COMPLEMENTARY AND ALTERNATIVE MEDICINE USE AMONG OLDER ADULTS: ETHNIC VARIATION

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Objective: Complementary and alternative medicine (CAM) is widely used in the United States, but information is lacking on CAM use among older minority adults. This analysis documents CAM use among Black, Hispanic, Asian, and White adults age ≥65 and delineates the importance of ethnicity in predicting CAM use.

Methods: Data are from the 2002 National Health Interview Survey (NHIS). The 2002 NHIS oversampled Blacks and Hispanics and included a special module on CAM use. Logistic regression models were fit to examine the effects of ethnicity, sex, age, educational attainment, number of health conditions, and US census region on any CAM use and use of CAM within five major groupings.

Results: 27.7% of older adults use CAM, with the highest level of use among Asians (48.6%), followed by Hispanics (31.6%), Whites (27.7%), and Blacks (20.5%). Asian elders have significantly greater odds than Whites of using any CAM, alternative medical system, biologically based therapies, and mind-body medicine and lower odds of using body-based and manipulative methods. Hispanic elders have greater odds than Whites of using any CAM and biologically-based therapies. Black elders differ significantly from Whites only in their lesser use of body-based and manipulative methods. Overall, more women than men are CAM users. CAM use declines among those age ≥75 years.

Conclusion: CAM is an important component of older adults' health self-management, and research should examine how they learn about CAM and delineate the decision process in selecting CAM modalities. (*Ethn Dis*. 2006; 16:723–731)

Key Words: Asian, Black, Complementary and Alternative Medicine, Hispanic, Minorities, Older Adults, Utilization

INTRODUCTION

Complementary and alternative medicine (CAM) is widely used in the United States. The use of CAM among older adults can be conceptualized as a component of health self-management in that individuals proactively select CAM modalities to maintain health or treat illness.[1,2] Research literature has begun to address CAM use by different segments of the population and the effects of CAM use on health, quality-of-life, and financial status.[3] However, information is lacking on the degree to which older adults, particularly members of different ethnic minority groups, use CAM, specific modalities they use, and factors related to their CAM use. Documentation of the types of CAM used by older adults and ethnic differences in CAM use is an essential step in understanding how older adults make decisions about including CAM therapies in their health self-management regimens. The incomplete documentation of CAM use limits the understanding of health self-management among older adults.

The level of CAM use among older adults is considerable.[4–8] However, the only analysis of national data focused on CAM use among older adults included too few ethnic minority participants to address ethnic differences.[4] Analyses of other national datasets that include all age groups present conflicting results about the relative levels of CAM use among Whites vs ethnic minority group members. Bausell et al[9] and Ni et al[10] report greater CAM use among Whites than among minority group members, while Barnes et al[11] and Graham et al[12] show that CAM use is similar among ethnic groups. Differences in the types of CAM used by each ethnic group have been documented and may explain the contradictory findings in the national survey data.[7,10,11] For example, Najm et al[8] report that Asians are higher users of acupuncture and Oriental medicine; Hispanics of dietary supplements, home remedies, and *curanderos*; and Whites of chiropractic, massage, diet, and psychospirituality.

Analyses show a decline in CAM use from middle-aged to older adults[10,13]; however, most reports have grouped all older adults into a single ≥65-year age group, and they have not considered differences by age among older adults. Therefore, how CAM use changes with increasing age is not clear. Most analyses of CAM use among older adults have not shown sex differences.[4,5,8] Exceptions include the Houston et al[14] report of greater supplement use among women over men in their 60s and McMahan and Lutz's[15] report indicating greater use of any CAM remedy among women over men age 65–74 years.

Several life-course factors are related to CAM use among older adults, including educational attainment, region of residence, and health status. Education is positively associated with CAM use.[5,8,15] Poorer health, as indicated by the number of specific health conditions, is positively associated with

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CAM use.[5] Finally, regional differences in CAM use include greater use of all CAM in the West, and greater use of chiropractic in the Midwest.[5] Each of these life-course factors also varies by ethnicity. Latinos and Blacks tend to have lower educational attainment compared to Whites and Asians. The West's population has a high proportion of Asians and Latinos, the South has a high proportion of Blacks, and Blacks and Latinos have larger numbers of health conditions than do Whites. These confounding characteristics may account for any ethnic differences in CAM use. Analyses of ethnic differences in CAM use among older adults must control for these characteristics.

The objectives of this analysis are to measure CAM use among Black, Hispanic, Asian, and White elders (age ≥65 years) and to delineate the importance of ethnicity in determining CAM use while controlling for personal characteristics (age, sex) and life-course factors (educational attainment, number of health conditions, region of the county) that may account for ethnic differences. This analysis uses data from the 2002 National Health Interview Survey (NHIS), the first national dataset that includes a sufficiently large minority sample to allow ethnic group comparisons.[11]

METHODS

Data Source

Data for this analysis come from the 2002 National Health Interview Survey (NHIS). The NHIS is a representative, population-based survey of the civilian, noninstitutionalized US population. Face-to-face interviews are conducted by personnel of the US Census Bureau. All interviews were conducted in English. The sampling plan for the NHIS follows a multistage area probability design. The NHIS includes a basic module that includes three components: the family core, the sample adult core, and the sample child core. The 2002 NHIS included a supplement assessing alternative health care in the sample adult core. The alternative healthcare supplement includes extensive questions on the use of alternative health providers, products, and practices, with reference to the use of these therapies to treat specific health conditions and the perceived benefit of these therapies.

The subpopulation for this analysis is limited to adults age ≥65 years who were members of one of four ethnic groups, non-Hispanic Black (Black), Hispanic, non-Hispanic Asian (Asian), and non-Hispanic White (White). The Asian group includes Asian Indian, Chinese, Filipino, and other Asian. The NHIS oversampled Black and Hispanic participants but not Asian participants. Therefore, with only 98 Asian elder participants, standard errors of percentages for this subpopulation are expected to be relatively large. An insufficient number of Native American elders was available to include in this analysis.

Use of Complementary and Alternative Medicine

Several measures of CAM use were constructed for this analysis. Use of 28 specific CAM therapies in the past year was described. These 28 specific therapies were grouped into the five CAM categories delineated by the National Center for Complementary and Alternative Medicine (NCCAM): alternative medical system, biologically based therapies, body-based and manipulative methods, mind-body medicine, and energy therapies. Dichotomous measures were constructed for each of the five categories based on whether an individual used at least one remedy within that category in the past year. If all individual therapies that make up one of the five categories had missing information or had a combination of missing and "no" responses to past year, the outcome variable was coded as missing. Finally, any CAM use was a dichotomous measure of whether an individual used at least 1 of the 28 remedies in the past year. We did not include prayer in this analysis because its inclusion dramatically affects estimates of total CAM use in the population and ethnic difference in CAM use.[11]

Personal and Life-Course Factors

Ethnic groups included Black, Hispanic, Asian, and White (Table 1). Age was divided into the cohorts 65 to 69 years, 70 to 74 years, 75 to 79 years, 80 to 84 years, and 85 years and older. Educational attainment was divided into the categories of less than high school; high school, general equivalency diploma, and some college; or college graduate. Number of health conditions is based on the sum of 36 different conditions and grouped into the categories none, one or two, three or four, and five or more. Finally, the NHIS provides information on only the four major census regions, Northeast, Midwest, South, and West, in the public use dataset.

Statistical Analysis

All analyses were performed with SAS (SAS Institute, Cary, NC) callable SUDAAN software to account for the complex survey design.[16] We used the sample adult weight – final annual variable to produce population esti-

Table 1. Personal and life-course characteristics among Black, Hispanic, Asian, and White older adults (age ≥65 years), 2002 National Health Interview Survey

Measures	%	SE	*n*	*N*
Ethnicity				
Black	8.3	.45	642	2,735,166
Hispanic	6.4	.42	536	2,111,235
Asian	2.0	.28	98	655,660
White	83.3	.65	4,561	27,403,883
Sex				
Female	57.2	.70	3,670	18,838,189
Male	42.8	.70	2,167	14,067,755
Age in years				
65 to 69	28.3	.73	1,532	9,328,660
70 to 74	25.5	.69	1,421	8,405,813
75 to 79	22.1	.67	1,305	7,277,705
80 to 84	14.3	.51	912	4,691,845
≥85	9.7	.41	667	3,201,921
Education				
Less than high school	28.7	.77	1,818	9,261,706
High school, GED, and some college	55.0	.84	3,044	17,758,281
College graduate	16.3	.61	875	5,270,147
Number of heath conditions				
None	10.3	.46	592	3,348,574
1 or 2	28.2	.68	1,629	9,191,011
3 or 4	25.6	.65	1,468	8,352,318
≥5	35.9	.78	2,090	11,689,756
Region				
Northeast	20.3	.70	1,144	6,675,300
Midwest	24.1	.76	1,406	7,940,457
South	37.4	1.04	2,169	12,292,687
West	18.2	.89	1,118	5,997,500

mates. The SUBPOPN statement was used to restrict the analysis to non-Hispanic Black, Hispanic, non-Hispanic Asian, and non-Hispanic White adults age ≥65 years. PROC CROSSTAB was used to generate percentages of past year use of individual CAM modalities by ethnicity.

The chi-square test was used to test for difference in CAM use by ethnicity. We calculated percentages of past year use of any CAM and use of CAM within the five major CAM categories by each personal and life-course characteristic. Logistic regression models were fit by using PROC RLOGIST to examine the effects of ethnicity, sex, age, educational attainment, number of health conditions, and US census region on any past year CAM use and past year use of CAM within the five major CAM groupings. Odds ratios and 95% confidence intervals were calculated for each logistic model.

RESULTS

Participant Characteristics

The sample is limited to 2002 NHIS participants age ≥65 years of Black, Hispanic, Asian, or White ethnicity (Table 1). The proportion of female participants is greater than the proportion that is male (57.2% vs 42.8%). Each age cohort from 65 to 69 through ≥85 years has a minimum of 650 individuals, indicating sufficient cell size for analysis. Most participants (55.0%) have a high school degree or equivalent, with 16.3% having a college degree or greater. While 10.3% have no health conditions, 35.9% have five or more.

The use of sampling weights ensures that the number of participants in each region is proportionate to the size of the general population in those regions. However, the proportion of older adults of each ethnicity differs by region. Most Black participants live in the South (55.6%), followed by Midwest (20.1%), Northeast (16.4%), and West (7.9%). A plurality of Hispanic participants lives in the South (45.0%) and West (35.6%), with 13.2% living in the Northeast and 6.2% in the Midwest. Most (63.3%) Asian participants live in the West, with far fewer in the South (16.3%), Northeast (13.3%), and Midwest (7.1%). White participants are fairly evenly spread across the regions with 34.1% in the South, 27.1% in the Midwest, 20.9% in the Northeast, and 17.9% in the West.

CAM Use by Ethnicity

The percentage of older adults using any CAM is substantial and differs among the ethnic groups (Table 2). More than one quarter (27.7%) of older adults use CAM, with the greatest percentage among older Asians (48.6%), followed by Hispanics (31.6%) and Whites (27.7%). Black elders have the lowest percentage of CAM use (20.5%). Little use of alternative medical systems or energy therapies by older adults was seen, and no significant differences in the use of these modalities were seen among the ethnic groups. Asians were the only ethnic group for whom a non-negligible percentage of older adults used an alternative medical system or energy therapy: 5.9% of Asian elders used an alternative medical system, with 3.7% using acupuncture and 2.1% using homeopathic treatment; 1.3% of Asian elders used an energy therapy, specifically qi gong.

Approximately one in seven older adults used biologically based therapies, with significant ethnic differences.

Table 2. Use of complementary and alternative medicine among Black, Hispanic, Asian, and White older adults (age ≥65 years), 2002 National Health Interview Survey

				Ethnic Groups											
	Total			Black			Hispanic			Asian			White		
Modality	*N**	%	SE	*n*	%	SE	*n*	%	SE	*n*	%	SE	*n*	%	SE
Any CAM used§	8,734	27.7	.71	524	20.5	1.81	644	31.6	2.49	290	48.6	6.14	7,274	27.7	.77
Alternative medical system	452	1.4	.18	26	1.0	.63	31	1.5	.55	36	5.9	2.30	358	1.3	.19
Acupuncture	231	.7	.13	20	.8	.61	8	.4	.29	23	3.7	1.96	178	.7	.13
Ayurveda	0	.0	–	0	.0	–	0	.0	–	0	.0	–	0	.0	–
Homeopathic treatment	225	.7	.12	8	.3	.20	23	1.1	.48	12	2.1	1.25	181	.7	.13
Naturopathy	22	.1	.03	0	.0	–	3	.2	.18	0	.0	–	18	.1	.03
Biologically-based therapies§	4,968	15.6	.57	339	13.1	1.38	540	26.1	2.49	212	34.7	6.33	3	14.6	.59
Chelation therapy	2	.01	.01	0	.0	–	0	.0	–	0	.0	–	2	.01	.01
Folk medicine	10	.03	.03	0	.0	–	0	.0	–	0	.0	–	10	.04	.04
Nonvitamin, nonmineral, natural products§	4,213	13.1	.53	286	10.8	1.35	502	24.2	2.34	186	30.3	5.92	3	12.1	.54
Diet-based therapies	491	1.5	.19	41	1.6	.61	39	1.9	.79	31	5.1	2.44	378	1.4	.19
Vegetarian diet	282	.9	.15	33	1.3	.58	31	1.5	.74	31	5.1	2.44	185	.7	.15
Macrobiotic diet	21	.1	.04	3	.1	.13	0	.0	–	0	.0	–	18	.1	.05
Atkins diet‡	147	.5	.10	0	.0	–	3	.2	.19	0	.0	–	143	.5	.12
Pritikin diet	28	.1	.04	7	.3	.30	4	.2	.22	0	.0	–	15	.1	.04
Ornish diet	18	.1	.03	0	.0	–	0	.0	–	0	.0	–	18	.1	.04
Zone diet	26	.1	.04	0	.0	–	0	.0	–	0	.0	–	26	.1	.05
Megavitamin therapy§	764	2.4	.22	37	1.5	.72	25	1.2	.65	0	.0	–	701	2.6	.24
Body-based and manipulative methods§	2443	7.6	.39	61	2.3	.58	84	4.0	1.14	10	1.7	.97	2,287	8.5	.45
Chiropractic care§	1888	5.9	.36	39	1.5	.52	65	3.1	1.00	3	.6	.59	1,779	6.6	.41
Massage	687	2.1	.22	23	.9	.24	25	1.2	.56	10	1.7	.97	628	2.3	.26
Mind–body medicine	3689	11.7	.48	264	10.3	1.58	196	9.5	1.40	139	23.5	5.11	3,089	11.7	.52
Biofeedback	16	.1	.03	0	.0	–	0	.0	–	0	.0	–	16	.1	.04
Meditation	1228	3.8	.30	108	4.1	.77	73	3.5	.97	34	5.5	3.02	1,011	3.8	.32
Guided imagery‡	250	.8	.13	7	.3	.08	3	.2	.19	6	1.1	1.05	232	.9	.16
Progressive relaxation	352	1.1	.15	22	.9	.42	9	.4	.26	30	4.9	2.94	290	1.1	.17
Deep breathing exercises*	2156	6.7	.40	136	5.2	1.03	86	4.2	1.09	68	11.1	4.13	1,864	7.0	.43
Hypnosis	14	.04	.04	0	.0	–	0	.0	–	0	.0	–	14	.1	.04
Yoga‡	408	1.3	.16	8	.3	.18	24	1.2	.57	20	3.4	1.73	355	1.3	.18
Tai Chi‡	384	1.2	.16	8	.3	.20	13	.6	.44	65	10.7	4.12	296	1.1	.17
Healing ritual	729	2.3	.22	76	3.0	.78	78	3.8	.84	10	1.8	1.48	564	2.1	.24
Energy therapies	109	.3	.09	1	.1	.07	7	.3	.35	7	1.3	1.28	92	.3	.10
Qi Gong	54	.2	.06	1	.1	.07	0	.0	–	7	1.3	1.27	44	.2	.07
Energy healing/Reiki	54	.2	.06	0	.0	–	7	.3	.35	0	.0	–	47	.2	.07

N=national estimate (in 1,000s).
* $P<.05$; † $P<.01$; ‡ $P<.001$; § $P<.0001$.

Across all biologically based therapies, the highest proportion of use was among Asian elders (34.7%) followed by Hispanics (26.1%). Approximately 14% of Black and White elders used some biologically based therapy. Nonvitamin, nonmineral, natural products (consists largely of herbs with a few animal-based products such as fish oil) were the most widely used biologically based therapy among older adults, with 13.1% using one of these products. The greatest use of nonvitamin, nonmineral, natural products was among Asian (30.3%) and Hispanic elders (24.2%), with 10.8% of Black and 12.1% of White elders using these products. Megavitamin use was significantly different among the ethnic groups, with 2.6% of White elders, 1.5% of Black elders, 1.2% of Hispanic elders, and no Asian elders using this therapy.

Body-based and manipulative methods were used by 7.6% of older adults, driven largely by White elders' overall use (8.5%) and their use of chiropractic care (6.6%). A small proportion of White elders (2.3%) also used massage, which is a greater percentage than among the ethnic minority elders.

Mind-body medicine was used by 11.7% of older adults. The highest percentage of use was among Asians, with 23.5%, compared to 11.7% of Whites, 10.3% of Blacks, and 9.5% of Hispanics, although differences by eth-

Table 3. Use of complementary and alternative medicine by personal and life-course characteristics among Black, Hispanic, Asian, and White older adults (age ≥65 years), 2002 National Health Interview Survey

	Any CAM Use			Alternative Medical Systems			Biologically Based Therapies			Body-Based and Manipulative Methods			Mind-Body Medicine			Energy Therapies		
Characteristic	***N****	**%**	**SE**	***n***	**%**	**SE**	***n***	**%**	**SE**	***n***	**%**	**SE**	***n***	**%**	**SE**	***n***	**%**	**SE**
Sex																		
Female	5,487	30.4	.90	242	1.3	.21	3,144	17.2	.77	1,427	7.7	.52	2,551	14.1	.66	61	.3	.10
Male	3,247	24.1	1.10	209	1.5	.32	1,823	13.4	.82	1,016	7.4	.62	1,139	8.4	.70	49	.4	.15
Age (years)																		
65–69	2,709	30.1	1.30	146	1.6	.38	1,672	18.4	1.15	836	9.1	.91	1,192	13.2	.91	53	.6	.22
70–74	2,548	31.5	1.36	185	2.3	.47	1,461	17.9	1.15	844	10.3	.92	954	11.8	.98	16	.2	.13
75–79	1,927	27.7	1.39	70	1.0	.27	1,022	14.5	1.04	423	6.0	.72	845	12.1	1.00	18	.3	.15
80–84	993	22.4	1.59	21	.5	.26	530	11.7	1.12	272	5.9	.97	434	9.7	1.09	3	.1	.06
≥85	555	18.5	1.75	28	.9	.34	282	9.2	1.39	65	2.1	.52	264	8.7	1.34	20	.6	.42
Education																		
Less than high school	1,792	20.1	1.19	100	1.1	.30	1,104	12.2	.98	416	4.6	.57	636	7.1	.75	22	.2	.13
HS or GED	4,820	28.2	.98	190	1.1	.21	2,620	15.2	.78	1,420	8.2	.60	2,068	12.1	.66	47	.3	.11
College graduate	2,058	40.2	1.78	161	3.1	.64	1,201	23.4	1.58	597	11.6	1.21	964	18.8	1.35	41	.8	.33
Number of health conditions																		
0	594	19.1	2.12	32	1.0	.48	335	10.5	1.49	137	4.2	1.14	215	6.8	1.11	2	.1	.06
1–2	2,119	24.1	1.25	82	.9	.29	1,205	13.5	.98	551	6.1	.73	851	9.7	.86	24	.3	.13
3–4	2,124	26.5	1.37	117	1.4	.33	1,253	15.5	1.11	705	8.6	.88	823	10.2	.95	17	.2	.13
5 or more	33.9	33.9	1.18	216	1.9	.34	2,132	18.7	1.03	1,049	9.1	.67	1,790	15.8	.81	66	.6	.20
Region																		
Northeast	1,583	25.1	1.57	82	1.3	.36	903	14.2	.98	369	5.7	.85	719	11.4	1.09	36	.6	.24
Midwest	2,320	30.2	1.33	63	.8	.21	1,130	14.6	.94	881	11.3	.94	991	12.8	.91	14	.2	.14
South	2,674	22.7	1.06	152	1.3	.30	1,559	13.0	.83	702	5.8	.62	1,059	9.0	.73	23	.2	.10
West	2,156	37.7	2.00	153	2.6	.59	1,374	23.8	1.89	489	8.4	.73	920	16.0	1.27	37	.6	.28

* N=national estimate (in 1,000s).

nicity were not significant. Asians were greater users of guided imagery (1.1%), deep breathing exercises (11.1%), yoga (3.4%), and tai chi (10.7%) than were older adults in the other ethnic groups.

CAM Use by Personal and Life-Course Characteristics

More female older adults used any CAM than did males (30.4% vs 24.1%) (Table 3). However, while more women than men used biologically based therapies (17.2% vs 13.4%) and mind-body medicine (14.1% vs 8.4%), approximately equal percentages of women and men used alternative medical systems (1.3% and 1.5%, respectively), body-based and manipulative methods (7.7%, 7.4%), and energy therapies (0.3%, 0.4%). Differences in CAM use by age were not straightforward. The percentage that used CAM increased from those age 65–69 years to those aged 70–74 years and then declined among those ≥75 years for any CAM use, alternative medical systems and body-based and manipulative methods. Biologically based therapies and mind-body medicine use declined with increasing age. We saw a a positive association between education and CAM use for any CAM use and for each CAM category. We also saw a positive association between number of health conditions and any CAM use and for each CAM category. A greater percentage of those who live in the West used CAM than of those who live in other regions, except for body-based and manipulative methods and energy therapies. While a greater percentage of those who live in the West than in the Northeast and South used body-based and manipulative methods, the greatest percentage was among those living in the Midwest.

Predictors of CAM Use

Ethnicity is a predictor of CAM use among older adults when controlling for personal and life-course characteristics (Table 4). Hispanic and Asian elders had significantly greater odds of any CAM use compared to Black and White elders. Older women had significantly greater odds of using any CAM compared to men. Those ≥80 years had significantly lower odds of any CAM use when compared to those age 65–69 years. Older adults with a high school diploma or a college degree had significantly greater odds of using any CAM compared to those with less than a high school education. Those with

Table 4. Logistic regression models of any CAM use and use of five major CAM categories by personal and life-course characteristics

Personal and Life-Course Characteristics	Any CAM	Alternative Medical System	Biologically-Based Therapies	Body-Based and Manipulative Methods	Mind-Body Medicine	Energy Therapies
	Odds Ratio 95% CI	Odds Ratio 95% CI	Odds Ratio 95% CI	Odds Ratio 95% CI	Odds Ratio 95% CI	Odds Ratio 95% CI
Ethnicity						
White	1.00	1.00	1.00	1.00	1.00	1.00
Black	.82	.87	1.01	.30	1.12	.29
	.65–1.05	.25–2.99	.77–1.31	.17–.50	.77–1.63	.03–2.52
Hispanic	1.48	.98	2.35	.58	1.02	1.13
	1.14–1.93	.42–2.27	1.72–3.21	.32–1.06	.71–1.48	.15–8.61
Asian	2.37	3.41	2.76	.21	2.38	3.06
	1.41–3.99	1.28–9.10	1.58,4.81	.07–.64	1.31–4.33	.44–21.37
Sex						
Male	1.00	1.00	1.00	1.00	1.00	1.00
Female	1.58	1.02	1.54	1.19	2.07	1.19
	1.36–1.84	.60–1.74	1.29–1.85	.93–1.54	1.65–2.60	.38–3.70
Age (years)						
65–69	1.00	1.00	1.00	1.00	1.00	1.00
70–74	1.00	1.28	.92	1.08	.79	.29
	.84–1.20	.67–2.45	.74–1.15	.80–1.45	.62–.99	.07–1.30
75–79	.84	.60	.72	.59	.85	.37
	.70–1.02	.29–1.25	.57–.91	.41–.84	.66–1.10	.09–1.53
80–84	.64	.30	.59	.57	.67	.11
	.51–.81	.09–.99	.45–.77	.39–.85	.49–.91	.01–.91
≥85	.51	.58	.45	.21	.58	.97
	.39–.66	.25–1.37	.31–.65	.12–.36	.40–.85	.19–4.86
Education						
Less than high school	1.00	1.00	1.00	1.00	1.00	1.00
HS or GED	1.61	1.02	1.45	1.53	1.81	1.09
	1.34–1.94	.54–1.95	1.14–1.85	1.12–2.09	1.37–2.39	.30–3.89
College graduate	3.09	2.68	2.69	2.38	3.64	3.28
	2.47–3.87	1.37–5.25	2.04–3.56	1.63–3.47	2.72–4.87	.73–14.64
Number of health conditions						
0	1.00	1.00	1.00	1.00	1.00	1.00
1–2	1.15	.97	1.39	1.40	1.45	5.87
	.98–1.86	.30–3.14	.97–1.98	.75–2.62	.96–2.18	.62–55.52
3–4	1.63	1.65	1.74	2.11	1.60	5.22
	1.19–2.42	.58–4.74	1.22–2.49	1.15–3.85	1.04–2.45	.50–54.07
5 or more	1.43	2.26	2.26	2.29	2.78	14.38
	1.79–3.28	.78–6.56	1.62,3.16	1.27–4.13	1.89–4.07	1.69–122.52
Region						
Northeast	1.00	1.00	1.00	1.00	1.00	1.00
Midwest	1.32	.63	1.07	2.03	1.12	.32
	1.06–1.63	.29–1.38	.86–1.34	1.40–2.94	.85–1.47	.05–1.91
South	.86	.92	.88	1.00	.75	.33
	.70–1.06	.43–1.93	.71–1.09	.67–1.47	.56–1.00	.08–1.37
West	1.63	1.68	1.63	1.46	1.37	.93
	1.28–2.07	.79–3.55	1.26–2.11	1.00–2.12	1.02–1.84	.28–3.13

a large number of health conditions (three or four, five or more) had greater odds of using any CAM than those who have no health conditions. Older adults in the Midwest and West had greater odds of any CAM use than those in the Northeast.

Asian elders had greater odds of using an alternative medical system than Whites. Other than ethnicity, only education predicted the use of alternative medical systems. Those with at least a college degree had greater odds of using these modalities than those with less than a high school education.

Asian and Hispanic elders had greater odds of using a biologically based therapy than did White elders. Older women had significantly greater odds of using a biologically based therapy compared to men. Those ≥75 years of age had lower odds of using a biologically based therapy when compared to those age 65 to 69 years. Those with a high school diploma or a college degree had significantly greater odds of using a biologically based therapy compared to those with less than a high school education. Those with a larger number of health conditions (three or four, five or more) had greater odds of using a biologically based therapy. Older adults in the West had greater odds of using a biologically based therapy than those who live in the Northeast.

Blacks and Asians had lower odds of using a body-based and manipulative method than did Whites. Those ≥75 years had lower odds of using a body-based and manipulative method when compared to those age 65 to 69 years. Older adults with a high school diploma or a college degree had significantly greater odds of using a body-based and manipulative method compared to those with less than a high school education. Those with a larger number of health conditions (three or four, five or more) had greater odds of using a body-based and manipulative method. Midwesterners had greater odds of using a body-based and manipulative method than those in the Northeast.

Asian elders had greater odds of using mind-body medicine than did Whites. Older women had significantly greater odds of using mind-body medicine compared to men. Those age ≥80 years had lower odds of using mind-body medicine when compared to those age 65 to 69 years. Those who completed high school or college had significantly greater odds of using mind-body medicine compared to those with less than a high school education. Those with a larger number of health conditions (three or four, five or more) had greater odds of using mind-body medicine. Those in the West had greater odds of using mind-body medicine than those in the Northeast.

Few older adults used energy therapies, and the odds ratios were unstable because of the small percentage of users. Only number of health conditions was significant, such that those with a large number of health conditions (five or more) had greater odds of using an energy therapy; however, the confidence interval for this odds ratio was very large.

DISCUSSION

A large percentage of older adults surveyed in the 2002 NHIS reported using a CAM therapy in the past year. The overall percentage of 27.7% parallels the percentage (30%) reported in the only other national sample survey of CAM use among older adults.[4] The CAM therapies most frequently reported by older adults in the 2002 NHIS are nonvitamin, nonmineral, natural products (13.1%), deep breathing exercises (6.7%), chiropractic (5.9%), meditation (3.8%), and healing ritual (2.3%). Foster et al found the CAM therapies most frequently used by older adults to be chiropractic (11%), herbal remedies (8%), relaxation techniques (5%), megavitamins (5%), and religious healing by others (4%).[4] Differences in the CAM therapies most often used among older adults in these two studies in part reflect the differences in types and categories elicited in the two surveys. However, for both surveys, the therapies that include chiropractic, herbal remedies, and relaxation are among the most widely used.

The 2002 NHIS is the first survey of CAM use with a sufficiently large sample to examine ethnic differences among older adults. Both bivariate and multivariate analysis show significantly different patterns of CAM use by ethnicity. A substantial proportion of older adults in all ethnic groups reported using CAM in the past 12 months, although the percentage from each ethnic group that used at least one CAM therapy was different. Any CAM use in the past 12 months was greatest among Asians (48.6%). Asians had greater odds of using any CAM, using alternative medical system, biologically based therapies, and mind-body medicine than did Whites and lower odds of using body-based and manipulative methods. Asians are the only ethnic group for which as much as 1% used an energy therapy. The greater use among Asian elders of alternative medical systems, which includes acupuncture, and of mind-body medicine, which includes yoga and tai chi, is reasonable in that these therapies have an Asian origin. The greater use of biologically based therapies, which includes herbs, among Asian elders is also reasonable; herbs, while certainly not exclusively of Asian origin, are still widely used in several forms of Asian medicine. Almost one third of Hispanic elders used any CAM in the past 12 months. They had greater odds of using any CAM and of using biologically-based therapies than did Whites. Others have reported on the high use of herbs among Hispanic elders.[6] Use of any CAM in the past 12 months was lowest among Blacks, with only one in five reporting the use of a CAM therapy. Older Blacks did not differ significantly from Whites in the use of any of the CAM categories except body-based and manipulative methods, for which they has significantly lower odds of use. This difference is driven by the greater use of chiropractic among White elders.

Sex and age, as well as ethnicity, are predictors of CAM use among older adults. A greater percentage of women than men reported using any CAM in the past year. In the multivariate models, women had greater odds than men of using any CAM and of using

Use of any CAM in the past 12 months was lowest among Blacks, with only one in five reporting the use of a CAM therapy.

biologically based therapies and mind-body medicine. While greater use of CAM among women compared to men has been reported for adults in general, other analyses of CAM use among older adults have not shown sex differences.[4,5] The larger and more ethnically diverse NHIS sample, as well as the relatively broad set of CAM therapies included in the NHIS CAM supplement, may have captured more of the sex differences than did these earlier surveys.

Complementary and alternative medicine (CAM) use remains approximately the same among those age 65 to 69 years and those age 70 to 74 years for the total sample. However, those who are ≥75 years have consistently lower odds of using any CAM and therapies in the five major categories than those who are age 65 to 69 years. The literature reports a decline in CAM use from middle to old age.[9,10,13] This analysis indicates that across all older adults, CAM use remains relatively high among the young-old, and then declines among the old and the old-old. These findings parallel those from a recent report using the entire 2002 NHIS adult sample that found the use of CAM for treatment and general health maintenance are lowest among the oldest-old.[17] The analysis by Grzywacz et al[17] further argues that variation in the use of CAM therapies among older adults is complex. Studies among older adults that have sufficiently large samples from across these older age categories are needed to determine if this decline in CAM use across old age is a cohort or life-cycle phenomenon or whether it is an artifact of not including items on all forms of CAM in survey questionnaires. Assuming that these age differences are a legitimate life cycle phenomenon, more research is needed to examine how older adults come to use or stop using CAM modalities.

These results indicate CAM is an important component of health self-management. These results are also a further step in delineating how older adults make decisions to include CAM in their self-management regimens. One factor in these decisions is culture. Ethnicity, particularly among those of Asian and Latino heritage, is a primary factor that differentiates the level and type of CAM use among older adults. Knowledge and acceptance of different therapies are parts of the cultural heritage among ethnic communities. Regional differences in CAM use may also reflect regional culture. Education is also a factor in the selection of a CAM therapy. Education may prepare an individual to select new behaviors over traditional behaviors. Having numerous health conditions also influences an older adult to use a CAM therapy. Older adults are likely to experience health conditions, such as arthritis, which are chronic and debilitating and for which conventional medicine often can provide only limited relief. In this situation, individuals are apt to try remedies outside of conventional medicine.[18] That women are more likely to include CAM therapies in their health self-management regimens reflects other health behavior research that shows that women may be more knowledgeable and proactive about health than are men.[19]

As Barnes et al[11] found for the general adult population, the inclusion or exclusion of prayer as a CAM modality substantially affects the level of CAM use among older adults as well as the pattern of ethnic variation in CAM use in this component of the population. When prayer is included as a CAM modality, 67.3% of older adults in the NHIS use any CAM, and more older Blacks (77.9%) use any CAM, followed by Asians (70%), Hispanics (68.9%), and Whites (66.1%). Mind-body medicine with prayer is used by 61.6% of older adults, with use by more than three quarters of Blacks, compared to 60.2% of Whites, 63.1% of Hispanics, and 57.5% of Asians. Blacks are greater users of prayer than are older adults in the other ethnic groups. We did not include prayer as a CAM remedy in this analysis; conceptually, we feel that prayer is an act of religion and not an act of health care. However, we also feel that the study of the relationship of spirituality and health is an important domain of investigation.[7] Conceptual development that considers the relationship of spirituality, prayer, and religion with health and health behavior, particularly among older adults and minority group members, is needed.

This analysis must be considered in light of its limitations. The sample does not include sufficient numbers of older adults from all ethnic groups. Therefore, some ethnic groups, such as Native Americans, are not considered. The ethnic categories of Hispanic and Asian include individuals with very different cultural traditions. Further, length of residence in the United States among immigrants in any ethnic group is not known, so the relationship of level of acculturation to CAM use cannot be discerned. Underlying economic differences within and between ethnic groups may be important in delineating variation and differences in CAM use. However, the NHIS is a health survey and collected limited information on participant economic status. The NHIS did not collect data on all forms of CAM. In particular, it did not include home remedies, which other research has shown to be a widely used form of CAM by rural, older, and minority adults.[7,20] Finally, the data are limited to CAM use for the past year.

This analysis also has strengths. The 2002 NHIS is a national probability sample that oversampled Black and Hispanic adults. It was the first national sample with sufficient numbers of older, ethnic minority adults to allow some analysis of ethnic differences in CAM use. While it does not include items on all forms of CAM, the 2002 NHIS list of 28 specific CAM modalities is more inclusive than those used in most other studies. Future research needs to examine how older adults learn about CAM use and delineate the decision process in selecting and continuing use of CAM modalities among all older adults and minority elders.

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REFERENCES

1. Clark NM. Management of chronic disease by patients. *Annu Rev Public Health*. 2003; 24:289–313.
2. Quandt SA, Arcury TA, Bell RA. A conceptual model of nutritional self-management among the elderly. *J Aging Stud*. 1998;12:351–368.
3. Wootton JC, Sparber A. Surveys of complementary and alternative medicine: Part I. General trends and demographic groups. *J Altern Complement Med*. 2001;7:195–208.
4. Foster DF, Philips RS, Hamel MB, Eisenberg DM. Alternative medicine use in older Americans. *J Am Geriatr Soc*. 2000;48:1560–1565.
5. 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. *J Gerontol Med Sci*. 2000;55A:M4–M9.
6. Loera JA, Black SA, Markides KS, Espino DV, Goodwin JS. The use of herbal medicine by older Mexican Americans. *J Gerontol Med Sci*. 2001;56A:M714–M718.
7. Arcury TA, Quandt SA, Bell RA, Vitolins VZ. Complementary and alternative medicine use among rural older adults. *Complement Health Pract Rev*. 2002;7:167–186.
8. Najm W, Reinsch S, Hoehler F, Tobis J. Use of complementary and alternative medicine among the ethnic elderly. *Altern Ther Health Med*. 2003;9:50–57.
9. Bausell RB, Lee WL, Berman BM. Demographic and health-related correlates of visits to complementary and alternative medical providers. *Med Care*. 2001;39:190–196.
10. Ni H, Simile C, Hardy AM. Utilization of complementary and alternative medicine by United States adults: results from the 1999 National Health Interview Survey. *Med Care*. 2002;4:353–358.
11. Barnes PM, Powell-Griner E, McFann K, Nahin RL. *Complementary Alternative Medicine Use Among Adults: United States 2002*. Hyattsville, Md: National Center for Health Statistics; 2004. Advance Data from Vital and Health Statistics, No. 343.
12. Graham RE, Andrews C, Davis RB, O'Connor BB, Eisenberg DM, Phillips RS. Use of complementary and alternative medicine therapies among the racial and ethnic minority adults: results from the 2002 National Health Interview Survey. *J Natl Med Assoc*. 2005;97: 535–545.
13. Astin JA. Why patients use alternative medicine: results from a national study. *JAMA*. 1998;279:1548–1553.
14. Houston DK, Daniel TD, Johnson MA, Poon LW. Demographic characteristics of supplement users in an elderly population. *J Appl Gerontol*. 1998;17:79–96.
15. McMahan S, Lutz R. Alternative therapy use among the young-old (ages 65 to 74): an evaluation of the MIDUS database. *J Appl Gerontol*. 2004;23:91–103.
16. Research Triangle Institute. *SUDAAN User's Manual, Release 8.0*. Research Triangle Park, NC: Research Triangle Institute; 2001.
17. Grzywacz JG, Lang W, Suerken C, Quandt SA, Bell RA, Arcury TA. Age, race, and ethnicity in the use of complementary and alternative medicine for health self-management: evidence from the 2002 National Health Interview Survey. *J Aging Health*. 2005;17:547–572.
18. Arcury TA, Bernard SL, Jordan JM, Cook HL. Gender and ethnic differences in alternative and conventional remedies use among community dwelling rural adults with arthritis. *Arthritis Care Res*. 1996;9:384–390.
19. George LK. The social psychology of health. In: Binstock RH, George LK, eds. *Handbook of Aging and the Social Sciences*. San Diego, Calif: Academic Press; 2001;217–237.
20. Stoller EP, Forster LE, Portugal S. Self-care responses to symptoms by older people: a health diary study of illness behavior. *Med Care*. 1993;31:24–42.

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