The evolution of mental health outcomes across a combat deployment cycle: A longitudinal study of a Guam-based National Guard unit

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Abstract

Sustained overseas military operations over the last two decades have resulted in large numbers of United States and Allied servicemembers being faced with multiple unique occupational and environmental stressors, from serving in a combat zone, to having to be away from family and home for long periods of time. These stressors result in numerous negative health (physical and mental) and behavioral outcomes. Whereas there is a substantial amount of research focused on deployment-related health outcomes within active duty military populations, reserve forces are less understood. This study focuses on a United States Army National Guard combat unit before, during and after a deployment to Afghanistan. This prospective longitudinal study, conducted over the course of an operational deployment cycle (i.e., before, during and after), documents the trajectories of salient mental health outcomes (i.e., post-traumatic stress, depression, general anxiety, and aggression). The findings show that both combat (e.g., killing others) and non-combat (e.g., boredom) stressors negatively affect mental health outcomes, and the severity of these outcomes increases over the course of a deployment cycle. Of special note, the study reveals key gender differences in the evolution of PTSD, depression and anxiety across a deployment cycle: females report increased PTSD, depression and anxiety 6 months post-deployment whereas the levels reported by males stabilize at their mid-deployment levels. The findings offer insights for medical providers and policymakers in developing more targeted health promotion campaigns and interventions, especially during the post-deployment phase.

Introduction

Trajectories of mental health outcomes across a combat deployment cycle

The United States (US) military and its allies have been engaged in protracted military operations across the globe for nearly two decades, which has resulted in many casualties and
substantial devastation; for instance, during Operations Iraqi Freedom, Enduring Freedom and Freedom’s Sentinel, the US military alone has endured ~6,790 total deaths (~4,056 killed in action) and ~52,212 wounded [1]. These operations have in turn resulted in a multitude of mental health (MH) and behavioral health (BH) outcomes [2]. Despite the growth of military population focused research, the underlying factors and full implications of sustained contemporary military operations on the health and well-being of servicemembers are still not comprehensively understood [3]. One limitation in the extant literature is the disproportionate focus on active component (AC; i.e., full-time force) servicemembers, resulting in a knowledge gap concerning the heavily relied upon reserve component (RC; i.e., part-time force).

In the US, the RC comprises the federally controlled Army Reserve (USAR) and the state-controlled National Guard (NG). The NG is a unique and understudied population within the US Army in that it is not only charged with providing most of the RC’s combat forces (the USAR’s primary focus is support-related) for traditional military operations but it is also charged with supporting state government domestic missions, which range from responding to natural disasters and terrorist attacks to supporting law enforcement during civil unrest [4–5]. As such, within the RC population, the NG is exposed to numerous unique stressors; the result being that these servicemembers often exhibit higher levels of MH issues and compared to their AC/RC peers [6–8] and lack access to treatment options [9–10]. This understudied population warrants research attention to identify risk and protective factors associated with its occupational exposures and enhance its health and well-being needs [11–12].

Key health implications associated with military service

In the US, a large number of servicemembers and veterans continue to suffer MH and maladaptive behavioral issues despite the numerous programs that strive to mitigate the negative outcomes associated with military service [13–14]. Among the MH issues, Posttraumatic Stress Disorder (PTSD) remains a forefront concern and persists in military and veteran populations [15]. Military population PTSD rates are higher than those observed in the general population [16–18]. The core symptoms of PTSD include hyperarousal, avoidance, numbing, and re-experiencing of trauma [19–20]; its etiology is distinctive amongst other MH outcomes in that the defining traumatic event can usually be identified, thus allowing for a more precise cause-and-effect relationship [21–22]. Although PTSD is a key concern within military populations, it is often comorbid with other MH outcomes (e.g., depression and suicidal ideation) as well as problematic substance use [23–24]; for example, those with PTSD are seven times more likely to concurrently suffer from depression compared to those without PTSD [25–26].

Servicemembers face a variety of environmental stressors during combat deployment. One of the most documented stressors is combat experiences (e.g., fighting, killing/injuring others, threat to oneself, exposure to death/injury, and witnessing atrocities) known to trigger negative MH and maladaptive behavioral outcomes (e.g., substance abuse and misuse) [10, 27]. In addition to combat stressors, which can ebb and flow, servicemembers also face a number of more constant deployment-related environmental stressors, which include issues such as boredom, tedious and monotonous workloads, poor food quality, a lack of personal time and space, inability to maintain hygiene, difficulty in maintaining social support relationships with family and friends back home, as well as interpersonal issues with their unit’s leadership [28–29, 8]. Although understudied compared to direct combat stressors, such deployment-related environmental stressors are known to increase the prevalence rates of MH and maladaptive behavioral outcomes [30]. A longitudinal approach is needed to provide better insights concerning the relationship between how exposure to deployment-related stressors, combat or otherwise, evolve into MH and maladaptive behavioral issues over the course of a deployment cycle [31].
These issues are particularly salient for RC servicemembers who often struggle with the rapid transition between military and civilian life [32–33]; for instance, reservists returning from a deployment often exhibit increased levels of violent behavior, whether or not they served in a combat role [34] as well as PTSD [35].

**Methods**

This study utilizes a prospective longitudinal research design with data collected at three time points: pre-, mid- and post-deployment. Prospective longitudinal studies are suited to differentiate between short and long-term influences and serve to establish time-ordered associations between environmental exposures/stressors and health/behavioral outcomes compared to cross-sectional and retrospective studies [36]. This approach enhances the robustness of analyses by allowing an assessment of medical outcome trajectories. Unfortunately, this approach is seldom used in military studies due to logistical difficulties and resource limitations and, to our knowledge, it has not been undertaken before in such a manner with a NG cohort.

**Study approval**

Study approval was obtained from the Institutional Review Boards (IRB) of the US Department of Defense’s (DoD) Uniformed Services University and the US Army Medical Research and Materiel Command. Additionally, as NG personnel fall under the control of the states and territories to which they are assigned, general study approval was also obtained from the National Guard Bureau and the unit’s Adjutant General (i.e., the overall commanding officer). For the deployment phase of the study, general study authorization was obtained from North Atlantic Treaty Organization and the US Central Command, which were responsible for servicemembers serving in Afghanistan.

**Study population**

The study population consists of servicemembers from an infantry brigade (N = 585) from the US Territory of Guam (~48% of the entire Guam Army National Guard) that deployed to Afghanistan between April 2013 and January 2014. Baseline pre-deployment survey data (N = 526; 89.9% of the unit’s total) were collected in April 2013 at the unit’s mobilization station several days before it deployed to Afghanistan. Data could not be collected from the entire unit prior to deployment as approximately 50 servicemembers had deployed ahead of the main unit to make preparations; however, these servicemembers were given an opportunity to partake in the remaining data collections. Mid-deployment survey data (N = 571; 97.6% of the unit’s total) were collected throughout Afghanistan in September and October 2013. Not all servicemembers were available due to mission requirements (e.g., on patrol); additionally, two servicemembers were killed in action prior to the mid-deployment data collection. Post-deployment survey data (N = 472; 80.7% of the unit’s total) were collected approximately six months post-deployment, when mental and behavioral health issues often develop [37–38]. Post-deployment data were collected at the unit’s primary home base in July and August 2014; however, some data were collected from servicemembers who were receiving medical care at Tripler Army Medical Center, Hawai’i in August 2014.

**Informed consent and data collection processes**

For all data collections, servicemembers attended a recruitment briefing during routine duty hours that outlined the study’s purpose and their rights. During the briefing, servicemembers were encouraged to ask questions. Those wishing to partake in the study were required to...
complete an informed consent form at each time point; the consent forms were secured separately from the surveys to help maintain anonymity. Upon submitting their informed consent form, respondents were provided with a paper survey. Respondents were informed that they could skip any questions that made them uncomfortable and cease the study at any time. To help maximize the longitudinal study respondents’ confidentiality, surveys were de-identified using an anonymous self-generated sequential code (e.g., PPS1423) as to allow the linkage of individual respondent surveys across the three timepoints. To do so, as in previous military research, respondents listed the last character of their mother’s maiden name, day of their birth month, and year of their birth and also the first digits of their birth month and city where they were born [39].

The surveys were matched with probabilistic record linkage based on the self-generated codes [40]. For the purposes of this study, an additional step was taken in that respondents were excluded from the analyses if they did not fully complete all of the MH measure items across all three timepoints. Per IRB guidance, respondents were allowed to skip any survey item that might make them uncomfortable. Ensuring that there was no missing data resulted in a more thorough longitudinal dataset and this conservative approach yielded a total sample of 246 servicemembers with complete measures at each of the three time points.

Survey measurements

Validated measures used in both previous military and civilian studies were administered at each of the three timepoints.

**Mental and behavioral health measures.** Post-traumatic stress: PTS symptomology was assessed using the 17-item PTSD Checklist (PCL-17; $\alpha = .98$) [17, 41]. The PCL-17 lists all intrusion, avoidance and arousal PTSD symptoms. Respondents rated each item on a 5-point scale (1 = not at all to 5 = extremely) and the sum of these responses provided an indicator of PTS symptom severity (17-item summation). Respondents with sum scores $\geq 50$ were considered a positive screen for PTSD [17].

Depression: Depressive symptomology was assessed using the 9-item Patient Health Questionnaire subscale (PHQ-9) [42]. The sum of the 9 items provides an indicator of depression severity with probable major depression defined as endorsing five or more of the nine symptoms present “more than half the days” or “most days” in the past two weeks [43, 42].

Generalized anxiety: Anxiety disorder symptomology was assessed with the 7-item Generalized Anxiety Disorder measure (GAD-7) [44]. The sum provides an indicator of severity and a score $\geq 10$ was coded as a positive screen for anxiety.

Anger: Anger negatively impacts one’s ability to recover from traumatic experiences, especially following a military deployment [45–48]. Recent expressions of internally-focused anger were assessed using a measure adapted from the Interpersonal Conflict and the State/Trait Anger scales for use in military research [49]. Respondents indicated how many times in the past month (1 = not at all to 5 = very often) they had: boiled inside with anger, a hard time cooling down when angry, anger that got in the way of getting along with others, and anger that progresses instantly to aggression or rage ($\alpha = .93$).

Aggression: Externally-focused aggressive behavior [50] was measured by having respondents indicate how many times in the past month (1 to 10+) they had: been angry at someone and yelled or shouted at them; been angry with someone and kicked or smashed something; slammed a door, punched a wall, etc.; threatened someone with physical violence; and gotten into a fight with someone and hit that person ($\alpha = .83$).

General mental and physical health: Two single-item measures were used to assess respondents’ general mental and physical health. Respondents indicated the number of days over the past 30 days when they had poor mental or physical health.
Exposure measures. Deployment stressors: During the mid-deployment data collection, combat- and non-combat deployment stressors were assessed to capture for the degree to which each respondent experienced a number of deployment-related environmental stressors. Combat experiences place servicemembers at particular risk for developing a range of mental and behavioral health issues [17, 14, 10, 27] as well as physical ailments [51, 18]. Combat exposures were evaluated using a 31-item measure that has been used in multiple military studies ($\alpha = .78$) [17, 10, 52]; respondents were asked to indicate how many times during their current deployment they had experienced each item (e.g., Being shot at; $0 = 0$ to $6 = 5+$. Non-combat deployment stressors were assessed with a 25-item measure created for the purposes of this study; respondents were asked to indicate how stressful ($0 = not\ at\ all$ to $5 = extremely$) each item had been on their current deployment ($\alpha = .95$). See supplemental information for a complete list of the items.

Additional variables. A number of factors known to impact both the onset and treatment of MH outcomes were also assessed in the post-deployment survey.

Stigma and barriers to care: Perceived stigmas associated with seeking MH care were assessed in the post-deployment survey with a 10-item measure (e.g., I do not trust mental health professionals; $\alpha = .96$) [53–54]. Barriers to utilizing care were assessed with a 6-item measure (e.g., not knowing where to get help from; $\alpha = .92$). Respondents were asked to “rate each of the possible concerns that might have affected your decision whether or not to receive mental health counseling or services during the past month” ($1 = strongly\ disagree$ to $5 = strongly\ agree$) [53–54]. See supplemental information for a complete list of the items.

Organizational support: The degree to which respondents received positive psychological support from their unit overall was assessed with the shortened Perceived Organizational Support measure, which has been widely used in military research [55–56]; respondents indicated their level of agreement with the following items: 1) My unit strongly considers my goals and values; 2) My unit really cares about my well-being; 3) My unit cares about my opinion; and 4) My unit is willing to help me when I need a special favor ($0 = strongly\ disagree$ to $5 = strongly\ agree$; $\alpha = .95$).

Unit cohesion: The degree to which respondents perceived their immediate unit as functioning cohesively was assessed by asking respondents to indicate their level of agreement with the following statements: 1) The members of my unit are cooperative with each other; 2) The members of my unit know that they can depend on each other; and 3) The members of my unit stand up for each other ($0 = strongly\ disagree$ to $5 = strongly\ agree$; $\alpha = .96$) [57–58].

Facets of perceived leadership: Respondents’ perceptions of their immediate leadership in their unit (e.g., those directly in charge of them) were assessed by respondents indicating how often leaders did the following: 1) Tell servicemembers when they have done a good job; 2) Embarrass servicemembers in front of other servicemembers; 3) Try to look good to higher-ups by assigning extra missions or details to servicemembers; 4) Exhibit clear thinking and reasonable action under stress. Each of these items was measured from $0 = never$ to $5 = always$ [59–61].

Reintegration: General post-deployment reintegration was assessed with a shortened 11-item version of the Military to Civilian Questionnaire [62]; respondents indicated the level of difficulty they had with each item (e.g., Finding meaning or purpose in life) since returning from the deployment ($0 = no\ difficulty$ to $5 = extreme\ difficulty$; $\alpha = .95$). Additionally, post-deployment family reintegration was assessed with a shortened 10-item Army Post-Deployment Reintegration Scale [63]; respondents indicated the extent to which each item (e.g., I feel closer to my family) held true for them since returning from deployment ($0 = not\ true\ at\ all$ to $5 = completely\ true$; $\alpha = .78$). See supplemental information for a complete list of the items.

Demographics: Consistent with other military studies, the key variables included: gender, military rank, age, ethnicity, education level, marital or significant other status, and years of military service. As this population is comprised of reserve personnel, more civilian-centric
questions were also posed, including: civilian employment status (full-time, part-time, unemployed, retired), employment type (self-employed, government employee, or private sector employee) socioeconomic status (annual household income and debt level), and college/university student status (full or part-time). No personally identifiable information was collected (e.g., birthdate).

**Results**

**Sample demographics**

The analysis sample consisted of 246 respondents with matched and complete MH data across the three time points. The majority were male (90.7%), Pacific Islander (84.6%), Chamorro (i.e., native people of Guam; 80.8%). Ages ranged between 19 and 57 years at mid-deployment, with a mean age of 29.50. The demographic characteristics, rank, education levels, marital status and deployment history of this matched sample are similar to those of the complete population (the whole unit who deployed), as reported in Table 1.

**Mental health outcomes**

Table 2 provides the scores for each MH outcome of interest at the three timepoints and, where applicable, the total number and percentage of servicemembers who screened positive at each timepoint.

Table 1. Demographic characteristics of the analysis sample (matched data across time points) with population.

| Demographics (as reported mid-deployment) | Population (Unit) | Analysis Sample |
|------------------------------------------|-------------------|-----------------|
| N                                        | 571               | 246             |
| Gender N males (% of total reported)     | 521 (91.7%)       | 223 (90.7%)     |
| Ethnicity N Pacific Islander (% of total reported) | 450 (82.0%) | 208 (84.6%) |
| Age Mean (SD)                            | 29.18 (8.52)      | 29.50 (8.23)    |
| Rank                                     |                   |                 |
| E1-E3                                    | 37 (4.7%)         | 18 (7.3%)       |
| E4                                       | 298 (37.5%)       | 143 (58.1%)     |
| E5-E6                                    | 154 (19.4%)       | 62 (25.2%)      |
| E7-E9                                    | 34 (6.0%)         | 9 (3.7%)        |
| Officer / Warrant Officer                | 46 (5.8%)         | 14 (5.7%)       |
| Education (as reported pre-deployment)   |                   |                 |
| < 12th grade                             | 10 (1.9%)         | 6 (2.5%)        |
| High School diploma / GED                | 267 (51.9%)       | 128 (52.7%)     |
| Some college / technical school          | 190 (37%)         | 91 (37.4%)      |
| Bachelor’s degree                        | 37 (7.2%)         | 15 (6.2%)       |
| Graduate degree                          | 10 (1.9%)         | 3 (1.2%)        |
| Marital Status (as reported pre-deployment) |               |                 |
| Single never married                     | 195 (37.4%)       | 97 (39.6%)      |
| Married                                  | 294 (56.3%)       | 135 (55.1%)     |
| Divorced or separated                    | 33 (6.3%)         | 13 (5.3%)       |
| Deployment History (as reported pre-deployment) | 316 | 154 |
| 0 previous deployment                    | 257 (81.3%)       | 131 (85.1%)     |
| 1 previous deployment                    | 32 (10.1%)        | 11 (7.1%)       |
| 2 + previous deployments                 | 27 (8.6%)         | 12 (7.8%)       |

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To assess the trajectories over the three timepoints and the role of combat and deployment-related stress factors, as well as address demographic differences in those trajectories, a series of repeated measures regression analyses were conducted: each of the continuous MH outcomes was analyzed with time as a repeated measure (3 timepoints) and included in the model main effects for gender, age, combat experiences and deployment stressors as well as their interactions with time. The analysis provides an assessment of the trajectory of the MH across time (main effect of time) as well as whether these trajectories differ significantly as a function of the other variables (interaction between time and the other variables in the model).

As reported in Table 3, time was significant for PCL-17, GAD-7, and PHQ-9, indicating that these MH outcomes worsen over time, which is in line with the scores reported in Table 2. In terms of main effects, combat experiences and deployment-related stressors are both significant predictors of all the MH outcomes, and age is related to PCL-17 and PHQ-9. Although there are no main effects of gender, the interaction between time and gender is significant for PCL-17, GAD-7, and PHQ-9, signaling that the temporal trajectories of these MH issues differ by gender. These trajectories are illustrated in Figs 1, 2 and 3; whereas scores on the PCL-17, GAD-7, and PHQ-9 assessments stabilize around mid-deployment levels for

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Table 2. Mental health outcomes across time points (N = 246).

| Mental Health Outcomes                  | Range of scores/scale | Pre-deployment | Mid-deployment | Post-deployment |
|-----------------------------------------|-----------------------|----------------|----------------|-----------------|
| Post-Traumatic Stress Disorder          |                       |                |                |                 |
| PCL-17 Sum Score (SD)                   | 17–79                 | 22.82 (9.73)   | 27.34 (12.29)  | 27.75 (14.36)   |
| PTSD Positive screen (%)                | 12 (4.9%)             | 28 (11.4%)     | 30 (12.2%)     |                 |
| Depression                              |                       |                |                |                 |
| PHQ-9 sum score (SD)                    | 0–27                  | 1.41 (2.94)    | 2.69 (4.37)    | 2.98 (4.92)     |
| Depression Positive screen (%)          | 5 (2.0%)              | 7 (2.8%)       | 25 (10.2%)     |                 |
| General Anxiety Disorder                |                       |                |                |                 |
| GAD-7 Sum Score (SD)                    | 0–14                  | 2.15 (2.77)    | 2.70 (3.17)    | 3.00 (3.65)     |
| Anxiety positive screen (%)             | 6 (2.5%)              | 7 (2.8%)       | 17 (7.1%)      |                 |
| Internal Anger                          |                       |                |                |                 |
| 1–5                                     | 1.37 (.61)            | 1.60 (.85)     | 1.67 (.96)     |                 |
| Aggression                              |                       |                |                |                 |
| 0–10                                    | .55 (1.33)            | .60 (1.27)     | 1.34 (1.69)    |                 |
| Bad Mental Health days (# in last 30 days) | 0–30                 | .22 (1.71)     | .84 (3.72)     | 1.34 (5.04)     |
| Bad Physical Health days (# in last 30 days) | 0–30                 | .63 (2.45)     | 1.34 (4.01)    | 2.38 (6.90)     |

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Table 3. Repeated measures regression results for each mental health outcome.

| F values         | PCL-17 | PHQ-9 | GAD-7 | Internal Anger | Aggression |
|------------------|--------|-------|-------|----------------|------------|
| Time             | 3.70*  | 6.02**| 5.66**| .77            | 2.03       |
| Gender           | .47    | 1.92  | .56   | .31            | .87        |
| Age              | 9.03** | 5.55* | 2.67  | .84            | .95        |
| Combat Experiences | 19.70**| 8.44**| 21.65**| 11.59**       | 14.82**   |
| Deployment Stressors | 55.60**| 70.25**| 67.08**| 62.62**       | 23.85**   |
| Time X Gender    | 3.62*  | 3.26* | 7.11**| 2.72           | .97        |
| Time X Age       | 1.29   | 4.27* | 2.62  | .52            | 1.08       |
| Time X Combat Experiences | .29   | .71   | .01   | 1.05           | 4.32*      |
| Time X Deployment Stressors | 15.60**| 14.81**| 9.14**| 6.31**        | .95        |

Note: *p < .05; **p < .01.
males, they are all significantly higher for females than for males six months post-deployment. Table 4 shows that female respondents report higher levels of post-deployment MH outcomes,
even though there were no such gender differences before or during deployment. These analyses control for combat and non-combat deployment stressors, so the gender differences identified are independent of those factors, which are also significantly and positively associated with MH outcomes.

**Exploratory post analysis**

Given the significant gender differences in the MH trajectories across the combat deployment cycle, an additional exploratory analysis was conducted to better understand the nature of the situation females face post-deployment. Focusing in on the post-deployment data and comparing gender in an independent sample t-test between the two groups, females were found not to differ from their male counterparts in terms of post-deployment reintegration, family reintegration, reintegration, and mental health outcomes.
barriers to care or stigma of care. The only factors that differed significantly between males and females were those related to the organization support received (or not) from the unit, with females reporting significantly lower rates of organization support (3.27 for females vs. 3.88 for males), or unit cohesion (3.54 for females vs. 4.02 for males) post-deployment (even though there were no such gender differences at mid-deployment; all post-deployment $t$s (244) > 2.65, $p < .05$). Two items in the perceived support from leadership differ by gender: females were significantly less likely to report that unit leadership told servicemembers when they have done a good job (females 3.26 vs. males 3.95; $t (242) = 3.63, p < .05$), and that unit leadership exhibits clear thinking and reasonable action under stress (females 3.22 vs. males 3.77; $t (242) = 3.37, p < .05$).

Discussion

This study reveals that the trajectory of MH issues varies as a function of the type of stressor (i.e., both deployment and combat related) experienced across a deployment cycle as well as one’s individual characteristics. Most notably, the findings highlight salient gender differences in the trajectories of PTSD, depression and anxiety. Whereas females reported lower rates of MH issues before and during their deployment, their MH outcomes post-deployment are more severe than male counterparts.

This finding adds to a growing body of research concerning gender-associated health outcome differences in military populations and highlights the need for additional gender-focused research [64]. To that end, an interesting avenue for future research might lie in more deeply documenting the factors, such as social support from fellow unit members, that may be lacking in the post-deployment environment for female servicemembers. Considering that the females in this study reported higher rates of PTSD, depression and anxiety as well as perceptions of receiving less unit and leadership support post-deployment, it is important that future research delineate what factors might underlie such perceptions and how to best palliate these cultural and organizational issues. Within such a line of research, a broader scope of inquiry is required to capture everyday realities post-deployment. It is well-documented that females face hardships and MH issues when returning to work following maternity leave. Research in this realm has shown the importance of accounting for socioeconomic status, childcare responsibilities, and household obligations [65]; and there have been calls for military researchers to better assess specific demographic, social, and environmental exposure factors [66]. Future research should increase focus to such factors when studying military reserve populations and assess the parallels between females returning from military deployments and returning to employment from parental leave. More specifically, future research should seek to understand and develop female-centric post-deployment reintegration and health promotion programs in an effort to mitigate negative MH outcomes.

Although most of the extant literature has focused on combat-related environmental stressors, this study’s findings suggest that more attention should be placed on everyday deployment-related stressors, which emerged as significant drivers of MH issues. Compared to combat-related stressors, non-combat stressors span a large spectrum and range from less serious factors, such as boredom, to more serious factors, such as sexual harassment [67, 30]. As to better account for the multitude of environmental stressors that servicemembers face on a deployment, future research should more accurately identify, operationalize and account for non-combat deployment-related stressors as to assess the degree to which they negatively impact health and well-being outcomes across a deployment cycle for active duty and reserve servicemembers alike.

In closing, we acknowledge that the study’s participants were primarily “Native Hawaiian or Other Pacific Islander.” While the focus on servicemembers from Guam may not generalize to the wider US or other military forces, this population represents a unique and understudied
segment of the military. Given that this isolated island nation is known to harbor strong cultural identities and social bonds, future research on aspects of the sociocultural environment that might afford protective factors could inform future research and culturally relevant prevention and intervention efforts in the area of mental health.

Supporting information

S1 File. Deidentified minimal dataset used in the MLM analyses. (XLSX)

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