The Health Status of Elderly Veteran Enrollees in the Veterans Health Administration

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OBJECTIVES: To examine the health status of elderly veteran enrollees, stratified by age group, and compare with nonveteran populations.

DESIGN: Cross-sectional study.

SETTING: Outpatient.

PARTICIPANTS: A total of 1,406,049 veteran enrollees were surveyed, and 887,775 returned the questionnaire (63.1%). Of these, 663,729 (74%) were aged 65 and older.

MEASUREMENTS: Patient demographics, comorbid conditions, and health status, which was assessed using the Veterans 36-item short form (SF-36), a reliable and valid measure of health-related quality of life (HRQoL).

RESULTS: Elderly veteran enrollees are a group with poor health status across all scales of the Veterans SF-36. Significant decline in HRQoL was found in patients grouped by increasing age (65–74, 75–84, and ≥85). Of the Veterans SF-36 scales, the role physical and role emotional scales and physical functioning presented the largest decrements by age group. The elderly veteran enrollees had poorer health status than older people enrolled in Medicare managed care, ranging from 0.5 to 1 standard deviations worse.

CONCLUSION: Elderly veteran enrollees have substantial disease burden, as reflected by major impairments across multiple dimensions of HRQoL. These findings bear important implications for use of services, suggesting that the Veterans Health Administration will require considerable resources to provide care for its aging population.

Key words: elderly; health related quality of life; health status; functional status

The Veterans Health Administration (VHA) is one of the largest managed care organizations in the United States.¹ It has been a leader in the implementation of innovative programs for geriatric care that have improved the care of older veterans as well as frail elderly persons across the country.² ³ It has been an established site for health services research in geriatrics. Moreover, the VHA is one of the most important training sites for geriatric care nationwide. Thus, understanding the health status of veteran enrollees is important for geriatric practice, research, and education.

In this study, Veterans Affairs healthcare databases were used for evaluating the health status of elderly veteran enrollees. Three specific questions were addressed. (1) What is the level of physical and mental health of elderly veteran enrollees? (2) How do the levels of physical and mental health differ by decade of age in elderly veteran enrollees? (3) How do elderly veteran enrollees compare with older people enrolled in Medicare managed care?

METHODS

Data Sources

This study analyzes data from the 1999 Large Health Survey of Veteran Enrollees, in which 1.5 million veterans were randomly selected from the enrollment file of 3.7 million veterans. Of the 1.5 million enrollees, 93,951 were excluded from the survey due to deaths or ineligibility as a result of incorrect names or addresses. Of the 1,406,049 veteran enrollees surveyed, 887,775 returned the questionnaire, representing an overall response rate of 63.1%. The response rates varied by age group; 75.5% of the veterans aged 65 to
74, 75.0% of the veterans aged 75 to 84, and 63.9% of the veterans aged 85 and older responded. African Americans and women were significantly less likely to respond (P < .05). Response bias for the physical component summary (PCS) and mental component summary (MCS) component summaries for the Veterans SF-36 item short form (SF-36) was evaluated by calculating predicted PCS and MCS based on the profile of inpatient and outpatient International Classification of Diseases, Ninth Edition, Clinical Modification diagnosis codes. Respondents were somewhat sicker physically (predicted PCS = 35.3 vs 37.3) than nonrespondents but healthier mentally (predicted MCS = 44.8 vs 43.7).

Functional Status Assessment
The 1999 Large Health Survey of Veteran Enrollees used the Veterans SF-36 to measure the health-related quality of life of veteran enrollees. The Veterans SF-36 was modified from the Medical Outcome Study (MOS) SF-36, a reliable and valid measure of health-related quality of life, for use in the veteran population. It includes eight important concepts of health: physical functioning, role physical, social functioning, general health perceptions, vitality, bodily pain, role emotional, and mental health. The modifications to the MOS SF-36 are in the response choices of the role physical and role emotional items. The dichotomized two-point yes/no choices were changed to 5-point Likert scales to reduce floor and ceiling effects. With the exception of these role scales, scoring of the Veterans SF-36 scales is the same as that for the MOS SF-36. This process includes a linear transformation from a raw score so that scores range from 0 to 100, with 100 denoting the best health. Scoring of the Veterans SF-36 role physical and role emotional scales uses an algorithm previously developed and validated to ensure comparability with the MOS SF-36.

The eight Veterans SF-36 scales were summarized into physical (PCS) and mental component (MCS) scales. The two summaries, PCS and MCS, were scored using a linear t score transformation that was normed to a general U.S. population with a mean of 50 and a standard deviation (SD) of 10. Thus, all scores above or below 50 can be interpreted as above or below the general U.S. population norm, respectively, and the degree of deviation can be measured in SD units.

Other Variables Collected to Characterize Elderly Veteran Enrollees: Sociodemographic, Service-Connected Disability, and Diagnoses
Sociodemographic information included age, sex, level of education (range, 1 to > 16 years), race, and marital status. Except for race, all sociodemographic variables were obtained from veterans’ administrative files. Race was obtained from patient self-reported data collected in the 1999 Large Health Survey of Veteran Enrollees because the administrative data contained a large proportion of missing information about race.

The veterans’ disability rating was also included because it is an indicator of eligibility for care from the Veterans Affairs (VA). Medical personnel evaluate the disabling condition, and then rating specialists from the Veterans Benefits Administration determine the percentage of service-connected disability from standardized tables. The disability level is rated from 0 to 100%. Patients with service connected disability of 50% or greater have comprehensive coverage of services in the VA system.

Diagnoses were obtained using patient self-report, which enabled us to identify comorbid disease in enrollees who were not currently being seen in the VHA. Patients were asked whether a doctor had ever told them that they had any of the following conditions: hypertension, coronary artery disease (myocardial infarction/angina pectoris), congestive heart failure, diabetes mellitus, arthritis, chronic low back pain, chronic lung disease, stroke, cancer (not including skin cancer, except if melanoma), benign prostatic hypertrophy, spinal cord injury with quadriplegia or paraplegia, depression, posttraumatic stress disorder, or schizophrenia. These conditions were chosen from the Medical History Questionnaire of the MOS based on their high prevalence and clinical importance. The reliability of this methodology has been confirmed with chart audits in the Veterans Health Study.

Statistical Analysis
To answer the first question (What is the level of physical and mental health of elderly veteran enrollees?), the characteristics of the elderly veteran enrollees are reported in terms of sociodemographics (sex, race, education level, marital status), service-connected disability status, the number and prevalence of comorbid conditions (hypertension, coronary artery disease (myocardial infarction/angina pectoris), congestive heart failure, diabetes mellitus, arthritis, chronic low-back pain, chronic lung disease, stroke, cancer, benign prostatic hypertrophy, spinal cord injury, depression, posttraumatic stress disorder, schizophrenia), and PCS and MCS scores.

To answer the second question (How do the levels of physical and mental health differ by decade of age in elderly veteran enrollees?), the study sample was divided into three age groups: 65–74, 75–84, ≥ 85. Chi-square tests were used to report significant differences between age groups for categorical variables (sex, marital status, level of education, service connected disability, and select diagnoses). The scores from the Veterans SF-36 scales and two component summary scores were examined by age group using means and 95% confidence intervals (CIs). Analysis of variance (ANOVA) and pairwise comparisons were used to identify significant mean differences between the age groups. Tests for linear trend were reported for the Veterans SF-36 scores.

To answer the third question (How do elderly veteran enrollees compare with other older non-VA populations?), older people from the 1998 Medicare Health Outcomes Survey (HOS) were used as a reference group. The HOS is one of the Effectiveness of Care measures in the Medicare health employer data and information set used by the Centers of Medicare and Medicaid Services (CMS). The surveyed population included only Medicare beneficiaries enrolled in Medicare managed care (referred to as Medicare+Choice plans). The sample size of the 1998 HOS was 167,854 Medicare managed care enrollees, representing a response rate of 65%. Five percent of the 167,854 Medicare managed care enrollees were veteran enrollees (8,921).
They were not included in the calculation of the PCS and MCS scores of the 1998 HOS cohort. The resulting PCS and MCS scores were standardized based on the VA sex distribution, because 98% of elderly veteran enrollees were male.

RESULTS
In the sample of 887,775 veteran enrollees, 663,729 (74%) patients were identified who were aged 65 and older. Of these, 98% were male, 91% were white, 64% were married, and 67% had 12 or fewer years of education (Table 1). Fifty-four percent (358,414) of veteran enrollees were aged 65 through 74 (young-old), 42% (278,766) were aged 75 through 84 (old-old), and 4% (28,747) were aged 85 and older (oldest old). Results by age group indicated that older groups were less likely to be married and were less well educated. As expected, there is a trend of increasing widowhood with age. Twelve percent of the veteran enrollees had disability ratings that were higher than 50%, ranging from 10% in the youngest to 13% in the oldest age groups.

Elderly veteran enrollees presented an average ± SD of 4 ± 2.4 chronic conditions (Table 1). The most prevalent diagnoses of those reported were arthritis (64.5%) and hypertension and (63.8%); the least prevalent conditions were spinal injury with quadriplegia or paraplegia (4.1%) and schizophrenia (2.4%). The mean number of comorbid conditions was comparable across age groups. Table 1 shows that the prevalence of some conditions (arthritis, benign prostatic hypertrophy, congestive heart failure, cancer, and stroke) increased with age, but most remained about the same across age groups, with the exception of hypertension and diabetes mellitus, which declined with age.

Figure 1 presents the mean values and 95% CIs of the Veterans SF-36 scales by age group. All the scales have lower scores (worse health) for the oldest age group. The linear age trends are highly significant \( P < .001 \) across all scales using ANOVA \( F \) test of trend. The role physical and role emotional scales and physical functioning presented the largest monotonic linear age trend decrements, reflecting high levels of impairment in the old-old and oldest-old veteran enrollees in their ability to perform daily activities.

Table 1 presents the mean values and 95% CIs of the PCS and MCS scores by age group. The PCS scores of veteran enrollees were worse than those of older people enrolled in Medicare managed care. The mean PCS score of the youngest age group of elderly veteran enrollees was 35.07 (95% CI = 35.03–35.11), which is 1 SD worse than those of Medicare enrollees of the same age (45.88). The

<table>
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<tr>
<th>Characteristic</th>
<th>All ≥65</th>
<th>65–74</th>
<th>75–84</th>
<th>≥85</th>
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<tr>
<td>Male, %</td>
<td>98</td>
<td>99</td>
<td>97</td>
<td>95</td>
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<tr>
<td>Race, %</td>
<td></td>
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<td>White</td>
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<td>Black</td>
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<td>4</td>
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<td>Hispanic</td>
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<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Married, %</td>
<td>64</td>
<td>64</td>
<td>66</td>
<td>53</td>
</tr>
<tr>
<td>Widowed, %</td>
<td>11</td>
<td>7</td>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td>Education, ≤12 years</td>
<td>67</td>
<td>65</td>
<td>70</td>
<td>78</td>
</tr>
<tr>
<td>Disability rating ≥50%, if rated, %</td>
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<td>10</td>
<td>13</td>
<td>13</td>
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<tr>
<td>Number of conditions, mean ± SD</td>
<td>4.0 ± 2.4</td>
<td>3.9 ± 2.7</td>
<td>4.2 ± 2.4</td>
<td>4.0 ± 2.4</td>
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<tr>
<td>Medical conditions, %</td>
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<td></td>
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<td></td>
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<tr>
<td>Arthritis</td>
<td>64.5</td>
<td>61.9</td>
<td>67.5</td>
<td>68.7</td>
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<tr>
<td>Hypertension</td>
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<td>64.1</td>
<td>63.8</td>
<td>58.3</td>
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<td>37.7</td>
<td>48.4</td>
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<tr>
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<td>42.6</td>
<td>41.5</td>
<td>43.8</td>
<td>44.1</td>
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<tr>
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<td>31.4</td>
<td>34.8</td>
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<td>Diabetes mellitus</td>
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<td>28.3</td>
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<td>Myocardial infarction</td>
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<td>25.9</td>
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<td>24.4</td>
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<tr>
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<td>16.9</td>
<td>22.6</td>
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<tr>
<td>Stroke</td>
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<td>13.3</td>
<td>16.9</td>
<td>19.5</td>
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<tr>
<td>Spinal injury</td>
<td>4.1</td>
<td>3.8</td>
<td>4.4</td>
<td>5.1</td>
</tr>
<tr>
<td>Psychiatric conditions, %</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>25.8</td>
<td>24.9</td>
<td>26.9</td>
<td>26.6</td>
</tr>
<tr>
<td>Posttraumatic stress disorder</td>
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<td>11.7</td>
<td>9.4</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>2.4</td>
<td>2.5</td>
<td>2.3</td>
<td>2.3</td>
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</table>

SD = standard deviation.
MCS scores of veteran enrollees were also worse than those of older people enrolled in Medicare managed care. The MCS score of the youngest age group (47.46, 95% CI = 47.41–47.51), for example, was about 0.5 SDs worse than that of the same age enrolled in Medicare managed care (53.26).

DISCUSSION

Like other healthcare systems that are seeking to adapt to the growth of the older population, the VA needs information about the health of current and prospective patients to anticipate patient needs, design effective services, and evaluate the outcomes of its care. In addition, the knowledge of older veteran enrollees’ health status offers a context for understanding the kinds of issues that VA geriatric units are addressing.

This study shows that elderly veteran enrollees are a group with substantial disease burden, as reflected by major impairment across multiple dimensions of health status. It also confirms the growing appreciation that, on average, there are important health differences in elderly people in different decades of life. Particularly striking is the disproportionately poor health status of elderly veteran enrollees compared with that of older people enrolled in Medicare managed care.

Health status declined across decades of life, despite the fact that the prevalence of chronic conditions did not in-
crease with age. This divergence between measures of health status and measures of disease prevalence suggests an increasing frailty or decreased functional reserve in older patients that is independent of disease. Old age does bring certain physiological changes as a normal aspect of aging. Thus, veteran enrollees who survive to old age seem to be less able to counter the adverse effects of those chronic conditions that are present. Another possible explanation is that the diseases that are present are more severe. Diabetes mellitus, for example, would vary depending upon whether it has caused little end-organ damage or has led to renal insufficiency or blindness. Further exploration of these issues is needed to understand better the ways in which disease versus aging itself affects the health status of older people.

Sociodemographic factors differ by age group and can have an important influence on the health of elderly veteran enrollees. One example is the increase rate of widowhood that occurs with age. Loss of a spouse can interact with medical problems in ways that can strongly affect a person’s emotional and physical well-being. Another example is the lower degree of education of older veteran enrollees. Less education is usually associated with lower income, lower standard of living, and below-average health status.

Future research should take into account differences in such sociodemographic factors before making interpretations of health status scores.

The poorer physical, emotional, and social functioning of older veteran enrollees than of other populations contribute to an understanding of the different medical needs of this group. For example, their high levels of emotional distress (as reflected by their low role emotional scores) indicate that these patients may benefit from mental health services as one way to improve their health status. Their strikingly low PCS scores reflect problems in activities such as bathing, walking up stairs, and shopping that might benefit from intensive physical therapy and rehabilitation services. Based upon the cost data available in the VHA, it has been determined that veterans with 10 points lower (worse health) than other veterans on the physical summary require $1,482 per patient per year more. The elderly veterans scored an average of 3 to 7 points lower than younger veterans (aged 50–64). Thus, the VHA requires on average between $445 and $1,037 per older veteran per year more than for the younger ones. This has important implications for the future of the VHA because the number of veterans aged 75 and older will increase from 4 million to 4.5 million, and the number of those aged 85 and older will triple to 1.3 million.

There are a number of limitations to this study. First, the group aged 85 and older had a lower response rate than the younger age groups. This may have been due to a greater disease burden, particularly dementia, because patients with significant cognitive impairment would not have been able to complete the survey. Thus, the disease burden of older patients may be greater than was found. Second, patient self-report of medical diagnoses was relied on. An alternative would have been to use diagnostic codes from their electronic medical records, but this would have caused patients who were not under care to have been missed. When chart diagnoses were substituted for patient self-report, the prevalence of disease still did not increase with age (data not shown). Third, the HOS population encompasses only Medicare beneficiaries enrolled in Medicare managed care (referred to as Medicare+Choice plans). A previous study has suggested that elderly populations enrolled in Medicare managed care may be healthier than those with fee-for-service Medicare. Fourth, period of service, where age is associated with the period of military conflict and may result in some cohort effects, influenced selection factors of VA enrollees. Fifth, a previous study found that VA disability status was a contributor to physical and mental health status, although it only explains 2.2% of the differences in health status; other patient attributes such as comorbid conditions were the major contributors.

In summary, elderly veterans are a vulnerable population, as reflected by their health status. This study’s emphasis on function provides useful insight into the particular kinds of health services that the elderly may need (e.g., services directed toward improvement of function as opposed to those directed solely at treatment of disease, e.g., rehabilitation services) and the cost in providing care for an aging population. Future efforts in the application of health status measures should be directed toward the monitoring of geriatric care, particularly for those aged 85 and older.

REFERENCES


