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Cigarette Smoking and Sociodemographic, Military, and Health Characteristics of Operation Enduring Freedom and Operation Iraqi Freedom Veterans: 2009-2011 National Health Study for a New Generation of US Veterans

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Abstract

Objective: We examined the sociodemographic, military, and health characteristics of current cigarette smokers, former smokers, and nonsmokers among Operation Enduring Freedom (OEF) / Operation Iraqi Freedom (OIF) veterans and estimated smoking prevalence to better understand cigarette use in this population.

Methods: We analyzed data from the US Department of Veterans Affairs (VA) 2009-2011 National Health Study for a New Generation of US Veterans. On the basis of a stratified random sample of 60 000 OEF/OIF veterans, we sought responses to a 72-item questionnaire via mail, telephone, or Internet. Cigarette smoking status was based on self-reported cigarette use in the past year. We used multinomial logistic regression to evaluate associations between smoking status and sociodemographic, military, and health characteristics.

Results: Among 19 911 veterans who provided information on cigarette smoking, 5581 were current smokers (weighted percentage: 32.5%, 95% confidence interval [CI]: 31.7-33.2). Current smokers were more likely than nonsmokers or former smokers to be younger, to have less education or income, to be separated/divorced or never married/single, and to have served on active duty or in the army. Comparing current smokers and nonsmokers, some significant associations from adjusted analyses included the following: having a Mental Component Summary score (a measure of overall mental health) above the mean of the US population relative to below the mean (adjusted odds ratio [aOR] = 0.81, 95% CI: 0.73-0.90); having physician-diagnosed depression (aOR = 1.52, 95% CI: 1.33-1.74), respiratory conditions (aOR = 1.16, 95% CI: 1.04-1.30), or repeated seizures/blackouts/convulsions (aOR = 1.80, 95% CI: 1.22-2.67); heavy alcohol use vs never use (aOR = 5.49, 95% CI: 4.57-6.59); a poor vs excellent perception of overall health (aOR = 3.79, 95% CI: 2.60-5.52); and being deployed vs nondeployed (aOR = 0.87, 95% CI: 0.78-0.96). Using health care services from the VA protected against current smoking.

Conclusion: Mental and physical health, substance use, and military service characteristics shape cigarette-smoking patterns in OEF/OIF veterans.

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Cigarette smoking exacts a heavy toll on veteran health.[1,2] Tobacco use is associated with higher rates of cancer and cardiovascular and respiratory diseases.[1] US Department of Veterans Affairs (VA) data suggest that approximately $2.7 billion in 2010 was allocated to treat health conditions resulting from the effects of cigarette smoking on veterans.[3] Of approximately 7 to 8 million enrollees in the Survey of Veteran Enrollees (SVE) from 2008 to 2015, the percentage of current smokers declined from nearly 20% in 2008, 2010, and 2011[4] to 17% in 2015.[5] Based on 2003-2007 Behavioral Risk Factor Surveillance System data, smoking prevalence was higher among male and female veterans born between 1985 and 1989, who may have served in more recent military conflicts, than among veterans born before 1975, putting younger veterans at greater risk of being current smokers.[6,7]

Current research on cigarette smoking among Operation Enduring Freedom (OEF) / Operation Iraqi Freedom (OIF) veterans is limited. In a 2011 veterans' health survey that targeted only VA health care users, OEF/OIF enrollees were oversampled to address their underrepresentation in previous survey years.[4] These OEF/OIF veterans were more likely than veterans who served during earlier military conflicts to be current smokers (48.0% vs 27.8%). About 25% of 1530 OEF/OIF respondents to the 2005 VA Survey of Healthcare Experiences of Patients self-identified as current cigarette smokers,[8] and 15.1% of OEF/OIF veteran VA health care users in fiscal year 2009 had a nicotine dependence diagnosis[9] based on *International Classification of Diseases, Ninth Revision, Clinical Modification* diagnostic code 305.1.[10] A 2015 analysis of VA electronic medical records showed that 37% of OEF/OIF veterans were current smokers.[11] Current cigarette use relative to never was also more likely among male, younger, unmarried, less educated, or white Iraq- and Afghanistan-era veterans.[12] Residing in a rural area; being male, younger, and homeless; having a low income; and using mental health services predicted nicotine dependence diagnosis.[9] OEF/OIF veterans who are smokers also have poor physical health,[8] poor mental health,[8,13,14] and substance use disorders.[8,13] Moreover, military service and deployment affect smoking behavior in OEF/OIF veterans.[14,15]

Many studies on cigarette use in OEF/OIF veterans targeted VA health care users,[8,9,11,13,14] were based on smaller sample sizes,[8,12,14,15] or were qualitative.[14] Other population-based quantitative analyses on smoking patterns in OEF/OIF personnel did not exclusively discuss veterans of these conflicts[16-18]; one analysis included statistics on military personnel separated from service but did not investigate this group extensively.[16]

Overall, few comprehensive analyses of population-based survey data address cigarette smoking among OEF/OIF veterans. The objective of this study was to describe the characteristics of cigarette smokers, report the prevalence of smoking, and investigate the sociodemographic, military, and health-related correlates of cigarette smoking in the OEF/OIF veteran population.

Methods

Study Population

The VA 2009-2011 National Health Study for a New Generation of US Veterans (hereinafter, NewGen; unpublished data, VA) compared the health and service-related exposures of deployed and nondeployed OEF/OIF veterans. The sampling frame comprised veterans who served in the military between October 1, 2001, and June 30, 2008.[19] The sampling frame was developed from the VA-US Department of Defense Identification Repository (VADIR) and the Defense Manpower Data Center database (US Department of Defense), which provide data on age, census region, service component, and service branch. A stratified random sample of 60 000 veterans included 30 000 deployed and 30 000 nondeployed veterans. Stratification was based on deployment status (ie, deployed to OEF/OIF or not), sex, service branch (army, air force, navy, or marines), and service component (active duty, reserve, or national guard). Female veterans were oversampled. The study was approved by the VA Medical Center Institutional Review Board.

We collected survey data from 2009 to 2011 through postal mail (paper), telephone, and a secure Internet site.[20] We applied a sequential mailing protocol modeled on a modified tailored design.[21] An advance letter asked respondents to complete either an Internet-based or pencil-and-paper survey (the latter was sent in a subsequent mailing). A computer-assisted telephone interview was administered to eligible nonrespondents. Details on the survey process and methods are described elsewhere.[19,21] A total of 20 563 veterans responded to the survey, for a response rate of 34.3%.[19] Of these, 652 (3.2%) did not provide data on smoking; the final analytic sample was 19 911 OEF/OIF veterans.

Measures

Respondents were classified as current smokers, former smokers, and nonsmokers based on their responses to NewGen questions. Nonsmokers responded "no" to the question "During the past 12 months, have you smoked cigarettes?" Former smokers responded "no" to this question but responded "yes" to the question "IF NO, have you ever smoked cigarettes even occasionally?" Current smokers answered "yes" to having smoked cigarettes in the past 12 months. We also collected data on the number of cigarettes smoked per day and age at smoking initiation.

Physical or mental health conditions in these veterans were based on self-reported physician diagnoses (eg, depression, respiratory conditions, repeated seizures). We also assessed Mental Component Summary (MCS) scores (a measure of mental health), Physical Component Summary (PCS) scores (a measure of physical health), and perception of overall health status through the 12-Item Short-Form Health Survey (SF-12) of the Medical Outcomes Study.[22] The MCS and PCS are computed according to responses to 12 items. Scores range from 0 to 100, with higher scores indicating better health. For 1 of the 12 items, perception of overall health, the respondents were asked, "In general, would you say your health is: excellent, very good, good, fair, or poor"? The PCS and MCS scores are compared with a national US norm, with a mean of 50 and a standard deviation of 10; scores $\geq$50 indicate average or above-average health relative to the US general population. A dichotomous variable was created to classify veterans whose scores were either $\geq$50 or <50 for the MCS and PCS. We calculated body mass index (BMI) in kilograms per square meter[23] (kg/m^2; <18.5, underweight; 18.5-24.9, normal weight; 25.0-29.9, overweight; $\geq$30, obese) using self-reported weight and height. We derived levels of alcohol use from federal guidelines (drinks per week—heavy use: $\geq$15 for males, $\geq$8 for females; moderate use: 4-14 for males, 3-7 for females; light use: 1-3 for males, 1-2 for females).[24-26] NewGen collected data on use of VA health care since separation from active duty (ie, service separated). The final analytic data set for NewGen contained data from the survey questionnaire and from the sampling frame.

We tested sociodemographic and military service variables that were relevant in other studies of smoking among military personnel and veterans.[1,6-9,12,14-18,27-33] The health variables, particularly those on mental health and substance use, were examined for similar reasons.[1,9,12,34-39] Associations with cigarette smoking and other health variables (eg, BMI) have been analyzed in other studies.[16,38,40] Health care utilization variables are indicative of health status and have been investigated in military personnel and veterans in relation to smoking.[39,41,42] Overall, sociodemographic, military, and health-related variables have been studied to varying degrees in OEF/OIF veterans but generally not in their totality. A broad analytic approach has been recommended to understand tobacco use[1,2] because smoking behavior is multifactorial, and it is this rationale that underlies the current analysis.

Statistical Analysis

We used SAS® 9.4 to generate all statistical output.[43] Survey responses were weighted to account for nonresponse and further modified through a poststratification approach to reduce bias resulting from the misclassification of deployment in the sampling frame.[44] All statistics reported, except for counts, were weighted.

We generated descriptive statistics. We considered percentages statistically unreliable if the denominator on which the estimate was based had a cell count $\leq$70 or the relative standard error was >30%.[45] We used contingency tables and univariable regression analysis to identify key unadjusted associations among >40 sociodemographic, health condition, health care utilization, and military service variables. We generated Rao-Scott χ^2 (design-adjusted Pearson's χ^2) and *t* test statistics. We used multinomial logistic regression analysis to examine associations between smoking status, a dependent variable with >2 discrete outcomes, and each independent variable while controlling for other covariates. We assessed multicollinearity to reduce the number of predictors by inspecting correlation matrices and collinearity diagnostics output from unweighted linear regression[46]; independent variables were excluded per the extent of multicollinearity (for tolerances <0.40), conceptual relevance, and significance. We examined all 2-way interactions with sex because the association between at least 1 of the main effects and smoking status may differ by sex.[47-50] The final number of independent variables was 16, plus 1 term for the sex/age interaction (education, race/ethnicity, marital status, census region, MCS, depression, alcohol use, overall perception of health status, BMI, other physical health conditions [respiratory, repeated seizures/blackouts/convulsions], VA health care use, use of alternative medical treatment, deployment status, service component, service branch, and sex/age interaction). We calculated adjusted odds ratios (aORs) with 95% confidence intervals (CIs) and considered $P \leq .05$ to be significant.

Results

Of 19 911 OEF/OIF veterans who provided responses on smoking, 5581 (32.5%, 95% CI: 31.7-33.2) were current smokers; 5067 (24.8%, 95% CI: 24.1-25.5) were former smokers; and 9263 (42.7%, 95% CI: 42.0-43.5) were nonsmokers. Of current smokers, most were male (86.6%, 95% CI: 85.8-87.4). Relative to former or nonsmokers, current smokers were more likely to be 24 to 34 years of age (70.7%, 95% CI: 69.4-71.9), earn <$35 000 per year (44.2%, 95% CI: 42.6-45.7), be either separated/divorced (18.5%, 95% CI: 17.3-19.6) or never married/single (27.2%, 95% CI: 25.8-28.6), have earned a high school diploma / general equivalency diploma (28.2%, 95% CI: 26.8-29.6), and have served on active duty (58.3%, 95% CI: 57.1-59.5) and in the army (53.0%, 95% CI: 51.7-54.3). Most current smokers were white (73.8, 95% CI: 72.5-75.1). Generally, former smokers resembled nonsmokers (Table 1).

The prevalence of current smoking was 33.5% (95% CI: 32.6-34.4) among males and 27.1% (95% CI: 25.5-28.7) among females. Relative to other age groups, more current smokers were aged 24 to 34 years (40.0%, 95% CI: 38.8-41.1). Almost half of high school graduates were current smokers (49.7%, 95% CI: 47.7-51.8), whereas

Table 1. Sociodemographic, health, and military service characteristics of OEF/OIF veterans by self-reported cigarette smoking status: National Health Study for a New Generation of US Veterans, 2009-2011[a]

Characteristic	Total respondents, n[b]	Weighted, %[c] (95% CI)	Nonsmokers		Current smokers		Former smokers	
			Unweighted, n	Weighted, %[c] (95% CI)	Unweighted, n	Weighted, %[c] (95% CI)	Unweighted, n	Weighted, %[c] (95% CI)
Total	19 911	100.0	9263	42.7 (42.0-43.5)	5581	32.5 (31.7-33.2)	5067	24.8 (24.1-25.5)
Sex[d,e]								
Male	15 715	84.0 (83.8-84.1)	7148	81.6 (80.9-82.2)	4494	86.6 (85.8-87.4)	4073	84.7 (83.7-85.6)
Female	4196	16.0 (15.9-16.2)	2115	18.4 (17.8-19.1)	1087	13.4 (12.6-14.2)	994	15.3 (14.4-16.3)
Age group, y[e,f]								
24-34	8691	57.4 (56.7-58.1)	3461	50.3 (49.1-51.4)	3229	70.7 (69.4-71.9)	2001	52.4 (50.8-53.9)
35-44	4776	20.4 (19.8-21.0)	2500	23.7 (22.7-24.6)	1127	16.2 (15.3-17.2)	1149	20.3 (19.1-21.5)
45-54	4793	17.5 (17.0-18.0)	2498	20.8 (19.9-21.6)	959	10.9 (10.1-11.6)	1336	20.6 (19.5-21.8)
≥55	1651	4.7 (4.4-4.9)	804	5.3 (4.9-5.7)	266	2.2 (1.9-2.5)	581	6.7 (6.1-7.3)
Education[d,e]								
High school / general equivalency diploma	3015	18.4 (17.8-19.1)	967	12.6 (11.7-13.4)	1369	28.2 (26.8-29.6)	679	15.7 (14.5-16.9)
Some college / associate's degree	9845	53.8 (53.0-54.6)	4095	50.0 (48.8-51.2)	3214	58.8 (57.3-60.3)	2536	53.7 (52.2-55.3)
Bachelor's degree or more	7004	27.8 (27.1-28.4)	4183	37.4 (36.3-38.5)	982	12.9 (12.0-13.8)	1839	30.6 (29.2-32.0)
Race/ethnicity[d,e]								
White	14 012	70.9 (70.2-71.6)	6138	66.1 (65.0-67.2)	4085	73.8 (72.5-75.1)	3789	75.3 (74.0-76.7)
Black	2540	12.2 (11.7-12.7)	1550	16.5 (15.6-17.3)	551	9.6 (8.7-10.5)	439	8.2 (7.4-9.1)
Hispanic	1749	9.0 (8.5-9.5)	832	9.5 (8.8-10.2)	471	8.3 (7.5-9.1)	446	9.0 (8.1-9.9)
Asian	387	1.9 (1.7-2.2)	204	2.3 (1.9-2.6)	96	1.7 (1.3-2.0)	87	1.8 (1.3-2.2)
American Indian / Alaska Native	138	0.8 (0.6-0.9)	56	0.7 (0.5-0.9)	47	0.9 (0.6-1.2)	35	0.7 (0.5-1.0)
Native Hawaiian / Pacific Islander	128	0.6 (0.5-0.8)	64	0.7 (0.5-0.9)	32	0.5 (0.3-0.7)	32	0.7 (0.4-0.9)
Other[g]	847	4.6 (4.2-4.9)	371	4.3 (3.8-4.7)	271	5.2 (4.5-5.9)	205	4.3 (3.6-4.9)
Current annual household income[d,e]								
<$35 000	4950	31.6 (30.8-32.4)	1883	26.0 (24.9-27.1)	2059	44.2 (42.6-45.7)	1008	24.8 (23.3-26.2)
$35 000-$49 999	3405	18.3 (17.6-18.9)	1407	16.7 (15.8-17.6)	1142	20.3 (19.1-21.5)	856	18.4 (17.2-19.7)
$50 000-$74 999	4493	21.8 (21.1-22.4)	2089	22.5 (21.5-23.5)	1166	19.2 (18.1-20.4)	1238	23.8 (22.5-25.1)
$75 000-$99 999	2872	12.5 (12.0-13.0)	1447	13.7 (12.9-14.4)	608	9.0 (8.3-9.8)	817	15.1 (14.0-16.2)
$100 000-$149 999	2700	11.1 (10.6-11.5)	1532	14.1 (13.3-14.9)	409	5.8 (5.2-6.4)	759	12.7 (11.8-13.7)
≥$150 000	1242	4.8 (4.5-5.0)	793	7.0 (6.5-7.5)	116	1.5 (1.2-1.8)	333	5.2 (4.6-5.8)
Is currently employed for wages[d,e]	11 958	58.7 (57.9-59.5)	5750	60.3 (59.1-61.5)	3119	55.5 (54.0-57.0)	3089	60.1 (58.5-61.6)
Marital status[d,e]								
Married	13 330	63.7 (62.9-64.4)	6459	66.9 (65.8-68.1)	3177	54.1 (52.6-55.7)	3694	70.5 (69.0-71.9)
Separated or divorced	2940	14.3 (13.7-14.8)	1198	12.3 (11.5-13.0)	1085	18.5 (17.3-19.6)	657	12.2 (11.2-13.2)
Widowed	61	0.2 (0.2-0.3)	27	0.3[h] (0.1-0.4)	19	0.2[h] (0.1-0.3)	15	0.2[h] (0.1-0.3)
Never married or single	3521	21.9 (21.1-22.6)	1556	20.6 (19.5-21.6)	1278	27.2 (25.8-28.6)	687	17.2 (15.9-18.5)
Census region[e,f]								
Northeast	2395	11.5 (11.0-12.0)	1070	11.0 (10.3-11.8)	733	12.5 (11.5-13.5)	592	11.1 (10.1-12.0)
Midwest	4070	19.9 (19.2-20.5)	1742	17.8 (16.9-18.7)	1303	22.6 (21.4-23.9)	1025	19.8 (18.5-21.0)
South	8864	45.8 (45.0-46.6)	4295	48.1 (46.9-49.3)	2393	44.6 (43.1-46.2)	2176	43.1 (41.6-44.7)
West	4198	22.9 (22.2-23.6)	1977	23.0 (22.0-24.0)	1037	20.2 (19.0-21.5)	1184	26.1 (24.6-27.5)

(continued)

Table 1. (continued)

Characteristic	Total respondents, n[b]	Weighted, %[c] (95% CI)	Nonsmokers		Current smokers		Former smokers	
			Unweighted, n	Weighted, %[c] (95% CI)	Unweighted, n	Weighted, %[c] (95% CI)	Unweighted, n	Weighted, %[c] (95% CI)
Service component[e,f]								
Active duty	7650	53.7 (53.4-53.9)	3215	49.1 (48.2-50.0)	2369	58.3 (57.1-59.5)	2066	55.6 (54.2-56.9)
Reserve	6835	25.0 (24.8-25.1)	3569	28.9 (28.2-29.7)	1589	20.1 (19.2-21.0)	1677	24.5 (23.4-25.6)
National Guard	5426	21.4 (21.2-21.5)	2479	22.0 (21.3-22.6)	1623	21.6 (20.7-22.5)	1324	20.0 (19.0-20.9)
Branch of service[e,f]								
Army	10 789	49.5 (49.2-49.8)	4925	48.6 (47.6-49.5)	3267	53.0 (51.7-54.3)	2597	46.5 (45.1-47.9)
Air Force	4200	19.7 (19.4-19.9)	2231	23.4 (22.6-24.1)	833	13.8 (12.9-14.8)	1136	20.9 (19.8-22.0)
Marine Corps	1920	12.7 (12.5-12.8)	745	10.7 (10.1-11.4)	659	14.8 (13.9-15.7)	516	13.2 (12.2-14.2)
Navy	3002	18.2 (17.9-18.4)	1362	17.3 (16.6-18.1)	822	18.3 (17.2-19.4)	818	19.4 (18.2-20.6)
Was deployed to OEF/OIF[d,i]	12 747	55.9 (55.4-56.4)	5994	56.0 (54.9-57.0)	3610	56.2 (54.9-57.6)	3143	55.3 (53.8-56.7)
No. of deployments[d,j]								
0	5481	39.1 (38.5-39.6)	2537	39.4 (38.3-40.5)	1476	38.3 (36.8-39.8)	1468	39.6 (38.0-41.1)
1	6792	32.8 (32.1-33.4)	3221	33.0 (32.0-34.1)	1877	32.3 (30.9-33.7)	1694	32.9 (31.4-34.3)
$\geq$2	5512	28.2 (27.5-28.8)	2565	27.6 (26.6-28.6)	1603	29.4 (28.1-30.8)	1344	27.6 (26.2-29.0)
Uses VA health care services[d,k]	7318	36.0 (35.3-36.8)	3277	35.1 (34.0-36.2)	2118	36.0 (34.5-37.4)	1923	37.7 (36.2-39.2)

Abbreviations: CI, confidence interval; OEF, Operation Enduring Freedom; OIF, Operation Iraqi Freedom; VA, US Department of Veterans Affairs.

[a]Data source: VA unpublished data.

[b]Cigarette smoking status was missing for 652 (3%) of the 20 563 survey respondents.

[c]Survey responses were weighted to account for nonresponse and further modified through a poststratification approach to reduce bias resulting from misclassification of deployment in the sampling frame. Percentages may not total to 100 because of rounding.

[d]Data were self-reported.

[e]Significant at $P < .001$ based on the Rao-Scott χ^2 test.

[f]Data were obtained from the sampling frame.

[g]Other race/ethnicity includes those who reported themselves as a combination of races/ethnicities or were undefined.

[h]Estimate is considered statistically unreliable. Caution should be used in interpretation of data.

[i]$P = .664$.

[j]$P = .276$.

[k]Significant at $P < 0.05$ based on the Rao-Scott χ^2 test.

15.1% (95% CI: 14.1-16.1) of veterans with a bachelor degree or more were current smokers. The percentage of current smokers was highest among American Indians / Alaska Natives (39.9%, 95% CI: 30.3-49.4), whites (33.8%, 95% CI: 32.9-34.7), and Hispanics (30.0%, 95% CI: 27.4-32.5) as compared with blacks (25.5%, 95% CI: 23.5-27.6), Asians (27.8%, 95% CI: 22.4-33.1), and native Hawaiians / Pacific Islanders (26.2%, 95% CI: 17.1-35.3). The prevalence of current smoking steadily declined from those with annual household incomes <$35 000 to those having incomes ≥$150 000. Current smoking was most prevalent among separated/divorced and never-married/single veterans relative to married or widowed veterans, for those who served in active duty and the national guard rather than reserves, and in the army and marine corps rather than the air force or navy (Table 2).

Among current smokers, men were more likely than women to report smoking at least 1 pack of cigarettes per day (ie, ≥20 cigarettes). The mean number of cigarettes smoked per day was significantly higher for men (12.6, SEM = 0.2) than for women (10.3, SEM = 0.3; $P < .001$). Of current smokers, nearly all initiated smoking by 25 years of age, and 46.2% (95% CI: 44.7-47.7) initiated smoking between 18 and 25 years of age (Table 3).

After controlling for other independent variables, sociodemographic variables that were significant between current smokers and nonsmokers were as follows: having a high school diploma / general equivalency diploma rather than a bachelor degree or more (aOR = 4.42, 95% CI: 3.80-5.15), being separated/divorced rather than married (aOR = 1.42, 95% CI: 1.24-1.63), being black (aOR = 0.49, 95% CI: 0.42-0.58) or Hispanic (aOR = 0.66, 95% CI: 0.55-0.79) rather than white, being a younger male rather than an older male (aOR = 2.15, 95% CI: 1.73-2.67), and residing in the Midwest (aOR = 1.28, 95% CI: 1.13-1.46) or West (aOR = 0.87, 95% CI: 0.76-0.99) rather than in the South (Table 4).

Health-related characteristics that were significantly associated with being a current smoker rather than a nonsmoker were having an MCS below rather than above the US mean (aOR = 1.23, 95% CI: 1.11-1.37; the inverse of aOR = 0.81, 95% CI: 0.73-0.90), reporting physician-diagnosed depression (aOR = 1.52, 95% CI: 1.33-1.74), reporting heavy alcohol use rather than no alcohol use (aOR = 5.49, 95% CI: 4.57-6.59), having a poor rather than excellent perception of overall health (aOR = 3.79, 95% CI: 2.60-5.52), and having respiratory disorders (OR = 1.16, 95% CI: 1.04-1.30) or seizures/blackouts/convulsions (OR = 1.80, 95% CI: 1.22-2.67). Using VA health care services (OR = 0.89, 95% CI: 0.80-0.99) or alternative medical treatments (aOR = 0.75, 95% CI: 0.66-0.86) were protective against current smoking (Table 4).

The estimated odds of being a current smoker rather than a nonsmoker among those who were deployed were 0.87 times the odds of the nondeployed given that all other predictors in the model were held constant (aOR = 0.87, 95% CI: 0.78-0.96). The odds of being a current smoker rather than a nonsmoker among air force veterans was 0.73 times that of army veterans (aOR = 0.73, 95% CI: 0.64-0.84). The odds of being a current smoker vs a nonsmoker were significantly higher for those who served in active duty (aOR = 1.36, 95% CI: 1.21 1.51) or the national guard (aOR = 1.35, 95% CI: 1.19-1.52) when compared with the odds for those in the reserves. We found fewer significant and generally weaker associations when comparing former smokers with nonsmokers (Table 4).

Discussion

The prevalence of current smoking among OEF/OIF veterans was 32.5% in NewGen, which is comparable with 37% in a 2015 published report based on VA electronic medical records[11] but lower than the 48% reported for OEF/OIF veterans by the 2011 national VA SVE.[4] The prevalence of current smoking in NewGen was also lower than that reported in a 2004 health survey based on the responses of >15 000 military deployed personnel, which found that 39% of US Iraq/Afghanistan troops smoked at least a half-pack of cigarettes daily.[51] These findings are consistent with previous research that showed a higher prevalence of current smoking among active-duty personnel compared with veterans[31] and that the prevalence of current smoking decreases with increasing time from discharge.[30]

The differences between the SVE and NewGen estimates may be attributable to the survey respondents (VA health care users vs all OEF/OIF veterans) or to differences in the wording of questions about cigarette smoking.[52-55] The SVE defined current smokers as those who answered "yes" to the questions "Have you smoked at least 100 cigarettes in your life?" and "Do you now smoke cigarettes every day, some days, or not at all?" NewGen, however, defined smokers as those who answered "yes" to the questions "During the past 12 months, have you smoked cigarettes?" and "IF NO, have you ever smoked cigarettes, even occasionally?" In addition to defining smokers as those who reported smoking "every day" or "some days," those who refused to answer were classified as current smokers in the SVE. Lifetime usage and the inclusion of those who refused to answer may account for the greater prevalence of smoking in the SVE. NewGen comparisons with US nationwide surveys are limited because of variations in question wording, and NewGen asks questions about current use that may not reflect typical or usual behavior.

Current cigarette smoking among OEF/OIF veterans was higher in our analysis than in the most recent published national estimate of 18.0% for everyday or some-day US smokers aged ≥18 years from the 2012-2013 National Adult Tobacco Survey.[56] The lower US prevalence could be attributed to question context and question order of the National Adult Tobacco Survey or to its tobacco-specific survey introduction, which may lead participants to underestimate use.[54]

Of OEF/OIF veterans who are current smokers, approximately 50% reported first using cigarettes when they were 18 to 25 years of age. This finding underscores the relevance of

Table 2. Prevalence of selected characteristics of OEF/OIF veterans by self-reported cigarette smoking status: National Health Study for a New Generation of US Veterans, 2009-2011[a]

Characteristic	Total respondents, n[b]	Weighted, %[c] (95% CI)	Nonsmokers		Current smokers		Former smokers	
			Unweighted, n	Weighted, %[c] (95% CI)	Unweighted, n	Weighted, %[c] (95% CI)	Unweighted, n	Weighted, %[c] (95% CI)
Total	19 911	100.0	9263	42.7 (42.0-43.5)	5581	32.5 (31.7-33.2)	5067	24.8 (24.1-25.5)
Sex[d,e]								
Male	15 715	84.8 (83.8-84.1)	7148	41.5 (40.7-42.4)	4494	33.5 (32.6-34.4)	4073	25.0 (24.2-25.8)
Female	4196	16.0 (15.9-16.2)	2115	49.1 (47.3-50.9)	1087	27.1 (25.5-28.7)	994	23.7 (22.2-25.2)
Age group, y[e,f]								
24-34	8691	57.4 (56.7-58.1)	3461	37.4 (36.3-38.6)	3229	40.0 (38.8-41.1)	2001	22.6 (21.6-23.6)
35-44	4776	20.4 (19.8-21.0)	2500	49.5 (47.9-51.1)	1127	25.8 (24.4-27.2)	1149	24.7 (23.3-26.0)
45-54	4793	17.5 (17.0-18.0)	2498	50.7 (49.1-52.2)	959	20.1 (18.9-21.4)	1336	29.2 (27.8-30.6)
≥55	1651	4.7 (4.4-4.9)	804	48.7 (46.1-51.3)	266	15.6 (13.7-17.5)	581	35.7 (33.2-38.2)
Education[d,e]								
High school / general equivalency diploma	3015	18.4 (17.8-19.1)	967	29.2 (27.4-31.0)	1369	49.7 (47.7-51.8)	679	21.1 (19.5-22.7)
Some college / associate's degree	9845	53.8 (53.0-54.6)	4095	39.7 (38.6-40.8)	3214	35.5 (34.4-36.6)	2536	24.8 (23.8-25.7)
Bachelor's degree or more	7004	27.8 (27.1-28.4)	4183	57.6 (56.3-58.9)	982	15.1 (14.1-16.1)	1839	27.3 (26.1-28.5)
Race/ethnicity[d,e]								
White	14 012	70.9 (70.2-71.6)	6138	39.9 (38.9-40.8)	4085	33.8 (32.9-34.7)	3789	26.3 (25.5-27.2)
Black	2540	12.2 (11.7-12.7)	1550	57.7 (55.5-60.0)	551	25.5 (23.5-27.6)	439	16.7 (15.1-18.4)
Hispanic	1749	9.0 (8.5-9.5)	832	45.2 (42.5-47.9)	471	30.0 (27.4-32.5)	446	24.8 (22.5-27.1)
Asian	387	1.9 (1.7-2.2)	204	49.8 (44.1-55.6)	96	27.8 (22.4-33.1)	87	22.4 (17.7-27.1)
American Indian / Alaska Native	138	0.8 (0.6-0.9)	56	36.9 (27.8-46.0)	47	39.9 (30.3-49.4)	35	23.3 (15.5-31.0)
Native Hawaiian / Pacific Islander	128	0.6 (0.5-0.8)	64	47.7 (37.7-57.7)	32	26.2 (17.1-35.3)	32	26.1 (17.0-35.3)
Other[g]	847	4.6 (4.2-4.9)	371	39.8 (36.1-43.6)	271	36.9 (33.0-40.8)	205	23.3 (20.0-26.5)
Current annual household income[d,e]								
<$35 000	4950	31.6 (30.8-32.4)	1883	35.2 (33.7-36.7)	2059	45.3 (43.8-46.9)	1008	19.5 (18.2-20.7)
$35 000-$49 999	3405	18.3 (17.6-18.9)	1407	39.0 (37.2-40.9)	1142	36.0 (34.1-37.8)	856	25.0 (23.4-26.7)
$50 000-$74 999	4493	21.8 (21.1-22.4)	2089	44.2 (42.5-45.9)	1166	28.6 (27.1-30.2)	1238	27.2 (25.7-28.6)
$75 000-$99 999	2872	12.5 (12.0-13.0)	1447	46.7 (44.6-48.7)	608	23.4 (21.6-25.2)	817	29.9 (28.0-31.9)
$100 000-$149 999	2700	11.1 (10.6-11.5)	1532	54.4 (52.3-56.5)	409	17.0 (15.3-18.7)	759	28.6 (26.7-30.5)
≥$150 000	1242	4.8 (4.5-5.0)	793	62.8 (59.8-65.8)	116	10.1 (8.1-12.0)	333	27.1 (24.3-29.9)
Marital status[d,e]								
Married	13 330	63.7 (62.9-64.4)	6459	44.9 (44.0-45.9)	3177	27.6 (26.7-28.5)	3694	27.5 (26.6-28.3)
Separated or divorced	2940	14.3 (13.7-14.8)	1198	36.8 (34.8-38.8)	1085	42.1 (40.0-44.2)	657	21.2 (19.5-22.8)
Widowed	61	0.2 (0.2-0.3)	27	46.5[h] (32.0-60.9)	19	30.8[h] (17.8-43.8)	15	22.8[h] (10.6-34.9)
Never married or single	3521	21.9 (21.1-22.6)	1556	40.2 (38.4-42.0)	1278	40.3 (38.4-42.2)	687	19.5 (18.0-21.0)

(continued)

Table 2. (continued)

Characteristic	Total respondents, n[b]	Weighted, %[c] (95% CI)	Nonsmokers		Current smokers		Former smokers	
			Unweighted, n	Weighted, %[c] (95% CI)	Unweighted, n	Weighted, %[c] (95% CI)	Unweighted, n	Weighted, %[c] (95% CI)
Service component[e,f]								
Active duty	7650	53.7 (53.4-53.9)	3215	39.1 (37.9-40.3)	2369	35.2 (34.0-36.4)	2066	25.7 (24.6-26.7)
Reserve	6835	25.0 (24.8-25.1)	3569	49.5 (48.2-50.9)	1589	26.1 (24.9-27.4)	1677	24.3 (23.2-25.5)
National Guard	5426	21.4 (21.2-21.5)	2479	43.9 (42.5-45.4)	1623	32.9 (31.5-34.3)	1324	23.2 (22.0-24.4)
Branch of service[e,f]								
Army	10 789	49.5 (49.2-49.8)	4925	41.9 (40.9-43.0)	3267	34.8 (33.7-35.8)	2597	23.3 (22.4-24.2)
Air Force	4200	19.7 (19.4-19.9)	2231	50.8 (49.0-52.6)	833	22.8 (21.2-24.5)	1136	26.3 (24.8-27.9)
Marine Corps	1920	12.7 (12.5-12.8)	745	36.2 (33.9-38.5)	659	38.0 (35.6-40.4)	516	25.9 (23.8-28.0)
Navy	3002	18.2 (17.9-18.4)	1362	40.8 (38.8-42.8)	822	32.7 (30.7-34.8)	818	26.5 (24.7-28.3)

Abbreviations: CI, confidence interval; OEF, Operation Enduring Freedom; OIF, Operation Iraqi Freedom.
[a]Data source: US Department of Veterans Affairs unpublished data.
[b]Cigarette smoking status was missing for 652 (3%) of the 20 563 survey respondents.
[c]Survey responses were weighted to account for nonresponse and further modified through a poststratification approach to reduce bias resulting from misclassification of deployment in the sampling frame. Percentages may not total to 100 because of rounding.
[d]Data were self-reported.
[e]Significant at $P < .001$ based on the Rao-Scott χ^2 test.
[f]Data were obtained from the sampling frame.
[g]Other race/ethnicity includes those who reported themselves as a combination of races/ethnicities or were undefined.
[h]Estimate is considered statistically unreliable. Caution should be used in interpretation of data.

Table 3. Self-reported number of cigarettes smoked per day and age at smoking initiation for OEF/OIF veterans by sex: National Health Study for a New Generation of US Veterans, 2009-2011[a]

	All current smokers (n = 5581)		Males (n = 4494)		Females (n = 1087)		
Variable	Unweighted, n	Weighted, %[b] (95% CI)	Unweighted, n	Weighted, %[b] (95% CI)	Unweighted, n	Weighted, %[b] (95% CI)	*P* Value[c]
No. of cigarettes smoked per day[d]							<.001
≤5	1590	30.2 (28.8-31.7)	1246	29.6 (28.1-31.2)	344	34.1 (30.6-37.5)	
6-10	1326	24.5 (23.2-25.8)	991	23.3 (21.8-24.7)	335	32.6 (29.2-36.0)	
11-19	745	13.9 (12.9-15.0)	615	14.2 (13.0-15.4)	130	12.3 (9.9-14.7)	
20-30	1611	28.9 (27.6-30.3)	1379	30.3 (28.8-31.8)	232	20.1 (17.4-22.8)	
31-40	110	2.0 (1.6-2.4)	101	2.2 (1.7-2.7)	9	0.7[e] (0.2-1.2)	
>40	23	0.4 (0.2-0.6)	20	0.4[e] (0.2-0.6)	3	0.3[e] (0.0-0.6)	
Mean (SEM)		12.3 (0.14)		12.6 (0.16)		10.3 (0.28)	<.001
Age at smoking initiation, y[f]							.06
≤10	121	2.3 (1.9-2.8)	103	2.4 (1.9-2.9)	18	1.5 (0.7-2.4)	
11-17	2505	47.1 (45.6-48.6)	1998	46.8 (45.1-48.5)	507	49.3 (45.7-52.9)	
18-25	2499	46.2 (44.7-47.7)	2025	46.6 (44.9-48.3)	474	43.9 (40.4-47.5)	
26-35	237	3.3 (2.9-3.8)	185	3.2 (2.7-3.7)	52	4.5 (3.1-5.9)	
36-45	74	0.8 (0.6-1.0)	62	0.8 (0.6-1.1)	12	0.6[e] (0.2-1.0)	
>45	20	0.2 (0.1-0.3)	17	0.2[e] (0.1-0.3)	3	0.1[e] (0.0-0.2)	
Mean (SEM)		17.8 (0.06)		17.8 (0.07)		17.8 (0.15)	.69

Abbreviations: CI, confidence interval; OEF, Operation Enduring Freedom; OIF, Operation Iraqi Freedom; SEM, standard error of the mean.
[a]Data source: US Department of Veterans Affairs unpublished data.
[b]Survey responses were weighted to account for nonresponse and further modified through a poststratification approach to reduce bias resulting from misclassification of deployment in the sampling frame. Percentages may not total to 100 because of rounding.
[c]Based on Rao-Scott χ^2 or *t* test.
[d]A total of 176 responses for number of cigarettes smoked per day were missing (142 for males, 34 for females).
[e]Estimate is considered statistically unreliable. Caution should be used in interpretation of data.
[f]A total of 125 responses for age at smoking initiation were missing (104 for males, 21 for females).

military service as a possible contributor to smoking behavior because enlistment is greatest in this age group. In one study, 37.5% of current smokers reported that they started smoking after joining the military.[57] Some reasons for starting to smoke among junior enlisted personnel included stress relief, ease of access to cigarettes, peer pressure, and fear of weight gain.[58] Premilitary tobacco use has been reported elsewhere,[59,60] and this finding likely parallels our finding that nearly 50% of all current smokers said that they started smoking at <18 years of age. Smoking initiation at a younger age may result in heavier smoking later in life and may even affect smoking behaviors of family members.[30]

Sociodemographic and military service relationships were consistent with previous research on cigarette smoking or nicotine dependence in veterans or active-duty military personnel.[4,6-9,12,29-33] Regarding health-related variables, the association between respiratory conditions and current smoking is concerning because smoking behaviors may be difficult to stop after veterans complete their service.[30] Mental health conditions, alcohol consumption, and poor overall health were found to be associated with cigarette use in other studies.[1,9,12-14,34,35,39] Although a strong relationship between elevated BMI (≥25 kg/m^2) and smoking would have been expected—because excess weight and current smoking both reflect negative health patterns and smoking has been used to aid in weight loss—the odds of obesity in current smokers vs nonsmokers in this analysis were 0.79 times (95% CI: 0.41-1.50) the odds for underweight veterans (or 1.27 times when comparing underweight veterans with obese veterans). In another study, a substantially lower risk (relative risk = 0.82, 95% CI: 0.69-0.98) of smoking initiation was found in obese (≥30 kg/m^2) relative to normal- or underweight (<25.0 kg/m^2) military service personnel.[16]

Our analysis found a significant relationship between current smoking and deployment status, with the odds of smoking being higher among nondeployed rather than deployed OEF/OIF veterans. Yet, in a study of active-duty and service-separated participants who were involved in the Iraq and Afghanistan conflicts, postdeployment smoking recidivism was strongly associated with combat experience and deployment length (>9 months) and frequency.[16] No relationship, however, was observed between smoking status and combat exposure in another study of Iraq- and Afghanistan-era veterans.[12] We believe that differences in smoking behavior by deployment status found in our analysis may be related to decreases in the military service applicant pool,[61] which may result in lowered recruiting standards based on health[27,61] and/or education.[61] Recruits may have more preexisting high-risk health behaviors[27] and related health conditions that may prevent them from meeting the requirements for deployment. Military readiness is also determined before deployment, and personnel who do not meet physical and mental health standards are not deployed.

Table 4. Multinomial logistic regression analysis of self-reported cigarette smoking status on sociodemographic, health-related, and military characteristics among OEF/OIF veterans: National Health Study for a New Generation of US Veterans, 2009-2011[a]

Characteristics[b]	Comparisons among levels of cigarette smoking, aOR[c] (95% CI)		
	Current smoker vs nonsmoker	Former smoker vs nonsmoker	Current smoker vs former smoker
Sociodemographic			
Education[d]			
Bachelor's degree or more	Ref	Ref	Ref
Some college / associate's degree	2.77 (2.46-3.11)[e]	1.30 (1.18-1.44)[e]	2.13 (1.87-2.42)[e]
High school / general equivalency diploma	4.42 (3.80-5.15)[e]	1.45 (1.25-1.68)[e]	3.05 (2.59-3.60)[e]
Race/ethnicity[d]			
White	Ref	Ref	Ref
Black	0.49 (0.42-0.58)[e]	0.50 (0.42-0.58)[e]	1.00 (0.82-1.20)
Hispanic	0.66 (0.55-0.79)[e]	0.77 (0.64-0.91)[e]	0.86 (0.71-1.05)
Asian	0.82 (0.58-1.17)	0.74 (0.53-1.04)	1.11 (0.75-1.65)
American Indian / Alaska Native	1.03 (0.58-1.85)	0.89 (0.51-1.55)	1.16 (0.62-2.17)
Native Hawaiian / Pacific Islander	0.85 (0.47-1.53)	0.79 (0.42-1.48)	1.07 (0.55-2.09)
Other[f]	0.96 (0.76-1.22)	0.87 (0.70-1.09)	1.10 (0.86-1.42)
Marital status[d]			
Married	Ref	Ref	Ref
Separated or divorced	1.42 (1.24-1.63)[e]	0.89 (0.77-1.02)	1.60 (1.38-1.86)[e]
Widowed	1.14 (0.45-2.92)	0.69 (0.31-1.51)	1.66 (0.63-4.38)
Never married or single	1.05 (0.92-1.20)	0.74 (0.65-0.85)[e]	1.42 (1.23-1.64)[e]
Interaction between sex[d] and age[g]			
Female age, y			
≥55	Ref	Ref	Ref
45-54	1.42 (0.75-2.67)	0.68 (0.42-1.10)	2.08 (1.13-3.83)[e]
35-44	0.93 (0.50-1.74)	0.46 (0.28-0.74)[e]	2.03 (1.10-3.75)[e]
24-34	1.30 (0.71-2.37)	0.58 (0.37-0.90)[e]	2.25 (1.27-3.99)[e]
Male age, y			
≥55	Ref	Ref	Ref
45-54	1.07 (0.86-1.34)	0.76 (0.64-0.91)[e]	1.41 (1.12-1.77)[e]
35-44	1.29 (1.03-1.61)[e]	0.71 (0.59-0.84)[e]	1.83 (1.45-2.30)[e]
24-34	2.15 (1.73-2.67)[e]	0.80 (0.67-0.95)[e]	2.69 (2.15-3.37)[e]
Census region[g]			
South	Ref	Ref	Ref
Northeast	1.12 (0.96-1.30)	1.04 (0.90-1.21)	1.08 (0.91-1.27)
Midwest	1.28 (1.13-1.46)[e]	1.17 (1.04-1.33)[e]	1.09 (0.95-1.25)
West	0.87 (0.76-0.99)[e]	1.19 (1.05-1.33)[e]	0.73 (0.64-0.84)[e]
Health related			
SF-12 MCS[d,h]			
<50	Ref	Ref	Ref
≥50	0.81 (0.73-0.90)[e]	0.93 (0.84-1.04)	0.87 (0.77-0.98)[e]
Physician-diagnosed depression[d]			
No	Ref	Ref	Ref
Yes	1.52 (1.33-1.74)[e]	1.16 (1.01-1.33)[e]	1.31 (1.14-1.52)[e]
Alcohol use[d,i]			
Never	Ref	Ref	Ref
Light	1.92 (1.65-2.24)[e]	1.26 (1.10-1.44)[e]	1.53 (1.28-1.82)[e]
Moderate	3.42 (2.90-4.04)[e]	1.93 (1.66-2.24)[e]	1.78 (1.47-2.14)[e]
Heavy	5.49 (4.57-6.59)[e]	2.45 (2.06-2.91)[e]	2.24 (1.83-2.74)[e]
Perception of overall health status[d,h]			
Excellent	Ref	Ref	Ref
Very good	1.54 (1.30-1.83)[e]	1.23 (1.07-1.42)[e]	1.26 (1.04-1.52)[e]
Good	2.20 (1.84-2.62)[e]	1.31 (1.13-1.53)[e]	1.68 (1.38-2.03)[e]
Fair	2.58 (2.09-3.18)[e]	1.23 (1.01-1.49)[e]	2.10 (1.67-2.64)[e]
Poor	3.79 (2.60-5.52)[e]	1.44 (0.97-2.13)	2.64 (1.79-3.89)[e]

(continued)

Table 4. (continued)

Characteristics[b]	Comparisons among levels of cigarette smoking, aOR[c] (95% CI)		
	Current smoker vs nonsmoker	Former smoker vs nonsmoker	Current smoker vs former smoker
BMI,[d,j] kg/m^2			
<18.5 (underweight)	Ref	Ref	Ref
18.5-24.9 (normal weight)	1.15 (0.60-2.20)	1.21 (0.62-2.38)	0.95 (0.51-1.75)
25.0-29.9 (overweight)	0.91 (0.48-1.74)	1.17 (0.60-2.29)	0.78 (0.42-1.44)
≥30.0 (obese)	0.79 (0.41-1.50)	1.25 (0.64-2.46)	0.63 (0.34-1.16)
Physician-diagnosed respiratory conditions (asthma, bronchitis, sinusitis)[d]			
No	Ref	Ref	Ref
Yes	1.16 (1.04-1.30)[e]	1.10 (0.99-1.22)	1.06 (0.94-1.19)
Physician-diagnosed seizures, blackouts, convulsions[d]			
No	Ref	Ref	Ref
Yes	1.80 (1.22-2.67)[e]	1.07 (0.69-1.66)	1.69 (1.09-2.63)[e]
Uses VA health care services[d]			
No	Ref	Ref	Ref
Yes	0.89 (0.80-0.99)[e]	1.07 (0.97-1.18)	0.83 (0.74-0.93)[e]
Used alternative treatments in previous 12 mo[d]			
No	Ref	Ref	Ref
Yes	0.75 (0.66-0.86)[e]	1.11 (0.99-1.25)	0.68 (0.59-0.78)[e]
Military			
Deployed to OEF/OIF[d]			
No	Ref	Ref	Ref
Yes	0.87 (0.78-0.96)[e]	0.93 (0.84-1.02)	0.94 (0.84-1.04)
Service component[g]			
Reserve	Ref	Ref	Ref
Active duty	1.36 (1.21-1.51)[e]	1.23 (1.11-1.37)[e]	1.10 (0.98-1.24)
National Guard	1.35 (1.19-1.52)[e]	1.00 (0.89-1.13)	1.34 (1.17-1.54)[e]
Branch of service[g]			
Army	Ref	Ref	Ref
Air Force	0.73 (0.64-0.84)[e]	0.95 (0.85-1.07)	0.77 (0.66-0.89)[e]
Marine Corps	1.03 (0.87-1.21)	1.14 (0.97-1.33)	0.90 (0.76-1.07)
Navy	1.07 (0.93-1.24)	1.12 (0.98-1.29)	0.96 (0.82-1.12)

Abbreviations: aOR, adjusted odds ratio; BMI, body mass index; CI, confidence interval; MCS, Mental Component Summary score; OEF, Operation Enduring Freedom; OIF, Operation Iraqi Freedom; Ref, reference group; VA, US Department of Veterans Affairs.

[a]Data source: VA unpublished data.

[b]Variables that were significant during development of the regression model are presented. Statistics are not presented for sex and age separately because of their interaction.

[c]Survey responses were weighted to account for nonresponse and further modified through a poststratification approach to reduce bias resulting from misclassification of deployment in the sampling frame. Odds ratios and their concomitant 95% CIs reflect the association between cigarette smoking status and each predictor variable after adjusting for the remaining independent variables in the regression model. The independent variables were education, race/ethnicity, marital status, census region, MCS, physician-diagnosed depression, alcohol use, overall perception of health status, BMI, other physician-diagnosed physical health conditions (respiratory, repeated seizures/blackouts/convulsions), VA health care use, use of alternative medical treatment, deployment status, service component, service branch, and sex/age interaction.

[d]Data were self-reported.

[e]95% CI does not contain 1.

[f]Other race/ethnicity represents those who self-reported a combination of race and/or ethnicity or were undefined.

[g]Data were obtained from the sampling frame.

[h]Computed per responses from the 12-Item Short-Form Health Survey.[22] The 12-question MCS is computed according to scores ranging from 0 to 100, with higher scores indicating better health. The MCS is typically compared with a national US norm with a mean of 50 and a standard deviation of 10, with scores ≥50 reflecting average or above-average health relative to the US general population. Perception of overall health, 1 of the 12 scored items, is determined with the question "In general, would you say your health is: excellent, very good, good, fair, or poor?"

[i]Derived from federal guidelines (heavy use: ≥15 drinks per week for males, ≥8 drinks per week for females; moderate use: 4-14 drinks per week for males, 3-7 drinks per week for females; light use: 1-3 drinks per week for males, 1-2 drinks per week for females).[24-26]

[j]Calculated as kilograms per square meter according to self-reported height and weight.

Strengths and Limitations

A strength of NewGen is that data were collected from a large representative sample of 60 000 OEF/OIF veterans, including VA health care users and nonusers. Unlike simple random sampling, the stratified random sample design allowed more precise estimates of subpopulations based on sex, military service component, service branch, and deployment status, with oversampling to generate reliable estimates

for the selected subgroup. Results may be generalizable to all OEF/OIF veterans because NewGen veteran participants were not restricted to VA health care users alone. Although the final report on NewGen methodology suggested minimal response bias for study participants as compared with the overall sample and by survey mode (eg, mail, telephone),[21] further adjustments were made to the survey weights to account for nonresponse and misclassification of deployment status.[44] This comprehensive analysis parallels most previous research on veterans and provides baseline information for additional analyses and program planning.

This study had several limitations. Estimates on cigarette use for the younger OEF/OIF population likely underestimate total tobacco use because information was not obtained on smokeless products or electronic cigarettes—tobacco products that are typically used by younger people.[59,62,63] The response rate for this survey was low, but adjustments were made to the sampling weights to reduce bias. Self-reports are also prone to recall bias; however, in a previous study, moderate to substantial agreement[64] between self-report of cigarette smoking and medical record data was demonstrated in veterans (kappa range: 0.56-0.74),[65] and almost perfect agreement[64] (mean kappa = 0.82) was found for self-reported smoking assessed from 2 questionnaires administered at the start and end of a 6-month period among military service personnel.[66]

Conclusion

Cigarette use is prevalent in OEF/OIF veterans, especially younger veterans, and tracking smoking patterns among veterans is important because of the established deleterious health effects of cigarettes. Physical and mental health disorders exist for veterans who are smokers, and veterans with mental illness may be less likely than people without mental illness to quit smoking.[1,36,37] Mental and physical health, substance use, and military service characteristics shape cigarette smoking patterns in OEF/OIF veterans. Continued emphasis should be placed on surveillance and integrating smoking interventions with mental health care[67] and other support mechanisms, but these efforts cannot be accomplished without continued research into the sociodemographic, health, and military service factors that underlie usage.

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Declaration of Conflicting Interests

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