Comparing the Smoking Behavior of Veterans and Nonveterans

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SYNOPSIS

Objectives. The authors analyzed self-reported questionnaire data from the 1987 National Medical Expenditure Survey (NMES) to determine the smoking patterns of veterans.

Methods. Using NMES data, the authors compared veterans versus nonveterans overall, women veterans versus women nonveterans, Vietnam-era veterans versus other veterans, and veterans whose usual source of medical care was the Department of Veterans Affairs (VA) system versus veterans who received care elsewhere.

Results. The likelihood of ever having smoked cigarettes was higher for veterans than for nonveterans and for women veterans than for women nonveterans. The prevalence of current smoking was higher for veterans than for nonveterans and higher for those seeking care within the VA system than for other veterans.

Conclusions. Given the enormous health care costs associated with smoking, health promotion efforts should be developed to reduce the high rate of smoking among veterans—especially those who are consumers of VA health care.

Until the mid-1990s, data on the smoking behavior of veterans were available only for small populations in select settings. Reports described the prevalence of smoking among outpatients as ranging between 25% and 44%[1–3] and among inpatients as ranging between 32% and 70%.[2–4] These single center studies were limited by lack of control populations, geographically defined populations, a paucity of data on women, inclusion of only those veterans who use the Department of Veterans Affairs (VA) health care system, or lack of adjustment for age, ethnicity, or sex.

One of the largest national studies of U.S. veterans reported an overall smoking prevalence of 38%.[5] In 1986, Luck and Prochazka calculated an age-adjusted smoking prevalence of 36% among outpatients at the Denver VA Medical Center and an age-adjusted smoking rate among inpatients of 64%.[3] They concluded that the smoking prevalence of inpatient veterans was twice that of the U.S. population as a whole, while that of outpatient veterans was similar to the national average for all males.[6] A 1989 study of 200 outpatient

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charts randomly selected for review at the same facility found a smoking prevalence of 38%.[6]

Dawley et al. reported a smoking rate of almost 70% among inpatients surveyed at the New Orleans VA Medical Center between 1974 and 1978, which had declined to 55% by 1986.[4,7] These data contrast with the decidedly lower rate of smoking at the Minneapolis VA center noted by Joseph and Korn,[2] who found a smoking prevalence of 32% among inpatients and 25% among outpatients, compared with a rate of 32% among an independent sample of men from the same state. A somewhat higher smoking prevalence of 44% was found among outpatients at the Providence VA center by Sirota.[1]

To obtain a more current, comprehensive, and unbiased view of the smoking behavior of U.S. veterans, including those not using VA health care services, we reviewed data from the 1987 National Medical Expenditure Survey (NMES).[8]

Methods

Source of data. The 1987 NMES is a database comprising the results of a survey of a random sample of the civilian, noninstitutionalized population of the United States. NMES was designed to over-represent certain segments of the population known to be at risk for chronic illnesses and long-term impairments, especially the elderly and functionally disabled.[8] Over-sampling was also directed at poor and low-income families and at African Americans and Hispanics. The survey's primary goal was to provide national estimates for calendar year 1987 of health insurance coverage and of usage, costs, and sources of payment for health care services for these groups. In this regard, it carried forward the goal of the 1977 National Medical Care and Expenditure Survey (NMCES), which was to describe trends in the utilization of health services.

Each component of NMES was designed to yield statis-

tically unbiased national and regional estimates of health insurance coverage and health care utilization, expenditures, and payment sources for the noninstitutionalized U.S. civilian population for calendar year 1987. The household survey, one of five parts of the Household Component of NMES, was based on a stratified area probability design using two independently drawn national samples. People in 85.4% of the households targeted during screening interviews agreed to participate in the first interview, and 94% participated in all rounds of interviewing.[9] The completed survey represented approximately 36,400 people from 15,000 households. Those agreeing to participate were interviewed over five rounds, the first four of which were conducted at four-month intervals. Whenever possible, interviews in Rounds 1,2, and 4 were conducted in person and those in rounds 3 and 5 by telephone. Each included a core interview requesting information about household composition, use of and expenses for health services, health insurance coverage, employment, and conditions associated with reported medical events. The sample design has been described in detail by Cohen and colleagues.[10]

The primary source of data for our analysis was a self-administered questionnaire mailed to each participating unit between the rounds 1 and 2 interviews. If respondents were unable to complete the questionnaire themselves, the questions were administered by trained interviewers.[9]

We analyzed questionnaire responses from all interviewees ages 18 and older. We classified respondents as veterans if they reported that they had ever served on active duty in the Armed Forces of the United States. For those reporting service during more than one era, we considered the period of military service to be the most recent era during which the veteran had served. Vietnam era service, however, included those who had served at any time during that period.

Using data from all NMES participants who completed the self-administered questionnaire, we compared veterans with nonveterans overall, women veterans with women nonveterans, Vietnam veterans with veterans of other eras, and those who did and did not report using the VA system as their usual source of care. Women veterans were addressed as a separate group because of the lack of past data regarding their smoking patterns and the increasing emphasis on women's health within the VA. Specifically, we compared: 3372 male and female veterans versus 18,606 male and female nonveterans; 133 female veterans versus 12,063 female nonveterans; 990 male and female Vietnam veterans versus 2382 male and female veterans of all other cohorts; and 173 male and female veterans whose usual source of medical care was the VA system versus 2218 male and female veterans who usually sought care elsewhere.

Statistical analysis. Data from paired groups were compared using analysis of covariance for continuous variables and the Mantel-Haenszel chi square analysis for categorical variables, adjusting for age, ethnicity, and sex. Reported

Cigarette smoking behavior of U.S. veterans

Group	Number	*Smoked at least 100 cigarettes in lifetime (percent)*	*Smoke cigarettes now (percent)*	*Mean age at initiation of smoking (years)*	*Mean age at cessation of smoking (years)*	*Cigarettes smoked per day if ever smoked (number)*
Male and female veterans	3372	77[a]	35[b]	18.4	39.1	14.9
Male and female nonveterans	18,606	49	28	18.9	40.0	15.2
Female veterans	133	63[c]	31	18.4	35.7[d]	17.0
Female nonveterans	12,063	46	27	19.9	38.8	13.9
Male and female Vietnam veterans	990	76	43	17.3	43.7	19.3
Other male and female veterans	2382	77	32	18.1	41.3	17.4
Male and female veterans using VA as usual source of care	173	82	47[e]	18.5	46.5	16.1
Male and female veterans using other sources of care	2218	78	32	19.0	43.2	14.7

[a]Relative risk = 1.29; 99% confidence interval = 1.24,1.34.
[b]Relative risk = 1.26; 99% confidence interval = 1.16,1.36.
[c]Relative risk = 1.37; 99% confidence interval = 1.12,1.68.
[d]Female veterans who stopped smoking did so at a significantly younger age than female nonveterans (P=0.04).
[e]Relative risk = 1.52; 99% confidence interval = 1.15,2.01.
VA = Department of Veterans Affairs

means were adjusted for the three covariates during statistical analyses; however, percentages reported in the text and table are the unadjusted values. Statistical significance was determined by a *P* value of less than 0.01 for the analysis of covariance and, for the chi-square analysis, by a 99% confidence interval for risk ratios (RR) that did not include 1.

Because of over-sampling of certain subgroups, we adjusted the results of all analyses to the U.S. population using the sample weights provided by the organizations that conducted NMES.[8] Statistical analyses were performed using the SAS System (SAS Institute, Cary, North Carolina), and results were further adjusted to account for the cluster sampling technique employed, using the Cluster Analysis Regression Program (Statistical Laboratory, Ames, Iowa).

Results

The results of our analyses are displayed in the table. The likelihood of having smoked five or more packs of cigarettes in their lifetime was higher for veterans than for nonveterans (RR = 1.29) and higher for women veterans than for women nonveterans (RR = 1.37). Similarly, the proportion currently smoking was significantly higher for all veterans than for nonveterans (RR = 1.26), with the same trend apparent among women. Veterans receiving care within the VA system had a likelihood of current smoking (RR = 1.52) significantly higher than other veterans. Women veterans who had stopped smoking were on average three years younger when they quit than women nonveterans who stopped smoking. Otherwise, there were no differences among groups in age of smoking initiation, number of cigarettes smoked per day, or age at smoking cessation for any of the groups.

Response rates to the questionnaire items on smoking were 94.5% for "Have you smoked at least 100 cigarettes in your lifetime?"; 97.0% for "Do you smoke cigarettes now?"; 94.8% for age at smoking initiation; 91.3% for age at smoking cessation; and, among those who said they had smoked at least 100 cigarettes, 85.1% for number of cigarettes smoked per day during the entire time they smoked.

Discussion

Results from our study are entirely consistent with a recent analysis of data from the National Health Interview Survey Supplements.[11] That analysis showed a smoking prevalence of 34% among veterans, compared with 28% among nonveterans, and a history of smoking rate of 74% among veterans, compared with 48% among nonveterans. Studies also confirm a higher prevalence of smoking among active duty military personnel than observed in the general population (51% versus 36% in 1982) and suggest a cohort effect of starting smoking while on active duty that leads to higher than average rates among veterans.[12–14] Other data support the supposition that the higher rate of smoking among active duty personnel is related to a high rate of initiation of smoking in the military rather than selective recruitment of smokers.[15]

There are several potential explanations for the high rates of smoking among military personnel. These include demographic characteristics such as low education level or economic status, group living conditions, stress, and boredom. In addition, the military encourages uniformity and conformity, and recruits may model their behavior after their superiors, many of whom are smokers. Traditionally, time for relaxation has been linked to opportunities to smoke, and smokers have been given extra work breaks. Another contributing factor may be that smoking products have been available in military commissaries at costs 25% to 45% lower than in civilian stores.[16]

The military's smoking culture is also bolstered by a high rate of alcohol consumption, which is known to be associated with smoking,[12] and by a unique relationship between the military and the tobacco industry. The tobacco industry sent cigarettes as part of K-rations and C-rations to boost morale in both World War I and World War II. Further evidence of the considerable influence of the industry was the military's giving the names of cigarette brands to camps for the demobilization of troops during World War II (Camps Lucky Strike, Twenty Grand, Old Gold, and Philip Morris).[17] Industry advertising targeting military personnel links patriotism, strength, and toughness with smoking. Publications carrying these advertisements seldom address the health risks of smoking.

Our data show significant differences in smoking prevalence between veterans who use the VA health care system and those who do not. Veterans in the VA health care system may be of lower socioeconomic status than veterans in the general population[18] and may have a higher prevalence of psychiatric and substance abuse problems, both of which are associated with smoking.[19,20]

The implications of these data for the formulation of health policy and the design of interventions to reduce smoking-related mortality and morbidity cannot be overstated. A study of smoking-attributable mortality and years of potential life lost in the United States reported by the Centers for Disease Control and Prevention[21] concluded that cigarette smoking is the single most preventable cause of premature death in the United States. A total of 418,690 deaths, representing 20% of all deaths and 1,152,635 years of potential life lost before age 65, were reported in 1990. Moreover, in addition to the widely known associations between smoking and coronary artery disease, peripheral vascular disease, chronic obstructive pulmonary disease, and cancers of the lung, oropharynx, esophagus, and larynx, cigarette smoking has more recently been linked to a variety of other malignant diseases. For example, epidemiologic associations between smoking and hepatocellular carcinoma,[22] soft tissue sarcoma,[23] prostate carcinoma,[24] and leukemia[25] have been reported in the past decade.

The high prevalence of smoking among veterans places a large disease burden on the VA health care system. A 26-year

follow-up of 248,046 U.S. veterans showed that more than 50% of cancer deaths among current smokers and 23% of cancer deaths among former smokers were attributable to cigarette smoking, making lung cancer the most common malignancy among veterans, with a relative risk of 11.6 for current smokers compared with nonsmokers.[26] A 1989 study showed that the rates of malignant tumors of the lung, bronchus, larynx, oral cavity, and esophagus in men using VA hospitals were approximately double the rates for men in the Surveillance, Epidemiology, and End Results (SEER) cancer registry, supplying strong evidence of the effects of cigarette smoking.[27] Chronic lung disease, atherosclerotic heart disease, peripheral vascular disease, cerebrovascular disease, lung cancer, and cancer of the oropharynx are among the most common diagnoses requiring inpatient care through the VA, which spends more than half a billion dollars each year on smoking-related disease among inpatients alone.[28]

Study limitations. We recognize several limitations of this analysis of the smoking behavior of U.S. veterans based on 1987 NMES data. First, our analysis is based entirely on self-reported data, which are subject to recall bias. Second, the data can not explain the differences observed between veterans and nonveterans, which are likely to be multifactorial. As noted above, these differences may be due in part to factors such as the distribution of cigarettes free of charge to active duty military personnel during wartime or to their availability at discounted prices through military exchanges and VA canteen services. Third, the small number of women veterans in the survey may have limited our ability to confirm a statistically significant difference in current smoking rates among women, although a trend in this direction was suggested by the data. Finally, there are no more recent comparable data to reflect the cessation of cigarette sales in VA hospitals and the impact of smoke-free policies implemented nationally within the VA hospital system.[29]

Military response. Recent surveys of smoking veterans indicate that more than 80% have indicated a desire to stop or have tried to stop smoking,[3,29] indicating likely receptiveness to smoking cessation intervention. The military has taken some steps to decrease smoking, but more are needed. In 1989, the Department of Defense placed some restrictions on smoking and started a campaign to reduce tobacco consumption.[30] This led to a ban on tobacco products in basic training in the Army[31] and on board ships in the Navy.[15] On April 8, 1994, the Pentagon announced that smoking would no longer be permitted in the military workplace but would be allowed in designated recreational and housing areas, restaurants, and prisons. Although changes in smoking policies will serve to discourage smoking in the military, it is critical to move beyond these policies in order to affect the smoking culture and to reduce smoking-related morbidity and mortality in future veteran populations. It is more efficient to develop public health strategies that prevent the initiation of smoking in the armed services than to develop smoking cessation interventions and treatment for preventable smoking-related illness among service personnel and veterans.

VA response. The Department of Veterans Affairs implemented a smoke-free policy in all acute care medical facilities in 1991. This initiative preceded the smoke-free accreditation standard of the Joint Commission on Accreditation of Healthcare Organizations.[29] All VA hospital canteens were ordered to stop selling tobacco products as of October 1, 1991. These initiatives were hampered by passage of Public Law No. 102-585, which required Department of Veterans Affairs hospitals to establish "suitable" indoor or outdoor smoking areas with appropriate heating and air conditioning to be paid for out of medical care budgets.[32] The VA has directed facilities without adequate shelters to establish and maintain detached buildings to comply with the law instead of establishing indoor areas.[33] Each hospital is required to have a smoke-free coordinator to implement the national smoke-free policy, coordinate smoking cessation activities, and disseminate information regarding smoking. A recent survey of 156 VA facilities showed that 93% of the 107 facilities for which responses were received had organized smoking cessation programs and that 74% of these programs employed nicotine replacement therapy (Personal communication, Mark D. Ackerman, PhD, VA Medical Center and Emory University School of Medicine, Atlanta). The VA has advocated the adoption of the Agency for Health Care Policy and Research smoking cessation guidelines[34] at all facilities to ensure the availability of state-of-the-art smoking cessation programs, which would offer nicotine replacement therapy among other approaches. Few facilities, however, have adequate funding for personnel dedicated solely to smoking cessation. Such positions are very much needed within the VA.

In conclusion, these data imply that veteran status is a strong predictor of ever smoking among both men and women and current smoking among men. Health promotional efforts should be developed to reduce the high rate of smoking among veterans, especially those who are consumers of VA-based health care, so that it no longer exceeds that of nonveterans.

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