



## Use of complementary and alternative medicine in an urban county hospital epilepsy clinic



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### ABSTRACT

We examined self-reported complementary and alternative medicine (CAM) use among a largely indigent population with epilepsy. Overall CAM use was 70%, with the most frequently reported complementary and alternative medicines (CAMs) being medical marijuana (33%), prayer/spirituality (31%), meditation (19%), vitamins (19%), and stress management (16%). Forty-four percent of patients reported improved seizure control with CAMs. Stress management accounted for perceived seizure reduction in 74%, followed by marijuana (54%), prayer (49%), and yoga (42%). Among the most commonly used and helpful CAMs, stress management was not associated with specific demographic or clinical variables; marijuana use was significantly associated with lower age (users =  $35.2 \pm 10$  years vs. nonusers =  $41.6 \pm 12$ ;  $p < 0.01$ ) and lower income (under \$15,000 40% use vs. 14% over \$15,000;  $p < 0.05$ ); and prayer was significantly associated with female gender (male = 21% vs. female = 45%;  $p < 0.01$ ) and Black ethnicity (Black = 55% vs. Hispanic = 30% vs. White = 23%;  $p < 0.05$ ). Taken together, our study was notable for the high rate of CAM utilization in a largely indigent population, with high rates of perceived efficacy among several CAM modalities.

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### 1. Introduction

Complementary and alternative medicine (CAM) encompasses medical treatments that fall outside of conventional “Western” medical practices and are broadly used worldwide. It is estimated that CAM use in developing countries is quite prevalent, with ranges from 80% in African countries [1] to 56–76% in East Asian countries [2]. In developed countries, estimates vary by study design but have been reported as follows: Canada = 15–20%, Australia = 49–52%, United States = 32–42%, and the United Kingdom = 20–28% [1–6]. While conventional Western medicine focuses on disease mechanisms, CAMs are thought to additionally promote health by addressing mind–body balance [7]. It has been asserted that patients tend to prefer Western medicine when the diagnosis and treatment course is certain, whereas CAMs are preferred when there is higher uncertainty surrounding diagnosis and treatment [7]. It is thought that some of the increasing interest in CAM use among patients with inadequately controlled epilepsy stems from such dynamics.

Initial reports of CAMs in epilepsy were quite limited [8], but, since that time, several groups have sought to better identify the patterns of CAM usage in persons with epilepsy. Studies focused specifically on

CAM use for epilepsy from tertiary referral clinics report rates from 24% to 44% in the US [9–11]. In the UK, surveys have found 34% reported CAM use for epilepsy [13], Indian surveys have found 57% [13], and Korean surveys have found 31.3% [14]. Demographic data have suggested that while higher education predicted higher rates of CAM usage, epilepsy duration and seizure frequency did not [12]. However, these findings are not consistent across studies [11,14]. It is unclear what accounts for these inconsistencies, but as these studies have been conducted in different countries, social and cultural differences, as well as types of CAMs studied, are likely contributory.

Although substantial data on CAMs in epilepsy have been published from comprehensive epilepsy centers, there are currently no published data on CAM use in the indigent population with epilepsy in the United States. The goals of this study were to characterize CAM usage with regard to rate of use and self-reported efficacy of each CAM for patients with epilepsy. Notably, as our county hospital resides in Colorado, where medical marijuana is increasingly prevalent, we included in our study the rate and self-reported efficacy of this controversial CAM to further understand its role in epilepsy treatment in our relatively underserved population.

### 2. Methods

The Colorado Multiple Institutional Review Board approved this prospective survey study. A self-administered 20-item survey was provided

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to all patients seen in the Denver Health and Hospitals adult epilepsy clinic from September through December 2011. The survey was structured to be completed in the clinic by the patient, with help from a language interpreter as needed. As we did not record patient identification, consent forms were not required, and patients were able to respond anonymously.

The survey collected self-reported demographic information, epilepsy diagnosis, seizure frequency, and medication usage, as well as use and efficacy of various forms of CAMs, based on a list modified from prior studies [9–11]. Please see supplement for full survey. Note that all disease characteristics reported below were self-reported. Efficacy of CAMs was assessed specifically by asking participants whether each individual CAM reduced seizure frequency. Also, note that, in Colorado at the time of this study, marijuana was available from dispensaries with physician approval.

Study data were inputted and managed using research electronic data capture (REDCap) tools hosted at Denver Health and Hospitals [15]. Research electronic data capture is a secure, web-based application designed to support data capture for research studies. Statistical analyses were performed in SAS and included unadjusted descriptive statistics. Determination of associations between demographic and clinical variables and CAM use was performed using Student's *t*-test for continuous variables and the chi-squared test or Fisher's exact test (if cell frequencies were less than 5) for categorical variables.  $p < 0.05$  was considered statistically significant. Multivariable analyses were not performed because of the exploratory nature of this study.

### 3. Results

One hundred and twenty of 178 unique patients with epilepsy seen between September and December 2011 responded to the survey. While many surveys had sections that were incomplete, no surveys were discarded for purposes of analysis, and overall data completion was above 90%. The 58 patients who did not respond to the survey either turned in a blank survey or failed to submit the survey entirely.

#### 3.1. Demographics

Consistent with our experience of over 1000 epilepsy visits annually at our county hospital, our survey respondents were patients with medically refractory epilepsy and were racially diverse and of poor socioeconomic class. This population was found to have relatively low educational attainment, as 79% reported less than a college degree. Employment was reported by only 23%, and 93% reported less than \$30,000 annual income. Over 77% were single, separated, or divorced. This was also found to be a patient population with highly refractory epilepsy similar to that typically seen in adult tertiary referral centers. Unlike the previous observations that between 60% and 80% of patients with epilepsy can be seizure-free on antiepileptic drugs (AEDs) [16–18], only 17% of this population was seizure-free, with 68% of the patients on 2 or more AEDs, the average being 2.1 (Table 1).

#### 3.2. Prevalence and efficacy of CAM use

Within the population of survey responders, 70% reported use of a least one CAM (Table 2). Our analysis of the frequency of CAM use revealed marijuana to be the most popular CAM, with 33% of the respondents reporting marijuana use. Prayer (31%), meditation (19%), vitamins (19%), and stress management (16%) also ranked among the most frequently used modalities (Table 2).

We further analyzed reported efficacy, based on the percent of patients reporting reduction in seizure frequency from each modality. The highest ranking was stress management (74%) followed by marijuana (54%) and prayer (49%). Lower rates of perceived benefit were reported for meditation (35%) and vitamins (30%) (Table 3).

**Table 1**  
Demographics of CAM survey participants.

Demographics	Total responses (n%)
Gender	112
Male	63 (56)
Female	49 (44)
Age	119
Mean age	39.6 ( $\pm 12.1$ )
Median age	38
Marital status	111
Single	67 (60)
Married	23 (21)
Divorced	13 (12)
Separated	5 (5)
Other	3 (3)
Race/ethnicity	120
Hispanic or Latino	48 (40)
Black or African American	22 (18)
American Indian or Alaska Native	4 (3)
White	46 (38)
Other	0 (0)
Education	111
Some high school or less	27 (24)
High school graduate or equivalent	35 (32)
Some college	26 (23)
College degree	14 (13)
Trade school	6 (5)
Professional degree	3 (3)
Employment status	115
Employed	27 (23)
Unemployed	36 (31)
Disabled	49 (43)
Retired	2 (2)
Other	1 (1)
Annual income	98
Less than \$15,000	77 (79)
Between \$15,000 and \$30,000	14 (14)
Between \$30,000 and \$50,000	4 (4)
Between \$50,000 and \$75,000	3 (3)
Greater than \$75,000	0 (0)
Seizure frequency per month	116
Seizure-free	20 (17)
<1 seizure	19 (16)
1–5	48 (41)
6–10	12 (10)
11–15	9 (8)
>15	8 (7)
Seizure diagnosis	105
Complex partial seizures	49 (47)
Generalized tonic-clonic seizures	27 (26)
Primary generalized epilepsies	15 (14)
Nonepileptic seizures	7 (7)
Unknown	28 (27)
Number of antiepileptic drugs	100
None	8 (8)
1	24 (24)
2	35 (35)
3	21 (21)
4	6 (6)
Greater than 4	6 (6)

#### 3.3. Association of demographic/clinical variables and CAM use

To better understand the patterns of CAM use, we explored whether any demographic variables (gender, age, marital status, race/ethnicity, education, employment, or income) or clinical variables (seizure frequency or type) were associated with CAM use. Regarding overall CAM use, no demographic or clinical variables were associated with CAM use. We then looked at the three most commonly used and helpful CAMs (stress management, marijuana, and prayer). Regarding stress management, no demographic or clinical variables were associated with this CAM use. Age (users =  $35.2 \pm 10$  years vs. nonusers =  $41.6 \pm 12$ ; Student's *t*-test,  $p < 0.01$ ) and income (under \$15,000 40% use vs. 14% over \$15,000; Fisher's exact test,  $p < 0.05$ ) were associated

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