


ORIGINAL ARTICLE

Army Warrior Care Project (AWCP): Rationale and methods for a longitudinal study of behavioral health care in Army Warrior Transition Units using Military Health System data, FY2008–2015

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Abstract

Objectives: Warrior Transition Units (WTUs) are specialized military units co-located with major military treatment facilities providing a Triad of Care involving primary care physicians, case managers, and military leadership to soldiers needing comprehensive medical care. We describe the rationale and methods for studying behavioral health care in WTUs and characterize soldiers assigned to WTUs.

Methods: The Army Warrior Care Project (AWCP) analyzes U.S. Department of Defense Military Health System data to examine behavioral health problems and service utilization among Army soldiers who were assigned to WTUs after returning from Afghanistan and Iraq deployments, FY2008–2015.

Results: WTU members ($N = 31,094$) comprised 3.5% of the AWCP cohort ($N = 883,091$). Almost all (96.5%) had one WTU assignment for a median of 327 days; 77.3% were assigned before deployment ended, ≤ 30 or > 365 days post-deployment; 59.4% had deployment-related behavioral health diagnoses.

Conclusions: An overwhelming majority of soldiers had one WTU assignment for almost a year. A substantial proportion of WTU soldiers had psychological impairment, which limited performance of their military duties. The AWCP is the first longitudinal study of redeployed soldiers assigned to WTUs and provides a unique opportunity to advance our understanding of behavioral health among soldiers needing comprehensive medical care after combat deployments.

KEYWORDS

combat deployments, military behavioral health, military medicine, U.S. Army veterans, Warrior Transition Units

1 | INTRODUCTION

From 2001 to 2015, U.S. Armed Forces deployed over 2.7 million troops on over 5.4 million deployments for Operations Enduring

Freedom (OEF), Iraqi Freedom (OIF), and New Dawn (OND)—characterized by multiple deployments, improvised explosive devices, and intense fighting (Tanielian & Jaycox, 2008; Wenger, O'Connell, & Cotrell, 2018). Deployed troops were, on average, younger than age

30; 86% were enlisted, 57% were married, 45% had children, and 10% were women (Wenger et al., 2018). Signature injuries of OEF/OIF/OND include traumatic brain injury (TBI), posttraumatic stress disorder (PTSD), and amputations (Stansbury, Lalliss, Branstetter, Bagg, & Holcomb, 2008; Tanielian & Jaycox, 2008; Wilk, Herrell, Wynn, Riviere, & Hoge, 2012).

Over a decade of war and a greater than 90% survival rate for serious injuries raised behavioral health concerns among OEF/OIF/OND veterans (Holcomb, Stansbury, Champion, Wade, & Bellamy, 2006; Tanielian & Jaycox, 2008). Behavioral health is associated with OEF/OIF deployments, with rates of alcohol and drug use disorders being higher after first deployments, and PTSD and anxiety more frequently after second or third deployments (Armed Forces Health Surveillance Center [AFHSC], 2011). In 2003, redeployed (i.e., returned home from deployment) soldiers and Marines reported higher rates of PTSD, anxiety, and depression than before deployment (Hoge et al., 2004). More mental problems were also reported at 3–6 months than 30 days postdeployment, and National Guard and Reservists (NGR; 42.4%) reported higher rates of mental problems than Active (20.3%) soldiers (Milliken, Auchterlonie, & Hoge, 2007).

Behavioral health problems associated with OEF/OIF/OND (e.g., PTSD, substance use) are often comorbid and linked to increased psychosocial problems, disease burden, and health care utilization (Bryan & Corso, 2011; Possemato, Wade, Andersen, & Ouimette, 2010). From 2000 to 2011, incident diagnosis of mental disorders among U.S. active duty members increased 65% (5,387.1 to 8,900.5 per 100,000 person-years). Of the 936,383 receiving a mental diagnosis, 46% received two or more diagnoses with adjustment, depression, and alcohol use disorders accounting for 85% (Armed Forces Health Surveillance Center, 2012d). Only one in five OEF/OIF veterans who screen at risk for behavioral health problems are referred for services, and help-seeking is between 23% and 40% (Government Accountability Office [GAO], 2006; Hoge et al., 2004). Incongruence between soldiers' reported alcohol problems within 30 days postdeployment and providers' assessment also exist, suggesting missed opportunities for early identification and referral to alcohol treatment (Larson, Mohr, Adams, Wooten, & Williams, 2014). Overall, evidence suggests high prevalence of behavioral health problems and significant behavioral health care needs among U.S. OEF/OIF/OND veterans.

1.1 | The need for Warrior Transition Units

Behavioral health problems of OEF/OIF/OND veterans require comprehensive medical care across multiple systems of care. Before 2008, Department of Defense (DoD) and Army-specific problems persisted regarding access to care and care coordination for redeployed troops (GAO, 2007). Inconsistent procedures existed to retain NGR on active duty to receive medical treatment despite injuries incurred while deployed. Postdeployment care provided in medical hold units lacked uniform structure and resources to support Ill,

Injured, and Wounded (IIW) troops (GAO, 2016). In response to congressional inquiry and negative media coverage about care received by IIW troops, the *Dignified Treatment of Wounded Warriors Act* (110th Congress, 2007–2008) provided comprehensive guidance on the care, management, and transition of troops with noncombat and combat-related injuries occurring on or after October 7, 2001. Entitlements included better access to care, care coordination, and medical care in military treatment facilities (MTFs).

1.2 | Army Warrior Transition Units established

Since 2001, the U.S. Army deployed 1.3 million (49.3%) soldiers on 2.3 million (58%) OEF/OIF/OND deployments—71% by Active, 20% by National Guard, and 9% by Reservists (Wenger et al., 2018). Consequently, the majority of OEF/OIF/OND veterans needing postdeployment care are in the Army (GAO, 2016). In 2007, Warrior Transition Units (WTUs)¹ were created to address barriers to care and to provide medical case management to soldiers with physical and psychological injuries (Department of the Army, 2009). WTUs are specialized military units co-located with major MTFs (e.g., Walter Reed National Military Medical Center) offering a Triad of Care—a soldier-centered service delivery model, involving military leadership, case managers, and primary care physicians who collaboratively ensure quality care and continuity of care, and transition of soldiers back to military duty. WTU goals include (a) care coordination for soldiers, (b) family support, and (c) seamless transition of soldiers back to military duty or to veteran status and Veterans Health Administration care. Upon WTU assignment, soldiers receive a prescription medication review to identify high-risk medication use and potentially lethal interactions (Department of the Army, 2015). Soldiers at high risk for medication misuse or behavioral health problems are enrolled in High-Risk Medical Review and Sole Provider Programs (Department of the Army, 2015). Guided by the Comprehensive Soldier and Family Fitness model (Casey, 2011), a comprehensive transition plan is developed for WTU soldiers to (a) return to military duty or (b) military discharge for those not meeting medical retention criteria (Department of the Army, 2011). The first full year WTUs were operational was 2008 (GAO, 2016).

The Army Warrior Care and Transition Program facilitates comprehensive medical care in WTUs and Community Care Units (CCUs; formerly Community-Based WTUs) at MTFs worldwide (Figure S1 in the Supporting Information; Department of the Army, 2009). WTU eligibility criteria vary. Active soldiers with a complex medical condition limiting duty performance for 6 months or more or a behavioral health condition posing a danger to self or others are eligible for WTU assignment (Department of the Army, 2015). NGR soldiers must have a medical condition incurred in the line of duty requiring medical treatment for 30 days or more (GAO, 2016). NGR soldiers meeting WTU eligibility criteria are assigned to CCUs if they attend unit

¹All branches of the U.S. Armed Forces (Army, Navy, Air Force, Marines, Coast Guard) have specialized units and/or programs for ill, injured, and wounded service members.

training and scheduled medical appointments, have permanent housing and reliable transportation, and live within a 50-mile radius of a MTF. Active soldiers are assigned to CCUs if they have a catastrophic injury or terminal illness requiring the assistance of a family member or caregiver who does not live near their assigned military installation (Department of the Army, 2015).

Since 2007, the length of WTU assignments increased progressively due to case mix, polytrauma, recovery, and rehabilitation. In 2012, the length of WTU assignments averaged between 256 and 420 days in CCUs (Department of the Army, 2012). An evaluation of five WTUs between 2008 and 2014 found that the average length of WTU assignments was shorter for Active soldiers (274–379 days) than National Guard (346–440 days) and Reservists (358–432 days; GAO, 2016). From 2007 to 2011, 50% of soldiers assigned to WTUs returned to duty, 47% were medically retired/separated, and 3% received disciplinary/administrative discharges (Department of the Army, 2012). Initially, WTUs primarily addressed physical conditions; however, between 2008 and 2015, behavioral health diagnoses (e.g., PTSD, depression, and anxiety) among WTU soldiers increased from 36 to 52% (GAO, 2016). Mental health and substance use disorders (SUD), risky drinking, polypharmacy, psychotropic medication use, and psychosocial problems were identified as risk factors for preventable deaths among WTU soldiers (Gallaway et al., 2014). Despite behavioral health concerns, the Army has not examined post-deployment behavioral health in WTUs (GAO, 2016).

1.3 | Rationale and purpose for the Army Warrior Care Project

The *Bioecological Model of Deployment Risk and Resilience* (Wooten, 2013) and *Gelberg-Andersen Behavioral Health Model for Vulnerable Populations* (Gelberg, Andersen, & Leake, 2000) guide the rationale for the Army Warrior Care Project (AWCP) based on three premises: (a) deployments occur along a deployment disruption continuum

exposing soldiers to potentially traumatic experiences; (b) post-deployment behavioral health is influenced by predisposing, enabling, and need characteristics unique to military service and combat deployments; and (c) WTU soldiers have increased behavioral health vulnerability and service utilization due to the cumulative effect of deployment stressors, combat exposures, polytrauma, and posttraumatic responses. The AWCP conceptual framework (Figure 1) hypothesizes predisposing, enabling, and need military and deployment characteristics associated with behavioral health vulnerability. The Gelberg-Andersen model posits that vulnerability factors within predisposing, enabling, and need domains explain health status and service utilization among vulnerable populations, who are at high risk for disease and injury, and have unique challenges seeking and receiving health services. Vulnerability factors exacerbate health needs of vulnerable populations and limit or impede their ability to access care. Redeployed soldiers assigned to WTUs are hypothesized as vulnerable.

Deployments are unique to military culture, disruptive and stressful, and relevant when assessing soldier well-being (Wenger et al., 2018; Wooten, 2013). As predisposing risk exposures, deployments disrupt military life and occur along a continuum, involving pre-deployment, deployment, and post-deployment experiences resulting in risk and resilient outcomes (Vogt et al., 2011; Wooten, 2012, 2013). Military characteristics (e.g., enlisted rank), which determine military duties, deployment length and frequency, total time deployed, and dwell time (i.e., time between deployments), are predisposing and enabling factors influencing post-deployment outcomes. Pre-existing (i.e., before or after combat deployments) physical or behavioral health problems are predisposing vulnerability factors increasing susceptibility for deployment and post-deployment problems. Military and deployment-related protective factors include short dwell time (<12 months), senior officers (O4–O9), short deployments (<12 months), and being married. Risk factors include younger age (18–25 years), lengthy dwell time (≥ 12 months), enlisted rank (E1–E9), multiple deployments, lengthy deployments (≥ 12 months), pre-deployment behavioral health diagnoses, female sex, racial/ethnic

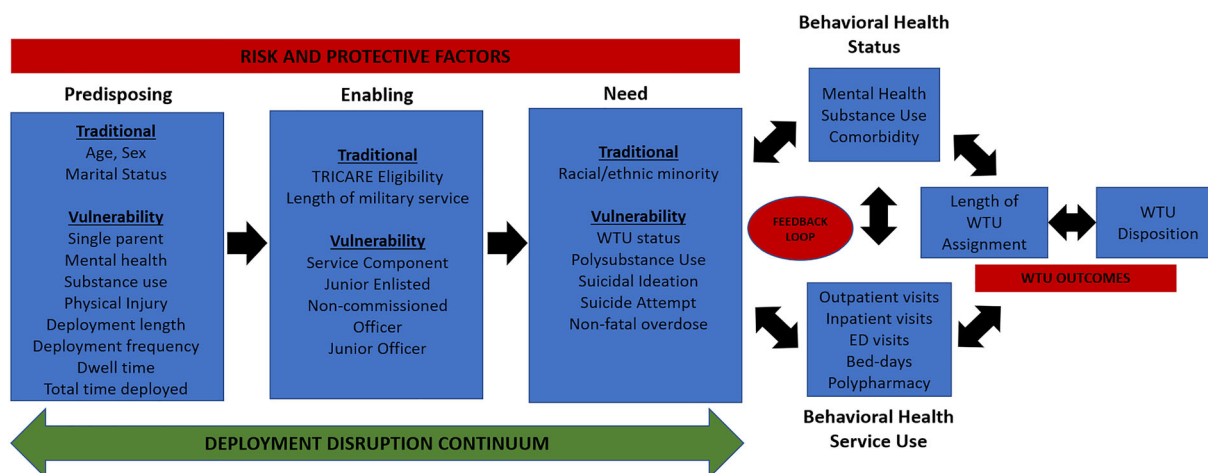


FIGURE 1 Army Warrior Care Project's conceptualization of behavioral health vulnerability in U.S. Army soldiers deployed for Operations Enduring Freedom, Iraqi Freedom, and New Dawn. Abbreviations: ED: emergency department; WTU: Warrior Transition Unit

minority, and being single (Armed Forces Health Surveillance Center, 2012b, 2012c). Feedback loops result from multiple cycles through the deployment disruption continuum, poor physical health practices (e.g., smoking, polysubstance use, medication misuse), comorbidities, suicidal gestures, and nonfatal overdose. When assigned to a WTU, behavioral health vulnerability, personal health practices, and the need for comprehensive health care influence WTU length of stay and disposition after WTU assignment (i.e., return to military duty or discharge).

Although behavioral health problems are prevalent among WTU soldiers (GAO, 2016), sparse evidence exists on their behavioral health diagnoses and service utilization. Recent DoD Inspector General (2011a, b) reports found inconsistent implementation of WTU eligibility criteria and variability in recovery, access to specialty care, and transition to Veterans Health Administration care. Because WTUs replaced medical hold units, they will continue as the service delivery model for IIW soldiers needing post-deployment care (GAO, 2016). Research is needed to examine differential WTU assignment, disposition after WTU assignment, behavioral health diagnoses, service delivery, and treatment effectiveness of WTUs. The AWCP addresses this knowledge gap by (a) characterizing WTU soldiers and (b) examining behavioral health diagnoses and service utilization in WTUs from fiscal years (FY) 2008–2015. This manuscript aims to (a) present the AWCP methodology, (b) characterize both AWCP and WTU cohorts, and (c) describe WTU, behavioral, and physical health characteristics of WTU soldiers.

2 | METHODS

The AWCP uses both cross-sectional and longitudinal designs to examine behavioral health problems and service utilization among soldiers assigned to WTUs after returning from OEF/OIF/OND deployments between FY2008–2015. Primary AWCP outcomes are WTU assignment, length of WTU assignment, treatment effectiveness, behavioral health diagnoses, and service utilization. Institutional review board approvals were received from the University of South Carolina and the Defense Health Agency (DHA) Human Research Protections Office. Data use agreements for limited data sets were received from the DHA and the U.S. Army Medical Department's Patient Administrative Systems and Biostatistics Activity. A project officer from the Clinical Services Division of DHA sponsored access to data used in the AWCP. The DoD Privacy Board approved and executed data use agreements and approves all presentations and publications for release to the public. This cross-sectional study describes demographic, military, and deployment characteristics of AWCP and WTU cohorts and WTU, deployment-related behavioral and physical health characteristics of WTU soldiers.

2.1 | AWCP cohort development

Figure 2 displays AWCP ($N = 883,091$) and WTU ($n = 31,094$) cohort selection criteria. The AWCP cohort includes soldiers, ages 18 and

older, who returned from OEF/OIF/OND deployments between FY2008 and FY2015. The WTU cohort includes redeployed soldiers who were assigned to WTUs between FY2008 and FY2015. Soldiers who were <18 years old and those who did not deploy were excluded.

2.2 | Study period

The study period, FY2008–2015 (October 1, 2007 to September 30, 2015), is significant because of the large number of soldiers deployed for OEF/OIF/OND who experienced intense fighting, improvised explosive devices, and war atrocities due to growing violence and troop surges in Iraq (January 2007 to July 2008) and Afghanistan (May 2009 to September 2012). Troops left Iraq in December 2011 and Afghanistan troop levels declined to 33,000 in March 2014. After FY2015, U.S. Armed Forces' presence in Iraq and Afghanistan declined significantly (Belasco, 2014). This observation period also facilitates examination of WTU and behavioral health outcomes in WTU soldiers from WTU inception up to 8 years afterwards.

2.3 | Military and deployment-related time periods

The *AWCP index deployment* is the most recent deployment end date between FY2008 and FY2015. Multiple retrospective and prospective observation periods were constructed relative to this index deployment. *Pre-September 11th military service* is any military service prior to the beginning of OEF on September 11, 2001. During this period, behavioral health problems and service utilization are measured to assess a prior history of behavioral health problems and service utilization. *Post-September 11th military service* is defined as military service beginning FY2002 (i.e., October 1, 2001). During this period, deployment-related behavioral health problems and service utilization are measured. *WTU assignment* occurs between WTU begin and end dates, and behavioral health problems and service delivery during WTU assignment are measured. The *WTU index deployment* is the deployment immediately preceding the WTU begin date. Soldiers with multiple WTU assignments have multiple WTU index deployments.

2.4 | Deployment-related risk exposures

Multiple deployment risk exposures were identified between FY2008 and FY2015. The primary risk exposure is the *deployment disruption continuum* (Figure 1). The *pre-deployment year* is the 365 days immediately prior to the AWCP index deployment begin date or any previous deployment's begin date. *Deployment* is defined as an OEF/OIF/OND deployment and is inclusive of deployment begin and end dates. *Dwell time* occurs between deployments and applies to soldiers who went on two or more deployments. *Post-deployment* begins the day after a deployment end date and is up to 12 or more months afterward. Soldiers with two or more deployments have multiple predeployment years, deployment, and postdeployment periods. Soldiers with three

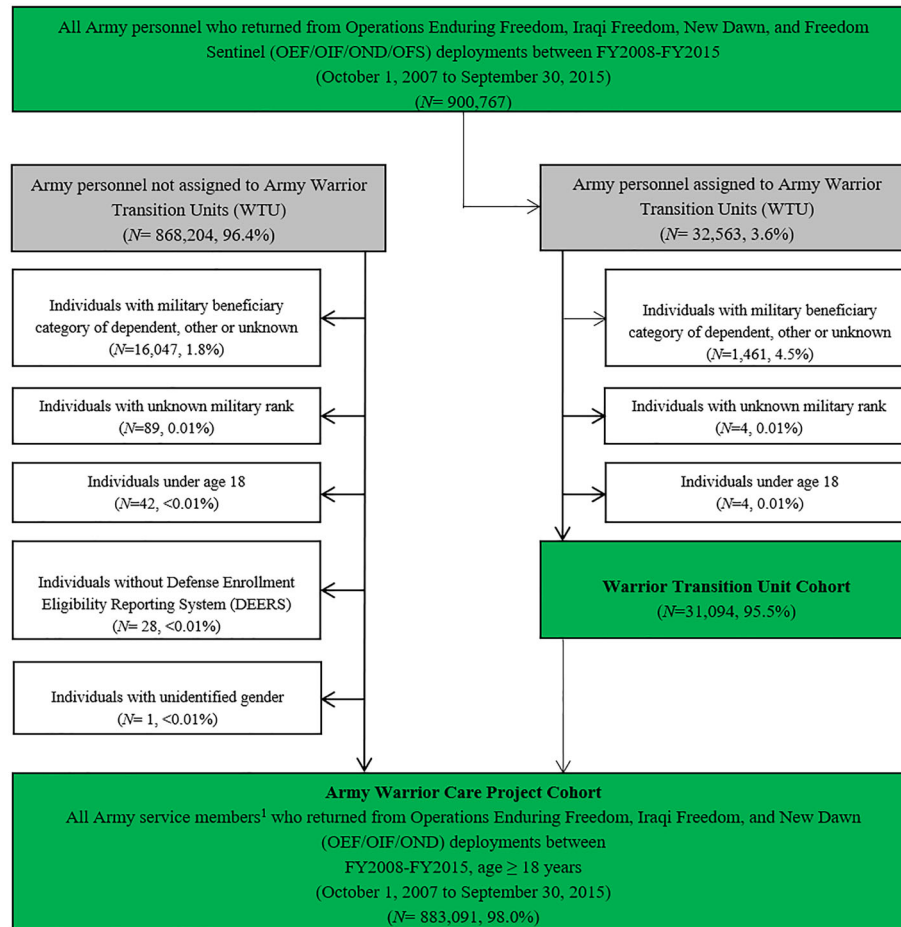


FIGURE 2 Flow diagram of Army Warrior Care Project cohort selection criteria. ¹Includes Active, National Guard, and Reserves, but service members may not be Inactive National Guard/Reserves, Discharged, or Retired

or more deployments have multiple dwell times. Begin and end dates for time periods and risk exposures vary for each soldier.

2.5 | Data sources, database, and analytic file creation

2.5.1 | Data sources

The primary data source was the Military Health System Data Repository (MDR), which includes direct and purchased care, pharmacy, and beneficiary administrative and claims data from the Military Health System (MHS). Aggregate and person-level files of encounter data for inpatient and outpatient behavioral health care and behavioral health problems based on major diagnostic codes (MDC) 19 (mental disorders/diseases) and 20 (alcohol/other drugs) were extracted from the MDR. Algorithms from the MDR IIW (Funk, 2012) file were used to create physical and psychological injury flags. See *A Guide for DoD Researchers on Using MHS Data* (Office of the Secretary of Defense for Health Affairs, 2012) for detailed

information about the MDR. Table 1 lists AWCP data sources with respective data elements.

2.5.2 | Database creation

A comprehensive data dictionary guided database creation, which included aggregate, visit-, pharmacy-, and person-level files (by month and fiscal year) for all soldiers who returned from OEF/OIF/OND deployments between FY2008 and FY2015. Service utilization was specified by visit type (inpatient, outpatient, emergency department, and readmissions), number of visits, prescriptions, drug classes, days of supply, and bed-days. Multiple variable formats (continuous, categorical, and count) were created. A unique individual identifier was used to link data from de-identified data sources (Table 1).

2.5.3 | Analytic file creation

After AWCP and WTU cohorts were finalized (Figure 2), encounter and claims data were analyzed and person-level summary files were generated, representing a soldiers' diagnoses and health care utilization from

TABLE 1 Army Warrior Care Project data sources and select data elements

Domain ^a	Select data elements	Data source
Demographics military characteristics	age, race, sex, marital status service component, military rank, months of TRICARE eligibility	DEERS
Deployment characteristics	deployment frequency, deployment length	CTS
Behavioral health diagnoses and service utilization	MDC 19, MDC 20 ICD-9-CM codes based on ARHQ Clinical Classification Software (CCS) Inpatient, outpatient, or emergency department visits for any MDC 19 or MDC 20 diagnoses ICD-9-CM codes based on ARHQ CCS	MDR, SADR, SIDR, TED-I, TED-NI
Prescription drug use ^b	Number of prescriptions, days of supply, opioid prescriptions, psychotropic prescriptions	MDR, PDTS
In-theater behavioral health diagnoses and service utilization	MDC 19 or MDC 20 ICD-9 codes based on ARHQ Clinical Classification Software (CCS) Inpatient, outpatient, or emergency department visits for any MDC 19 or MDC 20 diagnoses ICD-9-CM codes based on ARHQ CCS	TMDs
Postdeployment physical problems	Amputations, blindness, physical injuries, pain, and traumatic brain injury flags	IIW file
Warrior Transition Unit ^c	WTU begin date, WTU end date WTU primary diagnosis WTU behavioral health diagnosis, WTU behavioral health service utilization Timing of WTU assignment, Length of WTU assignment	MDR IIW file

Abbreviations: AHRQ CCS: Agency for Healthcare Research and Quality Clinical Classification Software; AUDIT-C: Alcohol Use Disorders Identification Test-Consumption; CTS: Contingency Tracking System; DEERS: Defense Enrollment Eligibility Record System; ICD-9-CM: International Classification of Diseases: Ninth Edition: Clinical Modification; IIW: Ill, Injured, and Wounded file; MDC: Major Diagnostic Category; MDR: Military Health System Data Repository; OEF/OIF/OND: Operations Enduring Freedom, Iraqi Freedom, New Dawn; PDTS: Prescription Drug Transaction Service.; PTSD: posttraumatic stress disorder; SADR: Standard Ambulatory Data Record; SIDR: Standard Inpatient Data Record; TED-I: TRICARE Encounter Data-Institutional; TED-NI: TRICARE Encounter Data-Non-Institutional; TMDs: Theater Medical Data System; WTU: Warrior Transition Unit.

^aVariables were created using individuals, visits, and prescriptions as units of analysis.

^bPDTS data are the original data source for prescription drug data but were accessed via the MDR for this study.

^cWTU variables are computed and/or identified between WTU begin and end dates.

FY2008 to FY2015. The AWCP analytic file includes behavioral health, physical injury, and prescription drug flags. Aggregate files were created to identify behavioral health diagnoses, physical injuries, prescriptions, and health care utilization, by month, service component, military and deployment-related time periods, and risk exposures. Behavioral health, physical injury, and prescription drug flags were created for each visit for each soldier to create visit-level flags, which were aggregated at person level by combining visits by specific time periods for each soldier. If a flag was present for at least one visit in a time period for a soldier, the flag was considered present at person-level. If the flag was not present at any visit, it was not present at person-level. To identify deployment-related problems diagnosed during deployment (V70.5_5) and postdeployment (V70.5_6), V-codes were scanned and linked to ICD-9 codes on visit-level claims (see MHS coding guidance), converted to person-level, and merged into the person-level file analyzed for this manuscript. V-code linked variables with zero or extremely low frequencies included overdose, suicide, homicide, lower body amputations, blindness, pain (acute and chronic), spinal cord, burns, and shrapnel. After linked and unlinked frequency comparisons, these variables were constructed and analyzed without linking V-codes.

2.6 | Measures

In this study, demographic, military, and deployment characteristics were computed at the beginning of the observation period. Only variables analyzed for this manuscript are discussed below.

2.6.1 | Demographics

Sex included male and female. Age was categorized as 18–25, 26–39, and 40+. Race/ethnicity categorized as black, white, and other. Marital status included married, single, and divorced/widowed. Single parent (yes/no) defined as single or divorced/widowed marital status and more than one child dependent.

2.6.2 | Military characteristics

Military service component included Active, National Guard, or Reserve. Military rank was categorized as junior enlisted (E1–E4), noncommissioned officers (E5–E9), commissioned officers (junior: O1–O3, senior: O4–O9), and warrant officers (WO1–WO5). TRICARE

eligibility was defined as the number of months of TRICARE health coverage since FY2002.

2.6.3 | Deployment characteristics

Deployment frequency was defined as the total number of OEF/OIF/OND deployments since FY2002 and categorized as 1, 2, and 3+. Total time deployed since FY2002 (*months*) was the total sum of differences between deployment end and begin dates for every deployment since FY2002. Index deployment length was the number of months deployed for the index deployment. Both were categorized as <12 months, 12–17 months, and ≥18 months.

2.6.4 | Physical injuries

Nine physical injury flags (*yes/no*), created using ICD-9 codes, identified physical injuries, including lower body amputations, TBI, musculoskeletal, blindness, pain, spinal cord, burns, shrapnel, and any other serious physical injuries. Pain was defined by 338.x; acute pain by 338.11, 338.12, 338.18, and 338.19; and chronic pain by 338.21, 338.22, 338.28, and 338.29.

2.6.5 | Behavioral health diagnoses

Behavioral health diagnoses met the Agency for Healthcare Research and Quality Clinical Classification Software definitions for major diagnostic category (MDC) 19 (mental disorders/diseases) and 20 (alcohol/other drugs). Diagnoses included behavioral health disorders (MDC 19 and MDC 20), mental health disorders (MDC 19), and SUD (MDC 20). Primary behavioral health diagnoses within 30 days after WTU assignment were defined using ICD-9 codes within MDC 19 and 20. For specific mental health and SUDs, diagnostic cases were defined using algorithms from surveillance case definitions of the Armed Forces Health Surveillance Center (2012a) that are used in epidemiological studies on physical and mental health among U.S. Armed Forces. Alcohol use disorders included alcohol abuse (305.0x) and alcohol dependence (303.xx). Drug use disorders included drug dependence [opioid/combination opioid-type dependence (304.0x, 304.7x); sedative, hypnotic, or anxiolytic dependence (304.1x); cocaine dependence (304.2x); cannabis dependence (304.3x); and amphetamine and other psychostimulant dependence (304.4x)].² IIW (Funk, 2012) file flags (*yes/no*), created using ICD-9 codes, identified suicidal ideation, homicidal ideation, overdose, sleep disorders, adjustment, mood, bipolar, anxiety, and PTSD.

²Hallucinogen dependence (304.5x); other specified drug dependence (304.6x); combinations of drug dependence excluding opioid type (304.8x), unspecified drug dependence (304.9x); and nondependent abuse of drugs [tobacco use disorder (305.1); nondependent cannabis abuse (305.2x); nondependent hallucinogen abuse (305.3x); nondependent sedative, hypnotic, or anxiolytic abuse (305.4x); opioid abuse (305.5x); nondependent cocaine abuse (305.6x); nondependent amphetamine or related acting sympathomimetic abuse (305.7x); nondependent antidepressant type abuse (305.8x); and nondependent mixed/unspecified drug abuse (305.9x)].

2.6.6 | WTU characteristics

WTU (*yes/no*) was defined as one or more WTU assignments since FY2008. The number of WTU assignments was categorized 1, 2, and 3+, and the mean was computed. The timing of WTU assignment was computed relative to the WTU index deployment before the first WTU assignment begin date and was categorized: before deployment end date, ≤30, 31–90, 91–180, 181–365, and >365 days post-deployment. The length of WTU assignment (*days*) was the difference between WTU begin and end dates.

2.7 | Statistical analyses

Descriptive statistics described demographic, military, deployment, and WTU characteristics and estimated the prevalence of physical injury and behavioral health diagnoses by military service component. Person-level analytic files included 883,091 (AWCP) and 31,094 (WTU) soldiers. Analyses were conducted using SAS/STAT 9.4.

3 | RESULTS

The AWCP cohort primarily comprised Active (67.4%) and National Guard (23.7%) soldiers. The majority were male (89.0%), White (70.0%), married (53.8%), junior enlisted (i.e., E1–E4; 54.9%), and went on two or more deployments (53.2%). Approximately half (49.9%) were ages 18–25, and mean age was 28.1 (*sd* = 8.0) years. Table S1 in the Supporting Information reports detailed AWCP cohort characteristics.

3.1 | WTU Cohort

Between FY2008 and FY2015, 3.5% (*n* = 31,094) of the AWCP cohort was assigned to WTUs (Table 2). The majority were Active (51.3%) or National Guard (34.1%), male (88.5%), White (69.2%), married (60.2%), enlisted (i.e., junior [E1–E4; 51.8%], noncommissioned officers [E5–E9; 37.8%]), ages 18–39 (79.7%), and went on two or more deployments (59.0%). Mean age was 30.8 (*sd* = 9.4) years. On average, National Guard and Reserve soldiers were older than Active soldiers (Table 2).

3.1.1 | WTU characteristics

Almost all (96.5%) WTU soldiers had one WTU assignment. Over three-fourths (77.3%) were assigned to a WTU before the end of the WTU index deployment, ≥30 or >365-day post-deployment (Table 2). The largest proportion of redeployed soldiers were assigned to WTUs (Figure 3a and Table S2) in FY2010 (19.5%), FY2011 (18.2%), and FY2012 (17.0%). The overwhelming majority of Active (98.7%), National Guard (72.6%), and Reservists (79%) were assigned to WTUs co-located with MTFs. A larger proportion of National Guard (27.4%) and Reservists (21%) were assigned to CCUs than Active soldiers. The median length of WTU assignments was 327 days, but was higher for Active soldiers (358 days) than National Guard (293 days) and Reservists (275 days). These trends remained greater than 8 months

TABLE 2 Demographic, military, and deployment characteristics of soldiers assigned to Warrior Transition Units, FY2008–FY2015^a

Characteristics	Active Duty N = 15,966 (51.4% of total)	National Guard N = 10,599 (34.1% of total)	Reserves N = 4,529 (14.5% of total)	Total N = 31,094
Age, mean (SD), years	27.2 (6.9)	33.9 (10.0)	36.4 (10.3)	30.8 (9.4)
Age, no. (%)				
18–25	8,116 (50.8)	2,872 (27.1)	940 (20.8)	11,928 (38.4)
26–39	6,830 (42.8)	4,350 (41.0)	1,659 (36.6)	12,839 (41.3)
40+	1,020 (6.4)	3,377 (31.9)	1,930 (42.6)	6,327 (20.4)
Sex, no. (%)				
Male	14,239 (89.2)	9,568 (90.3)	3,711 (81.9)	27,518 (88.5)
Female	1,727 (10.8)	1,031 (9.7)	818 (18.1)	3,576 (11.5)
Race, no. (%)				
Black	2,694 (16.9)	1,832 (17.3)	1,181 (26.1)	5,707 (18.4)
White	10,447 (65.4)	8,092 (76.4)	2,969 (65.6)	21,508 (69.2)
Other ^b	2,825 (17.7)	675 (6.4)	379 (8.4)	3,879 (12.5)
Marital status, no. (%)				
Married	9,683 (60.6)	6,343 (59.8)	2,690 (59.4)	18,991 (60.2)
Single	5,440 (34.1)	3,163 (29.8)	1,308 (28.9)	10,008 (31.7)
Divorced/widowed	848 (5.3)	1,094 (10.3)	531 (11.7)	2,473 (8.0)
Single parent, ^c no. (%)	844 (5.3)	1,067 (10.1)	434 (9.6)	2,345 (7.5)
Military rank, no. (%)				
E1–E4	9,909 (62.1)	4,776 (45.1)	1,419 (31.3)	16,104 (51.8)
E5–E9	4,916 (30.8)	4,739 (44.7)	2,090 (46.2)	11,745 (37.8)
O1–O3	678 (4.3)	600 (5.7)	383 (8.5)	1,661 (5.4)
O4–O9	223 (1.4)	292 (2.8)	525 (11.6)	1,040 (3.3)
WO1–WO5	240 (1.5)	192 (1.8)	112 (2.5)	544 (1.8)
Total deployed time since FY2002, mean (SD), months	9.4 (4.8)	7.8 (4.3)	8.3 (5.3)	8.7 (4.8)
Total deployed time since FY2002, no. (%)				
<12 months	11,949 (74.8)	10,133 (95.6)	4,240 (93.6)	26,322 (84.7)
12–17 months	3,709 (23.2)	296 (2.8)	171 (3.8)	4,176 (13.4)
≥18 months	308 (1.9)	170 (1.6)	118 (2.6)	596 (1.9)
Number of OEF/OIF/OND deployments since FY2002, mean (SD)	2.1 (1.4)	1.6 (0.9)	1.8 (1.1)	2.0 (1.3)
Number of OEF/OIF deployments since FY2002, no. (%)				
1	6,682 (41.9)	4,364 (41.2)	1,714 (37.8)	12,760 (41.0)
2	4,984 (31.2)	3,713 (35.0)	1,444 (31.9)	10,141 (32.6)
3+	4,300 (26.9)	2,522 (23.8)	1,371 (30.3)	8,193 (26.4)
Length of index deployment, ^d mean (SD), months	8.9 (5.2)	7.0 (4.3)	8.4 (5.6)	8.5 (5.0)
Length of index deployment, no. (%)				
<12 months	12,146 (76.1)	10,124 (95.5)	4,215 (93.1)	26,485 (85.2)
12–17 months	3,537 (22.4)	334 (3.2)	181 (4.0)	4,088 (13.2)
≥18 months	247 (1.6)	141 (1.3)	133 (2.9)	521 (1.7)
TRICARE Eligibility, since FY2002, ^e mean (SD), months	115.6 (40.5)	78.9 (35.9)	81.9 (36.0)	98.1 (42.3)
Number of WTU assignments since FY2008, mean (SD)	1.0 (.15)	1.0 (0.22)	1.1 (0.23)	1.0 (0.19)
Number of WTU assignments since FY2008, no. (%)				

(Continues)

TABLE 2 (Continued)

Characteristics	Active Duty N = 15,966 (51.4% of total)	National Guard N = 10,599 (34.1% of total)	Reserves N = 4,529 (14.5% of total)	Total N = 31,094
1	15,628 (97.9)	10,102 (95.3)	4,282 (94.6)	30,012 (96.5)
2	335 (2.1)	479 (4.5)	245 (5.4)	1,059 (3.4)
3+	*	*	*	*
When Soldier assigned to WTU, ^f no. (%)				
Before deployment end date	3,910 (24.5)	4,200 (39.6)	1,767 (39.0)	9,877 (31.8)
≤30 days post-deployment	2,180 (13.7)	2,860 (27.0)	1,076 (23.8)	6,116 (19.7)
31-90 days post-deployment	715 (4.5)	1,376 (13.0)	692 (15.3)	2,783 (9.0)
91-180 days post-deployment	808 (5.1)	718 (6.8)	278 (6.1)	1,804 (5.8)
181-365 days post-deployment	1,857 (11.6)	446 (4.2)	183 (4.0)	2,486 (8.0)
>365 days post-deployment	6,496 (40.7)	999 (9.4)	533 (11.8)	8,028 (25.8)
WTU disposition, ^g no. (%)				
Discharged	33,201 (20.1)	1,732 (16.3)	1,000 (22.1)	5,933 (19.1)
Returned to military duty	12,765 (80.0)	8,867 (83.7)	3,529 (77.9)	25,161 (80.9)
Length of WTU assignment, ^h median (Q1, Q3), days	358 (208, 569)	293 (127, 520)	275 (118, 508)	327 (164, 545)

Note. N = 31,094.

Abbreviations: (Q1, Q3) : 25th and 75th percentiles; OEF: Operation Enduring Freedom (Afghanistan); OIF: Operation Iraqi Freedom; WTU: Warrior Transition Unit.

^aWTU cohort includes all Army service members who were assigned to a WTU one or more time between FY2008 and 2015. Active duty, National Guard, or Reserve status defined by the service component to which the soldier was assigned prior to the first OEF/OIF deployment.

^bHispanic, Asian, Pacific Islander, Native American, and other ethnic minority groups.

^cDefined as single marital status and having one or more military dependents younger than age 18.

^dWTU index deployment is the defined by the deployment end date immediately preceding WTU assignment begin date.

^eNumber of months eligible for TRICARE health care since FY2002.

^fComputed at WTU index deployment begin date based on first WTU assignment begin and end dates between FY2008 and 2015 and is the time period Soldier was assigned to a WTU relative to deployment immediately preceding first WTU assignment (i.e., WTU index deployment).

^gWTU disposition is defined as the military status disposition of the WTU member after WTU assignment ends. Returned to military duty occurs when a Soldier returned to military duty after WTU assignment regardless of whether reclassified to another military occupational specialty. Discharge includes any type of retirement (e.g., medical) or military separation (e.g., administrative, disciplinary).

^hLength of WTU assignment is the median number of days of the first WTU assignment computed by subtracting the WTU end date from the begin date.

from FY2008 to 2014 (Figure 3b and Table S2). The overwhelming majority (80.9%) of WTU soldiers returned to military duty after WTU assignment. This trend remained constant from FY2008 to FY2013, but reversed in FY2015 (Figure 4 and Table S3).

3.1.2 | Deployment-related behavioral and physical health diagnoses

Active WTU soldiers had higher prevalence of mental health (63.8%) and SUDs (31.1%), including anxiety (58.2%), adjustment (55.6%), PTSD (40.4%), and drug use disorders (27.1%) than National Guard and Reservists (Table 3). A substantial proportion of Active soldiers also had sleep disorders (40.4%) and psychosocial problems (32.5%). For National Guard and Reservists, prevalence was highest for adjustment, anxiety, and sleep disorders. The most prevalent comorbidities were comorbid SUD (17.9%) and PTSD and mood (15.3%) disorders. The overall proportion of soldiers with a primary mental health

diagnosis within 30 days after WTU assignment (Figure 5 and Table S4) remained above 60% from FY2009 to FY2015 for Active soldiers, but was lower for National Guard (39.1% to 50.2%) and Reservists (34.9% to 48.9%). Primary SUD prevalence within 30 days after WTU assignment (Figure 5b and Table S4) was significantly lower over time (1.5% to 6.3%). Musculoskeletal, pain, and TBI were the most prevalent physical injuries across all military service components. The prevalence of chronic pain (32.2%; 40.8% Active, 23.0% National Guard, and 22.9% Reserves) was higher than acute pain (16.9%; 19.4% Active, 14.7% National Guard, and 13.5% Reserves).

4 | DISCUSSION

We presented the AWCP rationale and methods and characterized redeployed soldiers assigned to WTUs from FY2008 to FY2015. Although a small proportion (3.5%) of soldiers were assigned to WTUs,

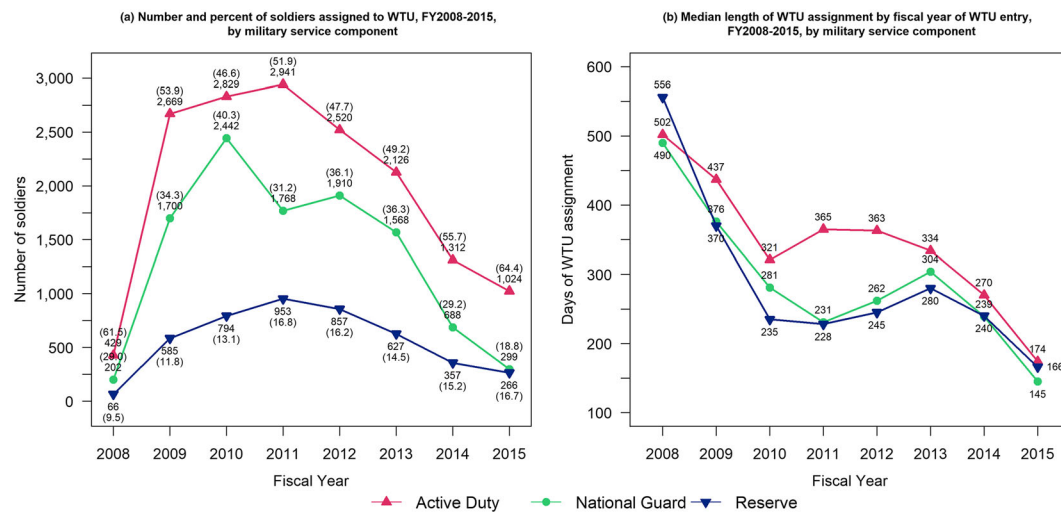


FIGURE 3 Number and percent of soldiers assigned to Warrior Transition Units and median length of Warrior Transition Unit assignment, by military service component and fiscal year of Warrior Transition Unit entry, FY2008–2015. Abbreviation: WTU: Warrior Transition Unit

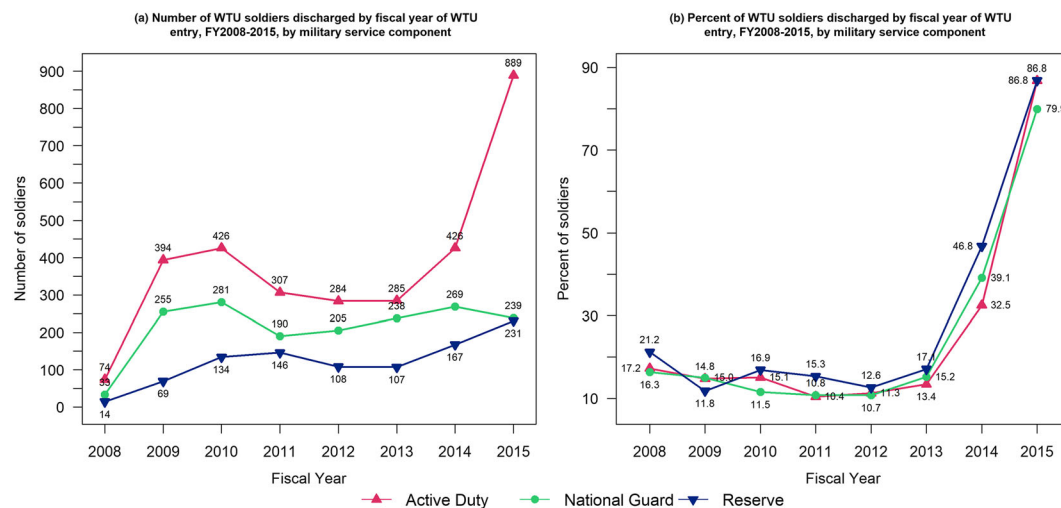


FIGURE 4 Number and percent of Warrior Transition Unit soldiers discharged by fiscal year of Warrior Transition Unit entry, FY2008–2015, by military service component. Abbreviation: WTU, Warrior Transition Unit

their demographic, military, and deployment characteristics were similar to the population of soldiers redeployed from OEF/OIF/OND between FY2008 and FY2015 (i.e., AWCP cohort). Although an overwhelming majority of WTU soldiers only had one WTU assignment, on average, they were away from their military occupations for approximately 11 months. A substantial proportion (59.4%) of WTU soldiers had deployment-related behavioral health disorders, suggesting that they experienced psychological impairment that negatively impacted their military duty performance.

WTU soldiers had a high prevalence (63.8%) of mental health diagnoses that were comorbid with SUDs, physical injuries, and psychosocial problems. The rate of mental disorders in WTU soldiers is higher than reported (11.2%–17.1%) by redeployed soldiers and Marines in 2003 (Hoge et al., 2004). Contrary to post-deployment health assessments, Active WTU soldiers had higher prevalence of behavioral health

problems than NGR. This higher prevalence can, in part, be an artifact of the use of diagnostic criteria, differential WTU eligibility criteria by military service component, and the systematic identification and assignment of high-risk soldiers with complex medical conditions to WTUs. The U.S. Army's focus on stigma reduction and health promotion during the later years of OEF/OIF/OND may have increased early identification of behavioral health problems, referrals, and help-seeking (Department of the Army, 2012). Mental health diagnoses were the leading cause of military discharge prior to OEF/OIF (1990–1999) and strongly associated with poor health-related quality of life in OIF veterans (Hoge et al., 2002; Hoge, Terhakopian, Castro, Messer, & Engel, 2007). Given this evidence and significant U.S. DoD resources dedicated to WTUs, it is critical to assess WTU treatment effectiveness for behavioral health diagnoses and behavioral health association with military discharge during and after WTU assignment.

TABLE 3 Deployment-related behavioral and physical health characteristics of soldiers assigned to Warrior Transition Units, FY2008–2015^a

Characteristics	Active Duty N = 15,966 (51.4% of total)	National Guard N = 10,599 (34.1% of total)	Reserves N = 4,529 (14.5% of total)	Total N = 31,094
Behavioral health diagnosis ^b	11,305 (70.8)	5,097 (48.1)	2,070 (45.7)	18,472 (59.4)
Mental health disorders ^c	10,185 (63.8)	4,194 (39.6)	1,809 (39.9)	16,188 (52.1)
PTSD	6,449 (40.4)	2,016 (19.0)	828 (18.3)	9,293 (29.9)
Mood	5,148 (32.2)	1,637 (15.4)	825 (18.2)	7,610 (24.5)
Adjustment	8,876 (55.6)	3,340 (31.5)	1,429 (31.6)	13,645 (43.9)
Bipolar disorder	212 (1.3)	53 (0.5)	24 (0.5)	289 (0.9)
Anxiety disorders	9,289 (58.2)	3,740 (35.3)	1,594 (35.2)	14,623 (47.0)
Sleep disorders	6,442 (40.4)	2,717 (25.6)	1,186 (26.2)	10,345 (33.3)
Psychosocial problems ^d	5,182 (32.5)	1,919 (18.1)	803 (17.7)	7,904 (25.4)
Suicide/self-harm	2,578 (16.2)	526 (5.0)	249 (5.5)	3,353 (10.8)
Homicidal ideation ^e	435 (2.7)	88 (0.8)	25 (0.6)	548 (1.8)
Substance use disorders ^f	4,963 (31.1)	2,282 (21.5)	656 (14.5)	7,901 (25.4)
Alcohol use disorder ^g	1,370 (8.6)	435 (4.1)	131 (2.9)	1,936 (6.2)
Drug use disorder ^h	4,320 (27.1)	2,088 (19.7)	582 (12.9)	6,990 (22.5)
Opioid use disorder ⁱ	214 (1.3)	74 (0.7)	9 (0.2)	297 (1.0)
Overdose	731 (4.6)	174 (1.6)	63 (1.4)	968 (3.1)
SUD comorbidity	2,854 (17.9)	1,111 (10.5)	320 (7.1)	4,285 (13.8)
SUD and PTSD	1,647 (10.3)	528 (5.0)	146 (3.2)	2,321 (7.5)
SUD and mood	1,256 (7.9)	432 (4.1)	150 (3.3)	1,838 (5.9)
PTSD and mood	2,446 (15.3)	540 (5.1)	270 (6.0)	3,256 (10.5)
SUD, PTSD, and mood	683 (4.3)	207 (1.9)	71 (1.6)	961 (3.1)
Physical injuries, no. (%)				
Any serious physical injury	6,976 (43.7)	4,171 (39.4)	1,625 (35.9)	12,772 (41.1)
Lower body amputations	557 (3.5)	57 (0.5)	20 (0.4)	634 (2.0)
TBI	6,641 (41.6)	2,379 (22.5)	962 (21.2)	9,982 (32.1)
Musculoskeletal	10,365 (64.9)	7,517 (70.9)	3,282 (72.5)	21,164 (68.1)
Blindness	166 (1.0)	56 (0.5)	24 (0.5)	146 (0.8)
Pain ^j	7,642 (47.9)	3,498 (33.0)	1,456 (32.2)	12,596 (40.5)
Acute pain ^k	3,089 (19.4)	1,554 (14.7)	609 (13.5)	5,252 (16.9)
Chronic pain ^l	6,519 (40.8)	2,441 (23.0)	1,036 (22.9)	9,996 (32.2)
Spinal cord	373 (2.3)	94 (0.9)	24 (0.5)	491 (1.6)

(Continues)

TABLE 3 (Continued)

Characteristics	Active Duty N = 15,966 (51.4% of total)	National Guard N = 10,599 (34.1% of total)	Reserves N = 4,529 (14.5% of total)	Total N = 31,094
Burns	458 (2.9)	82 (0.8)	26 (0.6)	566 (1.8)
Shrapnel	942 (5.9)	156 (1.5)	32 (0.7)	1,130 (3.6)

Note. N = 31,094.

Abbreviations: PTSD: posttraumatic stress disorder; SUD: substance use disorder; TBI: traumatic brain injury; WTU: Warrior Transition Unit.

^aDeployment-related physical and behavioral health problems were identified by time periods when deployment-related behavioral and physical health problems were identified including index deployment, from index deployment begin date to the day before WTU assignment, and during WTU assignment (i.e., between begin and end dates) based on the first WTU assignment using the behavioral or physical health diagnosis ICD-9 code in the primary position and V70.5_5 (diagnosed during deployment) or V70.5_6 (diagnosed during post-deployment) in positions 2, 3, or 4 on a claim except when otherwise noted. Estimates computed using person-level data with FY2008–2015 as the observation period. Frequencies less than or equal to 40 which are masked per deidentification protocol of the Defense Health Agency data sharing agreement.

^bDefined by Major Diagnostic Code (MDC) 19 (mental disorder/diseases) or 20 (alcohol/other drugs).

^cDefined by MDC 19.

^dDefined by MDC 20.

^eDefined by ICD-9 code of 303.xx.

^fDefined as any SUD cooccurring with another behavioral health diagnosis.

^gDefined by ICD-9 codes 304.0x, 304.7x, and 305.5x.

^hDefined as any secondary diagnosis of ICD-9 codes of V40.xx, V61.0x, V61.1x, V61.2x, V62.8-V62.82, V62.84-V62.85, and 995.8x.

ⁱDefined as any secondary diagnosis of ICD-9 code of V62.85.

^jDefined as any 338.x diagnosis.

^kDefined as 338.11, 338.12, 338.18, and 338.19.

^lDefined as 338.21, 338.22, 338.28, and 338.29.

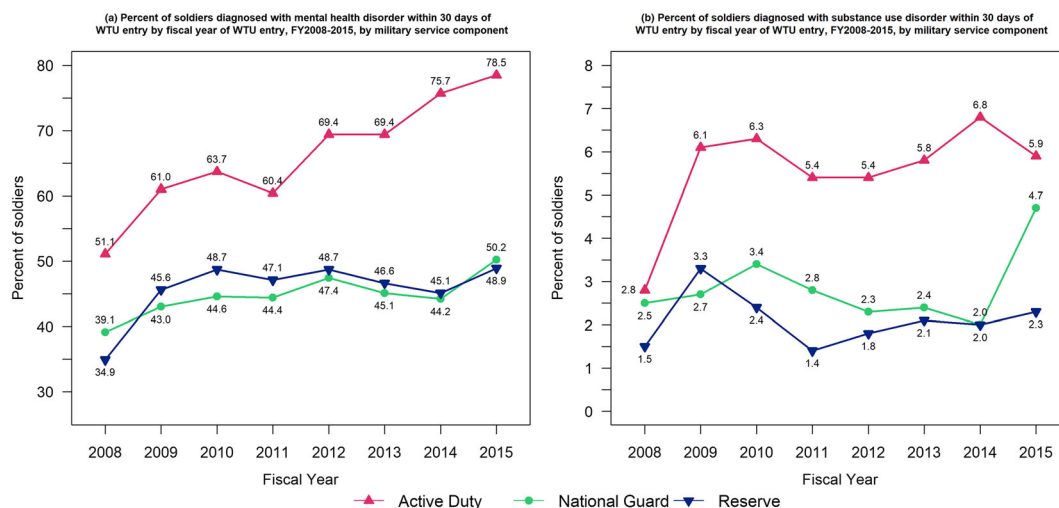


FIGURE 5 Number and percent of WTU soldiers diagnosed with behavioral health disorders within 30 days after WTU assignment begin date, by fiscal year of WTU assignment, FY2008–FY2015, by military service component. Abbreviation: WTU, Warrior Transition Unit

Although SUD prevalence was lower than mental disorders at WTU entry (Figure 5 and Table S4) and overall (Table 3), findings suggest mental health and SUD comorbidity in WTU soldiers. Given alcohol and drug use restrictions, the likelihood of developing SUDs during combat deployments is low. Thus, alcohol and other drugs may be used by WTU soldiers to cope with life-altering physical injuries and untreated mental problems before and while assigned to WTUs. Longitudinal examination of SUDs is needed to assess the development of SUDs during WTU assignment and SUD prevention. Prior GAO (2016) and Institute of Medicine (2013) reports indicate limited access to substance use treatment in the U.S. Armed Forces and WTUs. Consequently, evidence is needed about behavioral health specialty care received while assigned to WTUs.

Physical injury prevalence suggests polytrauma (e.g., TBI, pain, and musculoskeletal) among WTU soldiers, which may exacerbate behavioral health vulnerability, need for behavioral health specialty care, and increase the likelihood of a lengthy WTU assignment and military discharge. Consistent with GAO (2016) findings, soldiers had lengthy WTU assignments (≥ 9 months) from FY2008 to FY2013, which may be associated with behavioral health comorbidities and polytrauma. However, contrary to GAO (2016) findings, Active WTU soldiers had longer WTU assignments than NGR. Additional research is needed on behavioral and physical health characteristics associated with length of WTU assignment, disposition (return to duty or discharge) after WTU assignment, and military service component differences.

4.1 | Methodological strengths, limitations, and considerations

AWCP strengths include the use of an integrated dataset including objective, retrospective, cross-sectional and longitudinal data, and a large sample population. Limitations include the potential for missing, censored, and skewed data; limited post-deployment follow-up; and use of diagnostic codes in medical claims data. Censoring may

occur because of multiple deployments, military discharges, or death. NGR soldiers may have missing or censored data because their TRICARE health coverage varies by activation and deactivation for deployments and missing data before the beginning of OEF/OIF.

Missingness was addressed by carefully reviewing data quality and variable specifications when selecting variables from the MDR and not choosing poorly populated data elements. As a result, there was less than 5% missingness and no statistical adjustments in analyses. Given systematic recruitment of healthy young adults into the U.S. Armed Forces (Ramsberger, Wooten, & Rumsey, 2012), low rates of diagnoses occur in military populations and thus a broad definition of behavioral health was used. Statistical strategies to address non-convergence, non-coverage, and selection bias include stratifying analyses by sex, race, or military service component; recoding variables; computing estimates in person-time; and negative binomial, survival, and quantile regression models to account for zero-inflation, skewness, and/or censoring. Propensity score methods (Suarez & Faries, 2010) will be used to match WTU and non-WTU samples on demographic, physical, and behavioral health characteristics.

Current study limitations include limited demographic, military, and deployment variables. Use of ICD-9 codes may underestimate the prevalence of physical and psychological impairment. V-coding may be inconsistent across coders and MTFs. Thus, behavioral and physical health flags were computed and assessed with and without linking to V-codes on claims. Study findings are from WTU soldiers who have high levels of behavioral health vulnerability and findings are not generalizable to redeployed soldiers not assigned to WTUs and service members from other branches of the U.S. Armed Forces.

4.2 | Future AWCP research

The AWCP is well suited to examine quality of care, access to specialty care, and health and readiness outcomes associated with

WTUs—an innovative service delivery model of warrior care. Future AWCP research compares behavioral health diagnoses and service delivery in WTU and non-WTU soldiers. Behavioral health problems and service delivery in WTUs are examined to identify modifiable risk and protective factors predicting SUDs, WTU assignment, length of assignment, and treatment effectiveness. Differences by service component, sex, and race/ethnicity are examined, given unique military and deployment experiences of NGR, women, and racial minorities (Wooten, Adams, & Davis, 2017; Wooten et al., 2013; Wooten et al., 2016).

5 | CONCLUSION

The AWCP is the first longitudinal study of redeployed soldiers assigned to WTUs and provides a unique opportunity to advance our understanding of behavioral health problems and service utilization in WTUs for soldiers needing comprehensive medical care and case management after combat deployments. This manuscript described the AWCP rationale and methods, characterized deployment-related problems in WTU soldiers, and described how the AWCP intends to advance what is known about the WTU service delivery model. AWCP findings can inform military health policy and strategies to improve behavioral health service delivery in WTUs for soldiers with polytrauma and psychological impairment. AWCP findings can also identify the need for SUD prevention and intervention in WTUs. This evidence is critical to improving and sustaining warrior care and to ensuring the best health and readiness outcomes for OEF/OIF/OND veterans.

DECLARATION OF INTEREST STATEMENT

Dr. Wooten is a lieutenant colonel in the U.S. Army Reserves with over 30 years of military service, but did not conduct this study as a part of her official military duties. Dr. Jeffery is the Defense Health Agency's project manager who sponsored Dr. Wooten's access to these data. The Defense Health Agency's Privacy and Civil Liberties Office of the U.S. Department of Defense executed a data use agreement for access to these data and cleared this publication for release to the public. All other authors have no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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