms alone for mental health treatment-seeking among any or all family members. Some studies suggest that mental health treatment seeking by one family member promotes treatment seeking by other family members. In a study of low-income, ethnic minority women presenting to a community clinic for health care, Alvidrez and colleagues (1999) found that women who reported use of mental health services by friends or family were more likely to report mental health service use for themselves.[34] A study of mental health service use among older adults found that those with family members who had received mental health treatment had greater knowledge of how to seek mental health treatment.[35] Knowledge regarding how to access mental health treatment is an established predictor of actual service use.[36] These findings highlight the utility of the 'family as system' heuristic for service access and engagement. Engaging families in mental health services will likely improve Soldier engagement in mental health treatment.

Study Aims

The first aim of the study was to describe use of professional and non-professional mental health services in a sample of active duty Soldiers with PTSD, to obtain a broad view of where military service members might go for help. The second aim was to identify familial correlates of Soldier treatment engagement for PTSD, as a first step in determining possible facilitators of treatment engagement in this hard to engage population.

Methods

Recruiting

Active duty Soldiers were recruited at a small-to-medium size U.S. Army base, following approval from the Department of Defense Human Research Protections Office and the first author's Institutional Review Board. All Soldiers presenting to an outpatient behavioral health clinic on-base were screened for eligibility on-site. Those meeting all inclusion criteria were asked for permission to be contacted about the study. Soldiers were eligible if they had current PTSD (assessed by their clinician using the PTSD Checklist – Military version), had served in Iraq or Afghanistan in the last five years, spoke English, and had a spouse or domestic partner who also spoke English. Spouses and domestic partners were recruited only if their Soldier consented and gave contact information. Among Soldiers who participated (n=40), 100% of spouses completed the study, yielding complete questionnaire data and interviews with 40 Soldier-spouse dyads. Spouses who completed the survey were compensated with $50 giftcards.

Survey Methodology

The study was conducted via Computer Assisted Telephone Interview, using trained lay interviewers. Standardized instruments were programmed into a Blaise interview, and data were recorded by interviewers in real-time. Interviews were conducted over a 14-month period from June 2013 to August 2014. Soldiers were interviewed for approximately 20-30 minutes about their military background, job satisfaction, family functioning, and use of mental health services. Spouses completed a longer interview (approximately 30-45 minutes) in which they were asked demographic questions and given standardized modules on family functioning, depression symptoms, and use of mental health services. In addition, in couples that had at least one child age 3-17 years, spouses were asked questions about mental health and service use in their youngest preschool or school-age child. This study relies on data from the following modules:

demographics, military background, family functioning, spouse depression, and mental health service use. Other modules, such as job satisfaction and child mental health, were analyzed and reported separately (currently under review elsewhere).

Instrumentation

Family functioning. The Family Assessment Device (FAD)[37] is a 60-item, self-report questionnaire that assesses global family functioning (ability of the family to fulfill its functions), as well as six subdomains: *Problem Solving* (PS; the way in which the family resolves problems), *Communication* (the clarity and directness of the family's exchange of verbal information), *Role* (the clarity and appropriateness of distribution of family roles), *Affective Responsiveness* (the appropriateness of quantity and quality of feeling with which members respond to events), *Affective Involvement* (the extent to which family members are interested in each other's activities and concerns), and *Behavior Control* (the clarity of family rules). The FAD, used widely in research on child development, marital relationships, and family therapy, has been shown to distinguish between families with and without psychopathology[38-39]. Family members provide independent ratings which can either be combined into a composite score for the family, or analyzed independently.

Spouse depression. Current depression was measured using the Center for Epidemiological Studies Depression Scale (CES-D).[40] The CES-D includes cut-off scores that indicate high risk for clinical depression. The CES-D has demonstrated acceptable sensitivity and specificity and high internal consistency.[41] The CES-D has been used successfully across wide age ranges,[41] and in Canadian military service members,[42] and military partners.[43] In the current study total scores were used, because every spouse endorsed atleast one symptom on the CES-D.

Soldier and spouse mental health service use and engagement. The Composite International Diagnostic Interview (CIDI) was developed by the World Health Organization to assess adult psychiatric diagnoses and mental health service use. The CIDI is administered by lay interviewers, and has been used in large population studies such as the National Comorbidity Study-Replication.[44] The services component of the CIDI, administered to both Soldiers and their spouses in this study, asks respondents about a variety of professional and non-professional services they have used for "problems with their emotions or nerves." For the current study, the time period for recall was "since you (your spouse) returned from your (his/her) most recent deployment." When a respondent indicates that he/she has seen a specific provider (e.g., a psychiatrist or psychologist), follow-up questions are asked about the number of sessions attended and the average length of sessions. The derivation of treatment engagement variables for this study is described later in the Results section.

Results

Study participants

Among 60 eligible Soldiers who screened eligible, 40 completed the survey. Data on non-participants was not available, without breaking confidentiality around having PTSD, the main inclusion criteria for the study. However, the demographics of our sample were compared to the Army as a whole (described later). Descriptive statistics for the sample are given in Table 1. Soldiers were mostly male, with an average age of 37.2 years. The self-reported racial distribution was 40 percent White, 30 percent African American, 10 percent multi-racial and 20 percent 'Other'. Soldiers had been in the Army for an average of 16.4 years, and had been back from their most recent deployment for an average of 28 months. In terms of educational

attainment, the most commonly endorsed categories were GED (25%), "some college" (32.5%) and Associate's degree (17.5%). Participating couples had been married or living together for an average of 9.8 years. Spouses were 36.1 years old, on average, and half worked outside the home. On average, couples had 1.8 children. The average age of children selected for the spouse survey was 8.6 years. Out of 40 couples, 25 had a study-eligible child.

[Insert Table 1 about here]

The demographics of our sample were mostly in line with those for the Active Component of the Army.[45] Active duty Soldiers are 85.1 percent male. Among married Soldiers, their average age is 32.1 years, while that of their spouses is 31.2 years. This is about five years younger than the couples in our sample, but still past the age of 30. Active duty Soldiers are 68.5 percent White, indicating that our sample had a larger percentage of minorities. Regarding education, 77.8 percent of Active Duty Soldiers have a GED, some college, or an Associate's degree, compared with 75 percent of our sample. Among Army spouses, 38% are employed, compared with 50 percent of our sample. Finally, across all branches of active duty military, the average number of children in families with children is 2.0, compared with 1.8 in the current study sample.

Soldier service use

Figure 1 shows the percent of Soldiers in our sample who reported using a range of professional and non-professional services for their emotions or nerves. Given that the sample was drawn from Soldiers with PTSD who visited a behavioral health clinic, it is not surprising that 95 percent of the sample had seen a psychiatrist since their last deployment. Other mental health professionals were commonly seen as well; psychologist (72.5 percent), social worker (67.5 percent), counselor (65 percent), and other mental health professional (40 percent). Other

mental health professionals are described in the CIDI as "any other mental health professional, such as a psychotherapist or mental health nurse."

More than half of the sample had also seen their family doctor or another medical doctor (besides a psychiatrist) since their latest deployment. The most commonly used non-professional service providers were 'other healers' which on the CIDI are described as "any other healer, like an herbalist, chiropractor, or spiritualist," used by 40 percent of Soldiers, and pastors or priests who were seen by 42.5 percent of Soldiers. Self-help groups were attended by 27.5 percent of the sample. Finally, use of internet support groups and chat rooms, and use of telephone hotlines was not common (used by 5 to7.5 percent of the sample).

[Insert Figure 1 about here]

Receipt of minimally adequate care

We further analyzed study data to examine use of minimally adequate care in the sample. Minimally adequate treatment was defined using the method of Wang and colleagues (2005) who examined mental health service use in a national sample of US households.[46] Drawing from professional guidelines, there were two criteria for which care would be considered minimally adequate: (1) receipt of a prescription for an appropriate medication (antidepressant or mood stabilizer for mood disorders; antidepressant or anxiolytic for anxiety disorders; antipsychotic medication for nonaffective psychoses), in combination with 4 or more visits for a mental health problem with a psychiatrist, general medical doctor, or other medical doctor, or (2) among respondents who were not psychotic, 8 or more visits for a mental health problem with either a psychiatrist or another type of mental health specialist.

In our study, we could not determine specific medications used – the CIDI service use questionnaire asked, "In the time since you returned from deployment, have you gotten a prescription or medicine for your emotions, nerves, mental health, or substance use from any type of professional?" Soldiers' answers to this question were combined with number of visits to a psychiatrist or other medical doctor to derive a dichotomous variable for receipt of minimally adequate care (yes or no). Our definition of minimally adequate care was thus: (1) received a prescription medication for emotions, nerves, mental health, or substance use from any type of professional AND attended 4 or more visits with a psychiatrist or other medical doctor; or (2) attended 8 or more visits with a mental health professional (psychiatrist, psychologist, social worker, counselor, or other mental health professional). Using these criteria, 90 percent of the sample received minimally adequate care since the time of their most recent deployment.

Bivariate correlations among study variables

A bivariate table showing Pearson correlations among the key study variables is shown in Table 2. In addition to the variables described in the Methods section, the table includes two derived service variables. Soldier service engagement was derived in two separate ways to get at (1) total number of providers seen, and (2) engagement in professional mental health services. Total number of providers was calculated as the sum of all providers listed on the CIDI, with scores ranging from zero to 10. The average number of providers seen was 5.7, with a median of 6.0. Engagement in professional services was derived as the total number of visits to a psychiatrist, psychologist, social worker, counselor, or other mental health professional. The average number of visits to a mental health professional was 56 with a range of 0 to 150. The median number of visits was 51.

[Insert Table 2 about here]

As expected, there was a significant, positive correlation between Soldier FAD scores and spouse FAD scores. Table 2 also shows significant, positive correlations between both Soldier and spouse family functioning (FAD scores) and spouse depression, indicating that worse perceptions of family functioning were associated with higher spouse depression scores. The total number of providers seen by the Soldier was significantly correlated with his or her number of visits to a mental health professional, but not with any other study variable. Soldiers' number of visits to a mental health professional was significantly and positively associated with spouse number of visits to a mental health professional, but not with family functioning, number of deployments, or spouse depression. Both Soldier and spouse FAD scores were significantly correlated with the total number of providers (professional and non-professional) seen by the spouse. Higher FAD scores indicate worse family functioning, so worse family functioning was associated with more providers seen by the spouse. Neither Soldier nor spouse FAD scores were significantly associated with any measure of Soldier mental health service use.

Predictors of Soldier service use

A linear, simultaneous regression model was run using SPSS Statistics 21.[47] Four independent variables were chosen, drawing from the study's key questions, and using rules of thumb for adequate power in models examining relationships among variables, specifically that a sample size of 'around 50' or ten cells per predictor are needed.[48] The four predictor variables entered into the model were Soldier FAD score, number of deployments, spouse depression score, and spouse number of visits to a mental health professional. Results from both models are shown in Table 3. Significant predictors of Soldier service engagement (measured as the total number of visits to a mental health professional) were spouse service engagement, measured

identically, and total number of deployments. Soldier-rated family functioning and spouse depression scores were not predictive above and beyond these two significant variables.

[Insert Table 3 about here]

Discussion

The aim of the study was to examine mental health service engagement in a sample of active duty Soldiers with PTSD. This small, exploratory study was based on the premise that family systems theory may be as relevant for service engagement as it is for mental health symptoms and broader family functioning. The small, clinical sample included here was unique in its use of a wide array of services, and high engagement with professional mental health services (more than 50 visits on average). As such, it was an adequate platform to begin looking at the issue of family service involvement within a high-need population, military service members with PTSD.

Soldiers in the study sample used many types of services in the time since their last deployment (up to five years), ranging from psychiatrists and psychologists to priests and other complementary medicine practitioners. Some attention has been given to service engagement by service members with mental health problems, focusing on both active duty and discharged veterans. The only published research that has examined engagement among active duty service members returning from Iraq and Afghanistan found very low service engagement among those who accessed treatment, ranging from about 3 to 4 visits on average.[15,49] Such a low dose of treatment is unlikely to be effective. Other emerging research suggests that many veterans seek help outside the Department of Defense, from chaplaincy services, for example.[50] Further analysis of data from this national survey found that the median number of mental health sessions in the past year reported by veterans with PTSD was 2—again, well below that needed for

optimal treatment. Only 1 out of 5 veterans with PTSD attended 10 or more sessions, meaning 80% were not completing evidence-based practices (even if they were accessed). These studies give a picture of low service engagement among both active duty and discharged combat veterans with PTSD and other mental health needs.

In our sample, a different story emerged, one of deep service engagement, but new questions were raised about service effectiveness even under circumstances where Soldiers are highly engaged. Soldiers in the current study used six service providers, on average. Among those seeing mental health professionals (psychiatrists, psychologists, social workers, counselors, and other mental health professionals), Soldiers attended more than 50 sessions on average. Applying the criteria for minimally adequate care defined by Wang and colleagues (2005) for the National Comorbidity Survey,[46] almost every Soldier in the sample received minimally adequate mental health treatment. Yet, these Soldiers were still engaged in treatment and still met criteria for PTSD as assessed by behavioral health clinicians. This raises a critical question about current assumptions around the minimally adequate dose of services in the usual care environment. Soldiers with active PTSD being served on their base and in the surrounding community may need more care than what is currently assumed by the field to be minimally adequate (prescription medication plus four sessions with a mental health professional; or 8 sessions with a mental health professional). Alternatively, mental health care provided outside a clinical research setting may need more infusion of evidence based practices. Given that the study was based on a sample receiving care from a single facility on a military base, the current findings may have little external validity; however, they raise important questions to be examined on a larger scale in future research with combat veterans.

The conceptual framework of the study posited that Soldier PTSD symptoms would negatively impact the family system, leading to needs within multiple units of the family (Soldier, spouse, child) and ultimately to multiple possible paths to accessing services. For example, a spouse suffering from depression related to a Soldier's PTSD might be motivated to access mental health treatment for herself, and this might in turn facilitate the Soldier also attending treatment. Although there was a significant correlation between negative family functioning and spouses' use of mental health services, neither family functioning nor spouse depression was significantly associated with Soldier service engagement. The only familial variable in the study that predicted Soldier service engagement was spouse service engagement, above and beyond the spouse's own depression symptoms and the Soldier's perception of family functioning. Although the sample was small, this is an important, new finding that needs further study.

Much has been written about barriers to mental health treatment seeking by veterans with mental health needs. Other recent work has suggested a distinction between barriers to accessing care versus barriers to engaging in care; specifically, Elbogen and colleagues (2013) found that veterans with mental health problems not accessing treatment were more likely to believe they needed to solve problems on their own and medications would not help.[50] Their counterparts who had utilized care were more likely to endorse stigma beliefs related to treatment and not wanting to talk about war experiences. Our preliminary findings suggest that spouses may act as a facilitator in getting service members (and veterans) with PTSD to feel more comfortable talking about their experiences and fully engaging in the treatment process. Moreover, other emerging research suggests that spouses may be critical for treatment effectiveness. In a study of post 9/11 veterans, spouses provided key social support, which in turn mediated the association between

veteran PTSD and social functioning.[51] Engaging spouses in treatment may not only bring more combat veterans through the door, but it may also aide in keeping them engaged and ultimately contribute to treatment effectiveness.

Total number of deployments also predicted Soldier treatment engagement. Soldiers in our study had been deployed anywhere from one to seven times, with an average of 3.3 times for the sample. Deployment is a critical variable in mental health research with service members because it implies familial separation, combat exposure in many cases, and the cumulative, negative effects of multiple deployments are becoming well-documented.[30,52-53] As a factor in mental health service engagement, deployment may function in two important ways. First, multiple deployments may lead to higher severity of mental illnesses such as PTSD through the accumulation of multiple traumas. Mental health need is one of the strongest predictors of service access.[46] Second, multiple deployments yield multiple opportunities for system engagement by way of the required post-deployment health assessments (PDHA) which screen for health and mental health problems immediately upon return from deployment. Being subjected to multiple PDHAs increases the number of opportunities for a mental health referral. The role of deployment in mental health symptoms and treatment seeking is a subject of much research, and its predictive power in our sample gives the study some degree of validity, even though it does not in itself raise new research questions.

Although the study was limited by a small sample size recruited at a single location, our findings are important from an exploratory perspective. Obtaining full survey data using standardized instruments from both Soldiers and their spouses is rare, and the study found evidence that spousal treatment engagement may in fact have impact on treatment engagement among Soldiers with PTSD. This is the first study to report a positive finding linking mental

health treatment seeking among family members in a military sample. As such, the study provides a foundation for further exploration of the role of family functioning and familial mental health treatment seeking in engaging military service members in care.

Implications for behavioral health

In an arena where formidable barriers to care are known to exist, the promise of a possible facilitator of treatment engagement is worthy of further study. Within military families dealing with combat-related PTSD, if spouses' proclivity to seek out mental health treatment helps to engage service members fully in mental health treatment, outreach to spouses should be a critical component of the military healthcare system. In parallel, more work is needed on the effectiveness of mental health treatment that is currently being delivered in military usual-care settings. The current study suggests that standards for minimally adequate care may differ for military versus civilian clinical populations.

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Table 1. Sample Descriptives

	Mean (SD) or % n=40
Mean Age	37.2 (6.7)
% Male	92.5
Race/Ethnicity[1] (%)	
Hispanic	12.5
White	40.0
African American	30.0
Other	20.0
Multi-racial	10.0
Mean # Years in the Army	16.4 (4.9)
Mean # months since last deployment	28.0 (13.7)
Education (%)	
GED	25.0
High school diploma	5.0
Some college	32.5
Associates degree	17.5
Bachelors degree	10.0
Graduate or Professional degree	10.0
Mean # years married	9.8 (7.0)
Mean # deployments	3.3 (1.5)
Mean age of spouse	36.1 (7.9)
% Spouses who work outside home	50.0
Mean # children	1.8 (1.0)
Mean age of index child[2] (in years)	8.6 (3.1)

[1]Respondents were asked to choose from the following racial categories: white, African American, Asian/Pacific Islander, American Indian/Alaska Native, Other, and Multi-racial. Categories with no respondents are not included in the table.

[2]The index child was the child reported on by the spouse, and defined as the youngest preschool or school-age child in the household (age 3-17 years).

Table 2. Bivariate correlations among key study variables

	1	2	3	4	5	6	7	8	9
14. # providers seen	-								
15. # visits to MH professional	.72**	-							
16. # deployments	.06	.21	-						
17. # months married	-.07	-.07	.37*	-					
18. Spouse depression score	.02	.17	-.09	.03	-				
19. Spouse # providers seen	.17	.31	-.19	.05	.41**	-			
20. Spouse # visits to MH professional	.21	.43**	-.30	-.01	.37*	.57**	-		
21. Soldier FAD score	.02	.04	.13	-.13	.33*	.33*	.26	-	
22. Spouse FAD score	.21	.12	-.17	-.09	.57**	.52**	.26	.36*	-

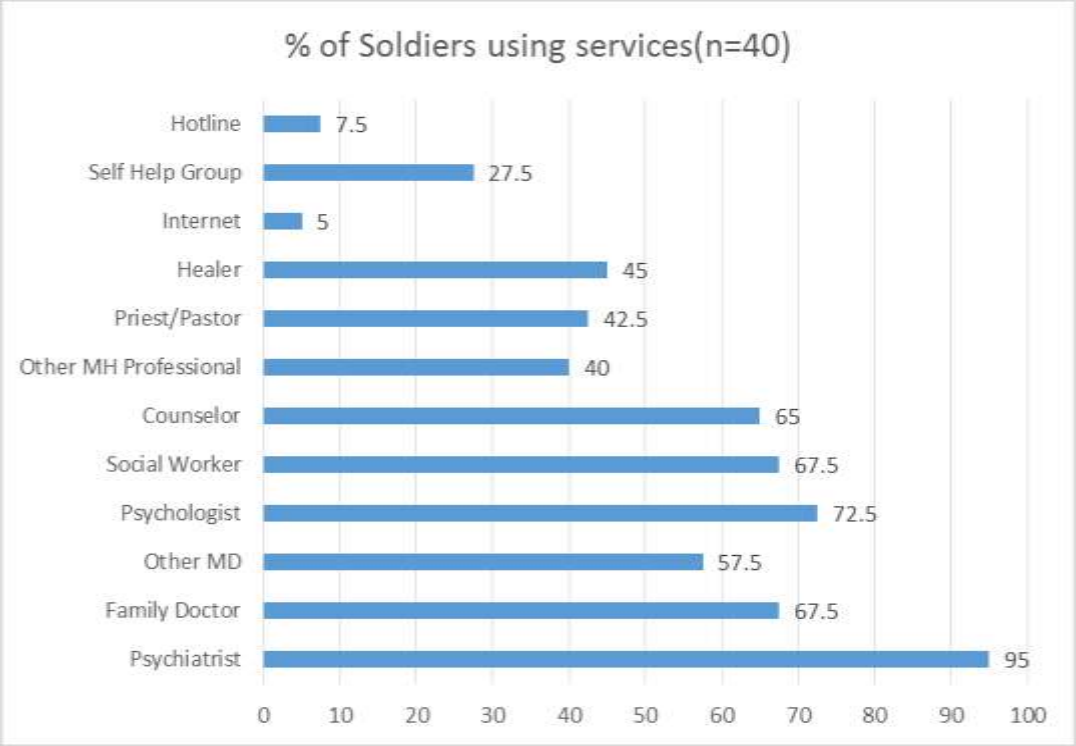
*p<0.05 (two-sided); **p<0.01 (two-sided)

Table 3. Regression analysis of factors related to Soldier mental health treatment engagement

	# visits to MH professionals		
	β	SE	p
Family functioning[a]	-0.18	26.72	0.256
# deployments	0.41	4.55	0.010
Spouse depression	0.05	1.32	0.776
Spouse # visits to MH professionals	0.58	0.26	0.001

[a]Rated by Soldiers using the FAD

Figure 1. Percent of Soldiers with PTSD using specific service types in the time since their most recent deployment



Appendix 3: Manuscript in preparation:

Ohse, D., Stambaugh, L., Kelley, M.L. (in preparation). Factors influencing reenlistment intentions of Soldiers with PTSD. *Military Medicine*.

Factors Influencing Reenlistment Intentions of Soldiers with PTSD

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INTRODUCTION

As the nation's military decreases in overall size, the need to retain a highly skilled and experienced force is more important than ever to meet the nation's safety and security challenges. The military's ability to retain a skilled and experienced force is threatened not only by the increasingly competitive market for talent but also by the toll the demands of war have taken on the military's service members.

The U.S. Department of Veterans Affairs (2015) estimates that in a given year, 11-20% of veterans who served in Operation Iraqi Freedom or Operation Enduring Freedom have post-traumatic stress disorder (PTSD). Risk for PTSD increases with exposure to combat, combat specialization, as well as cumulative length and number of deployments (Reger, Gahm, Swanson & Duma, 2009; Vogt et al, 2011; Xue et al, 2011) thus those with the most experience and training may be the most at risk for PTSD. PTSD has been shown to have negative impacts on a number of job related outcomes such as greater absenteeism, job burnout, and job strain (Hoge, Terhakopian, Castro, Messer, & Engel, 2007; Vinokur et al, 2011). Given that incidence and prevalence of PTSD could have a significant impact on retaining the experienced and skilled workforce needed for a strong future military, it is important to more fully understand the factors influencing reenlistment decisions of those affected by PTSD.

Factors Influencing Reenlistment

Many factors have been shown to impact a service member's intention to remain in the military including work related factors (e.g., job satisfaction), personal factors (e.g., marital status and satisfaction), and health (e.g., post-traumatic stress; Hidelang, Schwerin & Farmer,

2004; Vernez & Zellman, 1987; Vinokur, Pierce, Lewandowski-Romps, Hoboll,& Galea, 2011; Wilcove, Schwerin & Wolosin, 2003). Greater job satisfaction predicts not only greater intentions to reenlist (Hidelang, Schwerin & Farmer, 2004; Wilcove, Schwerin & Wolosin, 2003; Vinokur et al, 2011) but also actual reenlistment behavior (Huffman, Casper, Payne, 2014; Schwerin, Kline, Olmsted & Wilcove, 2006).

However, Wilcove, Schwerin and Wolosin's (2003) model of Navy quality of life found that personal factors such as relationships with family, both spouse and children, were better predictors of intention to re-enlist than work related factors such as professional development and job satisfaction. In a more recent study of Army OEF and OIF active duty soldiers, spouse and partner strain significantly predicted lower intentions to reenlist (Pierce, 2014). Family functioning may be particularly important to the reenlistment decisions of veterans with PTSD as they experience greater family stress through intimate partner relationship strain (Beckham, Lytle & Feldman, 1996; Erbes et al 2012; Evans, McHugh, Hopwood & Wood, 2003; Riggs, 1998) and greater likelihood for child mental health issues such as depression and stress (Caselli & Motta, 1995; Ruscio, Weathers, King, & King, 2002).

Another personal factor of the Wilcove et al (2003) model that predicted reenlistment intentions was health. Vinokur et al (2011) found that experiencing PTSD symptoms predicted lower intentions to re-enlist among Air Force personnel. Also, Schmied, Highfill-McRoy and Larson (2012) found that Marines who were eligible but did not reenlist after their first term of service had higher rates of PTSD than those who did reenlist. The current exploratory study

attempts to further examine the relationships among PTSD, job satisfaction, family functioning and reenlistment intentions among soldiers experiencing PTSD.

METHODS

Active duty Soldiers were recruited at the Behavioral Health Clinic at Moncrief Army Community Hospital at Fort Jackson, SC. Soldiers presenting to the clinic who had current PTSD, had served in Iraq or Afghanistan in the last five years, spoke English, and had a spouse or domestic partner who also spoke English were asked for permission to be contacted about the study. Sixty soldiers were eligible and 40 participated. Upon consent from soldiers who participated, spouses and domestic partners were recruited to participate. For all Soldiers who participated, all spouses also participated in the study which resulted in 40 complete Soldier and spouse pair interviews.

Active duty Soldiers were also recruited at Fort Bragg, NC at the time of their 6-month post deployment health reassessment. Soldiers who endorsed two or more symptoms of PTSD were given a flyer with a toll-free number to call in and complete the study. Approximately 40 flyers were distributed over a 9-month period, however only seven Soldiers and their spouses called in to complete the survey. Regardless of recruitment location, spouses who completed the survey were compensated with a $50 gift card.

Descriptive data for the Fort Jackson and Ft. Bragg samples is shown in Table 1. Although the Fort Bragg sample size is very small, and they differ from the Fort Jackson sample in some demographics and the methods used to recruit them, they are included in the study because they provide critical variation on some of the key study variables and increase power to

detect significant relationships between variables. Fort Bragg participants were younger (average age 26.3 years versus 37.2 years) and married for a shorter length of time (5.1 years versus 9.8 years). Fort Bragg participants were not involved with mental health services, according to their own reports, whereas, all Fort Jackson participants were recruited from a behavioral health clinic, and thus by definition engaged in services. The increased range of ages and educational backgrounds make the total sample more representative of the Army population. Overall, the decision to include the Fort Bragg participants was based on our assessment that their contributions to external validity outweighed their threat to internal validity; moreover they provide additional statistical power to the small sample size.

The current study was conducted via telephone. The Soldier questionnaire assessed military background, job satisfaction, family functioning, and use of mental health services. The spouses questionnaire assessed family functioning, anxiety and depression symptoms, and use of mental health services. Only measures pertinent to the questions of this study are described below.

Family functioning was assessed using the Family Assessment Device (FAD; Epstein, Baldwin, & Bishop, 1983) a self-report questionnaire that assesses global family functioning Higher FAD scores indicated worse family functioning and scores greater than 2 indicate families in the clinical range. Soldier mental health service use and engagement was measured using the services component of the Composite International Diagnostic Interview (CIDI) developed by the World Health Organization. The CIDI asks respondents about the professional and non-

professional3 services they have used in relation to a mental health problem. The time period for recall was "since you returned from your most recent deployment". The CIDI was used to determine the total number of providers as well as total number of visits to those providers.

Finally soldiers answered four items that had been used previously to assess Army satisfaction and turnover intentions (Hindelang, Schwerin, & Farmer, 2004; Kelley, Schwerin, Farrar, & Lane, 2005; Schwerin, Michael, Glaser, & Farrar, 2002). Soldiers were asked about their satisfaction with Army life (1, very dissatisfied to 5, very satisfied), satisfaction with their overall Army experience (1, very poor to 5, very good), intention to remain in the Army at their next decision point (1, very likely to 4, very unlikely or undecided), and if their plans to remain had changed as a result of their last deployment (yes or no).

RESULTS

As shown in Table 2, on average Soldiers were neither satisfied nor dissatisfied with Army life (M = 3.20, SD = 1.31) and were mostly satisfied with their overall Army experience (M = 3.62, SD = .95). Almost half, 47.7%, were unlikely or very unlikely to remain at their next decision point, where as 29.5% were either likely or very likely to remain, and the remaining 22.7% were undecided. For 59.6% of Soldiers their plans to stay or leave the Army had changed because of their last deployment. The majority, 75%, of the Soldiers had family functioning scores in the clinical range as reported by either the Soldier or their spouse. Soldiers exhibited not only treatment seeking behavior as evidenced by the average number of providers (M = 4.87, SD = 2.92) but also a high level of treatment engagement as shown by the average number of visits across those providers (M = 85.54, SD = 72.69).

3 The full list of providers was as follows: psychiatrist, psychologist, social worker, family doctor, other medical

As expected, those who were more satisfied with Army life were also more likely to rate their overall Army experience positively and were more likely to report that they intended to remain in the Army at their next decision point (among those who had decided4). Those who were unsatisfied with Army life were more likely to report that their plans to stay or leave the Army had changed as a result of their last deployment. Those who reported that their plans to stay or leave the Army had changed as a result of their last deployment were less likely to remain in the Army at their next decision point.

Family functioning impacted Soldier satisfaction with Army life. Soldiers who had higher total FAD scores (indicating worse family functioning) were less satisfied with Army life. Likewise, when either the Soldier or spouse had FAD scores in the clinical range, the Soldier was less satisfied with Army life. Interestingly, intent to remain in the Army was not related to family functioning.

Satisfaction with Army life and perceptions of overall Army experience were not correlated to treatment engagement. However, Soldiers who were accessing more services and more engaged in treatment were less likely to say they planned to remain in the Army at their next decision point and were more likely to say that their plans to remain in the Army had changed as a result of their last deployment. When those who answered that they were unlikely or very unlikely to remain in the military (n = 21) their main reason influencing their decision to leave, 12 soldiers indicated medical reasons such as physical or mental health.

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doctor, counselor, healer, priest, nurse, other mental health professional.

4 Those who were undecided about their intention to remain in the Army at their next decision point were excluded from further analyses.

Number of deployments and length of time in the Army was not related to satisfaction with Army life, satisfaction with the overall Army experience, or intention to remain in the Army at their next decision point. However, Soldiers who had been back from their last deployment longer were less likely to say they intended to remain in the Army at their next decision point. Soldiers who had been in the Army longer were more likely to say that their decision to stay or leave the Army had changed because of their last deployment. Additionally, those who had been in the Army longer had a greater number of providers and a greater number of visits to those providers.

DISCUSSION

As shown in past studies (Hidelang, Schwerin & Farmer, 2004; Wilcove, Schwerin & Wolosin, 2003; Vinokur et al, 2011) soldiers who were satisfied with life in the Army were more likely to remain in the Army at their next decision point. Contrary to previous findings (Pierce, 2014; Wilcove, Schwerin & Wolosin, 2003) family functioning did not predict reenlistment intentions. However, poor family functioning was related to decreased satisfaction with Army life. Treatment engagement was not related to satisfaction with life in the Army but Soldiers who had greater levels of treatment engagement were less likely to remain in the Army at their next decision point. If treatment engagement is an indicator of the severity of mental health impairment it may relate more directly to the Soldier's ability to perform their job functions and duties and thus weigh more heavily on their decision to leave the Army. Poor family functioning

may cause the Soldier stress but it may not directly interfere with their ability to perform their job effectively. Although family functioning did not appear to directly impact intention to remain in the Army it may have an indirect impact on intention to remain as it decreases satisfaction with Army life which does relate directly to intention to remain.

Surprisingly, number of deployments or total number of months deployed were not related to satisfaction with Army life, intent to remain in the Army, or family functioning. However, soldiers were more likely to say their decision to leave the Army was the result of their last deployment. Soldiers who said their plans to stay or leave the Army had changed because of their last deployment were also involved in greater levels of treatment which may indicate that the trauma experienced in their last deployment has influenced their decision to leave the Army. Additionally, soldiers who had been back from their last deployment longer exhibited greater levels of treatment engagement and were less likely to remain in the Army at their next decision point. These findings may also indicate that the prolonged effects of trauma are weighing more heavily on Soldiers' decision to leave the Army than the stresses of Army life, in general.

The current exploratory study is limited by a small sample size. Additionally the sample is composed of soldiers from two different installations using different recruitment methods. Different installations may have different cultures, given the types of units stationed there, and thus factors affecting both satisfaction with Army life and willingness to seek treatment may differ across installations. Additionally different installations may have different service provider offerings. Although the sample was composed of Soldiers from two different installations, the added variability to essential study variables (e.g., treatment seeking and

engagement) and increase in overall sample size outweighed any other concerns about adding extraneous variability.

CONCLUSION

Despite the persistence of stigma in seeking treatment for PTSD and fear of negative career related consequences as a reason to not seek treatment (Brown & Bruce, 2015), soldiers in this sample were actively seeking and intensely engaged in treatment. Given the number of deployments and service length, this sample also represents the highly experienced and skilled work force the military needs to retain. Future research should explore further the interrelationships between job satisfaction, health and family functioning on retention keeping in mind that these factors may weigh differently for unique needs of the OIF and OEF veteran whose experiences make them valuable assets but also puts them at higher risk of PTSD and willingness to remain in the force.

Table 1. Sample Demographics

	Fort Jackson n=40	Fort Bragg n=7	Total n=47
Mean Age	37.2	26.3	35.6
% Male	92.5	100	94
Race/Ethnicity[1] (%)			
Hispanic	12.5	29.0	15.0
White	40.0	57.0	43.0
African American	30.0	14.0	28.0
Other	20.0	29.0	21.0
Multi-racial	10.0	0.0	8.5
Mean # Years in the Army	16.4	5.6	14.8
Mean # months since last deployment	28.0	2.1	24.1
Education (%)			
GED	25.0	14.3	34.0
High school diploma	5.0	85.7	6.4
Some college	32.5	0.0	27.7
Associates degree	17.5	0.0	14.9
Bachelors degree	10.0	0.0	8.5
Graduate or Professional degree	10.0	0.0	8.5
Mean # years married	9.8	5.1	9.1
Mean # deployments	3.3	1.9	3.1
Mean age of spouse	36.1	25.7	34.6
Mean # children	1.8	1.5	1.8

[1]Respondents were asked to choose from the following racial categories: white, African American, Asian/Pacific Islander, American Indian/Alaska Native, Other, and Multi-racial. Categories with no respondents are not included in the table.

Table 2. Means, Standard Deviations, and Bivariate Correlations of job satisfaction, family functioning and treatment engagement

	Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
23.	Satisfaction with Army Life	3.20	1.31	-												
24.	Army Experience	3.62	.95	0.74**	-											
25.	Intent to Remain in Army	2.26	1.33	0.64**	0.50**	-										
26.	Change in Plans Because of Last Deployment	.60	.50	-0.45**	-0.20	-0.67**	-									
27.	FAD Total	2.17	.63	-0.32*	-0.20	-0.27	0.32*	-								
28.	FAD Agreement	.57	.50	0.30*	0.25	-0.06	-0.18	-0.13	-							
29.	Soldier or Spouse in FAD Clinical Range	.74	.44	-0.29*	-0.08	-0.08	0.41**	0.71**	0.50**	-						
30.	Soldier Number of Providers	4.87	2.92	-0.22	-0.14	-0.37*	0.40**	0.15	0.07	0.30*	-					
31.	Soldier Total Visits	85.54	72.69	-0.23	-0.23	-0.48**	0.37*	0.18	0.15	0.18	0.82**	-				
32.	Total number of Deployments	3.01	1.52													
33.	Total length of deployments (years)	2.69	1.24													
34.	Length of time since last deployment (years)	2.01	1.31	-0.21	-0.10	-0.47**	0.25	0.21	0.08	0.22	0.44**			0.54**		
35.	Time in Army	14.75	6.08	-0.07	0.10	-0.33	0.32*	0.10	0.29*	0.02	0.46**			0.47**	0.45**	-

*p<0.05 (two-sided); **p<0.01 (two-sided). Change in plans because of last deployment and FAD agreement are coded as 1 = Yes and 2 = No.