Successful Aging in Older US Veterans: Results From the 2019–2020 National Health and Resilience in Veterans Study

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ABSTRACT

Objective: To identify the current prevalence, and sociodemographic, military, health, and psychosocial correlates of successful aging in older US veterans.

Methods: Data were analyzed from the 2019–2020 National Health and Resilience in Veterans Study, which surveyed a nationally representative sample of 3,001 US veterans aged greater than or equal to 60 years (mean = 73). Multiple regression and relative importance analyses were conducted to identify key factors associated with successful aging. Results: A total 79% of older veterans rated themselves as aging successfully. Physical and mental health difficulties emerged as the strongest correlates of successful aging (71% variance explained), while psychosocial factors, most notably perceived resilience, purpose in life, and positive expectations about emotional aging, explained 29% of the variance in this outcome. Conclusions: Nearly 4 of 5 US veterans rate themselves as successful agers. Prevention and treatment efforts designed to mitigate physical and mental health difficulties, and promote protective psychosocial factors may help bolster successful aging in this population. (Am J Geriatr Psychiatry 2021; 29:251–256)

INTRODUCTION

On average, US military veterans are 20 years older than US nonveterans, with a median age of 64 versus 44. Currently, approximately 46% of US veterans are aged 65 and older, which is expected to increase to nearly 60% over the next 5 years. This aging of the veteran population underscores the importance of identifying factors associated with successful aging.
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successful adaptation to age-related morbidities, given the elevated prevalence and incidence of conditions such as heart disease and post-traumatic stress disorder (PTSD) in veterans relative to nonveterans,\textsuperscript{3,4} as well as disproportionate use of VA healthcare services and resources of older versus younger veterans.\textsuperscript{3,5}

While a large body of research has documented the burden of disease and disability in veterans,\textsuperscript{3–5} scarce research has examined the prevalence and correlates of successful aging, or the ability to maintain high levels of physical, mental, cognitive, and social functioning in spite of age-related morbidities, in this population. In 2011, we conducted the first known population-based study of successful aging in veterans using data from a nationally representative sample of 2,025 older US veterans.\textsuperscript{6} Results of this study revealed that the majority (82.1\%) of older veterans rated themselves as aging successfully; and while physical and mental health difficulties were negatively associated with successful aging, psychosocial characteristics such as greater resilience and purpose in life were positively associated with this outcome.

In the current study, we sought to build on our 2011 study\textsuperscript{6} by examining the prevalence and correlates of successful aging—operationalized using a multidimensional composite measure—in a new, nationally representative sample of 3,001 older US veterans aged 60 and older that was conducted between 11/18/19 and 3/8/20 (median completion date: 11/21/19). The current study focused on veterans aged 60 and older (n = 3,001; 73.8\%). Veterans completed a 50-minute, anonymous, web-based survey. The National Health and Resilience in Veterans Study sample was drawn from KnowledgePanel, a survey research panel of more than 50,000 households maintained by Ipsos, a survey research firm. KnowledgePanel is a probability-based, online, nonvolunteer access panel of a nationally representative sample of US adults that covers approximately 98\% of US households. Panel members are recruited through national random samples, originally by telephone and now almost entirely by postal mail. KnowledgePanel recruitment uses dual sampling frames that include both listed and unlisted telephone numbers, telephone and nontelephone households, and cell-phone-only households, as well as households with and without Internet access. To permit generalizability of study results to the entire population of US veterans, the Ipsos statistical team computed poststratification weights using the following benchmark distributions of US military veterans from the most recent (August 2019) Current Veteran Population Supplemental Survey of the US Census Bureau’s American Community Survey: gender by age, race/ethnicity, Census Region, metropolitan status, education, household income, branch of service, and years in service. An iterative proportional fitting (raking) procedure was used to produce the final poststratification weights. All participants provided informed consent and the study was approved by the Human Subjects Committee of the VA Connecticut Healthcare System.

**Successful Aging**

Using the major elements of researcher-defined successful aging,\textsuperscript{6,7} we operationalized a dimensional composite successful aging score that emphasized measures of physical, emotional, cognitive, and psychosocial functioning, and included: Role-Physical Functioning, Role-Emotional Functioning, Role-Social Functioning, and General Health subscales of the SF-8 Health Survey; Medical Outcomes Study Cognitive Functioning Scale, Brief Inventory of Psychosocial Functioning, and Subjective rating of successful aging (1 = least successful to 10 = most successful). Exploratory factor analysis revealed that scores on

**METHODS**

**Sample**

The National Health and Resilience in Veterans Study is a nationally representative survey of 4,069 US veterans that was conducted between 11/18/19 and 3/8/20 (median completion date: 11/21/19). The current study focused on veterans aged 60 and older (n = 3,001; 73.8\%). Veterans completed a 50-minute, anonymous, web-based survey. The National Health and Resilience in Veterans Study sample was drawn from KnowledgePanel, a survey research panel of more than 50,000 households maintained by Ipsos, a survey research firm. KnowledgePanel is a probability-based, online, nonvolunteer access panel of a nationally representative sample of US adults that covers approximately 98\% of US households. Panel members are recruited through national random samples, originally by telephone and now almost entirely by postal mail. KnowledgePanel recruitment uses dual sampling frames that include both listed and unlisted telephone numbers, telephone and nontelephone households, and cell-phone-only households, as well as households with and without Internet access. To permit generalizability of study results to the entire population of US veterans, the Ipsos statistical team computed poststratification weights using the following benchmark distributions of US military veterans from the most recent (August 2019) Current Veteran Population Supplemental Survey of the US Census Bureau’s American Community Survey: gender by age, race/ethnicity, Census Region, metropolitan status, education, household income, branch of service, and years in service. An iterative proportional fitting (raking) procedure was used to produce the final poststratification weights. All participants provided informed consent and the study was approved by the Human Subjects Committee of the VA Connecticut Healthcare System.

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these measures loaded on a single factor (eigenvalue 3.39; 52.7% variance explained; factor loadings = 0.603–0.820; average factor loading = 0.722; Supplemental Table 1).

Sociodemographic, Military, Health, and Psychosocial Variables

A broad range of variables were examined as potential correlates of successful aging (Supplemental Table 1). Exploratory factor analyses were conducted to generate factor scores for variables assessing common constructs (e.g., physical health difficulties, somatic symptoms, physical disability) were entered into individual exploratory factor analyses to yield standardized regression-weighted factor scores (mean=0, SD=1.0).

Data Analysis

Data analyses proceeded in three steps. First, we computed bivariate correlations between successful aging composite scores, and all of the sociodemographic, military, health, and psychosocial variables shown in Table 1. Second, we conducted a multiple linear regression analysis to identify independent correlates of successful aging scores; variables that were associated with this dependent variable at the p < 0.05 level in bivariate analyses were included in this model. Associations between independent variables and successful aging scores were quantified using standardized β coefficients. Third, we conducted relative importance analyses to assess the unique proportion of variance in successful aging that was explained by significant independent variables; this analysis partitioned the explained variance (R²) in successful aging scores that was explained by each independent variable after accounting for intercorrelations among these variables.

RESULTS

Table 1 shows characteristics of the sample. The mean age of the sample was 73.2 (range = 60–99), with the majority being male, white/non-Hispanic, married/partnered, retired, having a household income greater than or equal to $60,000, and having enlisted or commissioned into the military; a third had completed a college degree or higher education, and were combat veterans.

The mean subjective rating of successful aging was 7.8 (standard deviation = 1.9; range = 1–10). A total 2,393 (78.8%; 95% confidence interval = 77.1%–80.5%) veterans scored greater than or equal to 7 on this measure, which has been operationalized as indicative of successful aging.57

Table 1 shows results of bivariate and multiple regression analysis examining sociodemographic, military, health, and psychosocial correlates of scores on composite successful aging scores. The multiple regression model revealed that greater physical health difficulties, lifetime major depressive disorder (MDD) and/or PTSD, and current psychological distress were negatively associated with successful aging scores, while greater number of years in the military, positive perceptions of the military’s effect on one’s life, physical exercise, conscientiousness, protective psychosocial characteristics, and positive expectations regarding aging were positively associated with these scores.

Post hoc analyses indicated that instrumental activities of daily living (IADL) disability (β = −0.17, t = 15.74, p < 0.001), activities of daily living disability (β = −0.13, t = 8.39, p < 0.001), and number of medical conditions (β = −0.11, t = 6.61, p < 0.001; specifically, chronic pain, arthritis, respiratory disease, heart attack, kidney disease, and dementia; β’s = −0.05 to −0.13, t’s = 3.22–8.50, all p’s < 0.001); current MDD (β = −0.13, t = 6.47, p < 0.001), general anxiety disorder (β = −0.07, t = 3.93, p < 0.001), and PTSD (β = −0.07, t = 3.87, p < 0.001) symptoms; resilience (β = 0.12, t = 6.31, p < 0.001), dispositional gratitude (β = 0.06, t = 3.82, p < 0.001), and purpose in life (β = 0.05, t = 2.66, p < 0.005); and positive expectations regarding physical (β = 0.07, t = 4.67, p < 0.001) and emotional (β = 0.04, t = 2.57, p = 0.010) aging were associated with successful aging scores.

As shown in Supplemental Figure 1, relative importance analyses revealed that physical and mental health difficulties collectively explained 71.0% of the variance in successful aging scores, with IADL disability (13.4%), current MDD (12.2%) and PTSD (8.5%) symptoms, and chronic pain (7.4%) explaining the majority of this variance. After adjustment for these risk correlates, protective factors collectively

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accounted for 29.0% of the explained variance in successful aging scores, with resilience (6.4%), purpose in life (5.9%), positive expectations regarding emotional aging (4.2%), and conscientiousness (3.8%) explaining the majority of this variance.

### DISCUSSION

To our knowledge, this is the largest and most up-to-date study of the prevalence and correlates of successful aging in older US military veterans. Consistent with prior studies of older veterans\(^6\) and civilians\(^7\), the majority of older US veterans (78.8%) rated themselves as aging successfully. Overall, the multiple regression model explained more than 60% of the variance in composite successful aging scores, with physical and mental health difficulties explaining 71%, and protective psychosocial factors 29% of this variance.

The finding that physical and mental health difficulties were negatively associated with successful aging scores is consistent with prior work in veteran and civilian samples\(^6,7\) and suggests that these difficulties may deleteriously affect overall functioning in...
US veterans. However, even after adjustment for these factors, protective factors such as resilience, purpose in life, positive expectations regarding emotional aging, and conscientiousness explained nearly one-third of the variance in successful aging scores. Given that these factors are potentially modifiable, prevention and treatment efforts to bolster them, such as positive psychology, mind-body, and movement-based interventions,\textsuperscript{8,9} as well as implicit age-stereotype interventions,\textsuperscript{10} may help promote successful aging in the growing population of older veterans in the United States.

While certain factors that have been previously linked to successful aging, such as social connectedness,\textsuperscript{11} were associated with successful aging in bivariate analyses, they were not significant in the multiple regression model. One explanation for this finding is that the successful aging composite score was comprised largely of health-related measures of functioning, so physical and mental health variables accounted for the majority of the variance in these scores (Supplemental Fig. 1). Further, there is considerable variability with regard to how successful aging has been defined and operationalized,\textsuperscript{12} which may account for discrepancies in correlates/determinants of successful aging across studies. It would be helpful for the geriatric mental health field to work toward a consensus for how to define and operationalize successful aging, as well as key determinants (or categories of determinants) of successful aging. This would help promote comparability of findings across studies and different populations of older adults.

Methodological limitations of this study include the cross-sectional design; reliance on self-report assessments; and recruitment of a predominantly male, Caucasian, and noncombat veteran sample. Nevertheless, results provide an up-to-date characterization of the current prevalence and correlate of successful aging in US veterans, and identify several modifiable targets for prevention and treatment efforts designed to promote successful aging in this population.

Further research is needed to determine the generalizability of these results in other, more diverse samples of veterans; examine temporal associations between aging-related health and psychosocial factors, and successful aging; and evaluate the efficacy of interventions designed to mitigate physical and mental health difficulties, and bolster protective psychosocial factors in promoting successful aging in veterans and other aging populations.

**AUTHOR CONTRIBUTIONS**

RHP led the conceptualization of the study, acquisition of data, analysis and interpretation of data, and writing of the manuscript. BRL, JT, and SMS contributed to the design of the survey, interpretation of data and critical revision of the manuscript for important intellectual content. All authors have read and approved the final version of this manuscript.

**DISCLOSURE**

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**SUPPLEMENTARY MATERIALS**

Supplementary material associated with this article can be found, in the online version, at https://doi.org/10.1016/j.jagp.2020.08.006.

**References**

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