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## Strengths and vulnerabilities: Comparing post-9/11 U.S. veterans' and non-veterans' perceptions of health and broader well-being

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### ABSTRACT

**Background:** Prior research has examined how the post-military health and well-being of both the larger veteran population and earlier veteran cohorts differs from non-veterans. However, no study has yet to provide a holistic examination of how the health, vocational, financial, and social well-being of the newest generation of post-9/11 U.S. military veterans compares with their non-veteran peers. This is a significant oversight, as accurate knowledge of the strengths and vulnerabilities of post-9/11 veterans is required to ensure that the needs of this population are adequately addressed, as well as to counter inaccurate veteran stereotypes.

**Methods:** Post-9/11 U.S. veterans' (N = 15,160) and non-veterans' (N = 4,533) reported on their health and broader well-being as part of a confidential web-based survey in 2018. Participants were drawn from probability-based sampling frames, and sex-stratified weighted logistic regressions were conducted to examine differences in veterans' and non-veterans' reports of health, vocational, financial, and social outcomes.

**Results:** Although both men and women post-9/11 veterans endorsed poorer health status than non-veterans, they reported greater engagement in a number of positive health behaviors (healthy eating and exercise) and were more likely to indicate having access to health care. Veterans also endorsed greater social well-being than non-veterans on several outcomes, whereas few differences were observed in vocational and financial well-being.

**Conclusion:** Despite their greater vulnerability to experiencing health conditions, the newest generation of post-9/11 U.S. veterans report experiencing similar or better outcomes than non-veterans in many aspects of their lives. Findings underscore the value of examining a wider range of health and well-being outcomes in veteran research and highlight a number of important directions for intervention, public health education, policy, and research related to the reintegration of military veterans within broader civilian society.

The impact of military service on the health and well-being of those who join the armed forces has been of long-standing interest within the United States (U.S.) and around the world (Thompson et al., in press). The question of how military veterans fare after leaving service has assumed even greater importance within the U.S. in recent years, with more than 2.7 million U.S. service members deployed to support the post-9/11 wars in Afghanistan and Iraq (Wenger et al., 2018). Yet, no

study has provided a holistic examination of how the health, vocational, financial, and social well-being of the newest generation of U.S. military veterans compares with their non-veteran peers. This is a substantial gap in the literature, as knowledge of post-9/11 veterans' unique strengths and vulnerabilities is needed to inform the efforts of organizations responsible for supporting veterans' post-military readjustment. In addition, this knowledge can be used to correct inaccurate veteran

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stereotypes among members of the general public. This is an important goal, as research indicates that many individuals endorse veteran stereotypes that may be harmful to their post-military readjustment (Mobbs & Bonanno, 2018; Shepherd et al., 2019; Shephard et al., 2021; Stone, 2020; Stone & Stone, 2015), including the belief that most veterans experience mental health conditions as a consequence of their military service (Kime, 2017).

Many prior studies have examined how the general veteran population's health and broader well-being differs compared to non-veterans, or specifically, how veterans as a whole fare on outcomes relative to their non-veteran counterparts. Consistent with the perspective that military service brings with it a variety of health risks, these studies have revealed that veterans experience poorer health status on average and are at greater risk for engaging in risky health behaviors such as smoking and risky drinking than their non-veteran counterparts (Betancourt et al., 2021; Hoerster et al., 2012; Lehavot et al., 2012). Although less frequently studied than other types of outcomes, a recent study also found that veterans report less access to social support than their non-veteran peers (Campbell et al., 2021). In contrast, the majority of research on the veteran population's vocational and financial outcomes suggests that veterans do not experience poorer employment outcomes on average compared with non-veterans (e.g., Booth et al., 2000; Schulker, 2017), and may even fare better than their non-veteran peers on some vocational and financial outcomes (e.g., Schulker, 2017; Werum et al., 2020).

Prior research has also examined how the health and well-being of specific veteran cohorts (e.g., Vietnam and World War II veterans) compares to non-veterans (e.g., Angrist, 1990; MacLean & Elder, 2007; Vogt et al., 2004). Consistent with research on the broader veteran population, a review of that literature found that Vietnam and World War II veterans were at greater risk for poor post-military health outcomes than non-veterans (MacLean & Elder, 2007). However, findings regarding differences in other life outcomes varied across veteran cohorts, with some evidence that World War II veterans experienced similar post-military vocational and financial outcomes to their non-veteran counterparts, whereas Vietnam veterans experienced somewhat worse vocational and financial outcomes than their peers on average (MacLean & Elder, 2007).

Although these findings suggest both unique areas of strength and vulnerability for veterans relative to their non-veteran counterparts this research may not adequately reflect the experiences of the most recent generation of post-9/11 veterans. Not only are veterans who served after 9/11 younger than veterans from prior cohorts and more recently separated from service, but with the advent of voluntary service, the changing nature of warfare, and the increasingly diverse composition of the military workforce, it is likely that outcomes for this generation of military veterans may differ from their predecessors. Yet, we are not aware of any study that has provided a holistic examination of how post-9/11 U.S. veterans and non-veterans compare with regard to multiple aspects of their health, vocational, financial, and social well-being. Although many studies have examined the prevalence of health conditions and especially mental health conditions within this cohort (Eichler & Smith-Evans, 2018; Vogt et al., 2018), few have included samples of non-veterans to allow for a direct comparison of how outcomes differ from those of non-veterans (Oster et al., 2017). In addition, while at least some research has compared the health behavior of post-9/11 veterans to non-veterans with regard to specific health conditions (e.g., treatment seeking for mental health conditions; Goldberg et al., 2019), we know of no studies that have evaluated how post-9/11 veterans' engagement in a range of general health behaviors (e.g., tobacco use, diet, exercise, etc.) compares to that of non-veterans.

In contrast, several studies have examined how post-9/11 veterans' employment and financial outcomes differ from their peers (Kleykamp, 2013; Schulker, 2017). One study that examined differences in employment outcomes found that post-9/11 veterans were somewhat less likely to be employed than their non-veterans (Kleykamp, 2013).

This study also found that this difference was especially pronounced for post-9/11 women veterans. The more limited research comparing financial outcomes for post-9/11 veterans and non-veterans has revealed that post-9/11 veterans do not fare worse than their non-veteran peers with regard to their earnings and may even experience better earnings than their non-veteran peers under some circumstances (Kleykamp, 2013; Schulker, 2017).

As this overview of relevant research illustrates, additional research is needed on how the health and well-being of the post-9/11 veteran population compares with their non-veteran counterparts. In addition, we are only aware of one population-based study that has provided sex-stratified comparisons of post-9/11 veterans' and non-veterans' outcomes (Kleykamp, 2013). This is a significant oversight, as research suggests that post-9/11 women veterans face unique challenges in their reintegration to civilian life relative to their men peers (Street et al., 2009; Vogt et al., 2022), which could also translate into poorer outcomes relative to their non-veteran women counterparts.

The purpose of the current study was to examine how post-9/11 men and women veterans' reports of their health, work, financial, and social well-being compare with their non-veteran peers. Building on research supporting the value of a multidimensional approach to assessing veterans' health and well-being (Vogt et al., 2019), we evaluated differences in measures of life circumstances, perceived functioning within life roles, and satisfaction across health, work, financial, and relationship domains. We also applied weights to enhance the generalizability of study findings to the larger population. Given limited research on how the life experiences of this veteran cohort compares with their non-veteran peers, we did not specify hypotheses regarding how post-9/11 veterans might differ from non-veterans on study outcomes or whether the pattern of findings for veteran and non-veteran comparisons would be similar for women and men.

## 1. Methods

This investigation drew from the Department of Veterans Affairs (VA) Epidemiology Program's Comparative Health Assessment Interview (CHAI) Research Study, which is a cross-sectional study of military veterans' health and well-being. Veterans who served in the military between September 11, 2001 and May 2015 were identified from the U.S. Veterans Eligibility Trends and Statistics (USVETS) dataset, which includes information on all current and former military members. Veterans were sampled using stratification by service branch (Army, Air Force, Marines, Navy), component (Active Duty, Reserves/National Guard), and date of activation, with women oversampled to represent 30% of the sampling frame. Non-veterans were drawn from Ipsos's KnowledgePanel®, a probability-based, nationally representative web panel of non-institutionalized U.S. adults  $\geq 18$  years of age (Ipsos, n.d.).

Study invitations were mailed to veterans in 2018, followed by two reminders. Veterans could complete surveys online or via computer-assisted telephone interview. Following Ipsos's recruitment protocol, non-veterans received an email invitation and reminders, and completed surveys online. All study participants received compensation equal to \$50. Individuals outside the age range of 21 to 65 were excluded from analyses. The final analytical sample included 14,765 veterans and 4,425 non-veterans. All variables except the mental health measure had less than 4% missing data. Missing data for this variable was 9%, driven largely by the fact that not all individuals who endorsed experiencing a traumatic event identified a worst event and were thus not prompted to report on their posttraumatic stress disorder (PTSD) symptoms. Participants provided informed consent and the VA Central Institutional Review Board approved this study.

### 1.1. Measures

The measurement of health and broader well-being for this study drew primarily from the Well-Being Inventory (WBI), which has been

validated in prior research (Vogt et al., 2019). The WBI is a set of measures that assesses status, functioning, and satisfaction with respect to health, vocational, financial, and social circumstances. The WBI was supplemented with other widely used, well-validated measures of health status, mental health, financial status, and social support, which are described in Table 1. Because the study drew from multiple measures with varying response formats, all measures were dichotomized to provide a single presentation format and enhance ease of interpretation. We dichotomized WBI measures following procedures used in prior research (Vogt et al., 2020), and applied widely used strategies for dichotomizing supplemental measures (e.g., previously validated cut-off scores).

## 1.2. Analyses

All analyses were weighted to account for the complex sampling design, nonresponse bias, population frame calibration, and age range, and used a resampling-based variance estimation employing the (n-1) rescaling bootstrap (RBS) with 200 replicate weights (Kolenikov, 2010; Rao et al., 1992). Separate weights were constructed for veterans and

non-veterans. For veterans, final weights were calibrated based on population demographics: service branch, component, deployment/activation status, and sex. For non-veterans, weight construction included the probability of selection into the survey panel and CHAI sample and matched back to U.S. Census benchmarks from the 2016 American Community Survey.

The proportion of veterans and non-veterans endorsing each study outcome were assessed using frequency statistics and were unadjusted (i.e., crude). To assess group differences among outcomes, poisson regression analyses were conducted with the bootstrap-based method to produce robust standard errors (Kolenikov, 2010; Rao et al., 1992). Veteran status was included as the primary predictor, and analyses were stratified by sex. Given that veterans and non-veterans differed on age and race/ethnicity, we included both as covariates in the regression analyses. We did not include education as a covariate because many veterans complete their education following military service, and thus, education had the potential to be on the causal pathway between the primary predictor (veteran status) and study outcomes (indicators of health and well-being) (Miller & Chapman, 2001; Schisterman et al., 2009). Differences between subgroups were assessed based on adjusted

**Table 1**  
Measures used to assess health and broader well-being.

Construct	Measure	Response Format and Scoring
Primary Measure of Health and Broader Well-Being	Well-Being Inventory (WBI; Vogt et al., 2019) – measures of current status, functioning, and satisfaction over the past three months with respect to health, vocational, financial, and social circumstances	Status items (e.g., employment status) were scored dichotomously. Functioning item response options ranged from 1 (never) to 5 (most or all of the time). Satisfaction items response formats ranged from 1 (very dissatisfied) to 5 (very satisfied).
	WBI item sets were used to assess several key aspects of health functioning (healthy diet, regular physical activity and strength training, engagement in enjoyable and meaningful activities), as well as health-care insurance, health satisfaction, employment status, volunteer involvement, work satisfaction, intimate relationship status, community involvement, and community satisfaction.	Following previously validated scoring procedures for functioning and satisfaction measures (Vogt et al., 2019), scores on these measures were dichotomized to simplify the presentation of results. For functioning measures, those who responded that they were often to always functioning well or were somewhat or very satisfied (scores ranging from 3.668 to 5) were coded as 1, and those who reported rarely to sometimes functioning well or not being satisfied (scores ranging from 1 to 3.667) were coded as 0. For multi-item measures coding was based on average-item scores.
Health Status	Short Form-12 (SF-12; Jones et al., 2001) - Item #1: In general, would you say your health is: 1) poor; 2) fair; 3) good; 4) very good; or 5) excellent.	This item was dichotomized into two groupings reflecting very good or excellent health (coded as 1; original response options 4 to 5) versus poor, fair, or good health (coded as 0; original response options 1 to 3).
Mental Health	Depression: Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001) – nine items assessing core depression symptoms over the past two weeks	If participants screened positive for any of these three conditions they were identified as having a probable mental health condition and coded as 1. Participants that did not screen positive for all three conditions were coded as 0.
	Anxiety: General Anxiety Disorder (GAD-7; Spitzer et al., 2006) - seven items assessing core anxiety symptoms over the past two weeks	PHQ-9: response options range from 0 (none at all) to 3 (nearly every day). Participants with a sum score of 10 or higher (moderate depression) were coded as screening positive for depression.
	Posttraumatic stress disorder (PTSD): PTSD Checklist for Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition (PCL-5; Weathers et al., 2013) - twenty items assessing PTSD symptoms over the past month	GAD-7: with response options ranging from 0 (none at all) to 3 (nearly every day). Participants with a sum score of 10 or higher (moderate anxiety) were coded as screening positive for anxiety. PCL-5: with response options ranging from 0 (not at all) to 4 (extremely). Participants with a sum score of 31 or greater were coded as screening positive for probable PTSD.
Alcohol Misuse	Alcohol Use Disorders Identification Test-Concise (AUDIT-C; Bradley et al., 2003) - three items assessing frequency and quantity of alcohol use over the past	Items included varied response options (0 to 4). Following recommended scoring guidelines, women with a sum score of 3 or greater and men with a sum score of 4 or greater were coded as having probable alcohol misuse.
Tobacco Use	Single item adapted from NIDA ASSIST Quick Screen for Substance Use (WHO ASSIST Working Group, 2002) - "In the past three months, how often did you use cigarettes, cigars, pipes, snuff, or smokeless tobacco?"	Response options ranged from 1 (never) to 5 (daily or almost daily). Responses were categorized into two groupings: no tobacco use in the past three months coded as 0 (inclusive of original response option 1); 1) or any tobacco use in the past three months coded as 1 (inclusive of original response options 2 to 5).
Financial Difficulty	Single item adapted from RAND Financial Health Measure (RAND, 2014) – "Which of the following best describes your financial condition over the past 4 months?"	Response options were: 1) very comfortable and secure; 2) able to make ends meet without much difficulty; 3) occasionally have some difficulty making ends meet; 4) tough to make ends meet but keeping your head above water; and 5) in over your head Responses were categorized into two groupings: little or no difficulty making ends meet, coded as 1 (inclusive of response options 1 to 2) and some to a lot of difficulty making ends meet, coded as 0 (inclusive of response options 3 and 5).
Social Support	Two four-item subscales from the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) assessing current levels of support from: 1) Family and 2) Friends	Response options ranged from 1 (very strongly disagree) to 7 (very strongly agree). Participants with average item scores of 4.5 or less (disagree to neutral) were coded as 0 and those with scores greater than 4.5 (slightly to strongly agree) were coded as 1.

risk ratios (aRRs), with practically meaningful differences identified using Chen’s criteria for at least a small effect, which varies based on predictor prevalence (Chen et al., 2010), and statistical significance defined with a Bonferroni-corrected p-value of <.002 (i.e., p-value of .05 divided by the number of tests performed). All analyses were conducted using Stata MP version 17.0.

## 2. Results

### 2.1. Sample characteristics

The veteran response rate was 40.0%, which is comparable to response rates typically observed in other veteran surveys (Coughlin et al., 2011). The response rate for non-veterans was 56.5% for active panelists and 8.4% for inactive panelists recruited to meet sampling targets for males ages 18–39. Among veteran participants, 37.7% were women, the average age was 40.8 years (SD = 10.4), and 46.7% reported having at least a Bachelor’s degree. More than half (63.7%) identified as White, non-Hispanic, 15.6% identified as Black, non-Hispanic, and 11.4% identified as Hispanic. Veterans had been separated from service for 9.0 years (SD = 4.4) on average, and 57.2% reported a deployment in support of the recent wars in Iraq and Afghanistan. Among non-veteran participants, 29.9% were women, the average age was 39.2 (SD = 10.1), and 50.1% reported having at least a Bachelor’s degree. More than half (69.4%) identified as White, non-Hispanic, 8.3% identified as Black, non-Hispanic, and 14.0% identified as Hispanic.

### 2.2. Comparisons between veterans and non-veterans

Weighted unadjusted proportions between veterans and non-veterans are presented in Table 2 (women) and Table 3 (men), along with weighted aRRs associated with observed differences. As indicated by the aRRs in the tables, a number of significant differences emerged in the health and well-being of veterans and non-veterans. The most substantial differences were observed in the health domain. Veterans were more likely to endorse symptoms consistent with having a mental health condition, with women veterans 55% more likely and men veterans 88% more likely to endorse these symptoms than their non-veteran peers. Women and men veterans were also 16% and 14% less likely to be satisfied with their health than non-veterans, respectively. Other health differences were observed for general health status and tobacco use, but only for men. Specifically, veteran men were 18% less likely to endorse having very good or excellent health compared to non-veteran men, and 53% more likely to endorse using tobacco products compared to non-veteran men.

Despite these differences, both women and men veterans were more likely to report maintaining a healthy diet (42% and 24% more likely, respectively), as well as engaging in regular physical activity (33% and 24% more likely, respectively) and regular strength training (63% and 47% more likely, respectively) compared to their non-veteran peers. Both women and men veterans were also 5% more likely to report having health insurance than their non-veteran counterparts.

The only differences observed in the vocational and financial domain was that both women and men veterans were more likely to report being employed full-time than their non-veteran peers (13% and 5% more likely, respectively). There were two differences in the social domain; men veterans were 24% more likely to report being in an intimate relationship and women veterans were 13% more likely to endorse having supportive friends, compared to their non-veteran peers.

## 3. Discussion

Accurate knowledge of the unique strengths and vulnerabilities of post-9/11 veterans is required to ensure that the needs of this population are adequately addressed, as well as to counter inaccurate veteran stereotypes. In the first study to provide a comprehensive examination of

**Table 2**  
Weighted differences between post-9/11 U.S. veteran and non-veteran women.

	Unadjusted Proportions		Adjusted Estimates	
	Veterans	Non-Veterans	aRR	95% CI
<b>Health</b>				
Reported very good or excellent health	37.82	43.05	0.90	0.82, 0.98
Screened positive for mental health condition	43.93	24.59	<b>1.55*</b>	1.36, 1.75
Screened positive for alcohol misuse	34.28	28.46	1.18	1.05, 1.32
Uses tobacco products	22.33	18.36	1.14	0.95, 1.36
Maintains healthy diet	60.30	45.55	<b>1.42*</b>	1.30, 1.54
Engages in regular physical activity	47.99	37.30	<b>1.33*</b>	1.21, 1.46
Engages in regular strength training	33.85	20.99	<b>1.63*</b>	1.41, 1.88
Regularly spends time engaging in enjoyable activities	49.88	50.74	0.99	0.91, 1.08
Regularly spends time engaging in meaningful activities	48.04	43.46	1.13	1.04, 1.24
Satisfied with health	39.22	48.81	<b>0.84*</b>	0.77, 0.92
Has health insurance	95.02	92.53	<b>1.05*</b>	1.02, 1.08
<b>Vocation and Finances</b>				
In labor force	82.37	75.97	1.06	1.01, 1.10
Employed among those in labor force	88.72	88.34	1.03	0.99, 1.07
Employed full-time	85.19	73.80	<b>1.13*</b>	1.08, 1.19
Volunteering	24.20	19.50	1.28	1.10, 1.49
Little or no financial difficulties	52.87	60.05	<b>0.90</b>	0.85, 0.96
Satisfied with job	61.89	57.56	1.09	1.01, 1.17
<b>Social Relationships</b>				
Married or living with a partner	66.31	66.97	1.03	0.97, 1.10
Regular contact with friends or relatives	86.98	86.43	1.03	0.99, 1.07
Supportive family	70.10	71.75	1.01	0.96, 1.07
Supportive friends	70.72	64.81	<b>1.13*</b>	1.07, 1.20
Satisfied with community	70.26	70.05	1.04	0.99, 1.10

Note. Proportions presented are unadjusted. Risk ratios (aRR) and 95% confidence intervals (95% C.I.) presented are adjusted for age and race/ethnicity. Bolded aRRs indicate statistical significance  $p < .002$ . aRR cut-offs for women varied from 1.02 to 1.31 (inverse: 0.76 to 0.97), and aRRs that met the threshold for at least a small effect are specified with an asterisk. Sample size varied from 4,860 to 6,887.

how post-9/11 U.S. veterans’ perceptions of their health, work, and social well-being compare with their non-veteran counterparts, findings revealed that veterans experience both unique strengths and vulnerabilities after leaving military service. Consistent with research on prior veteran cohorts as well as the veteran population as a whole, the largest difference was observed in the health domain, with lower endorsement of good overall health status (men), and greater endorsement of mental health symptoms (both women and men) and tobacco use (men) among veterans. Yet, other health differences generally favored veterans, with both post-9/11 men and women veterans more likely to indicate having access to health care and to report functioning better with regard to diet, physical activity, and strength training. Although the former finding was expected due to veterans’ access to VA health care, the health

**Table 3**  
Weighted differences between post-9/11 U.S. veteran and non-veteran men.

	Unadjusted Proportions		Adjusted Estimates	
	Veterans	Non-Veterans	aRR	95% CI
<b>Health</b>				
Reported very good or excellent health	39.01	46.13	<b>0.82*</b>	0.77, 0.87
Screened positive for mental health condition	35.44	18.07	<b>1.88*</b>	1.68, 2.10
Screened positive for alcohol misuse	38.56	30.12	<b>1.25</b>	1.16, 1.35
Uses tobacco products	36.11	23.31	<b>1.53*</b>	1.41, 1.66
Maintains healthy diet	53.71	44.13	<b>1.24*</b>	1.17, 1.31
Engages in regular physical activity	55.44	43.99	<b>1.24*</b>	1.18, 1.31
Engages in regular strength training	39.47	26.45	<b>1.47*</b>	1.36, 1.59
Regularly spends time engaging in enjoyable activities	50.19	53.37	<b>0.92</b>	0.88, 0.96
Regularly spends time engaging in meaningful activities	46.53	46.38	0.99	0.95, 1.04
Satisfied with health	44.08	52.87	<b>0.86*</b>	0.81, 0.90
Has health insurance	94.14	90.19	<b>1.05*</b>	1.03, 1.07
<b>Vocation and Finances</b>				
In labor force	91.39	86.04	<b>1.04</b>	1.02, 1.06
Employed among those in labor force	92.21	92.50	1.00	0.98, 1.01
Employed full-time	93.89	89.87	<b>1.05*</b>	1.03, 1.08
Volunteering	22.37	20.24	1.13	1.03, 1.23
Little or no financial difficulties	59.67	64.97	<b>0.92</b>	0.88, 0.96
Satisfied with job	64.33	62.43	1.05	1.01, 1.09
<b>Social Relationships</b>				
Married or living with a partner	74.60	62.34	<b>1.24*</b>	1.19, 1.29
Regular contact with friends or relatives	84.28	79.11	<b>1.06</b>	1.03, 1.08
Supportive family	74.66	70.01	1.05	1.02, 1.09
Supportive friends	66.77	60.08	<b>1.09</b>	1.04, 1.13
Satisfied with community	69.30	67.78	1.05	1.01, 1.09

Note. Proportions presented are unadjusted. Risk ratios (aRR) and 95% confidence intervals (95% C.I.) presented are adjusted for age and race/ethnicity. Bolded aRRs indicate statistical significance  $p < .002$ . aRR cut-offs varied from 1.03 to 1.32 (inverse: 0.76 to 0.97), and aRRs that met the threshold for at least a small effect are specified with an asterisk. Sample size varied from 10,007 to 12,303.

functioning finding is at odds with research on the larger veteran population, which indicates that veterans are more likely to engage in risky health behaviors than their non-veteran peers (Hoerster et al., 2012; Lehavot et al., 2012). Taking these findings together, it seems plausible that veterans may start out their post-military lives with better health habits than their peers, but over time develop poorer health habits, perhaps as health conditions take a toll on their broader health functioning (Hinojosa, 2020). Although further research is needed to confirm this conclusion, this finding suggests that the answer to the question of whether veterans engage in riskier health behavior than their peers may depend on where a veteran is in his or her life course.

Although few differences were observed for other aspects of well-being beyond the health domain, the finding that men veterans were

more likely to report being in an intimate relationship and women veterans were more likely to report having supportive friends compared to their non-veteran peers is notable, as social support is among the most protective factors against other maladaptive life outcomes (e.g., Brewin et al., 2000). The former finding could be related to the high value placed on marriage within the military (Lundquist & Xu, 2014), which may continue to influence men’s lives even after military service. The reason for the latter finding is unclear, but could be due to women veterans’ greater involvement in the workforce as compared to their non-veteran peers, which may offer an additional venue for the development of supportive relationships. It might also reflect the possibility that women veterans forge especially strong friendships during military service, which they retain even after leaving service. Notably, these findings differ from a recent study of the general veteran population that found that both male and female veteran reported less structural social support than non-veterans (Campbell et al., 2021), again suggesting that there may be important differences in the health and well-being of the newest generation of veterans as compared to the veteran population as a whole.

The finding that there were few differences in vocational and financial outcomes between veterans and non-veterans beyond veterans’ greater likelihood of full-time employment is intriguing given some evidence for differences in earlier research (e.g., Kleykamp, 2013). This finding is also interesting in light of the fact that veterans were more likely to endorse mental health concerns than their non-veteran peers in this study, which has been shown to erode functioning in vocational outcomes in prior research (Vogt et al., 2017). One potential explanation for this discrepancy is that outcomes may fluctuate as a function of the life stage of veterans. Specifically, it is possible that the negative effects of veterans’ poorer mental health on vocational and financial outcomes are not yet apparent within this sample, whose average age was 40, and may instead emerge over time. Findings may also vary due to economic factors, as this study was conducted in 2018 when the U.S. economy was relatively strong.

Although some sex differences were observed in this study, it is interesting to note that most results followed similar patterns for women and men. Although the purpose of this study was to examine differences relative to non-veterans rather than to provide direct comparisons between men and women veterans, this pattern of findings suggests parallels that may be due to men’s and women’s shared military history. At the same time, it is important to note that even when the pattern of findings is similar for men and women, sex differences may still exist. For example, even though both men and women veterans were more likely to endorse mental health symptoms than their non-veteran peers, prior research has found that women veterans are at higher risk for mental health conditions than men veterans (Zinzow et al., 2007), and the current pattern of results aligns with this conclusion.

Results have numerous implications for intervention, public health education, policy, and research. The finding that post-9/11 veterans reported poorer health status than their peers, while not surprising due to their potential exposure to health risks in the military, supports the need for continued investment in the provision of high-quality health care in both the VA and community-based health-care settings. In addition to attending to veterans’ health conditions, and especially their mental health, these efforts should also focus on reducing veterans’ involvement in health risk behaviors (e.g., tobacco use). Given that post-9/11 veterans reported greater engagement in some health-promoting behaviors than their non-veteran peers (i.e., diet, physical activity, and strength training), these efforts should also focus on preventing declines in veterans’ engagement in health-promoting behaviors over time.

The finding that post-9/11 veterans’ outcomes varied across different life domains also underscores the need for public health educators, policy makers, and researchers to attend to a broader array of outcomes in the work they do. This is an important implication, as many veteran support services and much of the existing research on veterans’

reintegration experiences limit their focus to veterans' experiences within a single life domain, most commonly the health domain. The type of whole-person analysis used in this study, which offers insight into how individuals fared across multiple life domains, provides the opportunity to better contextualize the scope and significance of observed outcomes within any particular life domain. If this study had been limited to examining differences in health status alone readers may have come away with the erroneous impression that veterans generally have poorer health outcomes than their non-veteran peers, whereas the current study provided a more nuanced perspective on post-9/11 veterans' post-military readjustment. This nuance includes the fact that post-9/11 veterans' increased risk for poor health outcomes in this study did not translate into poorer outcomes across other aspects of veterans' lives during the timeframe of this study. Vocational, financial, and social well-being outcomes are also important to examine alongside health outcomes because they may contribute to veterans' longer-term health outcomes, for example by putting individuals at risk for the development or worsening of health conditions over time (Braveman & Gottlieb, 2014). Thus, their assessment is relevant to efforts aimed at reducing the development or worsening of health conditions over time.

Findings also support the need for public health educators, policy makers, and researchers to do their part to correct inaccurate stereotypes about the veteran population. Although some veteran stereotypes are positive (e.g., the hero; Parrott, Albright, Dyche, & Steele, 2018), many are not (e.g., the widely held belief that most veterans experience poor mental health; Kime, 2017), and these inaccurate perceptions may be harmful to veterans' reintegration (Mobbs & Bonanno, 2018; Shepherd et al., 2019; Shephard et al., 2021; Stone, 2020; Stone & Stone, 2015). These stereotypes could be corrected in a myriad of different ways. Educators could highlight veterans' strengths in well-being promotion efforts, for example, by featuring post-9/11 veterans' greater engagement in positive health behaviors in initiatives aimed at encouraging these behaviors in the broader population. Policy-makers could prioritize funding for veteran research that examines more holistic outcomes to enhance knowledge of areas of potential strength as well as weakness for this population. Veteran health researchers could expand their investigations to areas in which veterans may experience resilience as well as risk and provide adequate context and specificity when describing their research findings to avoid inadvertently reinforcing veteran stereotypes. They can also remind research consumers that group-based findings do not always accurately reflect the experience of individuals, something that is important to acknowledge for the current study as well.

Results also suggest other valuable directions for additional research, several of which reflect limitations of the current study. First, it will be important to examine the extent to which these findings mirror differences observed in other countries to better understand the extent to which results are specific to the post-9/11 U.S. military experience or reflect broader trends in the consequences of military service for more recently separated military veterans. It will also be important to examine the role of both background experiences (e.g., childhood adversity, pre-existing health status), and later life experiences (e.g., stress and trauma exposure) in explaining observed differences. In addition, future research should examine the role that life course factors, including time since separation and age at the time of the study play in outcomes, as prior research suggests that outcomes may change over time (e.g., Teachman & Tedrow, 2007). This research may benefit especially from the application of longitudinal or multi-cohort designs. Another valuable line of inquiry involves examining differences in earnings for post-9/11 veterans and non-veterans, which we were not able to evaluate in the current study but which has been the topic of considerable research with prior cohorts (e.g., Angrist, 1990) and has begun to receive research attention in the newest cohort of post-9/11 veterans (e.g., Vick & Fontanella, 2017). Future research will also benefit from exploring differences in health and broader well-being based on education, race/ethnicity, and military experiences, as outcomes may also

vary based on these factors (Shepherd, Sherman, et al., 2020). Finally, even though many of this study's outcomes were best assessed via self-report (e.g., satisfaction with different aspects of life), and respondents are in the best position to describe their functioning across multiple life domains, there may have been some bias in reporting on these outcomes. Although confidence in study findings is enhanced by the fact that there was no incentive to exaggerate either good or poor outcomes in this confidential study, future research would benefit from supplementing self-reports with other sources of available information.

Despite these limitations and future directions, this study had a number of unique strengths that increase confidence in study findings, including its use of large probability-based national sampling frames, inclusion of a comparison sample of non-veterans, application of weights to enhance generalizability to the larger population, and focus on a broad array of indicators of well-being that extend beyond health status. Together, these strengths allowed novel insight into how post-9/11 veterans' perceptions of their health and broader well-being compare with their non-veteran peers, with findings that suggest both unique strengths and vulnerabilities for the newest cohort of U.S. veterans.

#### Author credit statement

**Contributions:** **Dawne Vogt:** Resources, Supervision, Project Administration, Conceptualization, Methodology, Investigation, Writing – Original Draft, Supervision, Project Administration, Funding Acquisition. **Shelby Borowski:** Conceptualization, Methodology, Formal Analysis, Writing – Original Draft, Visualization; **Shira Maguen:** Conceptualization, Methodology, Writing - Review & Editing; **John Blossnich:** Conceptualization, Methodology, Writing - Review & Editing; **Claire Hoffmire:** Conceptualization, Methodology, Writing - Review & Editing; **Paul Bernhard:** Conceptualization, Methodology, Formal Analysis, Writing - Review & Editing; **Katherine Iverson:** Conceptualization, Methodology, Writing - Review & Editing; **Aaron Schneiderman:** Funding Acquisition, Data Curation, Resources, Project Administration, Conceptualization, Methodology, Investigation, Writing - Review & Editing.

#### Ethical statement

All study participants provided informed consent and ethical approval was provided by the Veterans Affairs Central Institutional Review Board.

#### Data availability

The data that has been used is confidential.

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