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Use of Complementary Medicine in Older Americans: Results from the Health and Retirement Study

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Abstract

Purpose—The correlates of Complementary and Alternative Medicine (CAM) utilization among elders have not been fully investigated. This study was designed to identify such correlates in a large sample of older adults, thus generating new data relevant to consumer education, medical training and health practice and policy.

Design and Methods—A subsample from the 2000 wave of the Health and Retirement Study (n=1099) aged 52 or older were surveyed regarding use of CAM (chiropractic, alternative practitioners, dietary and herbal supplements, and personal practices).

Results—88% of respondents over 65 years used CAM, with dietary supplements and chiropractic most commonly reported (65% and 46%, respectively). Users of alternate practitioners and dietary supplements reported having more out-of-pocket expenses on health than non-users of these modalities. Age correlated positively with use of dietary supplements and personal practices and inversely with alternative practitioner use. Men reported less CAM use than women, except for chiropractic and personal practices. Blacks and Hispanics used less chiropractic and dietary supplements, but reported more personal practices than Caucasians. Advanced education correlated with fewer chiropractic visits and more dietary and herbal supplement and personal practices use. Higher income, functional impairment, alcohol use and frequent physician visits correlated with more alternative practitioner use. There was no association between CAM and number of chronic diseases.

Implications—The magnitude and patterns of CAM use among elders lend considerable importance to this field in public health policy-making and suggest a need for further epidemiological research and ongoing awareness efforts for both patients and providers.

Keywords

complementary therapies; alternative medicine; chiropractic; dietary supplements; aged

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Complementary and Alternative Medicine (CAM) has been traditionally defined as a heterogeneous group of medical practices that “are not in conformity with the standards of the medical community and are not widely taught at U.S. medical schools or generally available at U.S. hospitals” (Eisenberg et al., 1993). Another more recent definition of CAM, highlighted by the White House Commission on Complementary and Alternative Medicine Policy, is that of “a group of medical, health care, and healing systems other than those included in mainstream health care in the United States. CAM includes the worldviews, theories, modalities, products, and practices associated with these systems and their use to treat illness and promote health and well-being” (White House Commission on Complementary and Alternative Medicine Policy Final Report March 2002, 2003).

Both definitions encompass numerous therapies, often clustered into five major domains: alternative medical systems (e.g. acupuncture, homeopathy, naturopathy, Ayurveda), mind-body interventions (e.g. meditation, mental healing), biologically based therapies (herbal products, non-herbal dietary supplements), manipulative methods (e.g. chiropractic, massage therapy) and energy therapies (e.g. Reiki, therapeutic touch, electromagnetic fields) (National Center for Complementary and Alternative Medicine, 2002). CAM practices have become increasingly popular among Americans. In a landmark, nationally representative survey of 2055 American adults, use of CAM in the previous year was reported by 42.1% of respondents (Eisenberg et al., 1998). The 2002 National Health Interview Survey revealed that 62% of American adults used some form of CAM therapy in the preceding year (Barnes, Powell-Griner, McFann, & Nahin, 2004). Among 16,068 Americans surveyed on their utilization of CAM practitioners, 8.3% had visited such professionals in 1996 (Druss & Rosenheck, 1999).

Less is known about CAM use among older adults. To our knowledge, the only nationally representative analysis of CAM use focusing on older adults in the United States was conducted by Eisenberg in 1997 (Eisenberg et al., 1998) and included 311 elderly respondents, 30% of whom had received at least one CAM intervention in the preceding year (Foster, Phillips, Hamel, & Eisenberg, 2000). Other national surveys, such as the 2002 National Health Interview Survey, have addressed elders as part of their study population but have not focused on this demographic group (Barnes, Powell-Griner, McFann, & Nahin, 2004). Regional surveys of older adults have been published. In a study of 1597 Medicare enrollees residing in California, 41% of respondents reported use of a CAM modality (Astin, Pelletier, Marie, & Haskell, 2000).

Additionally, surveys have also been conducted on older adults suffering from specific medical conditions, such as Alzheimer's disease (National Center for Complementary and Alternative Medicine, 2002; Howes, Perry, & Houghton 2003). For example, caregivers of patients with Alzheimer's disease report frequent use of CAM interventions to help with the patient's memory and cognition (Coleman, Fowler, & Williams, 1995). Among 699 older adults with the diagnosis of cancer, 33% used complementary medicine (Wyatt, Friedman, Given, Given, & Beckrow, 1999). A population-based telephone survey of 480 elderly patients with arthritis revealed that 66% used at least one CAM modality and 28% sought the care of CAM providers (Kaboli, Doebbeling, Saag, & Rosenthal).

The popularity of CAM has triggered the development of courses on the subject in some medical schools (Wetzel, Eisenberg, & Kaptchuk, 1998) and the re-evaluation of health insurance coverage provided by insurance carriers (Pelletier, Marie, Krasner, & Haskell, 1997), as billions of dollars are spent on these interventions on a yearly basis in the United States alone (Neal, 2001). Past surveys have identified being a perimenopausal woman, higher income, higher educational attainment and having chronic illnesses as correlates of increased CAM use in the general population (Eisenberg et al., 1998). Older individuals must be specifically considered in understanding CAM use, as they tend to have more morbidity, more

physical dysfunction, more health care utilization, and less disposable income than middle-aged adults. Thus, it is imperative to have comprehensive and detailed information on the patterns of use of complementary medicine by older Americans.

In order to formulate a coherent approach towards the emerging reality of CAM, recommendations for the coordination of research efforts in the field have been articulated at a federal level. Among other goals, policy efforts are being directed at: 1. Supporting research on CAM approaches designed to improve self-care and wellness-promoting behaviors; 2. Supporting new and innovative CAM research that could aid in expanding our knowledge about health and disease; 3. Strengthening the dialogue among CAM and conventional medical practitioners, researchers and research institutions, governmental funding and regulatory agencies, the private and nonprofit sectors and the public. So as to streamline such efforts, there is a need for ongoing epidemiological studies addressing what CAM interventions are being most commonly used, the correlates that define population subgroups most likely to use CAM and the socioeconomic framework within which such use occurs (White House Commission on Complementary and Alternative Medicine Policy Final Report March 2002, 2003). This holds particularly true for older adults who are not only frequent CAM users but also major health care consumers who may be particularly vulnerable to the biological, functional and economic repercussions of health care interventions.

In order to expand the information currently available in the literature on the use of CAM by older Americans and obtain much-needed sociodemographic and functional data in the field, a module on alternative medicine was administered to a subsample of participants of the Year 2000 wave of interviews of the Health and Retirement Study (HRS). HRS is a representative national sample of the American population born in 1947 or earlier. It was designed to obtain detailed information regarding the dynamics of retirement and how it interacts with health, health insurance, and economic well-being. The HRS provides comprehensive and detailed information on a wide range of domains such as demographics, health status, housing, family structure, employment history, disability and net worth, painting a biosocioeconomic picture of the cohort under study. Over 20,000 persons within 7,600 households have been followed for over a decade, with biennial interviews collecting a vast amount of pertinent data. The comprehensive and multifaceted data set provided by the HRS allowed us to explore important correlates of CAM use that are often not present in population surveys (Juster, & Suzman , 1995).

METHODS

In the Year 2000 HRS interview, a subsample of 1462 non-proxy respondents were randomly selected to answer an ancillary set of items on CAM use. The survey took the form of a three-minute module administered at the end of the main survey, conducted primarily by telephone. Respondents were asked to participate before the topic of the module was revealed to them. Of the 1462 selected respondents, 1160 (79.3%) agreed to do this module. An additional 61 respondents were dropped from the analysis because they were either outside the age range for eligibility (spouses of age-eligible respondents) or resided in a nursing home, leaving 1099 people for this analysis. Of the 1099 people surveyed, 926 (84.3%) were interviewed by phone and the remainder 173 (15.7%) were surveyed in person.

Within the survey, alternative medicine interventions were divided into alternative services (e.g., chiropractic, massage therapy, acupuncture), dietary supplements (e.g., multivitamins, specific vitamins and minerals), herbal supplements (e.g., garlic, Echinacea, gingko biloba), and personal practices (breathing exercises, meditation). The selection of these service clusters was determined by considerations pertaining to validity, thoroughness and the need to conform to the logistic constraints and limitations imposed by the fact that our module was an “add-on”

component of the lengthier Health and Retirement Study baseline survey. Respondents were queried as to whether they had ever used an alternative practitioner or personal practice and as to whether they were regularly taking a dietary supplement. Participants could report more than one service or supplement used. Personal practices, dietary supplements, and herbal supplements were based on current use; alternative practitioner use was reported as lifetime prevalence. “Any CAM Use” was defined as meeting the criteria for any of the specific interventions based on the time period for the original question. A number of potential correlates were available from the core instrument, including: demographic information, income, current smoking, current alcohol consumption, insurance coverage, hospitalizations and doctor visits over the previous two years, self-reports of a number of specific chronic health conditions (e.g., hypertension, diabetes, arthritis), and limitations on activities of daily living (ADL) or instrumental activities of daily living (IADL). Out-of-pocket medical expenses were measured by direct questioning regarding money spent on medications and payments to health care providers. The cost of prescription drugs was reported based on average month expenditure over the previous two years. Participants were also asked to report the total amount spent on dietary supplements and herbal supplements separately in the last 12 months. The Health and Retirement Study was reviewed by the University of Michigan Institutional Review Board, and the full questionnaire is available online at http://hrsonline.isr.umich.edu/ (The Health and Retirement Study, 2002).

STATISTICAL ANALYSIS

All prevalence estimates and statistical associations were weighted for the study sampling design. Annual out-of-pocket medical expenses and out-of-pocket drug expenses were treated as continuous variables and were tested for associations with CAM modalities using simple linear regression with expenditures as the dependent variable. Variables that were tested as potential correlates of CAM use were entered into multiple logistic regression models to predict each CAM modality. The number of chronic conditions was treated as a continuous variable summed from nine chronic conditions. All other variables were treated as categorical variables. Age was categorized as 52-64, 65-79, and 80 years and older. Annual household income was categorized into quartiles. Respondents were asked the number of times they saw a medical doctor in the previous two years, and these visits were categorized as 0- 4, 5-9, 10-19, or 20 or more. ADL limitations were categorized as none, mild (one ADL activity limited), or severe (at least two ADL activities limited).

RESULTS

Demographic and health characteristics of the study population

One thousand and ninety-nine persons over 52 years of age in 2000 were surveyed. Table 1 summarizes the demographic and health characteristics of the study population. Of interest, 85% of the population reported at least one chronic illness for the list supplied in the questionnaire.

Prevalence of usage

Table 2 provides detailed information as to the prevalence of CAM use by age, gender, and ethnicity. 87% of these respondents reported any CAM use, as defined in this study. 87% of people aged 65 to 79 years, and 92% of people aged 80 or over used some form of CAM. Current use of dietary supplements of any type was reported by 65% of the sample surveyed, 72% of those 65-79 years, and 66% of those 80 years and older. 46% of respondents reported using chiropractic, with similar percentages for the 65-79 and over 80 groups (44% and 46%, respectively). Personal practices, massage therapy and herbal supplements were also

commonly used. However, the use of herbal therapies was lower among those 80 and older (8%) when compared to the younger elderly respondents (21 % of those aged 65-79 years).

Table 3 shows specific prevalence rates of CAM use by modality. Among the alternative practitioners other than chiropractors, massage therapy was used more commonly than acupuncture (19.8% compared to 7.2%). The most common non-herbal dietary supplements reported were multivitamins (49.4%), followed by vitamin E (37.0%), calcium (34.4%) and vitamin C (32.1%). Garlic (8.7%), Echinacea (7.8%), ginkgo (7.4%) and ginseng (6.2%) were the most frequently used herbs reported. Table 3 also includes subgroup analyses according to age (younger than 65 versus 65 or older). Among respondents 65 years of age or older, the most commonly used non-herbal dietary supplements were multivitamins (51.2%), followed by vitamin E (39.4%), calcium (38.2%) and vitamin C (34.7%). These were the same supplements reported by younger respondents. When herbal supplement use was evaluated, garlic (9.3%), ginkgo (6.7%), Echinacea (6.4%) and ginseng (4.8%) were the most frequently reported herbs by adults 65 or older. On the other hand, although younger respondents reported the same herbs as the ones most commonly used, their order of prevalence differed (Echinacea – 9.1%; garlic – 8.2%; ginkgo – 8.1%; ginseng – 7.6%).

Out-of-pocket (OOP) health expenses associated with CAM use

There were no items in the survey concerning total or OOP payments specifically for CAM modalities. However, annual OOP expenses for health were queried, overall and for prescription drugs, and these expenses could be analyzed according to reported CAM use. Overall, CAM users reported spending an average of $1,136 per year OOP on medical services, including outpatient care, prescription drugs, and other services not covered by insurance (averaged over the preceding two years), as compared to $886 by non-CAM users, p=0.181 (Table 4). Of this, the average OOP spending on prescription drugs was $612 per year for CAM users vs. $420 for non-CAM users (p=0.123). By comparison, the average expenditure on dietary supplements was $113 in the previous twelve months (data not shown). If only those who reported using dietary supplements were considered, the average expenditure was $173. The average expenditure on herbal therapies was $24 per year, or an average of $125 for users of herbal therapies considered separately.

Correlates of use

Table 5 summarizes the factors associated with CAM use in our survey; each factor is adjusted for all other variables in the model. Factors thought to be related to CAM use (described above) were used to create the full multivariate model. Respondent age correlated positively with dietary supplement use and personal practices and inversely with the use of alternative practitioners and herbal supplements. Overall, women were more likely to use CAM interventions than men, especially alternative practitioners, herbs and dietary supplements. African-Americans and Hispanics were less likely to use CAM as a whole and, in particular, chiropractic and dietary supplements. However, both groups reported greater use of personal practices than Caucasians. Income levels were associated with more frequent alternative practitioner utilization, and those in the highest quartile of income were more likely to use some form of CAM. Greater educational attainment was associated with less chiropractic use and more dietary or herbal supplement use, as well as personal practices. Having frequent visits to allopathic physicians (twenty or more in the preceding two years) was positively associated with more use of alternative practitioners and personal practices. Hospitalizations over the same time period were not associated with CAM use. Those who had health insurance were less likely to use herbal supplements or personal practices than those who had no insurance. Those who currently smoked reported less CAM use overall. On the other hand, alcohol use was positively associated with alternative practitioner and dietary supplement use and inversely associated with personal practices. The number of chronic conditions reported was in general

not associated with CAM use. Finally, having one ADL impairment was generally associated with CAM use, but this association was not as strong among people with two or more ADL impairments.

Discussion

Self-reported CAM use was found to be substantial and important among this sample of Americans 52 years and older. These rates pertained for all age groups, including the "oldest old." Our survey allowed us to analyze several major CAM domains, including biologically-based therapies, manipulative methods such as the chiropractic, other alternative practitioner use and personal practices. Use of the various CAM modalities was rather common. Non-herbal dietary supplements and chiropractic services were among the most common modalities reported, with prevalence rates considerably higher than the ones found in comparable literature. Use of herbal products and personal practices was also more frequent than what had been described previously (Eisenberg et al., 1998). While these differences with previous studies may be due to population sampling or questionnaire differences, they may also reflect an increasing acceptance of such practices by older patients and/or their health care providers (Emslie, Campbell, & Walker, 2002; Kaczorowski, Patterson, Arthur, Mith, & Mills, 2002; Kreitzer, Mitten, Harris, & Shandeling, 2002).

Nevertheless, in the particular case of dietary supplements, the use of a less rigorous definition for the category may have played a fundamental role in our survey results. For instance, while we considered all multivitamins as CAM, other authors have limited the category to "high-dose or megavitamins" (Eisenberg et al., 1993). Dietary calcium supplements were considered as "CAM" in our study, even though their use has proven benefits for bone health. Appropriate calcium supplementation among elders and post-menopausal women is part of the current standard of care in the prevention and management of osteoporosis (National Institutes of Health Consensus Development Conference Statement, 2000).

Herbal supplement use, while not as common as non-herbal dietary supplements, was still prevalent among older adults. The most commonly utilized herbs in our survey include garlic, Echinacea, ginkgo biloba and ginseng. Of note, herbal use was substantially lower among respondents 80 years and older, and approximated use rates found in other surveys. The reasons for lower use rates with increasing age are unclear, especially when use of other CAM interventions remained popular. Cohort effects and differential access to herbs are possible explanations. Another possibility is that the sample size was too small to yield stable estimates of herbal use among those in this age group.

Higher age was associated with increased utilization of non-herbal dietary supplements. As previously discussed, multivitamin use played a considerable role in comprising these rates. However, at higher ages, there were fewer reports of alternative practitioner use. This could reflect cultural beliefs inherent to a specific cohort, lower income, less mobility and thus less access to practitioners out of the home and/or lack of insurance coverage for potentially expensive health care interventions. The latter has been shown to play a significant role in profiling the population that seeks CAM providers (Wolsko, Eisenberg, Davis, Ettner, & Phillips, 2002).

Women have been noted to make more frequent use of CAM (Eisenberg et al., 1998) and this was found in our sample as well. Ethnicity has also been found to be an independent predictor of CAM use, usually with Caucasians making more frequent use of CAM than other races (Eisenberg et al., 1998; Ni, Simile, & Hardy, 2002). Both these findings were corroborated by our survey. An exception was noted for personal practices, which were more commonly reported by African-Americans and Hispanics as compared to Caucasians.

Greater educational attainment was associated with more frequent dietary supplement use and personal practices, but with fewer chiropractic visits. Education has been previously linked to CAM utilization (Ni et al., 2002). In our survey, this pattern persisted even after adjustment for income levels. These data also corroborate other findings in the available CAM literature that point to an overall relationship between income and increased CAM utilization (Eisenberg et al., 1998), although the trend was clearer in the utilization of alternative practitioners. The association between dietary supplements and CAM use was greatest among those in the quartile above the median income, and the association with chiropractor use was greatest among those in the quartile below the median income. Income and education may simply be a marker of socioeconomic status in these findings, but these associations could also reflect differences in knowledge about the health effects of CAM modalities as well as differences in the amount of discretionary income that can be allocated to CAM services and products.

Out-of-pocket expenses on medical services and prescription drugs incurred by CAM users were significantly higher than those of non-CAM users, especially for those using alternative practitioners and dietary supplements. This finding, if correct, may have several explanations. It may reflect the fact that CAM users may have more chronic illnesses or more severe illnesses than non-users, although this was not seen in our sample. It may also reflect an orientation toward CAM use for perceived health promotional purposes. Finally, it may reflect respondent attribution of CAM expenses as part of their general health care expenses. This is quite possible since health insurance coverage frequently excludes many CAM interventions. This may change if private and government-funded insurance plans begin to adopt broader coverage plans for CAM modalities (Pelletier & Astin, 2002; Steyer, Freed, & Lantz, 2002). CAM-related expenses have grown considerably over the past decade and will certainly become a major public health issue in the future (Eisenberg et al., 1998; MacLennan, Wilson, & Taylor, 2002; Thomas, Nicholl, & Coleman, 2001).

Frequent visits to a physician in the preceding two years correlated positively with alternative services utilization. This confirms previous survey findings indicating that CAM users were more likely to use conventional medical services as well (Foster et al., 2000; Ni et al., 2002), and suggests that this subset of patients may seek complementary modalities as a means of treating conditions not relieved by conventional care, or as an additional pathway for preventive care (Astin, 1998; Sirois & Gick, 2002), but not as a substitute for allopathic care. Conventional and complementary interventions have been shown to be frequent partners in patients' perceptions of health care (Eisenberg et al., 2001). Of interest, having any type of health insurance was not associated with CAM use overall or with more frequent use of any CAM category. In fact, those with health insurance were less likely to use herbs or personal practices. Although this finding conflicts with previous data on CAM practices (Wolsko et al., 2002), it may reflect the heterogeneous nature of CAM-related coverage offered by different health insurance programs (Cleary-Guida, Okvat, Oz, & Ting, 2001).

Of interest, having one impairment, but not more than one, in the ability to perform activities of daily living was independently associated with increased overall CAM use and, in particular, with alternative practitioner utilization. Thus, functional limitation, at least when present to a modest degree, did not reduce the acceptance of most CAM modalities among older adults. However, with higher levels of physical impairment, CAM use was lower, possibly reflecting more severe disability and lesser access to some CAM modalities. This finding lends some support to the association between chronic illness burden and CAM use noted in previous studies (Eisenberg et al., 1998) and may indicate that CAM modalities retain their appeal in the face of some functional performance decrements. Whether such appeal arises from the patient's own beliefs, caregiver pressure, or a combination of both remains to be investigated. We did not observe a significant association between the number of chronic conditions and

CAM use, although the number of co-morbid conditions may itself be related to functional limitations.

Cigarette smoking was associated with less CAM use, especially when dietary supplements were considered. This association corroborates the results of various nutritional surveys (Phillips et al., 2000; Lyle, Mares-Perlman, Klein, Klein, & Greger, 1998) showing that using dietary supplements correlates with a higher likelihood of health-promoting behaviors such as physical activity, healthier eating habits and abstinence from tobacco use. Although this could explain our findings to a certain degree, the inverse relationship of smoking with overall CAM use merits further attention.

Current alcohol use was linked to more alternative practitioner and dietary supplement use, but less personal practices use. In a cohort of over 80,000 people aged 50-76 years, women using moderate amounts of alcohol (3-6 drinks/week) made use of certain non-herbal dietary supplements more commonly than those consuming less or more alcohol (1-2 drinks/week or more than 7 drinks/week, respectively) (White et al., 2004). Similar findings were identified in a Japanese cohort of over 78,000 people aged 45-74 (Ishihara, Sobue, Yamamoto, Sasaki & Tsugane, 2003). Our findings regarding CAM and alcohol use may be explained by the fact that moderate alcohol drinkers appear to use more dietary supplements and, possibly, resort to other CAM modalities more frequently as well. As moderate alcohol use is often perceived as a healthy lifestyle intervention, this correlation, as well as the one previously described for smoking, could suggest that certain CAM use may be a marker for a healthier lifestyle in general. The relationship between lifestyle habits and complementary medicine use clearly warrants further attention.

There are some potential limitations to our study. Institutionalized elderly patients were not interviewed. The data gathered in our study reflect self-reports and corroborating records were not accessed. Cross-sectional data analyses carry the intrinsic inability to establish a definite causation relationship, indicating the need for longitudinal research in order to further our understanding of these findings. The HRS offers this capacity. Finally, our data, albeit nationally representative, include a relatively small number of non-white persons and such minorities might warrant surveying in greater depth.

However, based on our findings and those of others, we may conclude that the use of complementary and alternative medicine remains widespread. This applies to the “oldest old” as well, who make frequent use of alternative modalities, especially chiropractic and dietary supplements. CAM users report more out-of-pocket health expenses than non-CAM users. While age-use associations are dependent on the CAM modality, female gender, Caucasian ethnicity, higher educational level, frequent visits to the doctor, and mild functional limitation are among the factors that predicted a higher prevalence of CAM use in this nationally representative population. Further research is needed to understand in greater depth why older adults seek certain alternative practices more often and to determine the impact of CAM use on a range of important health outcomes.

Potential research avenues that could be explored based on data yielded by our study include, but are not limited to, studies on the efficacy and safety of chiropractic as it pertains to older adults and, in particular, the oldest old; an assessment of the reasons given by older adults to use some of the most popular herbal and non-herbal dietary supplements, followed by comprehensive and methodologically strict evaluations of their efficacy and safety; qualitative research into the relationship between personal practices and physical and psychological well-being and follow-up studies addressing the feasibility and outcomes of transposing such practices into the conventional health care environment; and further epidemiological studies looking at a possible role for CAM as a “healthy” lifestyle marker. Finally, as insurance

coverage for CAM interventions grows in popularity and scope, studies addressing in depth the impact of such coverage upon CAM patterns of utilization and outcomes would be of great relevance.

The study results also bear significant implications for medical practice. Physicians and other providers involved in the care of older adults should be cognizant of how prevalent the use of CAM therapies is among elders and should undertake to query their patients routinely about such use. Patients will often neglect to mention or opt not to discuss CAM with their usual providers (Cohen, Ek, & Pan, 2002) and this information gap could lead to potentially detrimental consequences. Certain dietary supplements have been recently banned from the market due to hazardous side effects (Rados, 2004). Adverse interactions between dietary supplements and conventional pharmacological agents have been frequently described (Fugh-Berman, 2000; Fugh-Berman & Ernst, 2002) and are particularly concerning among older adults who commonly make use of numerous prescription and over-the-counter drugs. Chiropractic has been linked to stroke and other adverse vascular events, albeit unusually (Kapral & Bondy, 2001). Expenses related to CAM may curtail many patients' ability to afford other medications, leading to difficulties with compliance not fully understood by the primary care provider.

From a health care policy standpoint, the widespread use of CAM documented in our study suggests the need for ongoing educational efforts aimed at enhancing the awareness of patients and health providers regarding the implications, benefits and risks of CAM therapies. The development of appropriate educational venues for CAM should be accompanied by the implementation of credentialing protocols for the less well regulated CAM modalities, the delineation of a quality control program for herbs and other dietary supplements that would ensure that these products meet standards of consistency and safety and by the establishment of routine post-marketing surveillance for adverse effects and interactions associated with dietary supplements (Eisenberg et al., 1998; White House Commission on Complementary and Alternative Medicine Policy Final Report March 2002, 2003). Finally, as more evidence comes to light illustrating the benefits or lack thereof of specific CAM approaches, consideration should be given to broader health insurance coverage for those interventions proven to be effective and safe through rigorous clinical trials and comprehensive safety assessments.

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References

Astin JA. Why patients use alternative medicine: results of a national study. JAMA 1998;279:1548–1553. [PubMed: 9605899]

Astin JA, Pelletier KR, Marie A, Haskell WL. Complementary and alternative medicine use among elderly persons: one-year analysis of a Blue Shield Medicare supplement. Journals of Gerontology Series A-Biological Sciences & Medical Sciences 2000;55:M4–9.

Barnes PM, Powell-Griner E, McFann K, Nahin R. Complementary and Alternative Medicine Use Among Adults: United States, 2002. Advance Data From Vital And Health Statistics 2004;343

Cleary-Guida MB, Okvat HA, Oz MC, Ting W. A regional survey of health insurance coverage for complementary and alternative medicine: current status and future ramifications. Journal of Alternative & Complementary Medicine 2001;7:269–273.

Cohen RJ, Ek K, Pan CX. Complementary and alternative medicine (CAM) use by older adults: a comparison of self-report and physician chart documentation. Journals of Gerontology Series A-Biological Sciences & Medical Sciences 2002;57:M223–227.

Coleman LM, Fowler LL, Williams ME. Use of unproven therapies by people with Alzheimer's disease. Journal of the American Geriatrics Society 1995;43:747–750. [PubMed: 7602024]

Druss BG, Rosenheck RA. Association between use of unconventional therapies and conventional medical services. JAMA 1999;282:651–656. [PubMed: 10517718]

Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, Van Rompay M, et al. Trends in alternative medicine use in the United States, 1990-1997: results of a follow-up national survey. JAMA 1998;280:1569–1575. [PubMed: 9820257]

Eisenberg DM, Kessler RC, Foster C, Norlock FE, Calkins DR, Delbanco TL. Unconventional medicine in the United States. Prevalence, costs, and patterns of use. New England Journal of Medicine 1993;328:246–252. [PubMed: 8418405]

Eisenberg DM, Kessler RC, Van Rompay MI, Kaptchuk TJ, Wilkey SA, Appel S, et al. Perceptions about complementary therapies relative to conventional therapies among adults who use both: results from a national survey. Annals of Internal Medicine 2001;135:344–351. [PubMed: 11529698]

Emslie MJ, Campbell MK, Walker KA. Changes in public awareness of, attitudes to, and use of complementary therapy in North East Scotland: surveys in 1993 and 1999. Complementary Therapies in Medicine 2002;10:148–153. [PubMed: 12568143]

Fugh-Berman A. Herb-drug interactions. Lancet 2000;355:134–138. [PubMed: 10675182]

Fugh-Berman A, Ernnst E. Herb-drug interactions: review and assessment of report reliability. British Journal of Clinical Pharmacology 2002;52:587–595. [PubMed: 11736868]

Foster DF, Phillips RS, Hamel MB, Eisenberg DM. Alternative medicine use in older Americans. Journal of the American Geriatrics Society 2000;48:1560–1565. [PubMed: 11129743]

Howes MJ, Perry NS, Houghton PJ. Plants with traditional uses and activities, relevant to the management of Alzheimer's disease and other cognitive disorders. Phytotherapy Research 2003;17:1–18. [PubMed: 12557240]

Juster F, Suzman R. An overview of the Health and Retirement Study. Journal of Human Resources 1995;30:S7–S56.

Kaboli PJ, Doebbeling BN, Saag KG, Rosenthal GE. Use of complementary and alternative medicine by older patients with arthritis: a population-based study. Arthritis & Rheumatism 2001;45:398–403. [PubMed: 11501729]

Kaczorowski J, Patterson C, Arthur H, Mith KS, Mills DA. Complementary therapy involvement of physicians: implications for practice and learning. Complementary Therapies in Medicine 2002;10:134–140. [PubMed: 12568141]

Kapral MK, Bondy SJ. Cervical manipulation and risk of stroke. CMAJ Canadian Medical Association Journal 2001;165:907–908.

Kreitzer MJ, Mitten D, Harris I, Shandeling J. Attitudes toward CAM among medical, nursing, and pharmacy faculty and students: a comparative analysis. Alternative Therapies in Health & Medicine 2002;8:44–47. [PubMed: 12440838]50-53

Lyle BJ, Mares-Perlman JA, Klein BE, Klein R, Greger JL. Supplement users differ from nonusers in demographic, lifestyle, dietary and health characteristics. Journal of Nutrition 1998;128:2355–2362. [PubMed: 9868181]

MacLennan AH, Wilson DH, Taylor AW. The escalating cost and prevalence of alternative medicine. Preventive Medicine 2002;35:166–173. [PubMed: 12200102]

National Center for Complementary and Alternative Medicine. 2003. National Center for Complementary and Alternative Medicine; 2002. What Is Complementary and Alternative Medicine (CAM)?.

National Institutes of Health Consensus Development Conference Statement. Osteoporosis prevention, diagnosis, and therapy. NIH Consensus Statement 2000;17:1–45.

Neal R. Report by David M. Eisenberg, M.D., on educational issues pertaining to complementary and alternative medicine in the United States. Journal of Alternative & Complementary Medicine 2001;7:S41–43.

Ni H, Simile C, Hardy AM. Utilization of complementary and alternative medicine by United States adults: results from the 1999 national health interview survey. Medical Care 2002;40:353–358. [PubMed: 12021691]

Pelletier KR, Astin JA. Integration and reimbursement of complementary and alternative medicine by managed care and insurance providers: 2000 update and cohort analysis. Alternative Therapies in Health & Medicine 2002;8:38–39. [PubMed: 11795621]42, 44 passim

Pelletier KR, Marie A, Krasner M, Haskell WL. Current trends in the integration and reimbursement of complementary and alternative medicine by managed care, insurance carriers, and hospital providers. American Journal of Health Promotion 1997;12:112–122. [PubMed: 10174663]

Phillips EL, Arnett DK, Himes JH, McGovern PG, Blackburn H, Luepker RV. Differences and trends in antioxidant dietary intake in smokers and non-smokers, 1980-1992: the Minnesota Heart Survey. Annals of Epidemiology 2000;10:417–423. [PubMed: 11018344]

Rados C. Ephedra ban: no shortage of reasons. FDA Consumer 2004;38:6–7. [PubMed: 15101356]

Sirois FM, Gick ML. An investigation of the health beliefs and motivations of complementary medicine clients. Social Science & Medicine 2002;55:1025–1037. [PubMed: 12220087]

Steyer TE, Freed GL, Lantz PM. Medicaid reimbursement for alternative therapies. Alternative Therapies in Health & Medicine 2002;8:84–88. [PubMed: 12440844]

The Health and Retirement Study. An Overview of Health and Retirement Study Components 2002;2003

Thomas KJ, Nicholl JP, Coleman P. Use and expenditure on complementary medicine in England: a population based survey. Complementary Therapies in Medicine 2001;9:2–11. [PubMed: 11264963]

Wetzel MS, Eisenberg DM, Kaptchuk TJ. Courses involving complementary and alternative medicine at US medical schools. JAMA 1998;280:784–787. [PubMed: 9729989]

White House Commission on Complementary and Alternative Medicine Policy Final Report March 2002. 2003NIH Publication 03-5411

White E, Patterson RE, Kristal AR, Thornquist M, King I, Shattuck AL, et al. VITamins and Lifestyle Cohort Study: study design and characteristics of supplement users. Am J Epidemiol 2004;159:83–93. [PubMed: 14693663]

Wolsko PM, Eisenberg DM, Davis RB, Ettner SL, Phillips RS. Insurance coverage, medical conditions, and visits to alternative medicine providers: results of a national survey. Archives of Internal Medicine 2002;162:281–287. [PubMed: 11822920]

Wyatt GK, Friedman LL, Given CW, Given BA, Beckrow KC. Complementary therapy use among older cancer patients. Cancer Practice 1999;7:136–144. [PubMed: 10352076]

TABLE 1

Demographic Characteristics of Respondents of the Complementary and Alternative Medicine Module of the 2000 Health and Retirement Study Interview (N=1099)

Age:	**Percent**
50-64	43
65-79	43
80 and above	14
Gender:	
Male	44
Female	56
Ethnicity:	
Caucasian	79
African-American	12
Hispanic-American	7
Other	1
Education:	
< High school	28
High school	34
Some college	18
College	11
Advanced degree	10
Income:	
$0-17,000	25
$17,001-33,000	26
$33,001-60,000	24
$60,001+	24
Number of Chronic Conditions*:	
None	15
1 or 2	53
3 or 4	27
5 or more	5
ADL Impairment:	17
IADL Impairment:	13

* Self-reported physician diagnoses of hypertension, diabetes, cancer, heart diseases, lung diseases, stroke, psychiatric problems, memory problems, and/or arthritis

TABLE 2

Percentage of Respondents Using CAM Modalities, stratified by Age, Gender, and Ethnicity in the 2000 Health and Retirement Study*

	Chiropractic	Alternate Practitioner	Dietary Supplement	Herbal Supplement	Personal Practice	Any CAM
Total Sample	46	23	65	19	37	87
Age:						
- 52-64	48	27	60	20	33	86
- 65-79	44	21	72	21	38	87
- 80+	46	17	66	8	52	92
Gender:						
- Male	46	21	58	16	33	82
- Female	47	26	72	22	40	91
Ethnicity:						
- White, non-Hispanic	49	24	69	21	34	88
- Black, non-Hispanic	25	16	42	10	59	79
- Hispanic	31	23	45	12	48	76
- Other	47	7	78	18	46	95

* N = 1099

TABLE 3

Prevalence of CAM Utilization for Specific Interventions in the 2000 Health and Retirement Study Interview*

	Prevalence (%)	Prevalence among < 65 (%)	Prevalence among ≥ 65 (%)
A. Ever used chiropractic:	46.2	48.3	44.0
B. Ever used alternative practitioner:	23.4	26.7	20.1
B. 1. Acupuncture	7.2	6.6	7.8
B. 2. Massage Therapy	19.8	23.8	15.6
C. Current non-herbal dietary supplements:	65.4	60.3	70.6
C. 1. Multivitamins	49.4	47.6	51.2
C. 2. Vitamin A	10.5	11.8	9.1
C. 3. Vitamin C	32.1	29.6	34.7
C.4. Vitamin D	13.9	14.8	13.0
C. 4. Vitamin E	37.0	34.7	39.4
C. 5. Calcium	34.4	30.8	38.2
C. 6. Magnesium	12.6	12.9	12.2
C. 7. Other	23.4	20.9	26.0
D. Current herbal supplements:	19.3	20.4	18.2
D. 1. Aloe	4.6	4.6	4.5
D. 2. Astragalus	0.1	0.2	0.0
D. 3. Cat's claw	0.3	0.2	0.4
D. 4. Cayenne	2.7	3.5	1.9
D. 5. Echinacea	7.8	9.1	6.4
D. 6. Feverfew	0.3	0.5	0.2
D. 7. Garlic	8.7	8.2	9.3
D. 8. Ginkgo Biloba	7.4	8.1	6.7
D. 9. Ginseng	6.2	7.6	4.8
D. 10. Goldenseal	2.6	2.9	2.2
D. 11. Kava	1.9	2.7	1.0
D. 12. Ma huang	0.3	0.5	0.2
D. 13. Saw Palmetto	4.6	5.1	4.1
D. 14. St. John's Wort	4.6	6.8	2.2
D. 15. Valerian	0.8	1.2	0.2
D. 16. Others	6.8	7.3	6.3
E. Current personal practices:	37.2	33.2	41.3
E. 1. Breathing exercises	16.6	15.8	17.4
E. 2. Meditation	29.6	27.9	31.4

* N = 1099

TABLE 4

Expenses with health care in CAM users and non-users and according to CAM Modality in the 2000 Health and Retirement Study Interview

	Out-of-Pocket Medical Expenditures ($ per year)		Out-of-Pocket Prescription Drug Expenditures ($ per year)	
	CAM Users (mean)	Non-Users (mean)	CAM Users (mean)	Non-Users (mean)
Chiropractic	1,221	1,002	648	540
Alternate Practitioner	1,434*	1,002	780*	528
Dietary Supplement	1,194*	933	612	528
Herbal Supplement	1,094	1,105	516	612
Personal Practice	1,186	1,054	720*	516
Any CAM	1,136	886	612	420

* CAM users had significantly higher out-of-pocket expenditure than non-CAM users ($p<0.05$).

TABLE 5

Odd Ratios and 95% Confidence Intervals predicting CAM Modality in the 2000 Health and Retirement Study*

	Chiropractic	Alternate Practitioner	Dietary Supplement	Herbal Supplement	Personal Practice	Any CAM Use
Age (reference – 50-64 years old)						
– 65-79 years old	0.80(0.59-1.08)	0.80(0.56-1.13)	1.67(1.21-2.32)‡	1.19(0.82-1.72)	1.44(1.05-1.98)†	1.07(0.69-1.66)
– 80+ years old	0.86(0.55-1.35)	0.55(0.31-0.98)†	1.36(0.84-2.20)	0.44(0.21-0.92)†	2.57(1.62-4.08)§	1.72(0.81-3.67)
Male	0.94(0.72-1.22)	0.61(0.45-0.83)‡	0.43(0.32-0.57)§	0.63(0.45-0.88)‡	0.84(0.64-1.10)	0.40(0.27-0.60)§
Ethnicity (reference – White, non-Hispanic)						
– Black, non-Hispanic	0.34(0.20-0.58)§	0.67(0.35-1.28)	0.43(0.26-0.72)‡	0.53(0.25-1.14)	2.86(1.74-4.71)§	0.56(0.30-1.06)
– Hispanic	0.39(0.22-0.68)‡	0.94(0.50-1.78)	0.54(0.32-0.94)†	0.57(0.26-1.26)	2.06(1.20-3.54)‡	0.42(0.22-0.82)†
– Other	0.93(0.32-2.68)	0.26(0.04-1.87)	1.48(0.40-5.51)	0.82(0.21-3.24)	1.76(0.59-5.25)	2.28(0.19-27.90)
Income (reference – $0-17,000)						
– $17,001-33,000	1.51(1.02-2.22)†	1.76(1.08-2.85)†	1.26(0.84-1.89)	1.24(0.74-2.08)	1.17(0.78-1.73)	1.55(0.89-2.71)
– $33,001-60,000	1.25(0.83-1.88)	1.83(1.11-3.03)†	1.72(1.10-2.67)†	1.32(0.78-2.23)	1.14(0.75-1.74)	1.35(0.76-2.42)
– $60,001+	1.35(0.88-2.07)	2.15(1.27-3.62)‡	1.26(0.80-1.99)	1.17(0.67-2.03)	1.04(0.67-1.62)	2.15(1.14-4.03)†
Education (reference – Less than High School)						
– High School	0.75(0.53-1.07)	0.65(0.42-1.00)†	1.46(1.01-2.11)†	0.98(0.61-1.58)	1.33(0.92-1.93)	0.83(0.50-1.40)
– Some College	0.81(0.54-1.22)	0.90(0.56-1.44)	1.64(1.06-2.54)†	1.61(0.96-2.70)	1.49(0.97-2.29)	1.12(0.60-2.12)
– College Degree	0.63(0.39-1.02)	0.91(0.52-1.59)	2.34(1.38-3.96)‡	1.18(0.64-2.18)	1.20(0.72-2.00)	1.06(0.52-2.16)
– Advanced Degree	0.55(0.33-0.90)†	0.99(0.56-1.74)	2.26(1.31-3.92)‡	1.96(1.07-3.57)†	2.32(1.38-3.89)‡	0.88(0.42-1.87)
No. of Chronic Conditions	1.07(0.96-1.19)	1.06(0.93-1.20)	0.91(0.81-1.02)	0.97(0.84-1.11)	0.99(0.88-1.11)	1.06(0.90-1.25)
Insurance – any type	0.79(0.50-1.25)	0.74(0.44-1.23)	1.08(0.66-1.75)	0.56(0.32-0.96)†	0.45(0.28-0.72)§	1.01(0.52-1.97)
Hospitalized in the last 2 y.	0.77(0.56-1.05)	0.89(0.61-1.29)	1.12(0.80-1.58)	0.91(0.60-1.38)	1.01(0.73-1.40)	0.82(0.52-1.29)
Visits to Doctor in last 2 y. (reference – 0-4 visits)						
– 5-9 times	0.86(0.63-1.18)	1.11(0.76-1.63)	0.92(0.65-1.29)	0.69(0.46-1.04)	0.89(0.63-1.24)	0.64(0.40-1.01)
– 10-19 times	0.79(0.55-1.15)	1.02(0.65-1.60)	1.66(1.09-2.53)†	0.98(0.62-1.56)	0.99(0.67-1.46)	1.19(0.65-2.16)
—20+ times	1.08(0.70-1.68)	2.00(1.22-3.28)‡	1.11(0.69-1.78)	0.96(0.54-1.72)	1.65(1.05-2.58)†	1.20(0.60-2.38)
Current Smoking	0.74(0.52-1.06)	0.90(0.59-1.37)	0.71(0.49-1.03)	0.73(0.45-1.17)	0.95(0.65-1.39)	0.61(0.38-0.98)†
Current Alcohol Consumption	1.14(0.87-1.48)	1.55(1.13-2.12)‡	1.39(1.04-1.85)†	0.80(0.58-1.12)	0.61(0.46-0.80)§	1.02(0.69-1.52)
IADL Limitations	1.01(0.64-1.60)	1.09(0.64-1.86)	0.93(0.57-1.52)	0.60(0.29-1.22)	0.75(0.46-1.21)	0.65(0.34-1.26)
ADL Limitations (reference – none)						
– 1 ADL limitation	1.45(0.90-2.33)	1.78(1.06-2.98)†	1.54(0.90-2.65)	0.90(0.48-1.70)	1.00(0.61-1.65)	2.54(1.02-6.32)†
– 2+ ADL limitations	0.85(0.49-1.48)	1.54(0.82-2.87)	1.20(0.67-2.14)	0.62(0.26-1.46)	1.65(0.95-2.86)	1.45(0.63-3.35)

*CAM modality as the dependent variable; estimated odds ratios adjusted for all other variables in the model.

†p<0.05

‡p<0.01

§p<0.001