A Multivariate Test of an Expanded Andersen Health Care Utilization Model for Complementary and Alternative Medicine (CAM) Use in African Americans

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Abstract

Objectives: The objectives of this study were (1) to determine which Andersen Model variables [predisposing, enabling, and need (PEN)] are related to complementary and alternative medicine (CAM) use by African Americans in the past 12 months; and (2) to determine whether the addition of disease states to the Model will explain significant variation in CAM use in the past 12 months.

Design: The 2002 National Health Interview Survey was used with 4256 African American adults ($n = 23,828,268$ weighted) selected as the study population. The dependent variable, CAM Past 12 Months, represented participants' use of at least 1 of 17 CAM modalities during the past 12 months. The Andersen Model variables [predisposing (e.g., age); enabling (e.g., insurance); and need (e.g., medical conditions)] and prevalent disease states ($\geq 10\%$) comprised the independent variables. Logistic regression analyses, incorporating the sampling weights, were employed.

Results: Among predisposing factors, CAM use was associated with middle-aged to older, more educated, and female African Americans. Region (Northeast less likely than South) was the only significant enabling factor. Need factors had the most frequent relationships, with more medical conditions, more physician visits, better health status, prescription and over-the-counter medication use, more frequent exercise, and having activities of daily living limitations being associated with CAM use. After adjusting for PEN factors, the disease states of pain/aching joints, recurring pain, and migraine were related to CAM use.

Conclusions: African American CAM users are middle-aged to older, female, educated, and have more medical conditions (especially pain-related). Users report higher utilization of "traditional" care (e.g., physician visits), indicating that CAM is likely a complement to conventional treatment in this population. Health care providers should use these factors as prompts for inquiring about CAM use in African American patients.

Introduction

RECENT NATIONAL STUDIES revealed that a majority (67.6%–71.3%) of African American adults use complementary and alternative medicine (CAM) in a typical year.^{1,2} The most common therapies include prayer specifically for health reasons, herbals, and relaxation. CAM use is prevalent among people of all races/ethnicities with chronic conditions,^{2–4} and this holds true for African Americans as well. The prevalence of common disease states in African Americans (e.g., hypertension) is significantly higher (range: 1.4–2.9 times) for CAM users compared to nonusers.¹

CAM use varies in African Americans. Compared to other ethnic and racial groups, African Americans are less likely to

use body-based techniques (e.g., chiropractic care),^{5–7} dietary strategies (e.g., nutritional supplements, herbals),^{7,8} and psychologic therapies.⁹ However, they are more likely to use home remedies^{6,10,11} and mind/body (e.g., relaxation) and spiritual healing practices.^{2,12,13} One (1) study found that 35.4% of African American adults used home remedies.¹⁴ Use of prayer in coping with illness is common among African Americans,¹⁵ and religiosity and prayer have been found to be significant in managing hypertension, along with prescribed medication.¹⁶

National estimates indicate that African American CAM users are more likely to be older, female, college-educated, and insured.¹ Previous studies have shown similar characteristics of users except that lower education had traditionally

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FIG. 1. Study Model. CAM, complementary and alternative medicine.

been a predictor of CAM use.^{14,17–19} Socioeconomic issues such as lower income, urbanicity, living with a grandparent as a child, comorbidities, influence of family/friends/social group, community group involvement, and less access to care have all predicted CAM use in African Americans.^{12,14,17} Although most factors were identified in convenience samples, some (e.g., community group involvement) are unique predictors in African Americans and may give some insight into culturally related variables that might impact CAM use. Finally, African Americans and need for care variables have rarely been examined in CAM studies. Two (2) studies found that significant predictors of CAM use included a higher number of prescription medications, use of a caregiver, and current cigarette smoker.^{8,20} How representative these findings are among African Americans is unknown.

Until recently, there was limited generalizable evidence that African Americans were substantial users of CAM. Therefore, more information is needed about their CAM use on a larger scale and about intragroup variations in use as well. Moreover, most CAM studies examining African Americans have been descriptive and atheoretical; thus, factors identified as affecting their CAM use should be examined in a multivariate, theoretically based framework to better identify the unique contribution of each predictor.

Theoretical Framework

The Andersen Healthcare Utilization Model,²¹ the theoretical framework for this study, has been used extensively to examine relationships between predisposing, enabling, and need for care (PEN) factors and health care utilization.^{22–29}

The model purports that health care utilization is dependent on individuals' propensity to use services (predisposing), their ability to access services (enabling) and their illness level (need). Our study extends the Andersen Model to include the most prevalent disease states among African Americans and aims to determine whether these variables add additional prediction to CAM use while adjusting for PEN variables. The conceptual framework is shown in Figure 1.

Overall, need for care factors are the strongest predictors of health care utilization, followed by enabling and predisposing factors.²⁵ Andersen's Model is a useful framework for studying CAM use, a form of health care utilization, and for grouping the factors shown to affect CAM use in African American adults. Two (2) studies have used a variation of the Andersen Model for studying CAM use in selected populations,^{30,31} and 1 found that 28% of the variance in CAM use in patients with cancer was explained by PEN factors.³¹

African Americans are substantial users of CAM, yet there is little generalizable evidence about which factors predict their use of CAM modalities, including those that are unique (e.g., use of a caregiver) to African Americans. Thus, further examination of CAM use in African Americans using a nationally representative sample is needed. Moreover, no known studies have (1) assessed their CAM use utilizing a theoretical model; or (2) included disease states as a predictor. We hypothesize that the PEN variables and disease states will be significant predictors of CAM use in African Americans and that need variables will be the strongest predictors. The presence of identified predictors could serve as prompts

to health care professionals to inquire about CAM use, especially since most CAM users do not voluntarily reveal this information.^{4,32,33} Thus, uncovering factors associated with CAM use is important, particularly when used concurrently with conventional care and potential problems (e.g., drug–herbal interactions) could be avoided.

Objectives

The objectives of this study are the following.

1. Determine which Andersen Model variables (predisposing, enabling, and need [PEN]) are related to CAM use by African Americans in the past 12 months; and
2. Determine whether the addition of disease states to the Andersen Model will explain significant variation in CAM use by African Americans in the past 12 months.

Materials and Methods

Data source

Data from the 2002 National Health Interview Survey (NHIS) were used for this study. The 2002 NHIS population comprised all civilian, noninstitutionalized persons who resided in the 50 states and the District of Columbia in 2002. Only African American adults (reported as black non-Hispanic), an oversampled group in the 2002 NHIS survey, were included. The sample included 4256 adults (≥ 18 years of age) with the weighted sample representing 23,828,268 African American adults nationwide. The Institutional Review Board of The University of Texas at Austin approved this study.

CAM utilization measures. The dependent variable, CAM Past 12 Months, represents whether they had used or seen a practitioner for 17 CAM modalities during the past 12 months. The 17 modalities included acupuncture, Ayurveda, biofeedback, chelation therapy, chiropractic care, energy healing therapy/Reiki, folk medicine, herbal products, homeopathic treatment, hypnosis, massage, megavitamin therapy, naturopathy, prayer, relaxation techniques, special diets, and yoga/*t'ai chi/qigong*. Additional analyses of CAM use excluding prayer were conducted.

Andersen Model factors. The independent predictors have been empirically shown to impact CAM use; however, some variables unique to African Americans were not available in the NHIS database. *Predisposing* factors increase a person's need for health care services. *Enabling* factors facilitate (or impede) use of health care services. *Need* factors are related to illness that requires use of health care services. *Disease state* factors include 13 illnesses with at least 10% prevalence in the NHIS sample. Table 1 includes a description of all the predictors.

Data analysis. The data analysis involved analyzing CAM use (with and without prayer) in the past 12 months. The analyses used a generalized linear model with a binomial distribution for the outcomes.³⁴ The logistic regression analyses were conducted using Proc Surveylogistic in SAS Version 9.1.3 SP4. This procedure accounts for the complex, multistage cluster sampling design used in the NHIS.

TABLE 1. PREDICTOR DESCRIPTIONS

<i>Factors</i>	<i>Categories^a</i>
Predisposing factors	
Age	18–24 ^a 25–34 35–44 45–54 55–64 ≥ 65
Gender	Male ^a Female
Marital status	Not married ^a Married
Education	Less than high school ^a 12 years (high school degree) 13–15 years (some college or associate's degree) Bachelor's degree Advanced degree
Family size	Number of individuals in household (continuous)
Living alone	No ^a Yes
Enabling factors	
Employment status	Not currently working ^a Currently working Retired
Access to care	
Insurance coverage	Uninsured ^a Insured
Delayed care ^b	No ^a Yes
Unable to afford care	No ^a Yes
Usual source of care ^c	No ^a Yes
Health care seeking behavior ^d	≥ 1 year ^a <1 year Never
Geographic region	South ^a Midwest Northeast West
Need for care factors	
Total medical conditions	Number of reported conditions (continuous variable)
Depression/anxiety (past 12 months)	No ^a Yes
Prescription medication use (past 12 months)	No ^a Yes
Over-the-counter (OTC) medication use (past 12 months)	No ^a Yes
Health status change (past 12 months)	About the same ^a Better Worse
Physician visits (past 12 months)	None 1 2–3 4–5 6–7 8–9 10–12 13–15 16 or more

(continued)

TABLE 1. (CONTINUED)

Factors	Categories ^a
Emergency room visits (past 12 months)	None 1 2-3 4-5 ≥6
Preventive health behavior Prevention care ^c	No ^a Yes
Current smoking	No ^a Yes
Exercise frequency ^f Vigorous	Never/unable ^a <3 times per week ≥3 times per week
Moderate	Never/unable ^a <3 times per week ≥3 times per week
Strength training	Never/unable ^a <3 times per week ≥3 times per week
Activities of daily ^g living limitations	No ^a Yes
Use of a caregiver (past 12 months)	No ^a Yes
Disease states (%)	
Hypertension	No ^a Yes
Pain/aching joints	No ^a Yes
Lower back pain	No ^a Yes
Arthritis	No ^a Yes
Recurring pain	No ^a Yes
Insomnia	No ^a Yes
High cholesterol	No ^a Yes
Severe/migraine headache	No ^a Yes
Sinusitis	No ^a Yes
Neck pain	No ^a Yes
Diabetes	No ^a Yes
Fatigue	No ^a Yes

^aReference category.^bA "yes" response was assigned if there was a positive response to any of the following: couldn't get through on the phone; couldn't get appointment soon enough; have to wait too long; not open when you could get there; and no transportation.^cReferred to whether there was a place respondents usually go for care when sick.^dReferred to the last time the respondent sought care.^eReferred to respondents receiving prevention care or used one of six places for prevention care.^fHow often respondents engaged in at least 10 minutes of exercise activity.^gA "yes" response was assigned if the respondent indicated any degree of limitation for any one of 12 activities.

Due to the large number of predictors in the model, the effective sample size would have been reduced from an unweighted sample of 4256 to 3011 (29% loss of respondents) due to missing values on individual predictors. The analyses used multiple imputation to account for missing data across all of the predictors. SAS Proc MI was used to create 10 datasets with different imputed missing values. The logistic regression model using the survey weights was then run on each of the 10 imputed datasets and the results were integrated using Proc MIanalyze, which correctly averages the 10 estimates for each parameter and then computes an adjusted *t*-test statistic.

The predictors in Model 1 were based on the Andersen Model. Model 2 tests whether the addition of disease states adds incremental predictive power. The multivariate Wald χ^2 test was used to evaluate the statistical significance of the set of coefficients associated with the disease states. Adjusted odds-ratios (AOR) are reported, which represent the unique, additional explanation provided by an individual predictor. A *p*-value less than 0.05 was considered statistically significant.

Results

A total of 67.6% of African Americans used CAM in the past 12 months, when prayer for health reasons was included. When prayer for health reasons was not included, only 27.0% reported using CAM in the past 12 months. Table 2 shows descriptive statistics for each variable in the analysis. Table 3 shows the results of the tests of each Andersen Model predictor under Model 1. Of the predisposing predictors, three were related to CAM use: age, education, and gender. Middle-aged to older, more educated, and female African Americans were more likely to use CAM. In particular, the following were statistically significant: age group 35-44; age group 45-54; high school degree; some college experience; bachelor's degree; advanced degree; and female.

Of the enabling predictors, only region had a unique relationship to CAM use. Northeast region respondents were less likely to use CAM compared to those in the south.

Of the need predictors, characteristics related to CAM use were the following: higher total medical conditions; health status change as better; higher number of physician visits; prescription medication use; OTC medication use; more vigorous activity <3 times per week; more vigorous activity ≥3 times per week; moderate activity <3 times per week; moderate activity ≥3 times per week; and an activities of daily living (ADL) limitation.

After adjusting for the predictors in Model 1, the disease states of pain/aching joints (30 days), recurring pain, and severe headache predicted CAM use. The multivariate Wald test showed a statistically significant effect for the set of predictors [Wald $F(13) = 18.9$, $p < 0.001$].

Analyses of CAM 12 months without prayer

Additional analyses were conducted excluding prayer from CAM use (i.e., CAM without prayer) and results indicate that characteristics of African American CAM users differ when prayer for health reasons is excluded. Regarding predisposing factors, age is no longer significant. Although education and gender remain significant, the relationship with education is much stronger, with more education related to CAM use: high school degree (AOR = 1.76, $p < 0.000$); some college or asso-

TABLE 2. FREQUENCIES/MEANS OF MODEL FACTORS

<i>Factors</i>	<i>Frequency^a or mean</i>	<i>SD</i>	<i>Factors</i>	<i>Frequency^a or mean</i>	<i>SD</i>
Predisposing factors					
Age (mean SD)	42.1	0.3	Moderate activity		
18–24 (%)	12.7		<3 times per week (%)	13.6	
25–34 (%)	20.0		≥3 times per week (%)	27.7	
35–44 (%)	22.5		Never/unable (%)	54.4	
45–54 (%)	18.0		Unknown (%)	4.3	
55–64 (%)	11.6		Strength activity		
≥65 (%)	15.2		<3 times per week (%)	8.2	
Female (%)	62.7		≥3 times per week (%)	12.9	
Marital status			Never/unable (%)	75.1	
Not married (%)	66.6		Unknown (%)	3.8	
Married/living with partner (%)	32.5		Activities of daily living (ADL)		
Unknown (%)	0.9		limitations (%)	33.4	
Education			Use of a caregiver (%)	2.3	
Less than high school (%)	23.1		Disease states (%)		
High school degree	29.6		Hypertension	33.3	
or equivalent (%)			Pain/aching joints	30.2	
Some college or	31.2		Lower back pain	24.2	
associate's degree (%)			Arthritis	22.1	
Bachelor's degree (%)	9.9		Recurring pain	17.7	
Advanced degree (%)	4.8		Insomnia	17.0	
Unknown (%)	1.5		High cholesterol	18.0	
Family size (mean, SD)	2.4	1.5	Severe headache	16.1	
Living alone (%)	36.0		Sinusitis	15.4	
Enabling factors			Neck pain	12.2	
Employment status			Diabetes	10.5	
Currently working (%)	60.2		Fatigue	9.8	
Not currently working (%)	27.3				
Retired (%)	11.7				
Unknown (%)	0.8				
Access to care					
Insured (%)	87.9				
Delayed care (%)	10.6				
Unable to afford care (%)	11.3				
Usual source of care (%)	85.6				
Health care-seeking behavior					
Last sought care <1 year (%)	83.1				
Last sought care ≥1 year (%)	13.6				
Never (%)	1.6				
Unknown (%)	1.7				
Region					
South (%)	55.1				
Midwest (%)	18.9				
Northeast (%)	17.8				
West (%)	8.2				
Need for care factors					
Total medical conditions	3.5	3.9			
(mean, SD)					
Depression/anxiety (%)	17.7				
Prescription medication use (%)	62.0				
Over-the-counter (OTC)	67.1				
medication use (%)					
Health status change					
Better (%)	10.3				
About the same (%)	70.9				
Worse (%)	18.5				
Number of physician	2.6	2.2			
visits (mean, SD)					
Number of emergency room	0.5	1.0			
visits (mean, SD)					
Preventive health behavior					
Prevention care (%)	89.3				
Current smoker (%)	23.0				
Vigorous activity					
<3 times per week (%)	12.0				
≥3 times per week (%)	19.4				
Never/unable (%)	67.0				
Unknown (%)	1.6				

(continued in next column)

^aPercentages may not equal 100 because of rounding errors.
SD, standard deviation.

ciate's degree (AOR = 2.36, $p < 0.000$); bachelor's degree (AOR = 3.16, $p < 0.000$); and advanced degree (AOR = 4.20, $p < 0.000$). Additionally, family size emerged as a significant predictor, with those with a smaller family size more likely to use CAM (without prayer) (AOR = 0.90, $p < 0.016$).

Additional enabling factors were significant in the CAM without prayer model. Respondents who delayed care were more likely to use CAM (without prayer) (AOR = 1.33, $p = 0.038$). Also, compared to the south, all regions were more likely to use CAM (without prayer): midwest (AOR = 1.26, $p < 0.000$), northeast (AOR = 1.49, $p < 0.000$), and west (AOR = 1.55, $p = 0.006$).

The majority of differences between CAM users with and without prayer occurred with need factors. The following were not significant when prayer was included but emerged as significant predictors once prayer was excluded: anxiety/depression (AOR = 1.41, $p = 0.004$); strength activity <3 times per week (AOR = 1.71, $p < 0.000$); and strength activity ≥3 times per week (AOR = 2.23, $p < 0.000$). The following factors were significant when prayer was included, but were no longer significant once prayer was excluded: physician visits, OTC medication use, and moderate activity <3 times per week. All other relationships were the same as those when prayer was included.

When disease states were added, delayed care and midwest region were no longer significant, which were similar to the CAM with prayer model. However, when comparing disease states, there were differences in CAM with and without prayer. In CAM without prayer, pain/aching joints, recurring pain and severe headache were no longer significant, whereas insomnia (AOR = 1.50, $p = 0.004$) was the only disease state that emerged as significant.

TABLE 3. ADJUSTED ODDS RATIOS AND ASSOCIATED P-VALUES FOR TWO MODELS PREDICTING COMPLEMENTARY AND ALTERNATIVE MEDICINE USE IN THE PAST 12 MONTHS

Factors	Model 1		Model 2	
	Odds ratio	p-value	Odds ratio	p-value
Predisposing factors				
Age ¹				
25–34	1.22	0.152	1.27	0.084
35–44	1.40	0.013*	1.49	0.003*
45–54	1.45	0.021*	1.59	0.004*
55–64	1.13	0.541	1.26	0.276
65 or older	1.35	0.179	1.57	0.043*
Female ²	1.97	0.000*	2.00	0.000*
Marital status ³				
Married or living with partner	1.19	0.157	1.18	0.172
Education ⁴				
High school degree	1.26	0.034*	1.22	0.064
Some college or associate's degree	1.29	0.035*	1.26	0.053
Advanced degree	1.77	0.015*	1.73	0.018*
Bachelors degree	1.84	0.000*	1.76	0.001*
Family size	0.98	0.595	0.97	0.472
Live alone ⁵	1.19	0.162	1.20	0.138
Enabling factors				
Employment status ⁶				
Currently working	1.07	0.543	1.06	0.622
Retired	0.95	0.780	0.93	0.702
Insured ⁷	0.88	0.360	0.89	0.410
Delayed care ⁸	1.45	0.050*	1.41	0.081
Able to afford care ⁹	0.91	0.608	0.90	0.550
Usual source of care ¹⁰	1.03	0.869	1.03	0.867
Health care-seeking behavior ¹¹				
Last sought care <1 year	0.90	0.507	0.90	0.515
Last sought care = never	0.83	0.533	0.79	0.420
Region ¹²				
Northeast	0.74	0.001*	0.73	0.001*
Midwest	0.83	0.121	0.81	0.091
West	0.74	0.119	0.74	0.120
Need for care factors				
Total medical conditions	1.12	0.000*	1.06	0.164
Depression/Anxiety ¹³	1.07	0.638	1.08	0.598
Change in health status ¹⁴				
Better	1.46	0.005*	1.48	0.004*
Worse	1.01	0.945	0.96	0.831
Number of M.D. visits	1.06	0.028*	1.07	0.020*
Number of ER visits	1.09	0.119	1.09	0.122
Prescription medication use ¹⁵	1.49	0.001*	1.57	0.000*
Over-the-counter medication use ¹⁶	1.32	0.004*	1.29	0.008*
Prevention care ¹⁷	1.10	0.608	1.13	0.521
Current smoker ¹⁸	0.93	0.517	0.93	0.539
Vigorous activity ¹⁹				
<3 times per week	1.61	0.001*	1.61	0.001*
≥3 times per week	1.94	0.000*	1.89	0.000*
Moderate activity ¹⁹				
<3 times per week	1.38	0.0031*	1.40	0.025*
≥3 times per week	1.55	0.000*	1.54	0.000*
Strength activity ¹⁹				
<3 times per week	1.18	0.345	1.17	0.362
≥3 times per week	1.23	0.278	1.23	0.293
Activities of daily living (ADL) limitations ²⁰	1.47	0.003*	1.37	0.023*
Use of a caregiver ²¹	1.59	0.239	1.81	0.136
Disease states ²²				
Pain/aching joints			1.48	0.004*
Hypertension			0.82	0.081
Lower back pain			0.91	0.446
Arthritis			0.86	0.302
Recurring pain			1.45	0.028*

(continued)

TABLE 3. (CONTINUED)

Factors	Model 1		Model 2	
	Odds ratio	p-value	Odds ratio	p-value
Insomnia			0.98	0.857
Severe headache			1.48	0.012*
Sinusitis			0.99	0.926
High cholesterol			1.04	0.765
Neck pain			1.17	0.275
Diabetes			1.21	0.270
Fatigue			1.05	0.833

*Denotes $p < 0.05$.

Reference categories: ¹18–24; ²Male; ³Not married; ⁴Less than high school; ⁵Not living alone; ⁶Not currently working; ⁷Uninsured; ⁸Did not delay care; ⁹Unable to afford care; ¹⁰No usual source of care; ¹¹Last sought care >1 year; ¹²South region; ¹³No depression/anxiety; ¹⁴About the same; ¹⁵No prescription medication use; ¹⁶No over-the-counter medication use; ¹⁷No prevention care; ¹⁸Not current smoker; ¹⁹Never/unable; ²⁰No activities of daily living limitations; ²¹No use of a caregiver; ²²Disease state not present.

ER, emergency room.

Discussion

This use of a nationally representative sample enables our findings to be generalized to all civilian, noninstitutionalized African Americans residing in the United States. A notable contribution of our study is the sensitivity analysis that predictors of CAM use differed when prayer for health reasons was included versus excluded.

Utility of the Andersen Model in predicting CAM use

Predisposing factors. Consistent with previous CAM research in the general population,¹ our results show that African American CAM users compared to nonusers are middle-aged to older, more educated, and female. Older age as a predictor of CAM use is consistent with prior research in African Americans (using convenience samples and examining bivariate relationships) and supports the substantial evidence in the religion and health literature, which shows high levels of religiosity in older African Americans. A recent study showed that older African Americans were more heavily involved in prayer life across several dimensions of prayer compared to whites.³⁵ On the other hand, education was also positively and significantly related to CAM use—a finding that is inconsistent with prior research in African Americans. The reversal of education effects points to the value of examining predictors in a multivariate framework as well as across a broad spectrum of CAM modalities. This difference in education effects also could be explained by our use of a nationally representative sample.

Enabling factors. Only regional differences were significantly related to CAM use, indicating that users are more likely to reside in the south compared to other regions. Regional variations in prayer are well established,³⁶ and our findings further support this relationship, particularly in light of the pervasive use of prayer in the southern population. Future research should examine reasons for regional differences such as cultural variation among African Americans across regions or regional variations in the use of specific CAM modalities. Although past research has shown bivariate relationships with income and insurance and CAM use,¹ the current research shows no relationships between traditional access indicators and CAM use. Again, this is not

surprising given that prayer was such a dominating CAM modality used by African Americans. Although CAM use may stem from a lack of access to conventional care, this was not supported in our study (although there was a large enough effect for the delay care variable [AOR = 1.44] that future studies may examine this issue more carefully). Including prayer may affect these relationships since some people may wait for prayer to “work” before using alternatives. Whether or not employment of CAM contributes to that delay should be studied.

Need factors. As expected, the need predictors (e.g., higher number of medical conditions) were the most predominant predictors of African Americans’ CAM use, even when adjusting for enabling and predisposing factors. CAM users were higher health care utilizers and engaged in more physical activities compared to nonusers. Our results seem to indicate higher levels of health focus in CAM users, which may be linked to their tendency to report better health status compared to the previous year. Taken together, these findings indicate that African Americans use CAM as a supplement to conventional medicine and reflect a somewhat health-conscious orientation in CAM users.

Disease factors. Only pain-related diseases predicted CAM use. People who suffered with pain/aching joints, recurring pain and severe headaches (including migraines) were more likely CAM users compared to those without these conditions.

Use of CAM excluding prayer

When examining CAM use, studies may or may not incorporate prayer. Our sensitivity analysis highlighted changes in relationships, which may help in the understanding of the impact of prayer.

When prayer was excluded, the relationship between age and CAM use no longer existed, further validating the extensive use of prayer in middle-aged to older African Americans.³⁵ The strength of the association between education and CAM use increased substantially, which suggests that this group was more educated than those who pray. Perhaps this finding reflects a more self-care orientation

among CAM users (without prayer), especially since the other more prevalent CAMs (e.g., herbals and relaxation techniques) tend to be chosen by proactive consumer types.

Regional differences indicate that CAM users more likely reside in the northeast and west as opposed to the south, implying that prayer is more prevalent in the south. In addition, CAM users (without prayer) tended to delay care and had less contact with the health care system (e.g., medical visits) compared to CAM users with prayer, although anxiety and depression were more prevalent among those who did not use prayer. Whether or not this connotes substitution of conventional care with CAM should be studied further.

Finally, CAM users who do not pray for health reasons were more likely to have insomnia as opposed to the increased likelihood of pain-related conditions found in CAM users who pray. A possible connection between pain and use of prayer in African Americans is an interesting one and should be studied.

In summary, CAM use is substantial among U.S. adults and African Americans. Previous literature portrayed African American CAM users as uneducated, sick, and poor. However, our findings reveal that African American CAM users have quite a different profile—a health-conscious lifestyle profile that is adopted due to greater attention to disease prevention and control. Generally, health care professionals should routinely inquire about CAM use among all patients. However, according to our study, they should suspect CAM use among African Americans who are middle-aged to older, more educated, female, and Southern. CAM users also tend to be big health care utilizers and have a greater number of chronic conditions, pain-related diseases, and ADL limitations, but they also report better health status compared to the previous year and greater physical activity levels. Health care providers should use these factors as prompts for inquiring about CAM use in African American patients.

Limitations

This study has several limitations. For several variables in the NHIS, not all questions were asked in a way to precisely measure each variable. For example, one item in the NHIS asks if any household member is covered by health care insurance. This item was used as a proxy for individual coverage. In addition, variables found to be unique predictors of African American CAM use (e.g., living with a grandparent) were not included in the database. The validity of some questions may have been problematic and not worded in language commonly used by African Americans. For example, many African Americans use garlic as a home remedy, but “home remedy,” a familiar term among many African Americans, was not offered as a choice in the survey. Thus, the prevalence of CAM use in African Americans may have been underestimated. Finally, CAM use was a binary variable that could not distinguish regular CAM users from periodic users or those who tried CAM on a limited basis.

Conclusions

African Americans are substantial users of CAM, and their use is predicted by predisposing, enabling, need, and disease (PEND) factors. Supporting our hypothesis, need variables

were the strongest predictors of CAM use. Because of the differences in PEND factors between CAM users who pray and those who do not pray, health care professionals may consider these issues when conducting patient interviews and obtaining medical histories. Such information may be critical to creating optimal therapeutic plans.

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