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Herbal and Dietary Supplement Disclosure to Health Care Providers by Individuals with Chronic Conditions

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Abstract

Background: Very little is known about herbal and dietary supplement disclosure in adults with chronic medical conditions, especially on a national level.
Objective: To examine herbal and dietary supplement disclosure to conventional health care providers by adults with chronic medical conditions.
Design: Data on herbal and dietary supplement use ($N = 5456$ users) in the previous year were used from the 2002 National Health Interview Survey. Bi-variable analyses compared characteristics between herbal and dietary supplement disclosers and nondisclosers. Multivariable logistic regression identified independent correlates of herbal and dietary supplement disclosure.
Results: Overall, only 33% of herbal and dietary supplement users reported disclosing use of herbal and dietary supplements to their conventional health care provider. Among herbal and dietary supplement users with chronic conditions, less than 51% disclosed use to their conventional health care provider. Hispanic (adjusted odds ratio and 95% confidence interval = 0.70 [0.52, 0.94]) and Asian American (adjusted odds ratio and 95% confidence interval = 0.54 [0.33, 0.89]) adults were much less likely than non-Hispanic white Americans to disclose herbal and dietary supplement use. Having less than a high school education (adjusted odds ratio and 95% confidence interval = 0.61 [0.45, 0.82]) and not having insurance (adjusted odds ratio and 95% confidence interval = 0.77 [0.59, 1.00]) were associated with being less likely to disclose herbal and dietary supplement use.
Conclusion: Herbal and dietary supplement disclosure rates are low, even among adults with chronic conditions. These findings raise concerns about the safety of herbal and dietary supplements in combination with allopathic care. Future studies should focus on educating physicians about crosscultural care as well as eliciting information about herbal and dietary supplement use.

Introduction

Herbal and dietary supplements (HDS) are the most commonly used complementary and alternative medicine (CAM) therapies.[1] An herb (also called a botanical) is defined by the National Center for Complementary and Alternative Medicine (NCCAM) as a plant or plant part used for its scent, flavor, and/or therapeutic properties to supplement the diet.[2] The 2002 National Health Interview Survey (NHIS) indicated that 19% of adults used some form of herbal and nonvitamin dietary supplements during the previous 12 months,[1] and that use may be even higher among some ethnic minorities.

Despite the high rate of use of HDS among adults in the United States, relatively little is known about disclosure of HDS use to conventional health care providers and the factors associated with disclosure. Data suggest that only 23% to 37% of CAM users disclosed at least one type of CAM use to their physician.[3,4]

Questions of safety, efficacy, and herb-drug interactions fuel the importance of discussing HDS use with one's conventional health care provider. Few studies have examined

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disclosure of HDS use to conventional health care providers. In earlier national and small cross-sectional surveys, 30% to 44% of individuals who take HDS regularly did not share this information with a health care provider.[5,6] Studies suggest that there may be ethnic variation in the prevalence of HDS use; however, ethnic differences in disclosure of HDS use are poorly understood.[7–9] Recent studies using the 2002 NHIS found that disclosure of overall CAM use remained low, especially among potentially vulnerable groups such as the elderly and racial/ethnic minorities.[10–12]

Furthermore, other factors associated with HDS disclosure may be critical for physicians to know in providing quality health care. HDS use may be particularly concerning among individuals with chronic medical conditions, because they

TABLE 1. CHARACTERISTICS OF ADULT RESPONDENTS (N = 30,144) COMPARING USERS AND NONUSERS OF HERBAL AND DIETARY SUPPLEMENTS (HDS)

Characteristic	*HDS users (n = 5456)**	*HDS nonusers (n = 20,086)**
Age†		
18–24	11%	13%
25–44	41%	38%
45–64	37%	31%
≥65	11%	18%
Race/Ethnicity†		
Asian	5%	3%
Hispanic	8%	9%
Non-Hispanic black	9%	12%
Non-Hispanic white	79%	75%
Female†	58%	51%
Education†		
<High school	8%	18%
High school graduate	57%	60%
College or higher	35%	23%
Family Income†		
0–19,999	16%	21%
20,000–44,999	28%	31%
45,000–74,999	24%	23%
≥75,000	32%	25%
Region†		
Northeast	20%	19%
Midwest	23%	25%
South	32%	38%
West	25%	17%
Currently married	59%	58%
Foreign-born	13%	13%
Among foreign-born, years in US		
<5	13%	16%
5–10	13%	15%
≥10	74%	69%
Uninsured	14%	15%
Has access to conventional care	87%	87%
Self-rated health†		
Good or better	90%	88%
Chronic conditions		
Rheumatologic†	24%	20%
Oncologic	8%	7%
Cardiac‡	42%	39%
Vascular	10%	10%
Pulmonary†	14%	11%
Gastrointestinal†	15%	11%
Neurologic	3%	3%
Endocrine	13%	13%
Number of chronic conditions†		
0	37%	44%
1	25%	22%
≥2	37%	34%
Prescription medication use†	73%	66%

*Percents were weighted to reflect national estimates.
†$p < 0.001$.
‡$p < 0.05$.

are likely also to be taking medications to treat their condition. The combination of prescription medications and HDS places patients at increased risk of possible herb-drug interactions.[13] In addition, recent clinical studies have highlighted issues of contamination, adulteration, and misidentification of HDS products.[14–17] This is more troubling in those with chronic conditions who come from marginalized, disadvantaged, and disenfranchised populations. While the popularity and awareness of HDS has increased since 1997, it is not clear how HDS disclosure rates have changed.

Given this dearth of information, we used the 2002 NHIS to estimate national rates of HDS disclosure to conventional health care providers among individuals with chronic medical conditions who use prescription medication, explore ethnic variations in HDS disclosure, and identify factors associated with HDS disclosure.

Methods

Data source

The Institutional Review Boards at our institutions approved this study. We analyzed data from the 2002 NHIS Sample Adult Core and the Alternative Medicine Supplement. NHIS is a multi-purpose health survey conducted by the National Center for Health Statistics, Centers for Disease Control and Prevention, and is the principal source of information on the health of the civilian, noninstitutionalized, household population of the United States. Households were randomly selected using a multi-stage stratified sampling design. Face-to-face surveys were administered in English and/or Spanish by the U.S. Census Bureau. One randomly selected adult, aged 18 years or older, from each household was asked to complete the Sample Adult and Alternative Medicine questionnaires. Hispanic and non-Hispanic black populations were oversampled. The adult sample included 31,044 respondents, with an overall response rate of 74%.

The Alternative Medicine questionnaire solicited information on 19 nonconventional health therapies. We examined natural herb use, defined by the NHIS as "plants with medicinal properties."

Respondents were first queried about their use of herbal medicine: "Have you ever used natural herbs for your own health or treatment (for example ginger, Echinacea, or black cohosh including teas, tinctures, and pills)?" Respondents who replied yes to that question were then asked, "DURING THE PAST 12 MONTHS, did you use natural herbs for your own health or treatment?" The 5456 respondents who used HDS in the past 12 months comprised our primary study sample. From these individuals, disclosure was ascertained using the question: "Did you let any of these conventional medical professionals (medical doctor, nurse practitioner/physician assistant, psychiatrist) know about your use of natural herbs?" Our primary outcome of interest was disclosure of HDS use to conventional health care providers. Respondents who said "yes" to HDS use in the past 12 months were also queried about use of specific herbs from a list of 35 commonly used supplements (29 plant-based and 6 not plant-based). We further explored disclosure rates about the 7 most commonly used supplements (echinacea, ginseng, *Gingko biloba*, garlic, glucosamine/chondroitin, St. John's wort, and peppermint), because they had samples sufficient for descriptive analyses.

We identified potential correlates of HDS use from previous literature, including sociodemographic characteristics, health care access, and illness burden. Sociodemographic characteristics included respondent's age, race/ethnicity, sex, educational attainment, region of residence, annual family income, place of birth (US-born, foreign-born) and, for foreign-born respondents, the number of years resident in the US. Health care access was measured by insurance status, having a usual source of conventional health care, and number of clinic visits over the past 12 months. Disease burden was measured by self-rated health status, prescription medication use, and self-reported chronic medical conditions. Chronic medical conditions were grouped together as rheumatologic (osteoarthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia), cardiac (hypertension, coronary heart disease, angina, myocardial infarction, high cholesterol, irregular heartbeat, or congestive heart failure), vascular (stroke or poor circulation), pulmonary (emphysema or asthma), gastrointestinal (ulcer or inflammatory bowel disease), neurologic (multiple sclerosis, Parkinson's disease, seizure, or neuropathy), or endocrine (thyroid disease or diabetes mellitus). In addition, we measured the number of chronic medical conditions. Lastly, we examined whether HDS use was for maintenance of health and well-being.

Statistical analysis

All analyses used SUDAAN v. 8.1 (Research Triangle Institute, Research Triangle Park, NC) to obtain proper variance estimates that account for the complex sampling design. All results were weighted to reflect national estimates. We used bi-variable analyses to describe the study sample and compare characteristics between HDS disclosers and non-disclosers. We used multivariable logistic regression to examine HDS disclosure rates among individuals with chronic medical conditions, after adjusting for sociodemographic characteristics, health care access, disease burden, and use of HDS for maintenance of health and wellness. We then used multivariable logistic regression to identify independent correlates of HDS disclosure, after adjusting for sociodemographic characteristics, health care access, disease burden, and use of HDS for maintenance of health and wellness. Lastly, we describe disclosure rates for the most commonly used HDS.

Table 2. Disclosure of Herbal and Dietary Supplement (HDS) Use to Conventional Health Care Providers by Chronic Medical Condition

Medical condition	*HDS users (n = 5456)**	*Adjusted OR (95% CI)*
Rheumatologic	46%	**1.39 (1.18, 1.62)**
Oncologic	51%	**1.50 (1.18, 1.91)**
Cardiac	41%	**1.30 (1.11, 1.52)**
Vascular	45%	1.23 (0.97, 1.55)
Pulmonary	37%	1.07 (0.88, 1.30)
Gastrointestinal	44%	**1.26 (1.03, 1.55)**
Neurologic	50%	**1.79 (1.24, 2.60)**
Endocrine	43%	0.97 (0.77, 1.21)

OR, odds ratio; CI, confidence interval.

*Percents were weighted to reflect national estimates.

Bolded odds ratios represent statistically significant odds ratios (i.e. they do not cross 1.00).

Table 3. Disclosure of Herbal and Dietary Supplement (HDS) Use to Conventional Health Care Providers among HDS Users ($N = 5456$)

Characteristic	*Disclosure by HDS users**	*Adjusted OR (95% CI)*
Age†		
18–24	24%	0.82 (0.60, 1.11)
25–44	27%	**0.83 (0.71, 0.98)**
45–64	38%	Reference
≥65	43%	1.09 (0.86, 1.38)
Race/Ethnicity†		
Asian	17%	**0.54 (0.33, 0.89)**
Hispanic	22%	**0.70 (0.52, 0.94)**
Non-Hispanic black	31%	0.83 (0.66, 1.04)
Non-Hispanic white	35%	Reference
Sex†		
Male	28%	**0.85 (0.73, 1.00)**
Female	36%	Reference
Education†		
<High school	23%	**0.61 (0.45, 0.82)**
High school graduate	33%	Reference
College or higher	34%	1.08 (0.92, 1.27)
Income‡		
0–19,999	27%	0.88 (0.69, 1.11)
20,000–44,999	32%	Reference
45,000–74,999	34%	1.10 (0.90, 1.33)
≥75,000	34%	1.00 (0.83, 1.20)
Region‡		
Northeast	33%	0.90 (0.73, 1.10)
Midwest	34%	1.00 (0.83, 1.22)
South	34%	Reference
West	29%	0.83 (0.68, 1.01)
Place of Birth†		
Foreign-born	21%	0.83 (0.64, 1.10)
Born in US	34%	Reference
Insurance status†		
Uninsured	18%	**0.77 (0.59, 1.00)**
Insured	35%	Reference
Usual source of conventional healthcare†		
Yes	36%	Reference
No	11%	**0.45 (0.32, 0.64)**
Number of clinic visits in the past 12 months†		
0	3%	Reference
1–3	38%	**2.95 (2.07, 4.19)**
≥4	59%	**3.89 (2.69, 5.62)**
Self-rated health†		
Good or better	32%	0.87 (0.69, 1.10)
Fair or poor	42%	Reference
Number of chronic conditions†		
0	21%	Reference
1	32%	**1.35 (1.10, 1.65)**
≥2	44%	**1.62 (1.34, 1.97)**
Prescription medication use†		
Yes	39%	**1.89 (1.52, 2.34)**
No	15%	Reference
Using HDS for health and well-being†		
Yes	43%	**2.11 (1.81, 2.45)**
No	29%	Reference

*Percents were weighted to reflect national estimates.
†$p < 0.001$.
‡$p < 0.05$.
OR, odds ratio; CI, confidence interval.

Results

Table 1 presents characteristics of the 31,044 respondents to the Sample Adult and Alternative Medicine Supplement comparing HDS users to non-users. We found important differences between HDS users and non-users in sociodemographic characteristics and disease burden. Specifically, HDS users were more often younger, female, highly educated, and had higher incomes. Individuals with rheumatologic, cardiac, pulmonary, and gastrointestinal conditions were significantly more likely to be HDS users than non-users. Moreover, HDS users were more likely to use prescription medications than non-users. Among HDS users, 29% reported using HDS to maintain their health and well-being.

Overall, one-third of HDS users reported disclosing their use of HDS to their conventional health care provider. Table 2 presents unadjusted HDS disclosure rates according to chronic medical condition. With the exception of neurologic and oncologic conditions, fewer than 50% of people with a particular chronic medical condition indicated that they disclosed their use of HDS to their conventional health care provider. After adjustment for sociodemographic characteristics, health care access, and illness burden, individuals with vascular, pulmonary, and endocrine conditions were no more likely to report their use of HDS as compared to individuals without those respective conditions.

There was significant ethnic variation in HDS disclosure rates, with Hispanic and Asian Americans having lower disclosure rates than non-Hispanic whites and African Americans (Table 3). Unadjusted disclosure rates decreased with advancing age and were lower among men, persons who were foreign born, had less than a high school education, and had family incomes less than $20,000. In addition, disclosure rates were lower among the uninsured and those reporting no usual sources of conventional health care, but were higher among individuals with more chronic medical conditions, more clinic visits, and those who used prescription medications. Lastly, disclosure rates were higher among individuals who used HDS for maintenance of health and well-being. Table 3 also presents multivariable adjusted odds ratios for characteristics that were significantly associated with disclosure. Asian and Hispanic Americans were substantially less likely than non-Hispanic white Americans to disclose their use of HDS to their conventional health care provider. Advancing age, being female, and higher educational attainment were significantly associated with HDS disclosure. However, uninsured individuals and those without usual health care access were less likely to report HDS use.

Table 4. Disclosure of Specific Use of Herbs and Dietary Supplements

Herb/dietary supplement	*Users (n = 5456)*	*Percent of users who disclosed*
Echinacea	39%	33%
Ginseng	23%	35%
Gingko	20%	39%
Garlic	19%	39%
Glucosamine	14%	52%
St. John's wort	11%	41%
Peppermint	11%	32%

Individuals with greater numbers of clinic visits over the past 12 months were much more likely to report their HDS use to their conventional health care provider. Although multiple medical conditions and prescription medications were positively associated with HDS disclosure, less than 50% of adults disclosed their HDS use. Lastly, individuals who used HDS for maintenance of health and well-being were more likely to report HDS use to their conventional health care provider.

Table 4 presents HDS disclosure rates among users of specific HDS. Users of glucosamine/chondroitin and St. John's wort had the highest disclosure rates (52% and 41%, respectively) whereas users of peppermint and *Echinacea* had the lowest rates (33% and 32%, respectively).

Discussion

Only one in three adults reported disclosing their use of HDS to their conventional health care provider. Importantly, we found that only 39% of prescription medication users and only 44% of adults with two or more chronic medical conditions reported disclosing their HDS use to their health care provider. For most chronic medical conditions, fewer than 1 of 2 HDS users reported its use to their health care provider. Even after adjustment,* individuals who reported having vascular, pulmonary, or endocrine conditions were no more likely to report HDS use to their conventional health care provider than individuals without these conditions.

This study expands on previously reported rates of disclosure of HDS to conventional health care providers in the United States.[18,19] Our findings are consistent with studies in other countries that indicate few HDS users disclose HDS use to their conventional health care provider. One study of British adults also reported a HDS disclosure rate of 33%.[20] Clement et al. studied HDS users accessing primary health care in an ethnically diverse population in Trinidad.[21] Despite 87% of individuals perceiving herbal remedies as efficacious, less than 25% informed their physician about use. A Malaysian study found that less than 10% of herbal therapy users disclosed use to their physician.[22]

We found significant ethnic variations in HDS disclosure rates, with Hispanic and Asian Americans being much less likely to disclose their HDS use. These findings support community-based surveys that found Hispanic and Asian Americans had low rates of HDS disclosure (21% to 31%).[23,24] We suspect that more vulnerable members of these communities, including those with limited English proficiency or recent immigrants, may be even less likely to discuss HDS use with their physicians.[11] This is further supported by our finding that individuals who were less educated and did not have a regular source of conventional health care were substantially less likely to disclose HDS use.

Do patients feel comfortable discussing their HDS use with their conventional health care provider? In studies of Asian Americans[25] and Hispanic Americans,[26] it was postulated that individuals do not engage in discussions of CAM out of fear of negative reactions from their conventional health care providers. However, when these discussions do take place, patients report improved quality of care.[27]

*Results have been adjusted for sociodemographic characteristics, health care access, disease burden, and use of HDS for maintenance of health and wellness.

Our data do not provide information on who initiates the discussion about HDS use, or patients' comfort with such discussions. Are physicians asking their patients about their use of HDS? In a study of perimenopausal women, only 40% reported that their physicians had ever asked about HDS use.[28] A study of Hispanic Americans found that only 26% reported that their doctors asked them about use of herbs.[29] Combined, these studies suggest that physicians infrequently ask their patients about the use of HDS.

Respondents who used glucosamine/chondroitin had higher rates of HDS disclosure. We speculate several reasons as to why this may be the case. Glucosamine/chondroitin is most often used in the treatment of osteoarthritis. In recent years, there have been large double-blind, randomized controlled trials and meta-analyses that have raised awareness about its efficacy and use.[30,31] Given known risks associated with conventional treatments of osteoarthritis, many patients may have opted to use glucosamine/chondroitin in consultation with their physician. However, despite these facts, only 1 in 2 respondents who used glucosamine/chondroitin reported HDS disclosure.

Our study has several important limitations. First, as mentioned in previous studies,[10,11] many of the 35 HDS that were asked about in the survey are marketed primarily to the non-Hispanic white population. Since surveys are conducted in English and Spanish only, group who do not speak English or Spanish were not captured in the sample, without relying on English-speaking or Spanish-speaking household members to assist in translating questions during the interview.[32] These factors may not only underestimate the prevalence of HDS use among specific populations, such as Asian Americans, but may also underestimate the rate of HDS disclosure to conventional health care providers. Secondly, we were not able to assess disclosure rates for specific HDS, as the NHIS did not assess whether respondents disclosed use of the specific HDS (e.g., glucosamine/chondroitin). Since we assumed that disclosure of HDS use included all HDS that a respondent was using and since nearly 60% of respondents had used more than one herb,[33] our reported disclosure rates may overestimate the true disclosure rate. Future NHIS instruments might ask about specific HDS disclosure, thereby increasing statistical power to study important health care information about patient-physician communication, especially with regard to particular HDS that have known significant herb-drug interactions (e.g., St. John's wort). Finally, although we found that respondents who visited a clinic more often were more likely to disclose use of HDS, the NHIS does not provide any information about the physicians to whom respondents disclosed use of HDS. Greater physician and patient language concordance is associated with higher patient ratings on interpersonal processes of care, specifically elicitation and responsiveness.[34] Hence, future survey instruments might query respondents about physician characteristics.

While our study is a cross-sectional analysis representative of the national population, our findings have important implications. Low rates of HDS disclosure by individuals with chronic medical conditions should raise concern for herb-drug interactions, side effects, and safety of dietary supplements; this should compel physicians to ask their patients about their use of HDS, especially patients with multiple comorbid conditions who are on prescription medications.

Given our findings that Hispanic and Asian Americans have lower HDS disclosure rates, we suspect that this may, in part, reflect providers' lack of training in effective cross-cultural care. In conjunction with findings from other studies, the education of conventional health care providers must include curricula on HDS, so they may provide care that is both clinically and culturally competent. In the 2003 Institute of Medicine (IOM) report on racial and ethnic disparities, the Committee found that patient-doctor communication is directly linked to patient satisfaction and health outcomes.[35] Cross-cultural education should provide a tool to help reduce health care disparities. Hence, in concert with this IOM statement, there must exist an imperative within medical education to teach future providers how to ask patients about their use of HDS. Recent work that has emphasized residents' preparedness to provide cross-cultural care is augmented by the establishment of formal education in their curriculum.[36] In light of our findings, we suggest that the HDS education be included as a part of cross-cultural education, and that HDS disclosure rates can be used as a measurable outcome for studying racial and ethnic disparities in health care.

Future research should examine HDS use and its relation to patient belief systems and the extent to which these supplements are being used in conjunction with or substitution for conditions for which conventional therapies are effective. Studies should also begin to examine mechanisms by which health care providers elicit information from their patients so they may provide appropriate patient-centered medical care.

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Conflicts of Interest

No competing financial interests exist.

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