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Complementary and alternative medicine use in veterans with multiple sclerosis: Prevalence and demographic associations

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Abstract—The present study explored complementary and alternative medicine (CAM) use in veterans with multiple sclerosis (MS). We administered self-report questionnaires to 451 veterans who received healthcare from Veterans Health Administration facilities. CAM use among veterans with MS was widespread; 37% of respondents reported current or past use. Roughly 33% of CAM users reported using multiple interventions, and 40% of respondents desired interventions that they were not already using. Logistic regression suggested that CAM use was more likely among participants with graduate-level education, poor self-reported health over the past year, and a progressive relapsing MS subtype. Participants who used traditional medical services were also more likely to use CAM, which suggests that CAM services are used in addition to, as opposed to in place of, traditional services. As others have proposed, these results suggest that care providers who work with persons with MS would be well served to understand, routinely screen for, and make use of CAM when appropriate.

Key words: acupuncture, alternative medicine, chiropractic treatment, complementary therapies, herbal medications, logistic model, massage therapy, multiple sclerosis, naturopathy, traditional healthcare.

INTRODUCTION

Complementary and alternative medicine (CAM) encompasses a range of healthcare practices that are not routinely part of typical medical practice [1] or are not typically taught in medical schools [2–3]. Common CAM interventions that are sought by millions of healthcare consumers each year include chiropractic treatment, naturopathy, acupuncture, massage therapy, and herbal supplements. CAM interventions are used with such regularity that some estimates of CAM-related healthcare costs among Americans exceed estimates of traditional healthcare costs [2,4]. CAM use is widespread, and the trends over time suggest that the proportion of American healthcare consumers who access CAM services is increasing [4].

CAM use appears to be more prevalent among women and individuals with higher income and education [5–8]. CAM is also popular among people with chronic medical conditions, pain syndromes [9–10], and psychiatric illnesses, such as depression and anxiety [11]. CAM may augment typical healthcare that does not provide complete relief from suffering [10] or adequately address symptoms [9]. Research has suggested that CAM is generally sought in addition to, as opposed to in place of, traditional approaches [9–10,12–13]. While CAM users might not experience total relief with traditional treatment modalities, they do not appear to have abandoned them.

Multiple sclerosis (MS) is a chronic, unpredictable, incurable, and often debilitating neurological disease [14–15]. Prevalence estimates vary by geographic region and range from 250,000 to 350,000 persons in the United States [16–17]. Persons with MS may present an array of symptoms: fatigue, pain, visual disturbance or blindness, impaired cognition, mobility problems, and problems with bowel and bladder function [18]. Because no cure exists, current traditional medical treatment for MS focuses on symptom relief and retardation of disease progression. Appropriate treatments might include disease-modifying agents (DMAs) that reduce relapse rates and limit disability as well as therapies for secondary impairments that contribute to accumulated disability [19].

The chronic and unpredictable nature of MS presents a symptom constellation that is ripe for CAM interventions. Indeed, depending on the sample, estimates regarding the prevalence of CAM use in people with MS range from approximately 33 [13] to 66 percent [12,20]. People with MS have credited CAM with improving their quality of life and reducing their MS-related symptoms [12,20–21]. In one investigation of the perceived effectiveness of CAM treatments, substantial proportions of participants with MS believed that CAM services slowed disease progression and induced remission [22]. In light of disease-related statistical predictors, CAM use appears more likely among those with more severe symptoms and a more prolonged course [22]. One study observed that patients with secondary progressive MS (SPMS) were more likely to report CAM use than patients with other subtypes of the disease [21]. Overall, CAM use appears to be highly prevalent and highly valued by persons with MS. In spite of the popularity of CAM, a dearth of reliable information exists about the effectiveness, indica-tions, and contraindications of many CAM interventions for people with MS [23].

Veterans represent a unique group of persons with MS. For instance, compared with the general U.S. population of individuals with MS, veterans with MS who receive care from the Veterans Health Administration (VHA) are disproportionately male, older, more likely to be unemployed, less educated, and more disabled [24]. Moreover, persons who seek care through the VHA are more likely than others to evidence the primary progressive MS (PPMS) subtype [24]. Additionally, given that veterans with less impairment might work and pay for non-VHA healthcare through private insurance, the VHA is more likely to treat people with MS who present with a relatively high degree of impairment. In spite of these disease and demographic differences, veterans with MS who receive services from the VHA appear to receive traditional care (e.g., neurology) at levels commensurate with that of nonveteran patients. Further, VHA patients appear to see more rehabilitation specialists than those with MS treated outside the VHA [24].

To date and to our knowledge, only a few studies have investigated CAM use among veterans [25–26] and none has explored this issue among veterans with MS. Results from one study suggested that veterans who use CAM were likely to be Caucasian, earn more than $50,000 a year, and experience a high degree of daily stress [25]. Whereas existing studies have explored CAM use in veterans in general and CAM use in civilians with MS, the present investigation sought to expand the knowledge base regarding CAM use in veterans with MS who receive care from the VHA.

Our first goal was to use a self-report methodology to investigate the prevalence of five treatments commonly identified as CAM: (1) chiropractic treatment, (2) naturopathy, (3) massage therapy, (4) acupuncture, and (5) herbal/alternative supplements. Second, we assessed the degree to which CAM services were in demand in our sample. That is, if participants had not already used CAM services, we were interested in whether or not these treatments were desired. Third, we explored demographic, disease-related, and psychosocial factors associated with CAM use via logistic regression. Finally, in a separate logistic regression analysis, we explored the relationships between CAM use and traditional healthcare use (number of visits to primary care and traditional MS-related service providers).

METHODS

Participants and Data Collection

Participants were identified through the Consumer Health Information and Performance Set, a national database that tracks all patient encounters with VHA providers. Any individual was eligible for the study who received services from the VHA within the northwest region of the United States (Washington, Idaho, Alaska, and Oregon) between the years 1995 and 2000 with either an International Classification of Disease, 9th Revision, diagnostic code that began with 340 (the code for MS) or a prescription for a DMA[*] for treatment of MS. After eliminating all redundant identities and those who were incorrectly identified as having MS, we obtained a final electronic database sample size of 1,090 unique patients who had visited any VHA site within the region.

A total of 1,032 veterans from the electronic database sample were alive at the close of our study period[†] and were mailed a 284-item survey. Two mailings optimized response and incomplete information was gathered during follow-up telephone interviews with trained interviewers. The current results are based upon the responses of the 451 veterans (44%) who completed and returned the mailed surveys. The institutional review boards at the University of Washington and the Department of Veterans Affairs (VA) Puget Sound Medical Center approved the study procedures.

Assessment Instruments

The MS Needs Assessment Survey (MSNAS) is a self-report paper-and-pencil questionnaire that was designed by a team of physiatrists, psychologists, and a neurologist for a larger study that assessed the healthcare status and needs of veterans with MS within the northwest region of the VHA healthcare system. The MSNAS included established measures and original items that were written to assess traditional and CAM healthcare use, demographic characteristics, health status, and other disease-related and psychosocial variables.

Complementary and Alternative Medicine and Traditional Healthcare Use

Participants indicated whether they currently or had ever received a variety of VHA-sponsored and non-

VHA-sponsored services that were related to MS care. The response options included a list of traditional health services,[‡] such as a neurologist, physical therapist, or physiatrist, as well as CAM services. For the present study, CAM included chiropractic care, naturopathy, massage therapy, acupuncture, and herbal/alternative agents. The traditional service use variable reflected the total number of services that participants reported they had ever used or were currently using for MS care (maximum number of possible services = 25). For logistic regression analyses, CAM use was dichotomized to presence (indicated by current or past use of one or more of the five services) or absence (indicated by no current or past use of any of the five services). The total number of traditional services items was retained as a continuous variable.

To assess other aspects of healthcare use, we included two items that explored how often "on average" participants visited their primary care provider and their MS care provider. Each of these items had the following four response options: 1 = "Once or twice a year," 2 = "3 to 4 times a year," 3 = "Monthly," and 4 = "Weekly." For the purpose of analysis, we dichotomized these variables to reflect 3 to 4 times a year or fewer visits versus monthly or more frequent visits.

Demographic Characteristics

We recorded age, sex, race/ethnicity (dichotomized to Caucasian or non-Caucasian), annual income (coded to reflect three levels: $22,000, $22,001 to $32,000, and $32,001), and education (coded to reflect four levels: high school diploma or less, some college, completion of Associate's/Bachelor's degree, and graduate-level education).

General Health

General health over the past year was assessed with a single item from the 36-item short-form (SF-36) health survey [27] that asked participants, "In general, how would you rate your health during the past year?"

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[*]Agents included interferon β-1a, interferon β-1b, and glatiramer acetate.
[†]December 31, 2000.

[‡]To address this question, we created an additional variable that reflected the sum of all services reported for MS-related care. The traditional MS-related services included: dentist, marriage/family counselor, financial counselor, home healthcare provider, internist, neurologist, nurse, nutritionist, obstetrician/gynecologist, occupational therapist, orthopedic surgeon, physical therapist, podiatrist, primary care provider, psychiatrist, psychologist, recreation therapist, rehabilitation physician, sexual counselor, social worker, speech therapist, transportation provider, telephone support provider, vision/eye care specialist, and urologist.

Response options were 1 = "Excellent," 2 = "Very good," 3 = "Good," 4 = "Fair," and 5 = "Poor." The SF-36 is part of the broader Medical Outcomes Study [28] and is one of the most widely used generic measures of health-related quality of life. For the present study, participants' responses to this single item were dichotomized to reflect the presence versus absence of "Poor" self-reported health over the past year.

Depressive Symptom Severity

Depressive symptom severity was evaluated with the 9-item depression module from the Patient Health Questionnaire (PHQ-9) [29]. The PHQ-9 is a brief self-report screening instrument that was designed to provide diagnoses of prevalent psychiatric disorders based upon the endorsement of the Diagnostic and Statistical Manual for Mental Disorders, 4th Edition, criteria [30]. The module instructs participants to rate the degree to which they experienced each of nine symptoms of depression over the past 2 weeks: 0 = "Not at all" to 3 = "Nearly every day." Major depressive symptom severity was computed as the sum of scores on each of the nine items. The PHQ-9 has demonstrated utility for identifying psychiatric disorders and estimating the level of depressive severity in medical patients [29,31]. In the present sample, the PHQ-9 demonstrated good internal consistency, as evidenced by a Cronbach α coefficient of 0.88.

Disease-Related Factors

Four clinical types of MS are now recognized: relapsing-remitting MS (RRMS), SPMS, PPMS, and progressive relapsing MS (PRMS) [32]. To identify disease subtype, we asked participants to select a pictorial graph that corresponded to their disease course over time. Each graph depicted one clinical course of MS and was accompanied by a written description of the clinical course that included explanations of attacks and progression based on established definitions [32]. This technique generates reliable and valid responses with good agreement ($\kappa = 0.62$) between physicians and patients when RRMS versus other subtypes of MS[*] are compared. Time since symptom onset and time since diagnosis were assessed with single items designed for the MSNAS.

*Bowen JD, unpublished observations, 2000.

Participation Limitation

We included four items that were written to assess the degree to which MS has limited respondents' engagement in a variety of activities. We named these items the Participation Limitation Scale (PLS). Respondents were asked to "rate the impact of MS on [their] ability to participate in . . ." the following: community activities (clubs, support groups, etc), work, sexual activity, and family activities. Participants indicated the degree of impact for each item on a scale that ranged from 1 = "No impact" to 4 = "Severe impact." Degree of limitation was computed as the sum of scores of the four items. A fifth response option allowed respondents to indicate that a particular item was "Not applicable;" participants who indicated that none of the four activities was applicable were excluded from analyses that incorporated the PLS. The PLS evidenced a Cronbach α coefficient of 0.78 in the present sample.

Pain Impact

The Pain Effects Scale (PES) from the Medical Outcomes Study [28] is a component of the Multiple Sclerosis Quality of Life Inventory [33]. The six-item scale assessed the degree to which MS-related pain and other unpleasant experiences interfered with participants' mood, ability to move, sleep, work in and outside the home, recreational activities, and enjoyment of life. Respondents indicated the degree of impact for each item on a scale that ranged from 1 = "Not at all" to 5 = "To an extreme degree." Degree of impact of MS-related pain was computed as the sum of scores of the six items, with higher scores reflecting higher pain impact. The PES demonstrated good internal consistency in the present sample with a Cronbach α coefficient of 0.92.

Perceived Disability

We adapted items from the North American Research Consortium on MS Registry Survey [34] and created a perceived disability summary score as a proxy indicator of overall disability. Single-item questions required participants to rate their degrees of disability in five domains: mobility, fatigue, bowel care, bladder care-incontinence, and cognition. Item scores ranged from 0 = "Normal functioning" to 6 = "Total disability." Participants were assumed disabled within a particular domain if their rating indicated that they experienced symptoms that interfered with daily activities. The perceived disability summary score ranged from 0 to 5 and reflected the total number of domains for which participants reported disability.

Satisfaction with Care

We created an 11-item questionnaire for the present study to assess respondents' satisfaction with their care. We asked participants to "rate [their] satisfaction with the care [they] receive from [their] service provider regarding each of the following problems." The problems included incontinence, bowel problems, mobility, pain, vision, hearing, communication, swallowing, thinking-memory-attention, fatigue, and mental health-emotional problems. Each item had a 6-point response scale that ranged from 1 = "Not at all satisfied" to 6 = "Totally satisfied;" an additional response option allowed participants to indicate that a particular item was "Not applicable." Level of satisfaction with care was calculated as the sum of scores of the 11 items, with higher scores reflecting greater satisfaction. Internal consistency of the satisfaction scale was good as evidenced by a Cronbach α coefficient of 0.88. Participants were dropped from the relevant analyses if they indicated that none of the satisfaction items was applicable.

Analyses

We conducted all analyses with SPSS for Windows (version 10.0.5, SPSS Inc, Chicago, Illinois). Frequency data and the percentages of participants who reported CAM use constituted the prevalence analyses. Logistic multiple regression identified factors associated with CAM use. The pool of possible factors included demographic, disease-related, and psychosocial variables; the analyses consisted of two phases. In the first phase, univariate logistic regression models were fit for each variable as a sole concurrent predictor of CAM use. In the second phase, factors that demonstrated a significant or near-significant univariate association ($p \leq 0.15$) with CAM use were entered simultaneously on a single step in a final multivariate model; the second phase model provided the basis for interpretation. In all logistic regression models, we dummy coded categorical variables to facilitate contrasts. In the univariate models and the initial multivariate model, the category with the lowest proportion of CAM use was assigned as the reference category. To fully explicate the multivariate results and facilitate comparisons between levels of the categorical variables, we fit additional logistic regression models in which each level of each categorical variable was set as the reference category. Participants with missing data were excluded from relevant analyses. The number of participants with missing data varied with each model. Less than 4.5 percent of the total sample was excluded from any one of the univariate analyses and less than 10 percent of the sample had missing data for at least one of the variables in the final multivariate model.

We used additional analyses to investigate the relations between CAM use and traditional healthcare use. Three univariate logistic regression models were fit. A separate model tested the relation between each healthcare use variable and CAM use.

RESULTS

Participants

A total of 451 participants (44% response) completed and returned the MSNAS. **Tables 1** and **2** present values

Table 1.
Demographic characteristics and percentage of complementary and alternative medicine (CAM) use for participants with multiple sclerosis (MS).

Variable	*n* *	% Overall	% CAM Users
Sex			
Male	387	85.8	37.0
Female	61	13.5	41.0
Race/Ethnicity			
Caucasian	419	92.9	36.8
Non-Caucasian	32	7.1	43.8
Annual Income			
$0 to $22,000	162	35.9	35.8
$22,001 to $32,000	98	22.7	29.6
>$32,001	171	39.7	42.1
Education			
High School or Less	129	28.8	34.1
Some College	156	34.8	35.3
Associate's/Bachelor's	120	26.8	37.5
Graduate Level	43	9.6	55.8
MS Subtype			
Relapsing-Remitting	179	40.6	33.0
Secondary Progressive	123	27.9	36.6
Primary Progressive	75	17.0	38.7
Progressive Relapsing	64	14.5	46.9
General Health[†]			
Fair or Better	354	78.5	34.5
Poor	97	21.5	47.4
MS Provider Visits[‡]			
≤3 to 4 a yr	372	82.5	37.4
≥12 a yr	30	6.7	46.7
Primary Care Visits[§]			
≤3 to 4 a yr	388	86.0	36.1
≥12 a yr	55	12.2	45.5

*n varied from 402 to 451.
[†]General health is participants' self-reported health over past year.
[‡]MS provider visits is number of self-reported average annual MS provider visits.
[§]Primary care visits is number of self-reported average annual primary care visits.

Table 2.
Descriptive statistics (mean ± standard deviation [SD], minimum, maximum, and possible range) of continuous study variables for participants with multiple sclerosis (MS).

Variable	Mean ± SD	Minimum	Maximum	Possible Range
Age (yr)	56.2 ± 11.4	26	87	—
Time Since Diagnosis (yr)	19.1 ± 12.5	2	57	—
Depressive Severity[*]	9.83 ± 6.4	0	27	0 to 27
Participation Limitation[†]	12.3 ± 3.2	3	16	1 to 16
Pain Impact[‡]	17.8 ± 6.9	3	30	1 to 30
Perceived Disability[§]	3.4 ± 1.3	0	5	0 to 5
Satisfaction with Care[¶]	30.2 ± 17.6	1	66	1 to 66
Total No. of Services[**]	10.0 ± 4.9	0	26	0 to 26

[*]Sum of self-reported depressive symptoms from 9-item Patient Health Questionnaire.
[†]Degree to which MS limited participants' engagement in activities as measured by Participant Limitation Scale.
[‡]Degree to which MS-related pain interfered with functioning across life domains.
[§]Number of life domains affected by MS.
[¶]Participants' levels of satisfaction with MS-related care across several domains.
[**]Total number of traditional healthcare services presently or ever used by participants for MS.
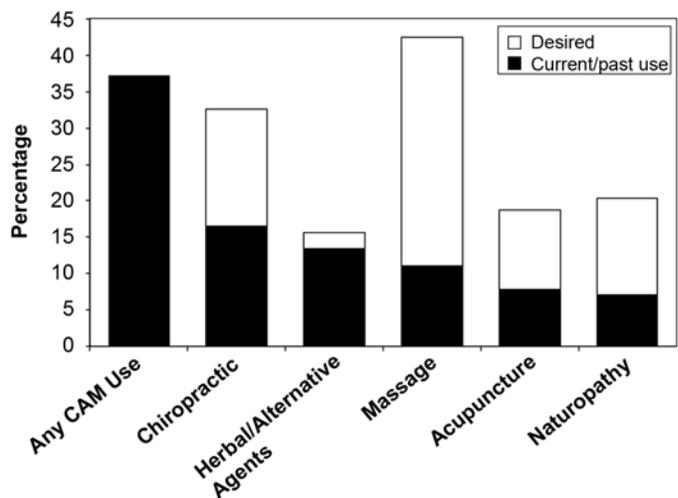
for dichotomous and continuous demographic characteristics, respectively. Additionally, **Table 1** presents information regarding the percentage of CAM use by demographic characteristic.

The sample was largely composed of Caucasian males, and over half of the participants reported being married. Roughly 35 percent of participants reported an annual income below $22,000. Participants' levels of education varied, with over 75 percent of the sample indicating that they had completed less than a college education.

Survey respondents and nonrespondents were comparable in age ($t_{1,1088} = 0.34$, not significant) and sex (Mantel-Haenszel common odds ratio [OR] estimate = 1.02, 95% confidence interval [CI] = 0.72 to 1.44). However, some significant differences existed between survey respondents and nonrespondents. Non-Caucasian veterans were less likely to respond to the survey than Caucasians (Mantel-Haenszel common OR estimate = 0.64, 95% CI = 0.48 to 0.86). Married veterans were more likely to complete the survey than were unmarried, separated, divorced, or widowed veterans (Mantel-Haenszel common OR estimate = 1.99, 95% CI = 1.55 to 2.55).

Prevalence of Complementary and Alternative Medicine Use

As illustrated in the **Figure**, CAM use for MS care among veterans in VHA facilities was widespread. Over 37 percent of respondents reported current or past use of CAM interventions specifically for MS. Many participants who reported present or past use of CAM used multiple CAM services (data not shown). Indeed, 67 percent of CAM

Figure.
Percentage of respondents who (1) reported current or past use of complementary and alternative medicine (CAM) and (2) reported no current or past use but desire CAM services.

users reported use of one intervention, 20 percent reported use of two interventions, 10 percent reported three interventions, 3 percent reported four interventions, and <1 percent reported use of all five CAM interventions. Among CAM users, the number of services reported was unrelated to a variety of demographic characteristics (age, sex, race/ethnicity, education, and income), disease-related factors (general health over the past year, number of years since diagnosis, satisfaction with care, pain impact, MS subtype, and perceived disability), and psychosocial factors (number

of depressive symptoms). A significant negative relationship ($r = -0.18$, $p \leq 0.05$) between the PLS and number of CAM services suggested that those participants who reported lower levels of limitation reported use of more CAM services. Although statistically significant, the strength of this relationship was low.

As presented in the **Figure**, participants reported chiropractic care as the most commonly used intervention. Use of herbal/alternative supplements, massage therapy, acupuncture, and naturopathy was evident among the sample with decreasing levels of prevalence.

Desire for Complimentary and Alternative Medicine Services

In addition to fairly prevalent current and past use, veterans with MS in VHA facilities reported that CAM services were in high demand, as illustrated by the **Figure**. Although they denied present or past use, almost 33 percent of participants desired services of a massage therapist and over 15 percent desired chiropractic services. Finally, more than 10 percent of participants desired acupuncture and naturopathy.

Predictors of Complimentary and Alternative Medicine Use

We conducted logistic regression analyses to determine demographic and disease-related factors that were associated with CAM use. **Table 3** presents the results of the univariate analyses that investigated the relationships between each factor and CAM use. Separate models were fit for all variables, including demographic, disease-related, and psychosocial predictors. As presented in **Table 3**, income, education, MS subtype, general health over the past year, pain impact, and degree of satisfaction with care demonstrated significant or near significant ($p \leq 0.15$) associations with CAM use. These variables were entered in a multivariate logistic regression model in the second phase of data analysis.

Table 4 presents the results of the multivariate model in which the six variables were entered on a single step. A single-step design was used because no compelling reason existed that any one factor was more important than the other. When we adjusted for significant or nearly significant variables from the univariate models, income, pain impact, and degree of satisfaction with care were no longer significant concurrent predictors of CAM use. In contrast, three variables demonstrated significant relationships with CAM use.

First, participants with graduate education were more likely to report CAM use compared with those with a high

Table 3.

Univariate relationships between logistic regression predictors and complementary and alternative medicine use.[*]

Variable	Odds Ratio	95% CI	*p*-Value[†]
Sex	1.19	0.68 to 2.06	0.55
Race/Ethnicity	0.75	0.36 to 1.54	0.43
Age	1.00	0.99 to 1.02	0.51
Income[‡]			
$0 to $22,000	1.33	0.77 to 2.28	0.30
>$22,001	1.73	1.02 to 2.94	0.04
Education[§]			
Some College	1.05	0.64 to 1.72	0.84
Associates/Bachelors	1.16	0.69 to 1.95	0.58
Graduate Level	2.44	1.21 to 4.93	0.01
Multiple Sclerosis Subtype[¶]			
Secondary Progressive	1.17	0.73 to 1.90	0.52
Primary Progressive	1.28	0.73 to 2.24	0.38
Progressive Relapsing	1.80	1.00 to 3.21	0.049
General Health	1.72	1.09 to 2.70	0.02
Time Since Diagnosis	1.01	0.99 to 1.02	0.45
Depressive Severity	0.99	0.97 to 1.03	0.96
Participation Limitation	1.04	0.98 to 1.11	0.17
Pain Impact	1.03	1.01 to 1.06	0.02
Perceived Disability	1.02	0.97 to 1.05	0.45
Satisfaction with Care	1.01	1.00 to 1.02	0.08

[*]Unadjusted relationships explored by fitting logistic regression model for each predictor in isolation.
[†]*p*-value of Wald statistic.
[‡]Reference category: $22,001 to $32,000.
[§]Reference category: High school or less.
[¶]Reference category: Relapsing-remitting.
CI = confidence interval.

school diploma or less education. To fully explore education effects, we fit three successive follow-up models in which each level of education was assigned as the reference category. These additional analyses (data not shown) indicated that those with graduate education were also more likely than participants with less education to report CAM use (graduate level vs some college: OR = 2.53, 95% CI = 1.21 to 5.31; graduate level vs Associates/Bachelors: OR = 2.27, 95% CI = 1.06 to 4.87). No other significant differences in CAM use were evident among persons with different education levels.

Second, participants with self-described PRMS were more likely to report CAM use than those with RRMS. Again, follow-up models (data not shown) with each MS subtype set as reference category suggested that participants with PRMS were also more likely to report CAM use than those with SPMS (OR = 1.96, 95% CI = 1.01 to 3.82). Differences in CAM use were not evident among other disease subtypes. Finally, as presented in **Table 4**, relative to

those who described their general health over the past year as "fair" or better, those with "poor" self-reported health were significantly more likely to report use of CAM.

Traditional Healthcare Use

Table 5 presents results of three additional logistic regression analyses that investigated whether CAM users accessed more traditional healthcare services than non-CAM users. Only the analysis that included the total number of services emerged as significant, which suggests that participants who reported a greater number of total healthcare services use for MS were more likely to report CAM use. Whereas the average annual number of traditional services reported by non-CAM users was 8.8,

Table 4.
Final model of predictors of complementary and alternative medicine use from demographic and disease-related characteristics.

Predictor	Odds Ratio	95% CI	p-Value*
Income			
$22,001 to $32,000[†]	1.00	—	—
< $22,000	1.28	0.71 to 2.30	0.41
> $32,001	1.59	0.90 to 2.79	0.11
Education			
High School or Less[†]	1.00	—	—
Some College	1.26	0.73 to 2.16	0.41
Associates/Bachelors	1.40	0.78 to 2.53	0.26
Graduate Level	3.19	1.46 to 6.96	0.004
Multiple Sclerosis Subtype			
Relapsing-Remitting[†]	1.00	—	—
Secondary Progressive	1.04	0.61 to 1.78	0.88
Primary Progressive	1.22	0.66 to 2.27	0.53
Progressive Relapsing	2.04	1.08 to 3.85	0.03
General Health	2.04	1.20 to 3.48	0.008
Pain Impact	1.02	0.98 to 1.05	0.19
Satisfaction with Care	1.01	1.00 to 1.02	0.07

*p-value of Wald statistic.
[†]Reference category.
CI = confidence interval.

Table 5.
Univariate relationships between measures of traditional healthcare use and complementary and alternative medicine use.*

Variables	Odds Ratio	95% CI	p-Value[†]
Multiple Sclerosis Visits	1.47	0.70 to 3.10	0.32
Primary Care Visits	1.48	0.84 to 2.61	0.18
Total No. Traditional Services	1.15	1.10 to 1.20	<0.001

*Univariate relationships explored by fitting logistic regression model for each predictor.
[†]p-value of Wald statistic.
CI = confidence interval.

CAM users reported accessing 11.9 services annually. Thus, in addition to seeking care from nontraditional services, apparently CAM users also sought higher levels of care from traditional providers.

DISCUSSION

The results of the present study add to a growing body of research that suggests that CAM use is prevalent among people with MS. Over one-third of the veterans with MS in VHA facilities who completed the mailed surveys indicated that they had used or presently use at least one type of CAM intervention to manage their symptoms. Furthermore, a sizeable proportion of CAM users accessed multiple treatments. Finally, in addition to reported use, many surveyed veterans indicated that they desired CAM services. In light of this desire, the likelihood exists that the prevalence of CAM use will increase as more services or products become available, more affordable, or more accessible.

Relative to some recently published studies of CAM use in people with MS [21–22], the present results reflect a substantially lower percentage of CAM users. These differences are likely attributable to a variety of factors, including methodological differences and differences related to sample composition. Considering methodology, the present study investigated the use of only five CAM treatments, a relatively strict definition that did not include some of the CAM treatments surveyed in other studies. Sample characteristics might also have resulted in a lower estimate of CAM prevalence for the present study relative to other studies. For instance, demographic factors that have demonstrated associations with increased CAM use (i.e., female sex, higher income) were underrepresented in the present sample of U.S. veterans who receive VHA healthcare. Finally, CAM users might have been less likely than nonusers to return the survey, which introduces the possibility that the observed CAM estimates were influenced by response bias.

Logistic regression analyses identified demographic and disease-related factors associated with CAM use in the present sample. As found by other researchers, higher levels of education were associated with CAM use. In the present analyses, participants with graduate-level education were significantly more likely than those with less education to report CAM use. As suggested by others, these results might be attributable to an exposure effect, whereby better-educated individuals are exposed to more

information about alternative approaches [8]. Furthermore, those with higher education might also be more likely to examine the rationale behind traditional physicians' treatment recommendations and to educate themselves about the disease process and treatment alternatives [8].

Two disease-related factors were associated with increased CAM use in the present sample. First, participants with poor self-perceived health over the past year were more likely than those with better self-perceived health to report CAM use. This result is consistent with existing work that has observed an association between CAM use and unremitting conditions. In an analysis of CAM use among cancer patients [6], for example, higher use was observed among those with more advanced disease and among those who indicated that traditional healthcare failed to meet their needs. Second, whereas a prior investigation observed increased CAM use among those with SPMS [21], our results suggest that CAM use was more likely among participants who self-identified themselves as having PRMS. This disease subtype is characterized by an overall progressive course with periodic attacks or exacerbations during which function gets considerably worse; instead of happening at disease onset, attacks and exacerbations occur later in the disease course. Although the self-report nature of our disease classification precludes definitive conclusions regarding this finding, our results suggest that the addition of attacks or exacerbations to a previously progressive disease course might have prompted participants to seek CAM treatment.

Increasingly poor health coupled with concern over a worsening disease course might be associated with perceived shortcomings of the traditional healthcare system. Disease chronicity and the gaps left by traditional treatment modalities might increase the likelihood that people with MS will seek relief through nontraditional services. The present analysis of the general healthcare use of CAM users versus nonusers might shed some light on this issue. Instead of restricting their healthcare to alternative treatments, CAM users also accessed greater numbers of traditional healthcare services to manage MS-related symptoms. While the extant literature is somewhat equivocal with respect to the reasons that patients seek alternative treatment, several interpretations of the present results are possible. For example, one interpretation may be that CAM users are more assertive with respect to their care than nonusers. Because CAM users as a whole do not appear to be more dissatisfied with conventional treatments than CAM nonusers, the possibility exists that

CAM users approach their illnesses and symptoms from a more assertive perspective than nonusers [8]. That is, instead of pursuing additional treatment as a result of dissatisfaction, CAM users might do so because they are more proactive at managing their own illnesses.

As others have recommended, the present results suggest that healthcare providers should be educated about the potential benefits and risks of alternative and complementary interventions. Because current medical technology does not offer a cure for MS, some patients may benefit considerably from nontraditional treatment. In particular, CAM interventions that reduce the impact of problematic symptoms might improve a patient's quality of life [12,20,35]. Knowledgeable and informed providers would be poised to recommend beneficial treatments, provide patients with needed information, and facilitate informed choices regarding care [21].

In contrast, as with any medical intervention, potential risks exist with CAM use. Care providers should consider screening patients routinely for the use of CAM to reduce the likelihood of iatrogenic effects that arise from the use of the interventions alone or in concert with typical medical interventions. For example, psychopharmacological treatments for depression might interact with herbal supplements intended for mood management. When advising patients, physicians might wish to consider the potential for harmful interactions between CAM and prescription medications and to consider side effects of CAM interventions used alone. In the worst-case scenario, providers who lack information about a patient's CAM use risk prescribing a medication that causes an iatrogenic interaction. Furthermore, numerous sham treatments for MS exist. A well-informed provider would be in a position to educate patients about potentially unhelpful and unnecessarily expensive treatments.

A number of limitations should be considered when the present results are interpreted. First, the study relied on patient self-report. Although a substantial proportion of respondents indicated that they received assistance with the survey, no objective way existed to confirm the veracity of responses. Furthermore, as many as 50 percent of individuals with MS experience a degree of cognitive impairment related to the disease [36–37]. The likelihood exists that the current sample included people with cognitive impairment, and cognitive impairment among nonresponders might also have affected sample composition. Although these possibilities are important to consider when interpreting the current results, we believe

that these results are a good estimation of respondents' use of CAM and other healthcare-related issues assessed in the survey.

Second, as just noted, we observed a lower prevalence of CAM use than other recently published studies among persons with MS [21–22]. Veterans who receive VHA healthcare share several demographic characteristics that are associated with lower CAM use, including male sex, lower mean income, and less education [24]. Although the present results provide a reasonable estimate of CAM use among persons of similar demographic characteristics, generalization to the general MS population should be done cautiously.

CONCLUSIONS

CAM use is prevalent among veterans with MS who receive VHA healthcare. In addition, many of the surveyed nonusers desire CAM services. As other authors have argued [2,12,21,38], VA healthcare providers who work with patients with MS would be well served to be knowledgeable about, screen for, and use CAM when appropriate. Particular attention to the likelihood of CAM use among highly educated patients in poor health is warranted.

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