Herbal Products and Dietary Supplements: A Survey of Use, Attitudes, and Knowledge Among Older Adults

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Context: Tens of millions of Americans use herbal products and/or dietary supplements, yet scant data are available regarding the purity, safety, or efficacy of these substances. A better understanding of usage trends and patient attitudes toward self-initiated supplementation is vital to obtaining accurate and complete medical history data.

Objective: To survey Americans aged approximately 60 years and older regarding their use of herbal products and dietary supplements and their attitudes and knowledge regarding the safety of these popular substances.

Methods: A face-to-face, 35-item survey was administered to 267 men and women residing in the Kansas City, Mo–metropolitan area. Researchers documented usage patterns for, attitudes about, and knowledge of herbal products and dietary supplements in this population.

Results: Fifty-six (21%) respondents were currently taking at least one herbal product or dietary supplement, and potential for adverse drug reactions was apparent in 12 (19%). Glucosamine, garlic, Echinacea, and Ginkgo biloba were the most frequently cited substances used by survey participants. White women with at least some college education were most likely to report taking these products. However, preservation of health was by far the most predictive indicator for use of herbal products and dietary supplements. Subjects were found to be receptive to patient education efforts for these products.

Conclusion: Although substantial misconceptions about herbal products and dietary supplements exist among older Americans, most individuals in this population are interested in receiving additional information about these products. Excellent opportunities exist for expanded patient education—and improved patient care.

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Recent statistics indicate that Americans are increasingly replacing prescription medications with vitamin and mineral supplements as well as medicinal herbs. Consumers spend more than $19 billion a year on these substances—an amount that has grown steadily since the early 1990s. In 2005, a secondary analysis of the complementary and alternative medicine (CAM) supplement to the 2002 National Health Interview Survey (NHIS) estimated that more than 38 million Americans use herbs and dietary supplements. More recent estimates have placed this number as high as 60 million. Despite the widespread use of these products, primary care physicians are generally unaware of the nonprescribed therapies their patients are taking. Most patients are reluctant to share this information with their healthcare providers even if they experience adverse events that might be related to use of medicinal herbs or dietary supplements.

Herbal remedies and dietary supplements are not classified as drugs by the US Food and Drug Administration (FDA). Therefore, although the 1994 Dietary Supplement Health and Education Act allows manufacturers to make claims intended to influence public opinion regarding the benefits of these products, herbs and supplements are exempt from the rigorous federal regulations and testing required for products classified as prescription drugs. Only recently has the FDA developed good manufacturing process guidelines for herbal products and dietary supplements. On November 4, 2004, the FDA released a strategy for dietary supplements that would focus on monitoring and evaluating product and ingredient safety, ensuring product quality, and monitoring and evaluating product labeling. The focus of these measures is to protect consumers against dietary supplements that are unsafe, as well as those making unauthorized, false, or misleading claims. However, no policy has been adopted to date. As a consequence, research on herbs and supplements within the context of randomized controlled trials has seldom been performed, and many questions regarding the efficacy, safety, and purity of these substances remain.

Anecdotally, it is thought that herbal products and dietary supplements are popular as a result of a widespread belief that the preparations are natural and, therefore, safe. However, in conjunction with this increasing popularity, the number of adverse events, drug interactions, and deaths involving these products has been on the rise. For example, the World Health Organization reported in 1995 that it had received thousands
of reports of suspected adverse reactions to herbal products.\textsuperscript{21}

From 1994 to 1998, the FDA received more than 800 reports of adverse events associated with dietary products containing ephedrine alkaloids, specifically Ephedra or \textit{ma huang}.\textsuperscript{22} In 2004, after a meta-analysis commissioned by the National Institutes of Health reported more than 16,000 adverse events associated with Ephedra,\textsuperscript{23,24} the FDA banned dietary supplements containing this plant-based alkaloid.\textsuperscript{25} Adverse events associated with Ephedra sinica include cardiac arrest, heart palpitation, insomnia, stroke, and tremor.\textsuperscript{23-25} Drug interactions involving a number of other herbal products are also becoming increasingly well documented.\textsuperscript{15,18-20}

The popularity of unconventional and alternative medical therapies in the United States is readily apparent. Unfortunately, the extent and patterns of use for these therapies are more difficult to ascertain. Commonly cited statistics come from a landmark study by Eisenberg and colleagues\textsuperscript{9} of trends in alternative medicine. In a 1991 telephone survey of 1539 American adults, about 34\% of respondents reported use of an “unconventional therapy” (eg, energy healing, herbs, homeopathy, massage, megavitamins, self-help groups) during the previous year.\textsuperscript{6} Three percent of these participants reported using herbal products during that time.\textsuperscript{6} When the survey was repeated in 1997 with 2055 participants, about 12\% of respondents reported that they were using herbal products.

In 2002, Kaufman and colleagues\textsuperscript{26} published the results of a telephone survey analyzing medication use among 2590 adults in the United States. They reported that herbal products and dietary supplements were used by 14\% of participants surveyed in 1998 and 1999.\textsuperscript{26} By contrast, another study published that same year with the participation of more than 31,000 subjects found that 19\% of American adults use natural products (eg, herbs, other botanicals, enzymes).\textsuperscript{27}

Limited data are available regarding the prevalence of herbal product and dietary supplement use in “special” populations (eg, low-income individuals, patients with cancer, racial minorities).\textsuperscript{6,28-33} Information regarding the use of these products in the elderly population is almost nonexistent.\textsuperscript{33,34} In one of the few studies looking at usage patterns in this population, a 1996 survey of 3939 elderly subjects in North Carolina documented that 26\% of participants reported using vitamin or mineral supplements.\textsuperscript{34}

In September 2001, Howard Beales, director of the Bureau of Consumer Protection of the Federal Trade Commission (FTC), delivered a prepared statement before the US Senate Special Committee on Aging titled, “Health Fraud and the Elderly: A Continuing Health Epidemic.”\textsuperscript{35} The statement concluded that health fraud poses a direct and immediate threat of both economic and physical injury to individuals already suffering from serious health conditions. Elderly Americans, noted Beales, are particularly vulnerable because of the high incidence of age-related health problems.\textsuperscript{35} The FTC combats fraudulent and deceptive advertising claims about the health benefits and safety of dietary supplements.\textsuperscript{36} The Commission’s authority in this area derives from the Federal Trade Commission Act, which prohibits “unfair or deceptive acts or practices in or affecting commerce” and which prohibits the false advertisement of food, drugs, devices, services, or cosmetics.\textsuperscript{37,38}

Dietary supplement labeling may include claims about the supplement’s effect on the structure or function of the human body. However, the law requires that claims related to structure or function have substantiation and be truthful and not misleading. The FTC coordinates those efforts closely with the FDA and frequently calls on the expertise of other government authorities, including the Office of Dietary Supplements of the National Institutes of Health. The FTC has filed over a dozen actions in the past year and more than 100 actions over the past decade challenging allegedly false or unsubstantiated efficacy or safety claims for dietary supplements.\textsuperscript{37}

With thousands of marketers promoting worthless or unproven remedies to older people, and with limited federal enforcement resources, Beales pointed out that there is much cause for concern. Among the products for which marketers have made unsubstantiated health claims are colloidal silver, comfrey, a dehydroepiandrosterone hormonal supplement, St John’s wort, several multiherbal supplements, and a variety of electrical therapy devices.\textsuperscript{35} In his September 2001 statement before the Senate committee, Beales noted that the FTC had filed 27 cases against companies between 1997 and 2001 for using false or deceptive claims to market unproven products.\textsuperscript{35} These fraudulent claims included cures for arthritis, cancer, circulatory diseases, impotence, osteoporosis, and sleep apnea. On October 22, 2004, the FDA sent warning letters to 8 distributors making unsubstantiated Internet claims for dietary supplement weight loss products.\textsuperscript{12} Earlier that year, the FDA sent warning letters to 16 dietary supplement distributors making false and misleading claims for similar products.\textsuperscript{39} The FTC has also sent warning letters to more than 90 Internet advertisers who were selling alleged human growth hormone enhancers, and monitoring those operations to ensure that the sites modified or dropped unfounded marketing claims.\textsuperscript{40}

The purpose of the present survey-based study was to analyze patterns of use for herbal products and nutritional supplements among individuals aged approximately 60 years and older. The study also sought to clarify this population’s attitudes and basic knowledge regarding the safety of herbs and supplements.

\textbf{Methods}

\textbf{Participants}

The potential pool of study participants consisted of adults aged approximately 60 years or older residing in the Kansas City, Mo, metropolitan area. Participants were identified at area clinics, retirement communities, assisted-living centers, and community centers. Individuals were excluded for the following reasons: unwillingness to participate in the survey, inability to speak or understand English (unless a translator was available), or prior participation in the study.
available), and residence in a long-term care facility. The University of Missouri–Kansas City Social Sciences Institutional Review Board approved study protocols. Each face-to-face survey was administered within 20 minutes by one of four interviewers—two physicians (C.L.B., L.A.G.) and two doctors of pharmacy (J.S.M., J.M.W.).

Survey Instrument
The AIDS (acquired immune deficiency syndrome) Knowledge and Attitudes Supplement to the 1992 NHIS,41 as well as the instrument used by Eisenberg and colleagues,5 were used as models for the creation of the present 35-item survey. The instrument was designed to measure usage patterns for, attitudes about, and knowledge of herbal products and nutritional supplements. Both models5,41 have functioned as prototypes for phraseology and format to assist in gathering demographic data.

To assess interobserver reliability and to evaluate the clarity of the survey queries, a pretest was conducted using 25 volunteers and 2 interviewers (J.S.M., S.K.W.).42 The investigator read the questions and statements on the survey form, most of which required a “true/false/don’t know” or “yes/no/don’t know” answer from the participant. The questions and statements used to solicit this information are provided in the Appendix.

Statistical Analysis
Data were prospectively stratified by sex, race, annual household income, and education level. Each demographic inquiry and assessment question was tabulated and then recorded as the percentage of the total survey. All statistical analyses were performed using Statistical Analysis Software (Version 8.0; SAS Institute, Cary, NC). We used descriptive statistics to assess basic knowledge, as well as perceptions—especially with regard to safety and usage.

Multiple logistic regression analysis was used to identify the independent contribution of sociodemographic factors, health status, and attitudes toward the probability of use of herbal products and dietary supplements. The use of herbs and supplements was the dependent variable. Sociodemographic factors, current health status, and participants’ attitudes toward use were the independent predictors. Adjusted odds ratio (OR) and 95% confidence intervals (CI) for the probability of using herbs and supplements were calculated for each predictor to explain the strength of the association after controlling for age, sex, race, health insurance status, annual income, and education level.

Results
Demographic Data and Health Status
Two hundred sixty-seven surveys were successfully completed over a 3-month period in late 1999 and early 2000. The sociodemographic characteristics and health status of the survey participants are summarized in Table 1. The mean age of survey respondents was 74.5 years (range, 57-93 years). Of these respondents, 186 (70%) were women and 81 (30%) were men. By race, respondents were almost evenly split between white (134 [50%]) and black (130 [49%]), with 3 (1%) respondents self-classified as “other.” The vast majority of survey respondents (232 [87%]) reported being currently under a physician’s care. A review of body systems revealed that 251 (94%) participants reported at least one current medical condition.

Information regarding interactions with nonphysician healthcare practitioners was also solicited from participants. Of the 67 (25%) participants who had seen CAM practitioners in the past year, 45 reported seeing a chiropractor; 7, an acupuncturist; 4, a faith healer; 2, an herbalist; and 1, a massage therapist. Four participants reported seeing both an acupuncturist and a chiropractor, while 1 participant reported seeing a chiropractor and an herbalist. Approximately 17% of patients presented to multiple CAM practitioners. The most common reason given for visiting these practitioners was for therapy related to either a musculoskeletal condition or musculoskeletal pain, which was mentioned by 13 (29%) of the 45 participants.

Use of Herbal Products and Dietary Supplements
Information regarding participant use of herbal products and dietary supplements is summarized in Table 1. Fifty-six (21%) survey respondents reported taking at least one of these products, with 19 individuals taking two or more products concomitantly.

A total of 90 different herbs or supplements were used by participants. Glucosamine and garlic were the most frequently used products, followed closely by Echinacea and Gingko biloba. Thirty other products not listed in Table 1 were each used by no more than 2 survey participants.

The most common reasons stated by survey respondents for taking an herbal product or dietary supplement were to improve general wellness, to help manage arthritis, to help prevent or manage colds, or to improve memory.

More than half of the 56 individuals who reported taking these products obtained them through health food stores, though 23% purchased them at grocery stores, and 12% received them via mail order or from a healthcare provider. Survey participants were asked to estimate their monthly expenditure for these products. Of the 56 participants, 48% reported paying less than $5 per month; 27%, between $5 and $10; 16%, between $10 and $20; and 1%, more than $100.

The results of our analysis of sociodemographic factors, participant attitudes, and health status issues that might influence the use of herbal products and dietary supplements are presented in Table 2. In terms of sociodemographic factors, white women who had at least some college education were more than twice as likely as other survey participants to use an herbal product or dietary supplement. With regard to health status, those participants who reported having three or more current medical problems were about twice as likely as other respondents to use herbs or supplements.
Other factors that appeared to be highly predictive of herb or supplement use were (1) an attitude that these products are taken if the person thinks they will help, and (2) a history of receiving healthcare from CAM practitioners. Participants who indicated that they do not take prescription or over-the-counter medications were unlikely to take herbal products or dietary supplements.

The strongest predictor of herb/supplement use was not based on subject demographic variables or attitudes toward these products, however. Instead, individuals citing “general health reasons” as an explanation for herb/supplement use were 16 times more likely than other participants to consume herbal products and dietary supplements. These findings suggest that the preservation of health—regardless of an individual’s assessment of his or her own health status, medical history, or concomitant medications—was by far the most predictive indicator for use of herbal products and dietary supplements.

Approximately 3 out of 4 survey participants reported using herbal products and dietary supplements. The most common products used were glucosamine or glucosamine/chondroitin, garlic, echinacea, ginkgo biloba, herbal tea, cod liver oil, St John’s wort, ginseng, saw palmetto, and other products. The duration of use ranged from weeks to years.

### Table 1

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, y</strong></td>
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</tr>
<tr>
<td>□ 57-64</td>
<td>50 (19)</td>
</tr>
<tr>
<td>□ 65-74</td>
<td>90 (34)</td>
</tr>
<tr>
<td>□ ≥75</td>
<td>127 (48)</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>□ Men</td>
<td>81 (30)</td>
</tr>
<tr>
<td>□ Women</td>
<td>186 (70)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
</tr>
<tr>
<td>□ Black</td>
<td>130 (49)</td>
</tr>
<tr>
<td>□ White</td>
<td>134 (50)</td>
</tr>
<tr>
<td>□ Other</td>
<td>3 (1)</td>
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<tr>
<td><strong>Employment Status</strong></td>
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<tr>
<td>□ Employed</td>
<td>24 (9)</td>
</tr>
<tr>
<td>□ Retired</td>
<td>243 (91)</td>
</tr>
<tr>
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<tr>
<td>□ Insured</td>
<td>240 (90)</td>
</tr>
<tr>
<td>□ Uninsured</td>
<td>27 (10)</td>
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<tr>
<td><strong>Annual Income</strong></td>
<td></td>
</tr>
<tr>
<td>□ &lt; $20,000</td>
<td>225 (84)</td>
</tr>
<tr>
<td>□ ≥$20,000</td>
<td>42 (16)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
</tr>
<tr>
<td>□ Some high school</td>
<td>70 (2)</td>
</tr>
<tr>
<td>□ High school graduate</td>
<td>98 (3)</td>
</tr>
<tr>
<td>□ Some college</td>
<td>56 (21)</td>
</tr>
<tr>
<td>□ College graduate</td>
<td>42 (16)</td>
</tr>
<tr>
<td><strong>Medical History</strong></td>
<td></td>
</tr>
<tr>
<td>□ Current medical condition(s)</td>
<td></td>
</tr>
<tr>
<td>– Coronary artery disease/hypertension</td>
<td>119 (45)</td>
</tr>
<tr>
<td>– Endocrine problem</td>
<td>55 (21)</td>
</tr>
<tr>
<td>– Rheumatism</td>
<td>54 (20)</td>
</tr>
<tr>
<td>– Respiratory problem</td>
<td>22 (8)</td>
</tr>
<tr>
<td>– Gastrointestinal problem</td>
<td>16 (6)</td>
</tr>
<tr>
<td>– Central nervous system problem</td>
<td>14 (5)</td>
</tr>
<tr>
<td>– Cancer</td>
<td>12 (5)</td>
</tr>
<tr>
<td>– Eye problem</td>
<td>12 (5)</td>
</tr>
<tr>
<td>– Renal problem</td>
<td>8 (3)</td>
</tr>
<tr>
<td>(continued)</td>
<td></td>
</tr>
</tbody>
</table>

* Survey participants were queried as to current use of prescription or over-the-counter medications.

† Survey participants were queried as to recent (ie, <1 year) treatment history with any of the following complementary or alternative medicine (CAM) providers: acupuncturist, chiropractor, faith healer, herbalist, or homeopath.

‡ n= 56
having received some information about herbal products and dietary supplements in the previous month. Television was the most commonly reported source of this information (73%) for these participants, followed by magazines and radio (both 13%), newspapers (13%), friends (8%), and store displays (5%).

**Product Safety**

Participant responses to survey questions related to the safety and government regulation of herbal products and dietary supplements indicated a wide gap between perception and reality (Table 3). Of 267 participants, the majority (176 [66%]) believed that these products “pose no risk to the general population.” In addition, a large number of participants (160 [60%]) were under the misimpression that the FDA “regulates herbal products,” and an overwhelming majority (187 [70%]) incorrectly believed that the FDA routinely tests these products. Although few participants (72 [27%]) knew that the purity of these products is questionable, nearly half (120 [45%]) knew that product contents were not standardized among manufacturers.

Participants’ responses to queries concerning their attitudes toward herbal products and dietary supplements also demonstrate a disparity between perceptions and reality. The vast majority of survey respondents (243 [91%]) expressed their belief that older Americans are often the targets of “medical quackery.” Yet, most participants (208 [78%]) also indicated that they believe herbal products and dietary supplements have health benefits, and about half (137 [51%]) believe that Medicare, Medicaid, or private insurance should pay for these therapies. A minority of participants (55 [21%]) incorrectly believe that “dietary supplements provide all the nutritional benefits of real food.” Nearly half (121 [45%]) of respondents said they would take an herb or supplement “if my doctor tells me to,” whereas only 75 (28%) said they would take it on their own “if I think it will help me.”

A number of drug or disease interactions involving herbal products and dietary supplements have been documented in the literature. Potential interactions were apparent in 12 individuals participating in the present survey. For example, though garlic has been cited as an aggravating factor for gastroesophageal reflux disease (GERD), one participant with GERD was taking concomitant garlic and cimetidine. In addition, though there may be an increased risk of bleeding when taking garlic with aspirin, we found that 2 survey respondents were taking both substances concurrently. One survey participant reported taking estrogen in addition to ginseng, which has been touted to have estrogen-like effects. Similarly, patients have been advised against combining oral diabetic agents and ginseng, as ginseng may reduce blood glucose levels, but 1 respondent reported taking both agents simultaneously. Five participants receiving aspirin or other nonsteroidal anti-inflammatory drugs were also taking *Gingko biloba*, which has known antiplatelet and anticoagulant properties. One participant with an anxiety disorder was taking ginseng, which has been reported to exacerbate this condition. Participants taking St John’s wort also reported taking

<table>
<thead>
<tr>
<th>Factors</th>
<th>Odds Ratio*</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, &gt;70 y</td>
<td>1.33</td>
<td>0.62-2.83</td>
</tr>
<tr>
<td>Sex, woman</td>
<td>1.13</td>
<td>0.55-2.29</td>
</tr>
<tr>
<td>Race, white</td>
<td>2.87</td>
<td>1.45-5.68</td>
</tr>
<tr>
<td>Insurance (health)</td>
<td>0.61</td>
<td>0.22-1.71</td>
</tr>
<tr>
<td>Annual income, &gt;$20,000</td>
<td>0.59</td>
<td>0.25-1.44</td>
</tr>
<tr>
<td>Education, some college</td>
<td>2.10</td>
<td>1.11-3.99</td>
</tr>
<tr>
<td>Attitude Toward Supplementation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“if I think it will help me”</td>
<td>3.30</td>
<td>1.36-8.01</td>
</tr>
<tr>
<td>“only if my doctor tells me to”</td>
<td>0.42</td>
<td>0.39-0.90</td>
</tr>
<tr>
<td>No (does not take them)</td>
<td>0.37</td>
<td>0.04-3.47</td>
</tr>
<tr>
<td>Medical History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently under physician care</td>
<td>1.41</td>
<td>0.55-3.62</td>
</tr>
<tr>
<td>Medical condition(s) not present</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>0.18</td>
<td>0.02-1.66</td>
</tr>
<tr>
<td>Central nervous system problem</td>
<td>0.27</td>
<td>0.05-1.51</td>
</tr>
<tr>
<td>Coronary artery disease/hypertension (cardiovascular problem)</td>
<td>0.45</td>
<td>0.16-1.27</td>
</tr>
<tr>
<td>Endocrine problem</td>
<td>0.36</td>
<td>0.11-1.20</td>
</tr>
<tr>
<td>Eye problem</td>
<td>0.39</td>
<td>0.06-2.43</td>
</tr>
<tr>
<td>Gastrointestinal problem</td>
<td>1.56</td>
<td>0.42-5.97</td>
</tr>
<tr>
<td>Respiratory problem</td>
<td>0.65</td>
<td>0.18-2.41</td>
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<tr>
<td>Rheumatism (musculoskeletal problem)</td>
<td>0.70</td>
<td>0.27-1.81</td>
</tr>
<tr>
<td>Three or more concurrent medical conditions</td>
<td>1.99</td>
<td>1.06-3.73</td>
</tr>
<tr>
<td>Current medication use†</td>
<td>0.92</td>
<td>0.27-3.11</td>
</tr>
<tr>
<td>Current client of CAM practitioner(s)‡</td>
<td>3.78</td>
<td>1.94-7.35</td>
</tr>
<tr>
<td>Current use of herbal product(s) and/or dietary supplement(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For general health purposes</td>
<td>16.63</td>
<td>6.91-40.02</td>
</tr>
<tr>
<td>As a result of physician recommendation or prescription</td>
<td>2.19</td>
<td>0.79-6.10</td>
</tr>
</tbody>
</table>

* Adjusted odds ratio after controlling for sociodemographic factors.
† Survey participants were queried as to current use of prescription or over-the-counter medications.
‡ For survey participants currently under care of complementary and alternative medicine (CAM) practitioners for pain, the odds ratio for herbal product and/or dietary supplement use was 3.75 (95% CI, 1.89-7.46).
A variety of hypotheses have been proposed to explain the increased use of CAM therapies, including herbal remedies, in the United States. These explanations range from a dissatisfaction with conventional treatments to a desire for more autonomy over decisions involving one’s own health. In support of the latter theory, the most significant predictor we identified for patient use of herbs or supplements was an interest in the “general health purposes” of these substances (OR, 16.63; 95% CI, 6.91-40.02). Being aware of this and other predictors can help physicians maximize their interactions with patients. It is important for physicians to understand which patients may be predisposed to use alternative forms of therapy, as well as why those individuals might choose that treatment course.

American consumers take for granted the high quality inherent in the manufacture of prescription and over-the-counter medications, usually accepting without question the consistency, purity, and potency of these items. The results of our survey suggest that many consumers have mistakenly transferred this trust to unregulated herbal products and dietary supplements. Two thirds of the survey respondents mistakenly believe that herbal products and dietary supplements are safe and pose no risk to the general public, 70% incorrectly believe that the FDA tests these products, and 60% falsely believe that the FDA regulates them.

These misperceptions may be the reason that 22% of respondents in our survey incorrectly believe that it is unimportant to disclose herbal/supplement use to their primary care physicians. Unfortunately, 19% of these patients were at risk for adverse events or drug interactions as a result of their failure to share this information with their physicians—and possibly their physicians’ failure to consider asking more pointed questions in patient encounters.

There are certain limitations of the present study. The usage and attitude patterns of mature adult residents of metropolitan Kansas City may not reflect the patterns of usage and attitudes found in other areas of the country. In addition, our data included mainly white and black patients and, therefore, cannot be extrapolated to other racial or cultural groups. Finally, we focused our efforts on mature adults in an independent-living setting; data derived from institutionalized individuals would likely differ significantly.

The general trend toward increased acceptance of herbal remedies and dietary supplements by American consumers is undeniable. Prevalence data from our survey, as well as others, indicate that herbal products and dietary supplements are important components in the growing search for general well-being by many Americans. Primary care physicians need to appreciate how important these products appear to be to patients’ self-care regimens. However, the communication gap between patients and physicians regarding the role of herbs and supplements as components of treatment is glaring.

Physicians must be cognizant of the potential adverse effects and interactions of herbs and supplements with various

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**Table 3**

Herbal Product/Dietary Supplement Survey: Baseline Measures of Participant Perceptions and Knowledge (N=267)

<table>
<thead>
<tr>
<th>Participants</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accurate Beliefs/Knowledge</strong></td>
<td></td>
</tr>
<tr>
<td>Herbal product purity is questionable</td>
<td>72 (27)</td>
</tr>
<tr>
<td>Familiar with FDA-required labeling for these products</td>
<td>168 (63)</td>
</tr>
<tr>
<td>Herbs can be dangerous when combined with prescription medications</td>
<td>224 (84)</td>
</tr>
<tr>
<td>Herbal product contents are not standardized among manufacturers</td>
<td>120 (45)</td>
</tr>
<tr>
<td><strong>Inaccurate Beliefs/Knowledge</strong></td>
<td></td>
</tr>
<tr>
<td>Herbal products pose no widespread risk</td>
<td>176 (66)</td>
</tr>
<tr>
<td>The FDA regulates herbal products</td>
<td>160 (60)</td>
</tr>
<tr>
<td>The FDA tests herbal products</td>
<td>187 (70)</td>
</tr>
<tr>
<td>Herbal products must fulfill labeling claims</td>
<td>187 (70)</td>
</tr>
</tbody>
</table>

Abbreviation: FDA, US Food and Drug Administration.

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paroxetine hydrochloride, digoxin, or estrogen—all of which have been shown to potentially interact with the herbal antidepressant.18,20

**Comment**

The present study is not intended as a commentary on the benefits or risks of herbal products and dietary supplements—or on the potential role of these substances in patient care. Rather, the purpose of the study was to document and analyze real use among older Americans and to determine this population’s understanding of potential risks. It is our hope that the information gained from the present study will assist healthcare providers in developing appropriate educational interventions for this patient population.

In our surveyed group of 267 older adults residing in a large Midwestern metropolitan area, 21% of participants indicated that they were currently taking at least one herbal product or dietary supplement. This prevalence rate is similar to that reported in various special populations. Most (86%) participants in the survey were under the care of a physician, yet less than 12% of the herbal or dietary products being used in this study group were prescribed or recommended by physicians.

Although no definite conclusions can be drawn regarding the type of individual who uses herbal products or dietary supplements, a few basic patterns are apparent. The results of our survey indicate that the most likely individual to use an herbal product or dietary supplement is a relatively well-educated white woman. These findings are consistent with other surveys that were not limited by age. It should be noted, however, that some investigators have found no correlation between use of these products and demographic factors.6,53
prescribed substances. Inquiries about herb/supplement use should become a routine component of each patient’s medical history interview.

Osteopathic physicians have a unique opportunity to take a lead in this process. Patient education materials should routinely carry warnings and information about concomitant use of herbal products and dietary supplements with conventional prescription and over-the-counter products. Educational opportunities should be made readily available for osteopathic physicians and trainees to increase their knowledge of CAM.

The present survey found that the most common reason for visiting a CAM practitioner was therapy for a musculoskeletal condition or pain. This information should be seen as yet another opportunity for osteopathic physicians. Given the osteopathic medical profession’s emphasis on “whole patient” care and its emphasis on musculoskeletal conditions, osteopathic physicians have an excellent opportunity to transfer their knowledge and training to the treatment of older adults with painful chronic conditions.

Consumers need more information from their physicians and other healthcare professionals about CAM approaches to healthcare using herbal products and dietary supplements.

Conclusion
Tens of millions of Americans use herbal products and dietary supplements, including about 20% of the participants in our survey of older Americans. We found misperceptions among these individuals regarding the safety and testing of these products. Two thirds of all respondents falsely believe that herbal products and dietary supplements pose no risk to the general population. The majority of participants incorrectly thought that the FDA tests these products and routinely regulates the herb and supplement industry. These findings indicate a wide gap between perception and reality.

An encouraging finding of the present study was that most respondents expressed interest in learning more about herbal products and dietary supplements. Thus, an excellent opportunity is available for expanded patient education and improved patient-physician interactions.

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References

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Appendix

University of Missouri–Kansas City School of Medicine herbal product and dietary supplement survey. During the 3-month study, this survey instrument was used to solicit responses from 267 Kansas City–area residents aged approximately 60 years or older. Survey has been altered for graphic enhancement only.

Herbal Product and Dietary Supplement Survey
University of Missouri–Kansas City School of Medicine

PART A
Solicit true/false responses from participant, assessing knowledge of safety and regulation of herbal products and dietary supplements.

(1) Vitamin and mineral supplements are risk free to the general public.
(2) The Food and Drug Administration, the same government body that controls prescription medications, controls herbal products.
(3) Herbal products must be safe to be sold in the United States.
(4) Herbal products sold in the United States are pure.
(5) Herbal products must do what they say they will do to be sold in the United States.
(6) All dietary supplements and herbal products must carry the labeling, “This product is not intended to diagnose, treat, cure, or prevent disease.”
(7) It can be dangerous to take herbs with some prescription medications.
(8) The amount of herb in herbal products is the same among different brand names. For example, all Ginkgo biloba products contain the same amount of Ginkgo biloba.

PART B
Solicit true/false responses from participant, assessing attitudes toward herbal products and dietary supplements. Solicit participant’s choice in question 16.

(9) It is important that my doctor know what herbal products I am taking.
(10) Insurance, Medicare, or Medicaid should pay for herbal products.
(11) Dietary supplements and vitamins have health benefits.
(12) I would like more information on whether dietary supplements or herbal products may help me.
(13) Dietary supplements provide all the nutritional benefits of real food.
(14) Older Americans are often the targets of medical quackery.
(15) Herbal products have health benefits.
(16) Which statement is closest to your feelings about herbal products and dietary supplements?
   ☐ I am likely to take one only if I need it.
   ☐ I am likely to take one if I think it will help me.
   ☐ I am likely to take one only if my doctor tells me to.
   ☐ I do not take herbal products or dietary supplements.

PART C
Solicit appropriate responses from participant, assessing current health status.

(17) Are you currently under a doctor’s care, and, if so, for what condition(s)?

(18) Do you have any of the following medical conditions?
   ☐ Cancer
   ☐ Central nervous system problem
   ☐ Coronary artery disease/hypertension
   ☐ Endocrine problem
   ☐ Eye problem
   ☐ Gastrointestinal problem
   ☐ Renal problem
   ☐ Respiratory problem

(19) Are you taking any prescription or over-the-counter medications? If so, can you name them or describe what they are used for?

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Appendix (continued)

University of Missouri–Kansas City School of Medicine herbal product and dietary supplement survey. During the 3-month study, this survey instrument was used to solicit responses from 267 Kansas City–area residents aged approximately 60 years or older. Survey has been altered for graphic enhancement only.

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### Herbal Product and Dietary Supplement Survey

**PART D**  
Solicit appropriate responses from participant, assessing use of alternative or complementary healthcare.

(20) In the past year, have you been seen by any of the following practitioners? If yes, for what condition?

- **Acupuncturist**
- **Chiropractor**
- **Faith healer**
- **Herbalist**
- **Homeopath**

**PART E**  
Solicit yes/no responses from participant, assessing awareness of herbal products and dietary supplements.

(21) Have you ever heard of any of the following herbal products?

- **Alfalfa leaves**
- **Codak**
- **Chamomile**
- **Echinacea**
- **Garlic**
- **Gingko biloba**

**PART F**  
Solicit appropriate responses from participant, assessing use of herbal products and nonvitamin dietary supplements.

(23) In the past month, have you received any information about nutritional supplements or herbal products from any of the following sources?

- **Brochure from health department**
- **Brochure from school**
- **Brochure from workplace**
- **Bus advertisement**
- **Church**
- **Community organization**
- **Friend**
- **Magazine**

- **Newspaper**
- **Radio**
- **Store display**
- **Street signs/billboard**
- **Television**
- **Other source**
- **Don’t know**
- **Received no information in past month**

(continued)
Appendix (continued)

Herbal Product and Dietary Supplement Survey
University of Missouri–Kansas City School of Medicine (continued)

PART F (continued from previous page)
Solicit appropriate responses from participant, assessing use of herbal products and nonvitamin dietary supplements.

(24) Are you currently taking dietary supplements? □ Yes □ No
(25) If so, what are you taking? ________________________________
(26) How did you find out about it? ____________________________
(27) Did you talk to anyone before starting to take it? □ Yes □ No
(28) What are you taking it for? _______________________________
(29) Did your doctor prescribe it for you? □ Yes □ No
(30) How much are you taking each day? _______________________
(31) How long have you been taking it? _________________________
(32) Do you feel it helps you? _________________________________
(33) Do you experience any adverse effects? ___________________
(34) Where do you buy your supplements? _____________________
(35) How much do you spend on supplements on a monthly basis? ____________________________