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## Mental and physical health factors related to dual use of veterans affairs and non-veterans affairs healthcare among U. S. reserve soldiers

Bonnie M. Vest<sup>a</sup>, Jessica A. Kulak<sup>b</sup>, D. Lynn Homish<sup>c</sup>, Rachel A. Hoopsick<sup>a,c</sup> and Gregory G. Homish<sup>c</sup>

<sup>a</sup>Department of Family Medicine, University at Buffalo, Buffalo, NY, USA; <sup>b</sup>Department of Health, Nutrition, & Dietetics, Buffalo State College, Buffalo, NY, USA; <sup>c</sup>Department of Community Health & Health Behavior, University at Buffalo, Buffalo, NY, USA

### ABSTRACT

This study examined the association between mental and physical health factors and dual use of Veterans' Affairs (VA) and non-VA healthcare among previously deployed male Reserve/National Guard (R/NG) soldiers (N = 214). Participants completed online annual surveys on a range of topics, including validated measures of mental and physical health, as well as questions about past-year healthcare utilization. Multinomial logistic regression models separately examined the association between mental health symptoms (PTSD, anxiety, depression, emotional role limitations), physical health symptoms (bodily pain, physical role limitations), and healthcare use (single use and dual use compared to no use), controlling for geography, trust in the VA, age, and race. Anxiety (aRR: 1.13; 95% Confidence Interval (CI): 1.02, 1.26;  $p < .05$ ), depression (aRR: 1.23; 95% CI: 1.06, 1.43;  $p < .01$ ), and PTSD (aRR: 1.05; 95% CI: 1.01, 1.10;  $p < .05$ ) symptoms were all related to past year dual use of VA and non-VA healthcare, even after controlling for known demographic factors. Bodily pain and emotional and physical role limitations were not related to healthcare outcomes. This suggests that mental health symptoms themselves may be a primary factor driving healthcare use. Further study is needed to examine whether **dual use of VA and non-VA healthcare** is duplicative or complementary.

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Healthcare utilization;  
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Between 2002 and 2010, 55% of eligible Iraq and Afghanistan veterans utilized Veterans Health Administration healthcare (VA) in the United States (Lee et al., 2015). Previous studies have examined relations between demographic, service, and health-related factors and use of VA healthcare (Harris et al., 2014; Lee et al., 2015), finding that veterans who are older (Lee et al., 2015), have a lower income, and are Black (Petersen et al., 2010) tend to be greater users of VA care compared to other veterans. Furthermore, VA use increases with total cumulative deployment time (Lee et al., 2015).

**CONTACT** Bonnie M. Vest  [bvest@buffalo.edu](mailto:bvest@buffalo.edu)  Department of Family Medicine, University at Buffalo, Buffalo, NY 14203, USA

Special attention has been paid to U.S. veterans in rural areas, who may have more difficulty accessing VA healthcare, and to those who use both VA and non-VA healthcare (dual users). Dual users are slightly more likely to be rural residents, and to have the highest VA priority ratings (West & Charlton, 2016), a measure used to determine eligibility and priority for care (Department of Veterans Affairs, 2019). Additionally, one study showed that dual users had a greater total number of diagnoses than were being treated in either healthcare setting alone, indicating they may be accessing different sources of care for different conditions (West & Charlton, 2016). Chronic illness, availability of private insurance, and confusion about where to seek care are also associated with greater likelihood of dual use (Nayar et al., 2014). Among dual users, those with mental health and substance use diagnoses had greater reliance on VA care and dual users had more diagnoses than VA-only users (Petersen et al., 2010).

Much of this research on dual healthcare use focuses on all veterans, regardless of differences in military service characteristics. U.S. Reserve and National Guard (R/NG) members have different eligibility criteria for VA use (Harris et al., 2014) than their active duty counterparts. Furthermore, evidence suggests that R/NG soldiers may experience higher rates of mental health problems than active duty soldiers (Milliken et al., 2007; Thomas et al., 2010) and may be more likely to access mental health care (Kim et al., 2010). Given potentially greater availability of private healthcare options resulting from civilian employment, R/NG members may be more likely to engage in non-VA care, though this has only been examined in relation to mental health treatment (Gorman et al., 2016). Previous work has shown that greater mental and physical health needs among reservists are related to greater use of mental health care, but only demographic factors such as age, gender, and income, related to use of VA versus non-VA care (Gorman et al., 2016). Few studies have examined VA healthcare utilization among R/NG members specifically (Gorman et al., 2016; Harris et al., 2014), although reserve members, overall, access VA care at similar rates to active duty members (Harris et al., 2014; Lee et al., 2015).

A deeper understanding of factors related to dual use of VA and non-VA healthcare among U.S. R/NG service members is needed. Furthermore, less attention has been given to the role of mental or physical health-related factors in veterans' healthcare utilization. The recently implemented MISSION Act (Steinhauer & Philipps, 2019) allows veterans to use their VA benefits to access care in non-VA settings, potentially greatly expanding the number of veterans seeking healthcare outside the VA. Therefore, a better understanding of how health factors relate to utilization decisions will help improve care processes, such as identification of veteran patients, lead to identification of unmet needs, and provide opportunities to streamline care to best address military service members' needs across settings.

The goal of this paper is to examine the association between health-related factors (mental health symptoms, bodily pain, and emotional and physical role limitations) and past year dual use of VA and non-VA healthcare among male U.S. R/NG soldiers ( $N = 214$ ). We hypothesized that mental and physical health factors would be related to greater likelihood of dual use compared to no use, and that this would be true after accounting for demographic factors (e.g., geography, trust in the VA, age, and race) already known to be related to VA use (Harris et al.; Lee et al., 2015; Petersen et al., 2010).

## Methods

Data were drawn from Operation: SAFETY (Soldiers and Families Excelling Through the Years), an ongoing longitudinal study of U.S. Army Reserve and National Guard soldiers and their partners ( $N = 418$  couples). The study protocol was approved by the University at Buffalo Institutional Review Board. The Army Human Research Protections Office, Office of the Chief, Army Reserve as well as the Adjutant General of the National Guard also vetted the study protocol. Detailed study methods have been published elsewhere (Devonish et al., 2017; Heavey et al., 2017; Vest et al., 2017).

### Recruitment

From summer 2014–fall 2015, the Operation: SAFETY study recruited R/NG soldiers and their partners, by presenting an overview of the project at drill training weekends at 47 units across New York State. Interested participants completed a screening form and were provided with information to share with their partner. Participants were screened on six inclusion criteria: (1) the couple was married/living as if married; (2) one partner was a current USAR/NG soldier; (3) the soldier was aged 18–45; (4) both partners were able to speak and understand English; (5) both partners were willing and able to participate; (6) both partners had at least one alcoholic beverage in the past year. All participants provided informed consent to participate in the study.

Of the 1,653 screening forms received, 731 soldiers and partners were identified as eligible (922 failed screening; 579 were single, 329 failed on screening items, and 14 were incomplete). In total, 572 (78%) agreed to participate and 472 (83%) completed some part of the survey. Couples where a civilian partner screened for the study ( $n = 11$ ) were less likely to enroll ( $p < .001$ ). No differences existed on soldiers' screening health variables between those who enrolled and completed versus those who enrolled and did not complete. Only couples where both partners completed the entire survey were included for follow-up ( $N = 418$ ).

### Participants

The sample for the present analysis consisted of cross-sectional data from 214 male soldiers who reported at least one overseas deployment at baseline (and therefore, would meet eligibility criteria for receiving healthcare at the VA). Sample characteristics are presented in [Table 1](#).

### Survey administration

Soldiers and their spouses completed annual surveys covering a variety of health topics such as nutrition, physical and mental health, sleep, substance use, romantic relationship, military experiences, and healthcare utilization. The surveys were administered through a secure, HIPAA-compliant, online survey programming software, StudyTrax™. Participants completed their surveys either at the university or remotely via secure log in. Each participant received 60 USD for baseline and 70 USD for each of the follow-ups.

**Table 1.** Demographic characteristics of previously deployed male U.S. Army Reserve and National Guard soldiers (N = 214).

Variable	% (N) or <i>M</i> ( <i>SD</i> )
Years Served	12.0 (6.0)
Race\Ethnicity	
Non-Hispanic White	81.8% (175)
Other	18.2% (39)
Education	
HS Grad	13.6% (29)
Some College	59.4% (127)
≥ College	27.1% (58)
Family Income (median)	\$60,000 – \$79,999
Age	33.4 (6.2)

The current analysis was conducted using a subset of baseline data from deployed male soldiers.

## Measures

### Dependent variable

The outcome was self-report of being seen at the VA and/or non-VA healthcare provider in the past year. Dichotomous responses to two questions ('Were you seen by a healthcare provider at the VA in the past year?'; 'Did you see your [non-VA] healthcare provider in the past year?') were categorized into three distinct groups: no past year healthcare use, past year use of *either* VA or non-VA care, past year use of *both* VA and non-VA care.

### Independent variables

**PTSD.** The PTSD Checklist (Bovin et al., 2015), for DSM-5 (PCL5) is a 20-item self-report measure of past month PTSD symptoms; greater scores indicate greater severity of PTSD. Each response is rated on a 5-point Likert-type scale ranging from 0 (Not at all) to 4 (Extremely), with an overall range of 0–80 (alpha: 0.95).

**Depression.** The Patient Health Questionnaire 8 (PHQ-8) (Kroenke et al., 2001), measured the severity of depression symptoms over the past 2 weeks with 8 items that range from 0 (Not at all) to 3 (Nearly every day) (Range: 0–24; alpha: 0.91).

**Anxiety.** Anxiety was assessed with 10 items based upon the 'emerging measures' from DSM-5 (Craske et al., 2013). The items examine symptoms over the past 7 days on a 5-point scale ranging from 0 (Never) to 4 (All of the time) (Range: 0–40; alpha: 0.91).

**Bodily pain.** Participants' self-report of bodily pain was assessed using items from the RAND SF-36, developed as part of the Medical Outcomes study (Ware, 1993; Ware & Sherbourne, 1992). A pain score was calculated based on participants' response to two questions: 'How much bodily pain have you had during the past 4 weeks?' and 'During the past 4 weeks, how much did pain interfere with your normal work (including both work

outside the home and housework)?' Each item was scored on a 5-point scale (alpha: 0.81). The original scale is reverse coded so that higher scores indicate less pain. For regression analyses, the scale was re-coded such that higher scores indicate worse bodily pain.

**Physical and emotional role limitations.** Participants' limitations in usual activities related to physical and emotional problems were also assessed using items from the RAND SF-36, developed as part of the Medical Outcomes study (Ware, 1993; Ware & Sherbourne, 1992). Items assess whether participants had to reduce the time spent on work or other activities, accomplished less than they would like or were limited, based on physical or mental symptoms over the past 4 weeks. Scores for each scale range from 0–100 with higher scores indicating fewer limitations (alphas: 0.86 physical; 0.88 emotional). For regression analyses, the scales were re-coded so that higher scores indicate greater limitations.

### **Covariates**

**Geography.** Participant zip codes were classified into rural versus urban using the Rural-Urban Commuting Area (RUCA) codes (Version 2.0) developed by the Office of Rural Health Policy in collaboration with the University of Washington and the Department of Agriculture's Economic Research Service (Rural Health Research Center, 2005).

**VA trust.** A single item asked participants to select their level of trust in the VA Healthcare system on a 5-point scale, ranging from 1 (very untrusting) to 5 (very trusting).

**Age.** Participants self-reported date of birth. Age was calculated by subtracting date of birth from the survey date.

**Race.** Participants self-reported race and ethnicity. In the analyses, race was dichotomized into non-Hispanic White and Other.

### **Data analysis**

We used multinomial logistic regression models to examine the association between mental health symptoms (PTSD, anxiety, depression, emotional role limitations), physical health (bodily pain, physical role limitations) and past year healthcare use (no healthcare use, single use, and dual use of VA and non-VA healthcare). Separate models were used for each independent variable, with no past year healthcare use as the referent category. Adjusted models controlled for previously identified factors related VA use, including geography, trust in the VA, age, and race (Harris et al., 2014).

## Results

### Descriptive results

Approximately 14.0% of the sample had no past year healthcare use, while 65.9% had used a single source of care (either VA or non-VA), and 20.1% were dual users (had used both VA and non-VA care). The mean anxiety score was 4.5 (standard deviation (sd): 5.5), mean depression was 3.7 (sd: 4.4), and mean PTSD was 10.7 (sd: 12.3). For anxiety, 59.8% of the sample reported at least mild anxiety, while 13.1% reported moderate to extreme anxiety. For depression, 23.8% of the sample had mild depression and 10.3% had moderate to severe depression. Six and a half percent of the sample met criteria for probable PTSD. The mean sample bodily pain score was 78.2 (sd:18.9), which indicates less pain compared to population-level estimates (bodily pain mean = 50.66; (Maglinte et al., 2012), a reflection of the younger, primarily current military service sample. Mean scores for emotional role limitations were 85.4 (sd: 31.4) and physical role limitations were 88.1 (sd: 26.7), indicating overall low levels of limitations due to physical or emotional health problems in our sample. More than one third (43.5%) of respondents report they are 'somewhat' or 'very' trusting in the VA. Approximately 18.2% were classified as living in a rural area.

### Multinomial logistic regression results

*Unadjusted Results.* Anxiety (risk ratio (RR): 1.14, 95% confidence interval (CI): 1.03, 1.26), depression (RR: 1.22, 95% CI: 1.06, 1.40) and PTSD (RR: 1.05, 95% CI: 1.01, 1.10) symptoms were significantly associated with dual healthcare use, compared to no past year use (Table 2). Level of bodily pain, emotional role limitations, and physical role limitations were not associated with any healthcare use outcomes.

*Adjusted Results.* Adjusted models (Table 3) controlled for geography, trust in VA healthcare, age, and race. In separate models for each predictor, soldiers with greater anxiety, depression, or PTSD symptoms were significantly more likely to be dual healthcare users (anxiety aRR = 1.13; depression aRR = 1.23; PTSD aRR = 1.05). Consistent with unadjusted models, level of bodily pain, emotional role limitations, and physical role limitations were not associated with any healthcare use outcomes. Age was also significantly related to dual healthcare use in all models, such that older individuals were more

**Table 2.** Unadjusted regression models, effect of mental and physical health on past-year healthcare utilization.

	Single Use (VA or Non-VA) RR (95% CI)	Dual Use (Both VA & Non-VA) RR (95% CI)
<b>Anxiety</b>	1.06 (.96, 1.17)	1.14 (1.03, 1.26)*
<b>Depression</b>	1.12 (.98, 1.28)	1.22 (1.06, 1.40)**
<b>PTSD</b>	1.02 (.98, 1.06)	1.05 (1.01, 1.10) *
<b>Bodily Pain</b>	1.01 (.99, 1.04)	1.03 (1.00, 1.05)
<b>Physical Role Limitations</b>	1.01 (.99, 1.03)	1.01 (.99, 1.03)
<b>Emotional Role Limitations</b>	1.01 (.99, 1.03)	1.01 (1.00, 1.03)

- Results of unadjusted multinomial regression models; models compared each form of healthcare use to no past year healthcare, as the referent.
- RR = risk ratio; CI = confidence interval.
- \* p <.05, \*\* p <.01, \*\*\* p <.001.

**Table 3.** Adjusted multinomial regression models (n = 214), effect of mental and physical health on past-year healthcare utilization, controlling for deployment, race, age, geography, and trust in the VA healthcare system.

	Single Use (VA or Non-VA) aRR (95% CI)	Dual Use (Both VA & Non-VA) aRR (95% CI)
<b>Model 1: Anxiety</b>	1.06 (.96, 1.17)	1.13 (1.02, 1.26)*
Race	.68 (.26, 1.80)	.77 (.23, 2.52)
Age	1.07 (1.00, 1.16)	1.10 (1.01, 1.20)*
Geography (rural)	.79 (.28, 2.22)	.85 (.25, 2.91)
VA Trust	1.21 (.87, 1.68)	1.12 (.76, 1.67)
<b>Model 2: Depression</b>	1.13 (.99, 1.30)	1.23 (1.06, 1.43)**
Race	.66 (.25, 1.77)	.73 (.22, 2.43)
Age	1.07 (.99, 1.16)	1.10 (1.01, 1.20)*
Geography (rural)	.87 (.31, 2.45)	.96 (.28, 3.34)
VA Trust	1.25 (.90, 1.74)	1.14 (.76, 1.70)
<b>Model 3: PTSD</b>	1.02 (.98, 1.06)	1.05 (1.01, 1.10) *
Race	.67 (.25, 1.79)	.76 (.23, 2.50)
Age	1.08 (1.00, 1.16)	1.10 (1.01, 1.20)*
Geography (rural)	.83 (.30, 2.31)	.95 (.28, 3.25)
VA Trust	1.22 (.88, 1.70)	1.16 (.78, 1.74)
<b>Model 4: Bodily Pain</b>	1.01 (.99, 1.03)	1.02 (.99, 1.05)
Race	.70 (.26, 1.85)	.80 (.25, 2.59)
Age	1.07 (.99, 1.15)	1.10 (1.01, 1.20)*
Geography (rural)	.82 (.29, 2.28)	.88 (.26, 2.98)
VA Trust	1.19 (.86, 1.64)	1.06 (.72, 1.55)
<b>Model 5: Physical Role Limitations</b>	1.01 (.99, 1.03)	1.01 (.99, 1.03)
Race	.68 (.26, 1.82)	.76 (.23, 2.45)
Age	1.07 (.99, 1.15)	1.10 (1.01, 1.20)*
Geography (rural)	.79 (.28, 2.19)	.83 (.25, 2.80)
VA Trust	1.18 (.85, 1.64)	1.05 (.71, 1.54)
<b>Model 6: Emotional Role Limitations</b>	1.01 (.99, 1.02)	1.01 (1.00, 1.03)
Race	.70 (.26, 1.85)	.75 (.23, 2.45)
Age	1.07 (.99, 1.15)	1.09 (1.01, 1.19)*
Geography (rural)	.81 (.29, 2.25)	.88 (.26, 2.97)
VA Trust	1.18 (.86, 1.64)	1.05 (.71, 1.55)

● Results of multinomial regression models; models compared each form of healthcare use to no past year healthcare, as the referent.

● aRR = adjusted risk ratio; CI = confidence interval.

● \* p <.05, \*\* p <.01, \*\*\* p <.001.

likely to be dual users. Interestingly, rural vs. urban geography was not related to healthcare usage in our sample.

## Discussion

Limited research has examined healthcare utilization among R/NG populations, and in particular this population's dual use of VA and non-VA healthcare. Further, existing research on veterans' healthcare utilization has focused more on geographic and demographic factors than health-related factors. We found that mental health symptoms (anxiety, depression, PTSD) among deployed male R/NG members, are related to greater likelihood of past year dual healthcare use. This expands on findings that greater mental health symptoms were related to greater use of mental health treatment among R/NG soldiers (Gorman et al., 2016), by looking at all healthcare usage, specifically dual use. Although a study of Medicare-eligible veterans (primarily >age 65) found that mental

health care was most often provided in the VA (Liu et al., 2010), this may differ significantly for a younger, currently serving reserve population.

The fact that mental health symptoms were related to greater likelihood of dual healthcare use may be reflective of the military's recent initiatives aimed at reducing stigma around seeking help for mental health concerns (Hoge et al., 2016). Research has documented potentially lower levels of stigma around mental health among reserve populations, compared to active duty, which may translate into differential access to care between these two populations (Kim et al., 2010). However, it may also be possible that decisions about where to seek care are unrelated to stigma, and may be more related to structural factors, such as wait times or continuity of care. Future studies are needed to examine this in greater detail to tease out variations in healthcare utilization decisions.

It is noteworthy, that even in a sample of younger, generally healthy service members, most of whom are still active in the military, many of these service members are using dual sources of healthcare regularly. Dual use may indicate that healthcare at a single source was not sufficient to meet all of a patient's needs, causing them to seek out additional options for their care. R/NG members may have prior established relationships with non-VA providers; research has demonstrated that NG soldiers with higher incomes and/or private insurance are more likely to access non-VA care for mental health conditions (Gorman et al., 2016). Given the relative youth and overall good health of this sample, it may be that they are choosing complementary sources of care (Nayar et al., 2014); strategically choosing different healthcare sources for different diagnoses to create a 'more comprehensive healthcare package' (Petersen et al., 2010). Other research supports this idea, finding that among veterans treated at the VA for depression, use of non-VA healthcare sources was more often for acute physical health needs (Liu et al., 2009). The extent to which this explains study findings is unclear; further work is needed to understand how individual health profiles and enabling factors such as private insurance availability (Gorman et al., 2016) relate to dual healthcare utilization. This is important for determining whether care is in fact complementary, or may potentially be duplicative and inefficient.

### **Limitations**

The present work is subject to several limitations. Due to the cross-sectional nature of the data, causal relationships cannot be determined. Data on what conditions were treated at VA versus non-VA healthcare settings were not available. This is important, as this knowledge would provide an improved understanding of whether care is duplicative or complementary; future studies should examine this in greater detail. Further, the sample was limited to married/partnered R/NG soldiers, and may not be generalizable to all soldiers nationally, although approximately half of US service members are married (Office of the Deputy Assistant Secretary of Defense, 2016). Additionally, as evidence indicates regional differences across the country in use of VA healthcare (West et al., 2017), the regional nature of the sample may not be generalizable to populations in other regions, where geographic factors, including access to VA facilities and active duty military bases may be different. Finally, the sample was limited to male soldiers; important sex/gender differences in healthcare access need to be explored.

## Conclusions

In conclusion, findings indicate that mental health symptoms are associated with dual use of VA and non-VA healthcare among previously deployed R/NG soldiers, even when accounting for factors commonly related to veterans' healthcare access, such as geography, trust in the VA, age, and race. Future studies need to examine these patterns in greater detail to understand whether dual use among reserve populations is duplicative, or a result of seeking complementary sources of care for different conditions. Given significant stigma in military populations around seeking help for mental health conditions, it was surprising that mental health symptoms were associated with past year dual use of VA and non-VA care, even after controlling for known demographic factors, but markers of physical health were not. This indicates that mental health symptoms themselves may be a primary factor driving healthcare use. The implementation of the MISSION Act, which changes aspects of healthcare provision for military members, requires continued attention to exploring ways to improve care access and processes to best address the health needs of military service members across settings.

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The authors assert that they have no conflicts of interest, financial or otherwise, to disclose.

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## ORCID

Bonnie M. Vest  <http://orcid.org/0000-0002-3401-7367>

Rachel A. Hoopsick  <http://orcid.org/0000-0001-5992-9007>

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