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Deployment characteristics and long-term PTSD symptoms

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Abstract

Objective—The impact of number, length, and time between (i.e., “dwell time”) deployments on long-term *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition* posttraumatic stress disorder (PTSD) symptoms was examined in post-9/11 U.S. veterans.

Method—This cross-sectional design includes data from 278 veterans participating in a larger longitudinal research program of post-deployment recovery. Measures included self-report questionnaires and the Clinician Administered PTSD Scale.

Results—Hierarchical regression was used to evaluate the independent contributions of deployment characteristics on long-term PTSD symptoms after controlling for demographics and combat exposure. As expected, dwell time was a significant predictor of long-term PTSD symptoms ($\beta = -0.17$, $p = .042$; $F_{5,108} = 8.21$, $R^2 = 0.03$, $p < .001$). Follow-up analyses indicated that dwell time of less than 12 months was associated with significantly greater long-term PTSD symptoms than those deployed once or with dwell time greater than 12 months.

Conclusion—In addition to combat exposure, time between deployments warrants clinical attention as an important deployment characteristic for predicting long-term PTSD symptoms.

Keywords

combat exposure; deployment; dwell time PTSD; veteran

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1 | INTRODUCTION

Post-9/11 U.S. veterans are at high risk for mental health problems, particularly posttraumatic stress disorder (PTSD; Riviere, Kendall-Robbins, McGurk, Castro, & Hoge, 2011). Whereas combat exposure is a known risk factor for PTSD (Brewin, Andrews, & Valentine, 2000) and other mental health conditions (Kimbrel et al., 2015), less data are available regarding the long-term effect of deployment characteristics, such as number, length, and time between (i.e., “dwell time”) deployments.

The impact of deployment characteristics is particularly relevant in light of findings suggesting that U.K.-armed forces deployed to Iraq and Afghanistan may have lower rates of probable PTSD than their U.S. counterparts (Fear et al., 2010; Hotopf et al., 2006). Varying rates of PTSD have been attributed to differences between the U.S. and U.K. military: troop demographics (U.S. troops are younger); deployment characteristics (e.g., U.S. military deployed 12–15 months vs. 6 months in U.K.; U.S. military often have shorter, variable dwell times, whereas U.K. Harmony guidelines stipulate 24 months between deployments); combat exposure (Hoge et al., 2004); and cultural/organizational differences in symptom reporting (Hotopf et al., 2006). However, in the only direct comparison of U.S. versus U.K. service members to date, Sundin et al. (2014) concluded that differences in PTSD rates could be primarily attributed to self-reported combat exposure.

Although studies demonstrate the importance of distinguishing between combat and support units (Kok, Herrell, Thomas, & Hoge, 2012), along with a robust dose-response relationship between combat exposure and PTSD (Hoge et al., 2004), research examining deployment characteristics is inconsistent in terms of whether the studies account for combat intensity. This is a significant issue because military personnel who experience multiple deployments may be at increased risk for PTSD and other mental health problems by virtue of higher levels of combat exposure associated with repeated deployments. Conversely, it is possible that those who are selected and able to deploy multiple times might be among the healthiest and resilient of warriors (Wilson et al., 2009). Thus, gaining deeper insight into the effects of deployment characteristics, above and beyond combat exposure, on long-term PTSD symptoms could enhance understanding of factors that influence long-term adjustment following warzone service and inform clinical intervention and future policy decisions.

1.1 | Length of deployment

The majority of research indicates that deployment length is negatively associated with mental health. Buckman et al. (2010) reviewed nine studies evaluating the impact of deployment length on the health of military personnel and their family members. Although two studies found no association between deployment duration and posttraumatic stress symptoms, psychiatric health, or well-being (Grieger et al., 2006; Hotopf et al., 2003), the other seven found that greater deployment length was associated with increased negative health outcomes. Of the two of seven studies that focused specifically on PTSD, both found increased risk for PTSD; however, Adler et al. (2005) found this effect only in male soldiers and controlled for unit role but not combat exposure. In the second study, a questionnaire-based study of UK armed forces personnel, those deployed to Iraq for 13 months or longer

within a 3-year period had higher rates of PTSD after controlling for demographics and role in combat (Rona et al., 2007). However, this study did not assess degree of combat exposure.

Two other studies found increased risk for acute stress and PTSD related to deployment length. In a survey study, U.S. soldiers deployed to Iraq for 6 months or more were more likely to screen positive for acute stress, other anxiety symptoms, or depression compared with soldiers deployed for less than 6 months, although combat exposure was not controlled (Castro & McGurk, 2007). Most recently, Rona, Jones, Keeling, Hull, Wessely, and Fear (2014) found that the cumulative deployment length of 13 months or more was associated with a score of 40 or higher on the PTSD Checklist using *Diagnostic and Statistical Manual of Mental Disorders Fourth Edition Text Revision (DSM-IV-TR*; American Psychiatric Association [APA], 2000) criteria (indicative of subthreshold cases; Blanchard, Jones-Alexander, Buckley, & Forneris, 1996), but it was not associated with a score of 50 or higher (indicative of probable PTSD; Hoge et al., 2004). Results were comparable in the total sample versus a subsample of those with a combat role, suggesting that combat exposure could not account for these findings.

1.2 | Number of deployments

The literature regarding number of deployments is mixed. A U.S. survey study found that soldiers who deployed to Iraq more than once were more likely to screen positive for PTSD and other mental health problems compared to first-time deployers (Castro & McGurk, 2004). Similarly, Reger, Gahm, Swanson, and Duma (2009) found that among U.S. soldiers deployed to Iraq, those who deployed twice (vs. once) had increased risk for developing PTSD symptoms. Using electronic medical and military deployment records, MacGregor, Han, Dougherty, and Galarneau (2012) reported that U.S. Marines who deployed to Iraq twice had higher rates of mental health diagnoses, including PTSD, compared to those who only deployed once. Similar results were found with an Australian Defense Force (Bleier et al., 2011). In contrast, a study of U.K. Armed Forces that deployed to Iraq or Afghanistan found that odds ratios for probable mental health disorders were similar across those who deployed once, twice, or three or more times (Fear et al., 2010). Likewise, among U.S. Operation Iraqi Freedom/Operation Enduring Freedom (OEF/OIF) Army National Guard troops, no differences in mental health symptoms were found between those deployed once versus more than once (Kline et al., 2010).

Finally, mixed results were found in a medical record study of active duty U.S. service members who returned from deployment between October 2001 and December 2010 (Armed Forces Health Surveillance Center, 2011). The impact of OEF/OIF and Operation New Dawn (OND) deployments was evaluated deployment by deployment (i.e., first vs. second through fifth deployments). Across gender, age, and military occupation, higher rates of PTSD were reported after second or third deployments versus first deployments. However, rates of PTSD were *lower* after fourth and fifth deployments, possibly suggesting resilience among those deployed more than three times. Importantly, none of these studies controlled for intensity of combat exposure or used clinical diagnostic assessments.

1.3 | Dwell time

Data regarding dwell time data are more limited and somewhat mixed. That is, although longer dwell time may provide increased time for recovery, lengthier periods could also be associated with difficulties with readjustment upon subsequent deployment (i.e., if service members have gotten out of the warrior mentality). In a study of U.S. OIF Marines, longer periods of dwell time in relation to time deployed were associated with lower PTSD risk (MacGregor et al., 2012). A Mental Health Advisory Team survey also found that those with dwell time of at least 24 months had fewer mental health problems (Mental Health Advisory Team VI, 2009).

In contrast, when using a dwell time to deployment ratio (DDR) to evaluate dwell time in relation to the length of the first deployment, DDR was not associated with a positive PTSD screen, yet it was associated with reduced odds of making a clinical mental health referral (MacGregor, Heltemes, Couser, Han, & Galarneau, 2014). Conversely, one study found that longer dwell times were associated with higher rates of mental health diagnoses, including PTSD, among U.S. OEF/OIF/OND service members (Armed Forces Health Surveillance Center, 2011). Importantly, only one (MacGregor et al., 2014) of these medical record studies accounted for combat exposure, a critical variable in evaluating risk and resilience for negative mental health outcomes.

1.4 | Study objectives

The current study examined the effects of number and length of deployments and dwell time on long-term military-related PTSD symptoms in veterans who served in support of the wars in Iraq and Afghanistan and were discharged approximately 3 years prior. We hypothesized that longer dwell time, by virtue of providing greater opportunity for recovery from the stressors associated with warzone deployment, would be associated with lower levels of long-term military-related PTSD symptoms, even after controlling for combat exposure, age, gender, and education level, all of which are associated with risk for PTSD (Brewin et al., 2000). In contrast, we expected that number and length of deployments would be strongly associated with level of combat exposure and would not independently predict long-term PTSD symptoms after controlling for combat exposure.

2 | METHOD

2.1 | Participants

A total of 334 post-9/11 veterans consented to participate in a longitudinal research program called Project SERVE from 2009 to 2013. Participants were deemed eligible if they were (a) classified as a post-9/11 veteran; (b) enrolled in the local Veterans Health Care System (although not necessarily seeking services); (c) able to provide informed consent and complete study procedures; (d) agreed to be contacted for follow-up assessments; and (e) stabilized on medications and psychosocial treatment for mental health problems (to limit the influence of symptom fluctuations related to having recently started or stopped treatment; defined as 3 months on a selective serotonin reuptake inhibitor, monoamine oxidase inhibitor, or in psychosocial treatment; > 1 month on an anxiolytic or beta-blocker;

or > 1 month medication/therapy discontinuation). Participants were allowed to stabilize and then opt to participate.

Participants were excluded if they (a) had a diagnosis of *DSM-IV* bipolar or psychotic disorder; (b) were in suicidal or homicidal crisis (defined as plan or intent at the level of requiring hospitalization); or (c) had plans to relocate out of the area within four months of the baseline assessment. Thirty-two participants were deemed ineligible for the larger study, leaving a final sample of 302 eligible participants. Reasons for ineligibility are as follows: 18 participants had a diagnosis of mania or psychosis; 12 were unable to complete the assessment; one was planning on moving out of the area; and one was not a post-9/11 Veteran. In addition, 24 of the eligible participants were excluded from the current analyses due to missing data on deployment characteristics, resulting in a final sample of 278 participants.

2.2 | Procedures

Study procedures were reviewed and approved by local institutional review boards. Participants were recruited through mailings, flyers, and in-service presentations to Department of Veterans Affairs (VA) staff. Mailing addresses were randomly selected from a list of post-9/11 veterans who were enrolled in the local VA system. Recruitment procedures were designed to oversample women veterans and those with mental health disorders via stratifying the randomly selected mailings to overselect these groups. Participation involved completion of informed consent, a diagnostic clinical interview, and a battery of self-report measures.

2.3 | Measures

2.3.1 | Inclusion/exclusion criteria—The Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998) is a clinician-administered diagnostic assessment that screens for bipolar disorder and psychotic disorders per exclusionary criteria.

2.3.2 | Demographics and military history—We administered a self-report questionnaire to assess demographics and military history. Participants classified themselves according to gender, ethnicity, and race. Classifications of ethnicity and race were defined according to the National Institute on Health's reporting policy. Gender, ethnicity, and race were assessed to ensure adequate representation of military demographics. A military history form assessed military demographics (branch, discharge date) as well as total number of deployments, dates of each deployment, and countries of each deployment. From this information, we calculated the length of deployment and dwell time. To account for varying numbers of deployments across participants, we created variables to reflect number of deployments, average length of deployment, and average dwell time (for those who deployed more than once). As there were few individuals with three or more deployments, number of deployments was condensed into a single variable – one deployment or more than one deployment.

As service members from various branches are deployed for varying lengths, we opted to use average length to account for multiple deployments of varying time frames. This strategy

enabled us to evaluate average deployment length versus cumulative length of time deployed (i.e., two deployments of 6 months might be conceptually different from one deployment of 12 months). Likewise, because dwell time included only those deployed more than once and varied across branch, we calculated average dwell time length versus cumulative dwell time across all deployments (e.g., one dwell time of 12 months might be conceptually different from two dwell times of 6 months). Post-9/11 deployments were defined as any foreign deployment after 9/11/2001 in support of the wars in Iraq and Afghanistan.

2.4 | Combat exposure

The Full Combat Exposure Scale is an 18-item self-report instrument that measures intensity of combat experiences (Hoge et al., 2004). Items are rated on a 5-point scale ranging from 0 (*never*) to 4 (*10+ times*) and are summed. Item examples include “being attacked or ambushed,” “seeing dead bodies or human remains,” “being wounded or injured,” and “engaging in hand-to-hand combat.” In the current study, internal consistency was 0.93.

2.5 | Mental health symptoms

The Clinician Administered PTSD Scale (CAPS) for DSM-IV is a semistructured interview for the assessment of PTSD (Blake et al., 1995) based on the *DSM-IV-TR* (APA, 2000). The CAPS assesses both PTSD symptom severity and diagnosis. CAPS interviews focused on the worst Criterion A deployment-related traumatic event that participants identified. A total of 241 veterans completed the CAPS based on meeting full criteria for Criterion A. For those participants who could not identify a post-9/11 deployment-related Criterion A traumatic event, the CAPS was conducted on an event that met Criterion A1 ($n = 18$), or if no Criterion A1 event could be identified, general deployment-related stress ($n = 19$). This allowed for a continuous PTSD symptom score to be derived for all participants who shared the common experience of deploying to a warzone.

Trained master's- and doctoral-level clinicians, who were supervised by doctoral level psychologists with expertise in trauma and military health, administered the CAPS. Assessment clinicians were trained to criterion by studying CAPS materials provided by the National Center for PTSD, listening to audiotapes of study interviews, observing interviews until they were comfortable, and matching on two assessments with a trainer until they administered the CAPS within a 5-point range of the trainer. Internal consistency for current symptom severity was 0.97.

2.6 | Statistical analysis

Hierarchical regression analysis was used to analyze the data. CAPS PTSD symptom severity total score served as the dependent variable in these analyses. All analyses controlled for gender, age, education, and combat exposure. Key deployment characteristic predictors included total number of deployments, average length of deployment, and average length of dwell time. Significance was evaluated using $p < .05$ and effect size estimates (partial η^2).

3 | RESULTS

3.1 | Participant characteristics

Demographic and military history characteristics are depicted in Table 1. Veterans (76.9%, $n = 214$ male) deployed between 2001 and 2011 with an average number of 1.5 deployments (standard deviation [SD] = 0.7; range, 1–6). A total of 164 (59.0%) deployed once, 86 (30.9%) twice, and 28 (10.1%) three or more times. The majority deployed to Iraq (92.8%, $n = 258$), with 15.1% ($n = 42$) deploying to Afghanistan (categories not mutually exclusive). The average length of each deployment was 11.5 months ($SD = 5.4$). The average length of dwell time was 19.4 months ($SD = 11.6$). A small proportion of veterans (2.3%, $n = 6$) also deployed to other countries in support of the wars in Iraq and Afghanistan. Of the 278 participants, 27.6% ($n = 77$) met criteria for current PTSD and 51.8% ($n = 144$) for lifetime PTSD. A paired samples t-test indicated that lifetime PTSD CAPS symptoms (mean [M] = 54.93, $SD = 34.36$) were more severe than current CAPS symptoms ($M = 31.83$, $SD = 28.07$; $t_{277} = 14.62$, $r = 0.68$, $p < .001$). Means and standard deviations for combat exposure and PTSD symptoms are presented by deployment characteristic in Table 2.

3.2 | Correlations

Combat exposure was associated with number of deployments ($r = 0.17$, $p = .004$) and current PTSD symptom severity ($r = 0.42$, $p < .001$) but not average length of deployment or dwell time. PTSD symptom severity was associated with number of deployments ($r = 0.12$, $p = .04$) and dwell time ($r = -0.22$, $p = .02$) but not average length of deployment.

3.3 | Average length of deployment

In the first hierarchical regression, gender, age, and education were entered in step 1, combat exposure was entered in step 2, and average length of deployment was entered in step 3. Results of step 1 indicated that the overall model was significant ($F_{2,274} = 5.59$, $R^2 = 0.06$, $p = .001$); years of education was a significant predictor in this model ($\beta = -0.18$, $p = .004$). No other predictors were significant. After step 2, the model remained significant ($F_{3,273} = 21.00$, $R^2 = 0.18$, $p < .001$). Combat exposure was a significant predictor in this model ($\beta = 0.45$, $p < .001$). After step 3, the overall model continued to be significant ($F_{4,272} = 17.01$, $R^2 = 0.00$, $p < .001$); however, average length of deployment was not a significant predictor.

3.4 | Number of deployments

A hierarchical regression analysis was conducted in the same manner as the prior regression analysis, except that number of deployments was added in step 3. Results were the same as the prior model for steps 1 and 2. After step 3 the model remained significant ($F_{4,271} = 16.93$, $R^2 = 0.00$, $p < .001$); however, number of deployments was not a significant predictor.

3.5 | Dwell time

Finally, a hierarchical linear regression was completed in the same previous manner but with average dwell time in the third step (Table 3). By definition, more than one deployment is required to calculate dwell time, and thus, 114 participants met criteria for this analysis.

Results of step 1 indicated that the overall model was not significant ($F_{3,110} = 1.54$, $R^2 = 0.04$, $p = .21$). After step 2, the model was significant ($F_{4,109} = 8.96$, $R^2 = 0.21$, $p < .001$), and combat exposure significantly predicted PTSD symptoms ($\beta = 0.47$, $p < .001$). In step 3, the overall model was significant ($F_{5,108} = 8.21$, $R^2 = 0.03$, $f^2 = 0.32$, $p < .001$), and average dwell time was a significant predictor in the model ($\beta = -0.17$, $p = .044$, $f^2 = .03$), even after accounting for demographics and combat exposure.

The sample size precluded determination of a cutoff for dwell time (i.e., number of months) in predicting long-term PTSD symptoms. However, because dwell time was the only significant deployment characteristic after controlling for combat exposure, we further explored its impact by coding dwell time as one deployment (i.e., no dwell time), average dwell time of greater than 12 months ($M = 23.76$, $SD = 10.39$), and average dwell time of less than 12 months ($M = 7.31$, $SD = 3.55$). This timeframe was used because, conceptually, 12 months allows for the service member to re-connect with their support system during important events that occur throughout the year (i.e., birthdays, holidays, etc.).

The three groups were compared using analysis of covariance, controlling for demographics and combat exposure. All assumptions of normality were met. A significant main effect for dwell time on CAPS PTSD symptoms was observed ($F_{4,273} = 6.91$, $p = .001$, partial $\eta^2 = 0.05$, small to medium effect), even after controlling for demographics and combat exposure. Planned comparisons using a Tukey's LSD test that accounted for covariates indicated significant differences on current PTSD symptom severity between those whose dwell time was less than 12 months and those who deployed once and those whose dwell time was greater than 12 months (all p values $< .001$). Those who had one deployment did not differ from those whose average dwell time was 12 months or longer on current PTSD symptoms (Figure 1).

4 | DISCUSSION

Because deployment-related stressors affect individuals, families, and society, understanding deployment-related factors that contribute to risk for long-term PTSD symptoms has important clinical and public health implications. This study expands upon the existing literature in several ways. First, published studies have focused on the impact of deployment characteristics on mental health among active duty and reservist military personnel. To our awareness, the effects of deployment characteristics on *long-term* PTSD symptoms (i.e. military-related PTSD symptoms present years after discharge) among veterans (vs. active duty) have not been studied. Second, prior studies have used brief screening measures, self-report measures, or medical record data to measure mental health outcomes. This is the first study to use a gold standard diagnostic interview to assess PTSD symptom severity.

Third, we accounted for several important confounding variables, most notably level of combat exposure. Consistent with the extant literature, combat exposure was associated with long-term CAPS PTSD symptoms. Combat exposure was also associated with number of deployments but not, somewhat surprisingly, average deployment length. Perhaps this is due to using average (vs. total) deployment length to account for the varying number of deployments across participants. Indeed, the correlation between combat exposure and total

deployment length was significant ($r = 0.22$, $p < .001$). Importantly, although deployment number and length has been used as a proxy for combat experiences, it is important to study these factors independently because combat exposure may vary depending on whether the person served in a combat or support unit (Kok et al., 2012). A strength of the current study is that it directly measured and accounted for intensity of combat exposure (vs. role).

As predicted, average length of deployment was not associated with current PTSD symptoms after accounting for demographics and combat exposure. Although inconsistent with the majority of the existing literature, at least two prior studies also found no such relationship with PTSD or mental health (Grieger et al., 2006; Hotopf et al., 2003). Discrepant findings could be related to our ability to control for intensity of (vs. role in) combat exposure, the fact that our sample had been deployed an average of 4.6 years ago, and because PTSD rates dropped from lifetime to current symptoms. Number of deployments was initially associated with long-term PTSD symptoms; however, this finding became nonsignificant after accounting for combat exposure. This shift in significance reiterates the importance of measuring degree of combat exposure.

The association between dwell time and long-term PTSD symptom severity held even after controlling for demographics and combat exposure. Follow-up analyses indicated that those whose dwell time was less than 12 months had the highest overall long-term PTSD symptoms. Interestingly, when dwell time was longer than 12 months, PTSD symptoms were equivalent to those who deployed only once. Although the effect size was small to medium, we believe that this finding holds significance both clinically and from a policymaking perspective given disparate rates of PTSD between U.S. and U.K. counterparts and the importance of prevention of PTSD.

The reasons why longer dwell time was associated with lower long-term PTSD symptoms warrant further investigation. For example, the effects of longer dwell time could be related to any number of factors, including simple passage of time, time to get out of the “warrior mentality,” time and opportunity to reconnect with family and friends, or time to fully implement coping strategies. Additionally, we do not know how many participants received treatment during their dwell time or how they otherwise spent their dwell time. Understanding how veterans spend their dwell time may be important for clinical consideration in terms of evaluating risk and protective factors during dwell time, including those that may still be present (e.g., family readjustment problems, other life events/stressors, coping style, social support).

Findings with respect to dwell time are in keeping with Conservation of Resources (COR) theory (Hobfoll, 1989, 2001). Specifically, a core tenet of COR is that individuals strive to attain, protect, and augment valued resources (e.g., personal, social, material, and energy resources). An event is perceived as stressful when there is a loss (or threatened loss) of resources, or the individual does not attain sufficient resources after expending significant effort to that end. With respect to dwell time, it is possible that shorter time between deployments may provide more threats to gaining, restoring, or attaining resources. For example, shorter dwell time may contribute to what feels like a more rapid transition from deployment to deployment and provide less opportunity for the veteran to reintegrate

with family members or deal with any stressors (e.g., parenting, financial). Collectively, these findings suggest that additional research is needed to better understand the impact of varied lengths of dwell time intervals on long-term PTSD symptoms and what resources or stressors are present during dwell time.

These findings also have clinical relevance, particularly in the context of the large number of returning veterans who are seeking mental health services and increasing numbers of civilian clinicians who are providing services to veterans. Specifically, trauma clinicians who work with veterans typically focus on assessing combat exposure and other criterion events per *DSM* criteria. However, when considering the longevity of PTSD symptoms, the assessment of dwell time (e.g., resources, coping styles, social support) may also be warranted. For example, it may be useful for the clinician to understand coping styles during dwell time to better understand what was left unresolved or how they are coping now.

Further, clinicians working with active duty veterans who anticipate being deployed again may find it beneficial to balance discussions of combat exposure and deployment experiences with how the service member is spending his/her dwell time and what stressors may be present. For active duty veterans who anticipate being deployed again, it may be useful to discuss how they are coping during dwell time, particularly if it is anticipated to be less than 12 months.

4.1 | Limitations

Several limitations warrant discussion. First, generalizability is affected by the primarily male sample of veterans enrolled in the local VA medical system, although we made efforts to oversample women (23.1%). Further, given our close proximity to Fort Hood, the sample had primarily served in the Army, which may limit generalizability to other service branches. We could not rule out cohort effects of veterans who may have served together with similar dwell time, but we believe this is unlikely due to our broad-based recruitment strategy using randomized mailings.

At the time this study was conducted, approximately 58% of post-9/11 veterans sought VA care (Epidemiology Program, Post-Deployment Health Group, Office of Public Health, Veterans Health Administration, Department of Veterans Affairs, 2014); thus, the sample is otherwise representative of veterans who served in the wars in Iraq and Afghanistan and were willing to enroll in the VA system (regardless of whether they were engaged in VA services). To increase representativeness of the sample, we mailed recruitment letters to a randomly selected group of all returning veterans enrolled in the system and invited them to participate. Second, this study relied on retrospective reporting of deployment characteristics and could be subject to recall bias. We were not able to verify combat experiences and deployment characteristics from medical records or other documentation.

Third, we do not know the lifetime mental health treatment history of our participants; notably, a significant proportion of participants had a remission of PTSD based on lifetime versus current month CAPS diagnoses (51.8% to 27.6%, respectively). Fourth, only 43% of the sample deployed more than once; thus, our sample size ($n = 114$) for dwell time analyses was relatively small. Further, our use of a 12-month cutpoint for dwell time

was conceptual, and future research with larger samples is needed to determine optimal cutoff points for sufficient dwell time. Large-scale studies are also needed to prospectively assess the relationship between deployment characteristics and mental health symptoms, including the impact of personal and family-level expectancies about the number and length of deployments and associated dwell time.

5 | CONCLUSION

In summary, our findings suggest that longer dwell time is uniquely associated with fewer long-term PTSD symptoms over and above the effects of demographics and combat exposure. If replicated, this finding could have important policy implications for postdeployment recovery and PTSD. For example, the U.K. harmony guidelines stipulate that tours should last no longer than 6 months and be followed by a 24-month break. Additional research aimed at replicating this important finding and comparing U.K. versus U.S. dwell time practices is needed to provide an empirical basis from which U.S. policymakers can draw when making decisions regarding deployments and dwell time in future conflicts.

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FIGURE 1.

Estimated marginal means: PTSD symptoms by dwell time, controlling for age, gender, education, and combat exposure

TABLE 1

Demographic and military characteristics (N = 278)

Sample Characteristic	Value
Age/years, mean (<i>SD</i>)	
Current	38.9 (10.1)
At enlistment	20.8 (4.3)
Male gender, <i>n</i> (%)	217 (78.1)
Hispanic or Latino, <i>n</i> (%)	65 (23.4)
Race, <i>n</i> (%) ^a	
White or Caucasian	168 (60.4)
Black or African American	78 (28.1)
American Indian/Alaska Native	14 (5.0)
Asian or Asian American	6 (2.2)
Hawaiian or Pacific Islander	2 (.7)
Other	21 (7.6)
Education/years, mean (<i>SD</i>)	14.1 (2.2)
Branch, <i>n</i> (%) ^a	
Army	235 (84.5)
Marine Corps	16 (5.8)
Navy	13 (4.7)
Airforce	12 (4.3)
National Guard	57 (20.5)
Service, <i>n</i> (%) ^a	
Active duty	265 (95.3)
Reservists	80 (28.8)
Number of deployments, mean (<i>SD</i>)	1.5 (0.7)
Length of deployment/months, mean (<i>SD</i>)	11.5 (5.4)
Deployed multiple times, <i>n</i> (%)	114 (42.8)
Number of dwell times, mean (<i>SD</i>)	.5 (0.7)
Dwell time length/months, mean (<i>SD</i>)	19.4 (11.6)
Discharge status, <i>n</i> (%) ^a	
Honorable	234 (84.2)
General	10 (3.6)
Medical	26 (9.4)
Retired from service	49 (17.6)
Other	6 (2.1)
Dishonorable	1 (0.3)
Grade at discharge, <i>n</i> (%) ^b	
E1-E4	75 (27.0)
E5-E6	104 (39.8)
E7-E9	60 (21.9)

Sample Characteristic	Value
O1-O3	11 (3.9)
O4-O9	14 (5.1)
W01-W05	6 (2.3)
Time since discharge/years, mean (<i>SD</i>)	3.3 (2.4)
Time since last deployment/years, mean (<i>SD</i>)	4.6 (2.2)

Note. SD = standard deviation.

^aCategories not mutually exclusive.

^bData missing for 8 participants.

TABLE 2

Means and standard deviations of combat exposure and PTSD symptoms by deployment characteristics

Measure	Total Sample (n = 278)	1 Depl (n = 164)	> 1 Depl (n= 114)	Dwell > 12 mo (n= 84)	Dwell < 12 mo (n= 30)
Combat exposure	20.73 (14.51)	18.87 (13.34) ^{**a, **b}	23.61 (16.08) ^{**c}	21.66 (15.61) ^{*b}	28.25 (15.21) ^{**c, *d}
CAPS current total	31.83 (28.02)	29.68 (27.79) ^{***b}	36.61 (28.75)	30.36 (27.17) ^{**b}	47.70(27.43) ^{**b, ***c}

Note. CAPS = Clinician Administered PTSD Scale; Depl = deployment; Dwell = dwell time; Mo = month; PTSD = posttraumatic stress disorder.

^a In comparison to more than one deployment.

^b In comparison to dwell time less than 12 months.

^c In comparison to one deployment.

^d In comparison to dwell time greater than 12 months.

* $p < .01$.

** $p < .01$.

*** $p < .001$.

TABLE 3

Summary of the continuous regression model of dwell time predicting current PTSD symptoms (n = 114)

Predictor	CAPS Scores		
	<i>R</i>²	<i>β</i>	<i>P</i>
Step 1	0.04		.21
Gender		−0.07	.46
Age		−0.20	.04
Education level		0.06	.55
Step 2	0.21		<.001
Gender		−0.22	.02
Age		−0.15	.08
Education level		0.03	.76
Combat exposure		0.48	<.001
Step 3	0.03		<.001
Gender		−.22	.02
Age		−.15	.09
Education level		.03	.76
Combat exposure		.46	<.001
Dwell time		−0.17	.04
Total <i>R</i> ²	0.28		.04

Note. CAPS = Clinician Administered PTSD Scale; PTSD = posttraumatic stress disorder.