Preventive Medicine Reports 34 (2023) 102267

Contents lists available at ScienceDirect

Preventive Medicine Reports

journal homepage: www.elsevier.com/locate/pmedr

Geographical access to specialized behavioral health treatment programs for U.S. active duty service members and military families from military installations

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ARTICLE INFO

Keywords:
Mental Health
Inequalities
Military and Veterans
Access
Drug use, substance abuse

ABSTRACT

Active duty service members and their families have unique behavioral health care service needs. The purpose of this study is to determine geographical access to specialized behavioral health programs tailored to active duty U. S. service members and military families from military installations. This study generated network distance measures between active duty military installations and licensed substance use disorder (SUD) treatment facilities and mental health treatment facilities for 2015–2018 using data from national surveys administered by the Substance Abuse and Mental Health Services Administration and coordinates for active duty military installations from the Defense Installation Spatial Data Infrastructure Program. Using regression analysis, we calculated the share of installations that are at-risk of being remote from behavioral healthcare services. Separately, we calculated the share of treatment facilities accepting military insurance that offer specialized programs for active duty service members and/or military families within a 30-minute drive to an installation. Three out of 10 installations were at-risk of being remote from a behavioral health treatment facility. About 25 percent of behavioral health treatment facilities accepting military insurance within a 30-minute drive to an installation offered a specialized treatment program for active duty military or military families. Lack of a specialized treatment programs could suggest facilities may not be equipped to manage stressors unique to being in the military, and as a consequence, could adversely impact the health and well-being of this population. Further research is necessary to understand what specialized treatment programs for military populations entail.

1. Introduction

Addressing the behavioral health care needs of the military and their families is important to ensure military readiness (Bray et al., 2010; Curley and Warner, 2017 Jul 1). While estimates of the incidence of mental health disorders suggest the rates are similar between military and civilian populations at about 20 percent (Center, 2017), the circumstances that lead to these behavioral health conditions are different. Unlike civilian populations, service members and their families face unique stressors that have been documented as drivers of behavioral health care problems. For instance, traumatic brain injury (TBI) rates are higher among those in the military than among civilians (Chapman and Diaz-Arrastia, 2014), and TBI has been associated with poor mental health conditions (Chin and Zeber, 2020 Jun 8). Deployments have been linked to service member substance abuse and mental health problems (Hoge et al., 2006 Mar 1; Larson et al., 2012 Jan 1), and are associated with elevated risks of behavioral and mental health problems, including substance abuse, among children (Acion et al., 2013 Aug; Gilreath et al., 2013 Feb; Gorman et al., 2010; Reed et al., 2011 Sep; Sullivan et al., 2015 Oct; Wadsworth et al., 2017) and spouses of service members (Mansfield et al., 2010 Jan 14). Frequent relocation, an aspect of military life that occurs at a higher rate than for civilians (Huebner, 2019), has also been correlated with behavioral health problems among children and can lead to difficulties with continuity of treatment for military populations more broadly (Tong et al., 2018).

Service members who seek behavioral health care from military treatment facilities (MTF) inherently receive treatment from providers who are familiar with military populations, but those who seek care from civilian providers may not. Furthermore, recent data on outpatient utilization of mental health care show that a sizeable share of service members being treated for mental health disorders obtain treatment through civilian providers, with lower bound estimates ranging from 7

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https://doi.org/10.1016/j.pmedr.2023.102267
Received 5 December 2022; Received in revised form 24 April 2023; Accepted 26 May 2023
Available online 27 May 2023

percent for adjustment disorders and up to 21 percent for substance use disorders (Center, 2018). However, surveys of civilian providers document a lack of knowledge about the military culture and lack of evidenced-based approaches used to treat mental health issues common among military and veteran populations (Kilpatrick et al., 2011; Tanielian et al., 2014; Koblinsky et al., 2014 Apr). Because military life presents circumstances that are outside the norm of civilian life, and these unique circumstances (e.g., TBI, deployments, frequent relocation) are correlated with behavioral health care problems, specialized treatment programs for service members and their families may be needed to ensure that civilian providers have the knowledge and tools to treat military populations. Moreover, there is evidence that behavioral treatment programs applied to civilian populations may not be as effective for military populations, most notably from a randomized clinical trial showing greater efficacy of PTSD treatment for civilians compared to combat veterans (Bradley et al., 2005). Furthermore, research documents that the unique circumstances from military life make reentry into civilian life problematic and suggests that professional counselors and social workers need to be able to address reintegration problems as part of their mental health care treatment (Coll et al., 2011). The existence of specialized treatment programs in civilian treatment facilities may indicate that a provider acknowledges military populations may need different treatment than the general population and has knowledge about military culture and relevant behavioral health conditions.

The objective of this study is to calculate the minimum drive times between military installations and both mental health and licensed substance use disorder (SUD) treatment facilities to assess the extent active duty service members and their families are at-risk of being remote from specialized treatment programs offered by civilian providers. To our knowledge, this is the first study to estimate the availability of specialized behavioral health treatment, i.e., programs specifically tailored to active duty service members and their families, around active duty military installations for multiple years using address-point data. The data used in this study is based on provider responses to a survey where they report whether they offer specialized behavioral health treatment programs. Although we do not have information about the specifics of these programs, we assume that the availability of such specialized programs indicates a better capability to effectively treat military populations compared to those without these programs. We estimate geographical access to specialized behavioral health treatment by using two distinct, geocoded annual national datasets of licensed SUD and mental health facilities. Following the existing literature, we deem installations that are more than a 30-minute drive from a facility as being at-risk of being remote from behavioral health care (Brown et al., 2015).

2. Methods

2.1. Treatment facility data

We used two different data sources for 2015–2018 licensed SUD treatment facilities and mental health treatment facilities that come from national surveys administered by the Substance Abuse and Mental Health Services Administration (SAMHSA). For data on licensed SUD treatment facilities, we used the National Directory of Drug and Alcohol Abuse Treatment Facilities of federal, state, and local government facilities and private facilities that provide SUD treatment services. The directory includes all treatment facilities that (1) are licensed, certified or otherwise approved for inclusion by the state substance abuse agency, and (2) responded to the previous year's National Survey of Substance Abuse Treatment Services (N-SSATS). For data on mental health treatment facilities, we used the National Directory of Mental Health Treatment Facilities which includes federal, state, and local government facilities and private facilities that provide mental health treatment services. The listing includes all mental health treatment facilities that responded to the previous year's National Mental Health Services Survey (N-MHSS).

The N-SSATS asked separate questions on whether the licensed SUD treatment facility provides residential, hospital inpatient, and outpatient services. For each of these, the N-SSATS also asked, "For which client categories does this facility at this location offer a substance abuse treatment program or group specifically tailored for clients in that category?" Relevant possible responses included veterans, active duty military, and members of military families. The N-SSATS also asked about forms of insurance accepted by the facility for substance abuse treatment, including "Federal military insurance (e.g., TRICARE)". The N-MHSS asked similar questions regarding mental health treatment.

Both the N-SSATS and N-MHSS are voluntary surveys of providers and consequently, not all providers respond to the survey each year. As a result, we use multiple years of data to adjust for non-response bias and better capture available resources for behavioral health treatment.

2.2. Military installation data

We obtained geographic coordinates for active duty military installations from the Defense Installation Spatial Data Infrastructure Program within the U.S. Department of Defense's Office of the Assistant Secretary of Defense for Energy, Installations, and Environment, Business Systems and Information Directorate. The data were based on information from 2015 and included the locations of the most commonly known Department of Defense (DoD) sites, installations, ranges, and training areas world-wide (U.S. Department of Transportation. Military Bases (National) . Last updated April 11, 2017). For our analysis, we restricted the data to the 552 active duty military installations in the United States.

2.3. Measures

We calculated the drive times between the centroid of a military installation to each treatment facility listed from 2015 to 2018. Drive-time calculations assumed optimal driving conditions (i.e., no traffic, no inclement weather, cars travel the speed limit). These times reflect the minimum drive time needed for those living on installations or just working at the installations to reach a facility. Drive times were calculated using ArcGIS's Network Analyst extension in version ArcGIS Desktop version 10.6.1.

Prior research has used a 30-minute drive time cutoff to identify individuals at risk of living in an area remote from behavioral health care (Brown et al., 2015). Other studies have found that the average travel time for ambulatory care is between 30 and 40 min (Ray et al., 2015 Aug; Ray et al., 2015 Dec), and that adults report being willing to travel 30 min to get primary care services (Yen, 2013). Given these previous results, the statistical analysis measuring geographical access to facilities is restricted to those within a 30-minute drive from military installations.

As described in further detail below in the Analyses section, we estimated two sets of regressions. The first set of regressions estimated the percentage of military installations more than a 30-minute drive away from behavioral health facilities. Separate indicators were created that equal one if an installation is more than 30-minutes away from 1) any licensed SUD treatment facility and 2) any mental health treatment facility, and zero otherwise. Three separate indicators were also created to measure whether installations were at-risk of being remote from licensed SUD treatment facilities with specialized programs for 1) active duty military, (2) military families, and (3) either active duty military or military families. Similarly, three separate indicators were created to measure whether installations were at-risk of being remote from licensed mental health treatment facilities with specialized programs for 1) active duty military, (2) military families, and (3) either active duty military or military families. These 8 indicators were then recreated for facilities that accepted military insurance (e.g., indicator that equals one

if an installation is more than 30-minutes away from any licensed SUD treatment facility that accepts military insurance).

The second set of regressions predicted the average number of facilities within a 30-minute drive time of military installations and the shares of facilities within a 30-minute drive to military installations that offer specialized treatment programs. For this set of regressions, the outcome variables were the number of facilities within a 30-minute drive time, the shares of facilities that offer a specialized treatment program for active duty military, military families, and either active duty military or military families within a 30-minute drive, the number of facilities accepting military insurance within a 30-minute drive, and the shares of facilities accepting military insurance that offer these specialized treatment programs. These outcome variables were constructed separately for licensed SUD treatment facilities and mental health treatment facilities.

2.4. Analyses

We conducted three sets of analyses. First, we provided descriptive statistics at the facility level to document the share of mental health treatment facilities and licensed SUD treatment facilities that accept various forms of payment, their service settings, and whether they offer a specialized treatment program for active duty military, military families and both active duty military and military families. We also provide statistics on the share of facilities offering specialized treatment programs among those that report accepting military insurance as a form of payment.

Second, using military installation level data, we estimated logit regression models to predict the percentage of active duty military installations that are at-risk of being remote from behavioral health services, including specialized treatment programs. To do so, we estimated separate logit regression models in which the outcome measures were dummy variables for: the absence of a facility within a 30-minute drive time from the military installation; the absence of treatment facilities within a 30-minute drive time that have a specialized treatment program for active duty military, military families, and either active duty military or military families; the absence of facilities that accept military health insurance with a 30-minute drive time; and the absences of facilities accepting military insurance within a 30-minute drive time that offer specialized treatment programs for active duty military, military families, and either active duty military or military families. Each logit regression includes year and state dummy variables as explanatory variables.

Third, using military installation level data, we estimated ordinary least squares regression models to predict the average number of treatment facilities within a 30-minute drive time to active duty military installations and the shares of treatment facilities within a 30-minute drive to active duty military installation with specialized treatment programs for military populations. These regressions are estimated separately to predict the shares with specialized treatment programs among facilities within a 30-minute drive time and the shares with specialized treatment programs among facilities within a 30-minute drive time that accept military health insurance.. Each regression includes year and state dummy variables as explanatory variables. These analyses provide us with information about the extent to which civilian providers are equipped to treat behavioral health conditions of military populations as proxied by the availability of specialized treatment programs.

For all the regressions, we report the regression adjusted means and 95 percent confidence intervals of the outcome measure. To address concerns related to non-response bias in the directory data, we estimated all of the analyses for each year separately to assess the extent to which this bias may impact the results. The RAND Corporation's Institutional Review Board determined the research exempt.

3. Results

Table 1 reports descriptive statistics on the licensed SUD and mental health facilities. Between 2015 and 2018, one-third of licensed SUD facilities accepted military insurance and only 13 percent offered a specialized treatment program for active duty military or military families. Among SUD facilities accepting military insurance, almost 90 percent were outpatient facilities. Even after restricting to facilities accepting military insurance, a minority of facilities offered a specialized treatment program for military populations. Only 15 percent offered a specialized treatment program for active duty military or military families. Twelve percent of facilities had a specialized treatment program for active duty military and 13 percent had a specialized treatment program for military families. Just under half of mental health treatment facilities accepted military insurance. Similar to SUD treatment facilities, a small share of mental health treatment facilities accepting military insurance offered a specialized treatment program for active duty military or military families (17 percent).

Table 2 shows the regression adjusted percentages of military installations that were at-risk of being remote from behavioral healthcare services. Approximately 3 out of 10 military installations were classified as being at-risk of being remote from a licensed SUD treatment facility and mental health facility separately. About half of military installations were at-risk of being remote from a specialized treatment program for active duty military members and military families. Access to specialized treatment programs from military installations was even worse when estimating access to facilities that accept military insurance as a form of payment, with over 60 percent of military installations being at-risk of being remote. We found similar results when estimating the regression models for each year separately.

Table 3 reports regression adjusted means for the total number of licensed SUD treatment facilities within a 30-minute drive to military installations and the percentages of these facilities that have a specialized treatment program for active duty military, military families, and either active duty military or military families. The average number of facilities accepting military insurance within a 30-minute drive from military installations was approximately 5, or a quarter of the average

Table 1
Treatment Facility Summary Statistics, 2015–2018.

	Substance Use Disorder	Mental Health
All Facilities	N = 47,846	N = 41,033
Method of Payment Accepted		
Medicare	33%	68%
Medicaid	62%	86%
Military Insurance	33%	47%
Private Insurance	68%	79%
Cash	91%	84%
Service Setting		
Inpatient	5%	16%
Outpatient	82%	78%
Residential	24%	16%
Specialized Treatment Programs		
Active Duty Military or Military Families	13%	12%
Active Duty Military	10%	8%
Military Families	11%	11%
Restricted to Facilities Accepting Military Insurance	N = 15,635	N = 19,443
Service Setting		
Inpatient	10%	23%
Outpatient	89%	82%
Residential	16%	9%
Specialized Treatment Programs		
Active Duty Military or Military Families	15%	17%
Active Duty Military	12%	12%
Military Families	13%	15%

Note: The data in this table are at the treatment facility level.

Table 2
Regression Adjusted Percentages of Military Installations More Than a 30-minute Drive from Treatment Facilities, 2015–2018 (n = 2,208).

	Substance Use Disorder	Mental Health
Any Facility	31.8% [30.0%–33.6%]	32.9% [31.0%-34.8%]
Specialized Treatment Programs		
Active Duty Military or Military Families	50.3% [48.4%-52.3%]	54.2% [52.3%-56.2%]
Active Duty Military	53.1% [51.2%-55.0%]	59.6% [57.7%-61.5%]
Military Families	53.8% [51.9%-55.7%]	56.8% [54.9%-58.7%]
Accepts Military Insurance	34.9% [33.0%-36.8%]	35.1% [33.1%-37.1%]
Specialized Treatment Programs		
Active Duty Military or Military Families	61.0% [59.1%-62.9%]	57.8% [55.9%-59.7%]
Active Duty Military	63.6% [61.7%-65.5%]	63.0% [61.1%-64.9%]
Military Families	65.8% [63.9%-67.6%]	61.1% [59.2%-63.0%]

Note: Each cell represents the regression adjusted means from a separate logit regression model that includes state and year fixed dummy variables as the explanatory variables. These regressions are estimated at the military installation level. There are 552 military installations and four years of data for a total of 2,208 observations. 95 percent confidence intervals are reported in brackets.

Table 3
Regression Adjusted Means for Share of Licensed Substance Use Disorder Treatment Facilities with a Specialized Treatment Program within 30-minute Drive Time (2015–2018) from a Military Installation, by Acceptance of Military Insurance.

	Any	Accepts Military Insurance
Mean number of facilities within a 30-minute drive time from an installation	19.3	4.7
Observations	2,208	2,208
Share offering specialized treatment programs:		
Active Duty Military OR Military Families	15.8% [14.9%–16.7%]	24.3% [23.0%–25.7%]
Active Duty Military	12.6% [11.7%–13.4%]	20.7% [19.5%–22.0%]
Military Families	12.1% [11.4%–12.9%]	17.6% [16.4%–18.7%]
Observations	1,547	1,357

Note: Each cell represents the regression adjusted means from a separate ordinary least squares regression model that includes state and year dummy variables as explanatory variables. The unit of analysis for this model is a military installation. 95 percent confidence intervals are reported in brackets. For the regressions estimating the share offering specialized treatment programs, the installations are restricted to the 1,547 installations that have any facility within a 30-minute drive in the Any column and restricted to the 1,357 installations that have any facility accepting military insurance within a 30-minute drive in the Accepts Military Insurance column.

number of total facilities. Less than 16 percent of treatment facilities within the 30-minute drive time have a specialized treatment program for these populations. The shares of licensed SUD treatment facilities within a 30-minute drive that have a specialized treatment programs are higher if they accept military insurance as a form of payment, but remain low at no more than 25 percent. Again, we found similar results when estimating the regression models for each year separately.

Table 4 reports regression adjusted means for the total number of mental health treatment facilities within a 30-minute drive from military installations and the percentages of these facilities that have a specialized treatment program for active duty military, military families, and either active duty military or military families. These results are similar to those for licensed SUD treatment facilities. Few mental health treatment facilities within a 30-minute drive time from the military installation, no more than 18 percent, had a specialized treatment program for active duty service members or military families. Again, the percentages of mental health treatment facilities that offer specialized treatment programs are higher among those accepting military insurance, but remain low at no more than 26 percent. Moreover, predicted average number of facilities within a 30-minute drive to military installations that accept military insurance was much smaller than the predicted average number of total facilities (5.8 versus 14.7). The results are similar when we estimated the model for each year separately.

4. Discussion

There is limited research on the availability of specialized behavioral health programs for active duty military and their families. Existing studies find proximity to behavioral health care services as a barrier to receiving care among military populations (Brown et al., 2015; Ho et al., 2019; Tanielian et al., 2016). Our study provides national estimates of the geographic availability of mental health and SUD treatment facilities for the years 2015–2018 and document a lack of behavioral health providers in areas surrounding active duty military installations, with approximately 3 out of 10 active duty military installations being at-risk of being remote from these types of providers. This estimate supports

Table 4
Regression Adjusted Means for Share of Mental Health Treatment Facilities with a Specialized Treatment Program within 30-minute Drive Time (2015–2018) from a Military Installation, by Acceptance of Military Insurance.

	Any	Accepts Military Insurance
Mean number of facilities within a 30-minute drive time from an installation	14.7	5.8
Observations	2,208	2,208
Share offering specialized treatment programs		
Active Duty Military OR Military Families	17.9% [16.8%–18.9%]	25.5% [24.1%–26.8%]
Active Duty Military	11.7% [10.9%–12.6%]	18.3% [17.2%–19.5%]
Military Families	15.5% [14.5%–16.5%]	21.9% [20.6%–23.2%]
Observation	1,547	1,421

Note: Each cell represents the regression adjusted means from a separate ordinary least squares regression models that include state and year dummy variables as explanatory variables. The unit of analysis for this model is a military installation. 95 percent confidence intervals are reported in brackets. For the regressions estimating the share offering specialized treatment programs, the installations are restricted to the 1,547 installations that have any facility within a 30-minute drive in the Any column and restricted to the 1,421 installations that have any facility accepting military insurance within a 30-minute drive in the Accepts Military Insurance column.

existing work that documented 27 percent of service members experienced remoteness from behavioral health care over a five-year period (Brown et al., 2015).

Our analysis also shows that about half of active duty installations are at-risk of being remote from facilities with specialized programs for military populations, and about 60 percent are at-risk of being remote from facilities with specialized programs that accept military health insurance. These results suggest a potential lack of geographical access from active duty installations to civilian providers who are equipped to provide military populations with the care they need. One caveat is that military populations located in rural areas may be acclimated to driving longer distances to receive medical care. Thus, while drive times of over 30 min indicates lower access to care, rural populations may not perceive this as being as large of a barrier as people in densely populated areas. Fourteen percent of installations are in rural areas, and among these installations, 77 percent are more than a 30-minute drive from a licensed SUD or mental health treatment facility.

We estimated regression models to predict the share of facilities that offer specialized treatment programs to understand whether treatment facilities are geographically accessible to active duty military installation and are able to address the behavioral health care needs of active duty service members and their families. Our results suggest that behavioral health treatment facilities that accept military insurance were more likely to have a specialized treatment program targeted to military populations than facilities overall. That said, under 26 percent of treatment facilities within a 30-minute drive time from an active duty military installation both accepted military insurance and had a specialized treatment program for active duty military, military families, or both groups.

This study has several limitations. First, the data contained only licensed SUD treatment facilities, and do not include unlicensed providers SUD treatment facilities (National Survey of Substance Abuse Treatment Services (N-SSATS), 2016). Second, the N-SSATS and N-MHSS data used in this study is subject to survey response bias. Currently, there are no estimates on the types of facilities that are more or less likely to respond to each survey. However, if facilities that offer military services are more or less likely to respond to either survey, then our estimates will be an over or underestimate of the truth, respectively. Furthermore, being listed in the directories is voluntary for facilities that take either the N-SSATS or N-MHSS. Given the cross-sectional nature of both datasets, it is important to use multiple years of data to correct for these issues. We note that all analyses were done for each year separately as a robustness check, and the annual results were similar to the multi-year results, thus reducing concern that non-response bias impacts the results. Third, our analyses did not measure quality of care provided at these facilities, but only self-reported availability of specialized treatment programs for active duty military and military families. Future studies should examine the types of treatment that are offered as part of these specialized programs to understand the quality of care that patients receive. Fourth, while being within a 30-minute drive to facilities provides one positive indicator for access to care, future research should study whether the capacity of such civilian facilities match the behavioral health needs of the military populations in each military installation, while accounting for potential access to local MTFs. Such analysis should also examine whether access to both civilian and military facilities will be sufficient given the growing behavioral health needs of the military. For example, suicides among active duty service members increased by over 40 percent between 2015 and 2020 (Khalil, 2022). Fifth, our study measures access to care from military installations, which is an approximation of drive time from where individuals might live. Future work could apply the methodology used in this study to measure drive times between treatment facilities and residences of active duty service members and their families using administrative data.

5. Conclusion

To our knowledge, this study provides the first national examination of the availability of behavioral health treatment facilities from active duty military installations. We do so by leveraging multiple years of address point data on these facilities. Our findings suggest that a sizeable share of active duty military installations was at-risk of being remote from specialized treatment programs. The lack of a specialized treatment program could suggest that these facilities may not be equipped to manage stressors unique to being in the military such as deployments. In sum, our results support research that shows a sizeable share of the civilian mental health providers lack knowledge about military culture and evidence-based behavioral treatment relevant to military populations (Kilpatrick et al., 2011; Tanielian et al., 2014; Koblinsky et al., 2014 Apr). Further research is necessary to understand what specialized treatment programs for military populations entail and whether policymakers should consider ways to improve civilian provider competency on military culture and treatments most relevant to military populations. Moreover, since providers need to be certified to become TRICARE network providers, DoD could consider imposing a requirement that behavioral health providers implement specialized programs for military populations or provide information to civilian providers on how to establish these specialized programs. Alternatively, DoD could include the presence of specialized programs as part of its clinical quality measures when evaluating performance of civilian behavioral health providers.

CRediT authorship contribution statement

Jonathan H. Cantor: Conceptualization, Methodology, Data curation, Formal analysis, Funding acquisition, Writing – original draft, Software. **Patricia K. Tong:** Conceptualization, Methodology, Data curation, Formal analysis, Funding acquisition, Writing – original draft, Software.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Acknowledgments

We thank Aaron Kofner for programming assistance, and John Winkler, Kimberly Hepner, and Tom Concannon for helpful comments. The research presented in this paper is that of the authors and does not reflect the official policy of the Office of the Secretary of Defense. This work was supported by funding provided by the Office of the Secretary of Defense as part of RAND's National Defense Research Institute, a federally funded research and development center. The study sponsor did not have any role in the study design, collection, analysis, and interpretation of data; writing the report; and the decision to submit the report for publication. The authors both contributed equally to the data analysis and writing of this paper. No financial disclosures were reported by the authors of this paper.

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