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OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

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Gurjeet S. Birdee, Russell S. Phillips, Roger B. Davis and Paula Gardiner  
*Pediatrics* 2010;125;249-256; originally published online Jan 25, 2010;  
DOI: 10.1542/peds.2009-1406

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<http://www.pediatrics.org/cgi/content/full/125/2/249>

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American Academy of Pediatrics

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# Factors Associated With Pediatric Use of Complementary and Alternative Medicine

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## KEY WORDS

complementary therapies, infant, child, adolescent

## ABBREVIATIONS

CAM—complementary and alternative medicine

NHIS—National Health Interview Survey

SC—sample child

ADHD—attention-deficit/hyperactivity disorder

aOR—adjusted odds ratio

CI—confidence interval

A portion of this article was presented at the North American Research Conference on Complementary and Integrative Medicine; May 15, 2009; Minneapolis, MN.

The views in this article are those of the authors and do not necessarily represent the views of the National Center for Complementary and Alternative Medicine or the National Institutes of Health.

[www.pediatrics.org/cgi/doi/10.1542/peds.2009-1406](http://www.pediatrics.org/cgi/doi/10.1542/peds.2009-1406)

doi:10.1542/peds.2009-1406

Accepted for publication Aug 15, 2009

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PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

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**FINANCIAL DISCLOSURE:** *The authors have indicated they have no financial relationships relevant to this article to disclose.*



**WHAT'S KNOWN ON THIS SUBJECT:** Using data from the 2007 NHIS, it was recently estimated that 11.8% of children in the United States use CAM.



**WHAT THIS STUDY ADDS:** We conducted this study to describe factors associated with pediatric CAM use, including sociodemographic factors, medical conditions, prescription medication use, absence from school resulting from illness, and access to health care.

## abstract

**BACKGROUND:** Limited data are available on the use of complementary and alternative medicine (CAM) and factors associated with use among the pediatric population in the United States.

**METHODS:** Using the 2007 National Health Interview Survey data among individuals <18 years of age ( $n = 9417$ ), we compared CAM users (excluding those using vitamins and minerals) and non-CAM users. Using bivariable and multivariable logistic regression models, we examined independent associations of CAM use with sociodemographic factors, prescription medication use, delays in health care caused by access difficulties, and common medical conditions/symptoms.

**RESULTS:** In an adjusted multivariable logistic model, CAM users were more likely than non-CAM users to be adolescents rather than infants or toddlers (adjusted odds ratio [aOR]: 1.61 [95% confidence interval (CI): 1.11–2.34]); live in the West (aOR: 2.05 [95% CI: 1.62–2.59]), Northeast (aOR: 1.36 [95% CI: 1.02–1.80]), or Midwest (aOR: 1.35 [95% CI: 1.04–1.74]) compared with those in the South; more likely to have a parent with a college education (aOR: 4.33 [95% CI: 2.92–6.42]); and more likely to use prescription medication (aOR: 1.51 [95% CI: 1.19–1.92]). Pediatric CAM users were more likely to have anxiety or stress (aOR: 2.54 [95% CI: 1.89–3.42]), dermatologic conditions (aOR: 1.35 [95% CI: 1.03–1.78]), musculoskeletal conditions (aOR: 1.94 [95% CI: 1.31–2.87]), and sinusitis (aOR: 1.54 [95% CI: 1.11–2.14]). Use of CAM by a parent was strongly associated with the child's use of CAM (aOR: 3.83 [95% CI: 3.04–4.84]).

**CONCLUSIONS:** In 2007, pediatric CAM users were more likely to take prescription medications, have a parent who used CAM, and have chronic conditions such as anxiety or stress, musculoskeletal conditions, dermatologic conditions, or sinusitis. Research is required to guide pediatricians in making recommendations on CAM modalities for children including potential risks and/or benefits and interactions with conventional therapies. *Pediatrics* 2010;125:249–256

Complementary and alternative medicine (CAM) is defined as “a group of diverse medical and health care systems, practices, and products that are not generally considered to be part of conventional medicine.”<sup>1</sup> Parents/patients frequently ask health care professionals about CAM therapies; however, many health care professionals feel uncomfortable advising patients and desire additional knowledge regarding CAM therapies.<sup>2-5</sup> The American Academy of Pediatrics Provisional Section of Complementary, Holistic, and Integrative Medicine, the Task Force on Complementary and Alternative Medicine, stated: “Pediatricians and other clinicians who care for children have the responsibility to advise and counsel patients and families about relevant, safe, effective, and age-appropriate health services and therapies regardless of whether they are considered mainstream or CAM.”<sup>6</sup> Using data from the 2007 National Health Interview Survey (NHIS), Barnes et al<sup>7</sup> recently estimated that 11.8% of children in the United States use CAM. This report highlighted the most frequent CAM therapies used among children: biologically based therapies (4.7%); mind-body therapies (4.3%); and manipulative and body-based therapies (3.7%). Particular sociodemographic patterns were suggested; such as equal CAM use between boys and girls, higher use among non-Hispanic white patients, higher use among educated families, and regional variations with a low use in the South. In 1996, the estimated expenditures toward CAM therapies or remedies for children were \$127 million and \$22 million, respectively.<sup>8</sup>

Although the authors of smaller clinical surveys have documented higher CAM use among adolescents<sup>9</sup> and the chronically ill pediatric population,<sup>10</sup> clinical factors associated with CAM use have not been fully explored in na-

tional surveys. In this context, we conducted this study to describe factors associated with pediatric CAM use including sociodemographic factors, medical conditions, prescription medication use, absence from school because of illness, and access to health care. We compared CAM users with non-CAM users and report independent correlates of CAM use in the pediatric population. We hypothesized that CAM use would be higher among prescription medication users, households with difficulties in accessing health care, children who missed more school because of illness, and children with musculoskeletal conditions.

## METHODS

### Data Source

We examined data collected in 2007 for the NHIS by the National Center for Health Statistics and Centers for Disease Control and Prevention. NHIS gathers data on the health of the civilian, noninstitutionalized, household population in the United States. The NHIS randomly selects households with a multistage stratified design. NHIS contains a basic module with the family core, the sample child (SC) core, the adult core, and supplemental questions that vary from year to year. In 2007, a child CAM supplement was provided specifically to collect data on individuals <18 years of age. A SC in each family was randomly selected for the SC core and the child CAM supplement. The SC core obtained data on medical conditions, prescription medication use, and use/access of health care. A knowledgeable adult family member in the household responded to the questionnaires regarding the child's health. The child CAM supplement included questions for adult respondents about the SC's use of non-conventional health care modalities in the previous 12 months. An adult in the household was similarly sampled for

the sample adult core and the adult CAM supplement. The family core collected data on sociodemographics, insurance status, and use of health care services for each family member. The survey was conducted face-to-face in English and/or Spanish. The child sample in 2007 had a 76.5% response rate and included data on 9417 children <18 years old.

The child CAM supplement survey asked respondents about the children's use of the following CAM modalities in the previous 12 months: acupuncture; ayurveda; biofeedback; chelation therapy; chiropractic or osteopathic manipulation; energy healing therapy; hypnosis; massage; naturopathy; movement techniques (Feldenkreis, Alexander technique, pilates, and Trager Psychophysical Integration); homeopathy; Asian mind-body techniques (yoga, tai chi, and/or qigong); other relaxation techniques (meditation, progressive relaxation, guided imagery deep breathing exercises, support group meetings, and/or stress management class); traditional healers (Curandero, Espiritista, Hierbero, Yerbera, Shaman, Botanica, Native American healer/medicine man, and Sobador); special diets (vegetarian, macrobiotic, Atkins, Pritikin, Zone, Ornish, and South Beach); and herbs and nonvitamin/mineral supplements. Although the NHIS collected data on the use of vitamins and minerals, we did not include these data in our study so that we could focus on plant-based herbs or medicinal plants. Also, vitamins and minerals are used routinely for preventive care in pediatrics.

### Statistical Analysis

We combined all individual CAM modalities into an overarching category of any CAM use in the previous 12 months while excluding vitamins and minerals. Using categories defined by the National Center for Complementary and

Alternative Medicine, we grouped CAM modalities into biologically based practices (herbal supplements and diets), manipulative/body based practices (chiropractic/osteopathic, massage, Alexander technique, pilates, Feldenkreis, and Trauger psychophysical integration), mind-body based practices (biofeedback, hypnosis, guided imagery, yoga, tai chi, qigong, meditation, progressive relaxation, guided imagery deep breathing exercises, support group meetings, and/or stress management class), whole medical systems (homeopathy, naturopathy, and ayurveda) and traditional healers (Curandero, Espiritista, Hierbero, Yerbera, Shaman, Botanica, Native American healer/medicine man, and Sobador), and energy medicine. Identical categories for CAM were used by Barnes et al<sup>7</sup> by using the same data set.

We defined any CAM use in the previous 12 months as the primary outcome for the study, with subanalyses of the 3 most common CAM modalities identified. Using data on sociodemographics, medical conditions in the previous 12 months, prescription medication use, and use/access to health care, we identified potential associations to any CAM use and the 3 most common CAM modalities used in the previous 12 months. Sociodemographic categories that we examined included age categories (0–4, 5–11, and 12–17 years), gender, race (non-Hispanic white, non-Hispanic black, non-Hispanic Asian, non-Hispanic all other race groups, and Hispanic), region (Northeast, South, Midwest, and West), income (\$19 999 or less, \$20 000–34 999, \$35 000–64 999, and \$65 000 or more), highest education of either parent (less than high school, high school, some college, and a 4-year college or more), and health insurance (Medicaid/Medicare, private, uninsured, and unknown). We explored the associa-

tion of CAM use with prescription medication use in the previous 3 months and difficulty in affording prescription medication in the previous 12 months. We collapsed data regarding delayed medical care because of access difficulties (for example, difficulty getting through on the telephone, could not get an appointment soon enough, waited too long to see doctor, was not open when you could get there, did not have transportation) into a single dichotomous category to identify possible correlates with CAM use (delay versus no delay in medical access). We used the number of school days missed because of illness in the previous 12 months (0–2, 3–5, 6–10, and >10 school days) as a proxy for health status. We explored the use of CAM by parental figures (parents, grandparents, foster parents, legal guardians) with overall CAM use of children in the same household.

We restricted analysis of self-reported medical conditions/symptoms to those with sufficient numbers ( $n > 30$ ) among CAM users for analysis to provide stable estimates of association. Some conditions/symptoms were grouped together to produce sufficient group sizes for analysis such as developmental disorders (mental retardation, other developmental delay, Down syndrome, or autism); headaches (migraine or nonmigraine); musculoskeletal (arthritis, back or neck pain); and dermatologic conditions (acne, warts, or other skin problems). Infrequent conditions with cell sizes  $<30$  such as cancer, congenital heart disease, cystic fibrosis, diabetes, and sickle cell anemia were excluded from analysis.

Because of the complex sampling survey design of NHIS, we used SAS-callable SUDAAN 8.1 (Research Triangle Institute, Research Triangle Park, NC) to obtain appropriate national estimates. Using  $\chi^2$  tests of independence, we compared sociodemo-

graphic characteristics, prescription medication use, ability to pay for prescription medications, missed school days because of illness, and medical conditions. Independent factors associated with CAM use were examined through bivariable and multivariable logistic regression analysis. Factors with a  $P$  value of  $\leq .20$  in bivariable analysis were considered for the multivariable model. The multivariable model was built in a stepwise fashion with a backward elimination strategy retaining factors associated with CAM use with a Wald statistic  $P$  value of  $\leq .05$  significance. This strategy was repeated for the 3 most common CAM modalities: mind-body techniques; biological therapies; and manipulation/bodywork.

We performed a secondary analysis to explore the relationship of CAM use by parental figures (parents, grandparents, foster parents, and legal guardians) and their children. Because not all adult respondents were parental figures in the household (eg, brothers, sisters, uncles, and aunts), we included only those households where a parental figure responded to the adult CAM supplement in this secondary analysis ( $n = 7455$ ). This study was reviewed by our institutional review board and considered exempt from full board review.

## RESULTS

The estimated prevalence of CAM use excluding vitamins in the United States by individuals  $<18$  years of age in 2007 was 8.7 million. In Table 1, we report the sociodemographic characteristics and medical conditions or symptoms for CAM users and non-CAM users. Overall, CAM use was higher among adolescents, non-Hispanic white patients, those who lived in households earning more than \$65 000, or those with a parent who completed college. Compared with other parts of the

United States, the South had a lower prevalence of CAM users to non-CAM users. CAM use was higher among individuals with private insurance. CAM use was higher in prescription medication users than in nonprescription medication users in the previous 3 months. CAM use was also higher among households reporting a delay in medical care of children because of difficulties in access. Children who missed more school days because of illness reported higher CAM use.

With the exception of asthma or frequent ear infections, we found higher CAM use among children with common medical conditions or symptoms including attention-deficit/hyperactivity disorder (ADHD), allergies, asthma, dermatologic conditions, developmental disorders, fever, gastrointestinal conditions, headaches, insomnia, learning disabilities, musculoskeletal conditions, overweight, psychological conditions, and respiratory infections. The most common subcategories of CAM use, including mind-body techniques, biologically based therapies, and manipulation/body work had very similar sociodemographic patterns to overall CAM use (data not presented).

Among a subset of children whose parents also responded to the adult survey, a larger percentage of children used CAM if a parental figure used CAM (65%) as compared with children whose parental figure did not use CAM (35%).

In adjusted multivariable regression analysis, we identified multiple sociodemographic variables and medical conditions independently associated with CAM use (Table 2). CAM use was higher among adolescents compared with children <5; those living in the West, Northeast, and Midwest than the South; households with parents with >12 years of education; and prescription medication users in the previous 3 months. Medical conditions or symp-

**TABLE 1** Characteristics of CAM Users Younger Than 18 Years in the United States Excluding Use of Vitamins and Minerals (*n* = 9414)

Characteristic	CAM Users ( <i>N</i> = 1055), %	Non-CAM Users ( <i>N</i> = 8254), %
<b>Demographic</b>		
Age, y <sup>a</sup>		
Infant and toddler, 0–4	17.8	29.4
Child, 5–11	34.5	38.3
Adolescent, 12–17	47.7	32.3
Gender		
Boys	48.3	51.5
Girls	51.7	48.5
Race <sup>a</sup>		
Non-Hispanic white	71.6	55.8
Non-Hispanic black	9.1	16.6
Non-Hispanic Asian	3.8	4.2
Non-Hispanic all other races	1.9	1.5
Hispanic	13.6	21.8
Income <sup>a</sup>		
\$19 999 or less	9.4	16.6
\$20 000–\$34 999	12.0	17.1
\$35 000–\$64 999	26.6	26.8
\$65 000 or more	51.9	39.4
Region <sup>a</sup>		
West	27.6	22.1
Midwest	27.3	23.3
South	27.1	38.1
Northeast	18.0	16.6
Highest education of either parent <sup>a</sup>		
Less than high school	5.4	13.7
High school	15.3	23.6
Some college	28.2	30.1
4-y college or more	51.2	32.6
Insurance		
Medicaid/Medicare	16.1	25.2
Private	62.6	53.4
Uninsured	7.9	13.3
Unknown	13.3	7.9
Prescription medication use in the previous 3 mo <sup>a</sup>	23.1	10.9
Difficulty affording prescription in the previous 12 mo <sup>a</sup>	3.8	1.8
Delayed medical care because of difficulties with access <sup>a</sup>	15.7	8.9
Missed school days because of illness <sup>a</sup>		
0–2	47.2	60.1
3–5	29.0	24.7
5–10	13.1	10.2
>10	10.7	5.0
Medical conditions and/or symptoms		
ADHD <sup>a</sup>	12.4	6.0
Allergies		
Hayfever <sup>a</sup>	17.9	9.1
Respiratory allergy <sup>a</sup>	17.1	8.6
Food/diet allergy <sup>a</sup>	7.6	3.5
Other <sup>a</sup>	7.9	4.6
Asthma	12.8	8.7
Dermatologic, acne and/or warts <sup>a</sup>	16.5	7.6
Developmental disorders <sup>a</sup>	7.5	3.1
Fever <sup>a</sup>	41.1	27.8
Gastrointestinal		
Nausea/vomiting <sup>a</sup>	33.8	18.9
Abdominal pain <sup>a</sup>	10.9	4.2
Reflux <sup>a</sup>	9.6	3.6
Constipation <sup>a</sup>	8.3	4.3
Headaches <sup>a</sup>	13.2	6.6
Insomnia <sup>a</sup>	12.2	4.1
Learning disability <sup>a</sup>	13.7	6.6
Musculoskeletal <sup>a</sup>	9.7	2.6
Overweight <sup>a,b</sup>	8.7	4.8

TABLE 1 Continued

Characteristic	CAM Users (N = 1055), %	Non-CAM Users (N = 8254), %
Psychological		
Depression <sup>a</sup>	7.2	2.3
Anxiety and/or stress <sup>a</sup>	21.6	6.1
Respiratory infections in the previous 12 mo		
Ear infections (≥3)	6.5	4.9
Sinusitis <sup>a</sup>	14.2	6.3
Chest/head colds <sup>a</sup>	66.0	53.0
Influenza/pneumonia <sup>a</sup>	11.1	5.8
Pharyngitis <sup>a</sup>	53.9	35.1
Parental use of CAM <sup>c</sup>	64.6	27.6

<sup>a</sup>  $P \leq .005$  for differences between CAM users and non-CAM users.

<sup>b</sup> Child reported by adult respondent as being overweight.

<sup>c</sup> Parental use of CAM represents a subset of all children sampled ( $n = 7455$ ) where a parental figure (parent, grandparent, foster parent, or legal guardian) completed the adult survey on CAM use.

Data source: NHIS 2007. Weighted percentages were extrapolated from the US census (2000) for the child civilian, noninstitutionalized household population.

toms independently associated with higher CAM use, while controlling for other significant sociodemographic factors, were anxiety and stress, dermatologic conditions, insomnia, musculoskeletal conditions, nausea and/or vomiting, gastroesophageal reflux, and sinusitis.

In 3 separate subanalyses with adjusted regression models, we analyzed the most frequent CAM modalities (Table 2), including mind body techniques, biologically based therapies, and manipulation/body work, and identified

TABLE 2 Sociodemographic Factors and Medical Conditions Independently Associated With All CAM Use and the 3 Most Common CAM Modalities Among Individuals Younger Than 18 Years

Factor	All CAM Use, aOR (95% CI) <sup>a</sup>	Mind Body Use, aOR (95% CI) <sup>b</sup>	Biologically Based Therapies, aOR (95% CI) <sup>c</sup>	Manipulation/Body Work, aOR (95% CI) <sup>d</sup>
Sociodemographic				
Age, y				
Infant and toddler, 0–4	Reference	Reference	Reference	Reference
Child, 5–11	1.08 (0.74–1.58)	1.42 (0.76–2.67)	1.60 (1.03–2.51)	1.18 (0.81–1.72)
Adolescent, 12–17	1.61 (1.11–2.34)	2.45 (1.36–4.40)	2.15 (1.35–3.44)	1.98 (1.39–2.81)
Race				
Non-Hispanic white	—	—	Reference	Reference
Non-Hispanic black	—	—	0.60 (0.37–0.96)	0.58 (0.37–0.92)
Non-Hispanic Asian	—	—	0.70 (0.38–1.27)	0.56 (0.25–1.26)
Non-Hispanic all other races	—	—	1.35 (0.49–3.72)	0.72 (0.21–2.54)
Hispanic	—	—	0.62 (0.40–0.95)	0.56 (0.41–0.78)
Region				
South	Reference	Reference	Reference	—
Midwest	1.35 (1.04–1.74)	1.25 (0.85–1.82)	0.98 (0.67–1.43)	—
Northeast	1.36 (1.02–1.80)	1.54 (1.06–2.26)	1.02 (0.64–1.64)	—
West	2.05 (1.62–2.59)	1.97 (1.43–2.70)	1.89 (1.24–2.90)	—
Income				
\$19 999 or less	—	—	—	Reference
\$20 000–\$34 999	—	—	—	0.75 (0.44–1.27)
\$35 000–\$64 999	—	—	—	1.32 (0.90–1.96)
\$65 000 or more	—	—	—	1.48 (1.03–2.11)
Highest education of either parent				
Less than high school	Reference	Reference	Reference	—
High school	1.89 (1.22–2.92)	1.43 (0.79–2.60)	1.55 (0.81–2.99)	—
Some college	2.31 (1.56–3.43)	2.01 (1.17–3.45)	1.71 (0.89–3.26)	—
4-y college or more	4.33 (2.92–6.42)	4.39 (2.50–7.69)	3.55 (1.88–6.69)	—
Prescription medication use in the previous 3 mo	1.51 (1.19–1.92)	—	—	—
Delayed health care because of access and/or economic barriers	—	—	1.50 (1.07–2.10)	—
Medical conditions or symptoms				
Abdominal pain	—	—	—	1.73 (1.12–2.68)
Anxiety and stress	2.54 (1.89–3.42)	4.02 (2.92–5.53)	—	—
Dermatologic	1.35 (1.03–1.78)	—	—	—
Fever	—	—	1.47 (1.08–2.00)	—
Insomnia	—	1.63 (1.11–2.41)	2.60 (1.76–3.85)	—
Musculoskeletal	1.94 (1.31–2.87)	—	—	3.69 (2.50–5.44)
Nausea and/or vomiting	1.62 (1.27–2.05)	1.79 (1.32–2.43)	—	1.49 (1.08–2.05)
Reflux	1.56 (1.07–2.28)	—	1.72 (1.10–2.69)	—
Sinusitis	1.54 (1.11–2.14)	—	1.45 (1.02–2.05)	—

<sup>a</sup> ORs have been adjusted for age, region, parental education, prescription medication use, and medical conditions with a  $P$  value of  $\leq .05$ .

<sup>b</sup> ORs have been adjusted for age, region, parental education, insurance status, and medical conditions with a  $P$  value of  $\leq .05$ .

<sup>c</sup> ORs have been adjusted for age, race, region, parental education, delays in access to medical care, and medical conditions with a  $P$  value of  $\leq .05$ .

<sup>d</sup> ORs have been adjusted for age, race, income, and medical conditions with a  $P$  value of  $\leq .05$ .

different sociodemographic and health conditions/symptoms associated with use. Mind-body use positively correlated with being adolescent versus infant or toddler, living in the West or Northeast versus the South, and higher parental education with some college or more versus parental education of less than high school. Medical conditions associated with mind-body use were anxiety/stress, insomnia, and nausea/vomiting. Use of biologically based therapies correlated with being an adolescent versus being an infant or toddler, white versus non-Hispanic black or Hispanic, living in the West versus the South, and parents being college educated versus parents completing less than high school. Biologically based therapies were also associated with delays in health care because of difficulties with access, and medical conditions including insomnia, fever, reflux, and sinusitis. Manipulation and bodywork correlated with being an adolescent as compared with infant or toddler, being white as compared with non-Hispanic black or Hispanic, and higher income as compared with lower income. Abdominal pain, musculoskeletal conditions, and nausea/vomiting were independently associated with use of manipulation and bodywork.

In a secondary analysis restricted to those children whose parents were also queried about CAM use, we created a regression model for CAM use that included socioeconomic factors associated with CAM use in the overall multivariable model and found that any parental use of CAM was associated with the child CAM use (adjusted odds ratio [aOR]: 3.83 [95% confidence interval (CI): 3.04–4.84]). When adjusted for parental use of CAM, other factors associated with CAM use remained significant except (1) the difference between adolescent CAM use and infant or toddler CAM use (0–4 years old)

was no longer statistically significant, and (2) dermatologic conditions were no longer associated with pediatric CAM use.

## DISCUSSION

We found that >8 million individuals younger than 18 years of age used CAM in the United States in 2007. Adolescents, children living in the West, and those with parents with >12 years of education and prescription medication use were independently associated with higher overall CAM use. CAM use was also associated with a range of common medical conditions and symptoms including gastrointestinal problems, anxiety/stress, dermatologic conditions, insomnia, musculoskeletal conditions, and sinusitis. We found higher associations of anxiety or stress, insomnia, and nausea and/or vomiting among mind-body users; fever, insomnia, reflux, and sinusitis among users of biologically based therapies; and abdominal pain, musculoskeletal conditions, and nausea and/or vomiting among manipulation/bodywork users. Parental CAM use is a strong correlate of child CAM use.

In an analysis adjusted only for age, Barnes et al<sup>7</sup> also noted no differences of CAM use by gender, higher use among adolescents than younger age groups, and higher use among white children than black children or non-Hispanic children than Hispanic children. Barnes et al<sup>7</sup> also noted higher CAM use in households with more parental education, among those who live in the West or Northeast, and among those with higher income. On the basis of an online national survey of adolescents in 2002, Wilson et al<sup>9</sup> reported higher CAM use in the previous 30 days among female patients than male patients, black patients than white patients, among those living in the East than Midwest or South, and among those with perceived low family

income. The authors noted no difference in CAM use according to parental education.

In our adjusted regression models, we found no independent relationship between overall CAM use and gender or race. Only among users of biologically based therapies and manipulation/bodywork did racial differences remain significant with less use among non-Hispanic black patients and Hispanic patients compared with white patients. Within the adult population, overall CAM use has been reported to be less among non-Hispanic black patients and Hispanic patients than non-Hispanic white patients.<sup>11</sup>

In our model, higher age, parental education, and living in the West were significantly associated with CAM use. Higher income was not associated with overall pediatric CAM use, but was associated with manipulation and bodywork therapies. There may be a financial barrier for children to access manipulation and bodywork, such as chiropractic and massage, as compared with other CAM modalities. Our results indicating that adolescents are more likely to use CAM is consistent with data reported by Wilson et al.<sup>9</sup>

Barnes et al<sup>7</sup> reported a low prevalence of pediatric CAM use for selected diseases and conditions with the most common being back or neck pain (6.7%), head or chest cold (6.6%), anxiety/stress (4.8%), other musculoskeletal conditions (4.8%), ADHD/attention-deficit disorder (2.5%), and insomnia/trouble sleeping (1.8%). These data suggest that CAM is used for symptom management, health maintenance or prevention, rather than treatment of specific conditions. However, many authors of studies have found higher CAM use among children with chronic conditions such as asthma,<sup>12,13</sup> ADHD,<sup>14</sup> autism,<sup>15,16</sup> cancer,<sup>17–19</sup> food allergies,<sup>20</sup> juvenile idiopathic arthritis,<sup>21</sup> type 1 diabetes,<sup>22</sup> and sickle cell anemia.<sup>23</sup> We

excluded anemia, cancer, congenital heart disease, diabetes, and sickle cell anemia from our analysis because of insufficient numbers. The respondents of NHIS reflect the general pediatric population, but there may be insufficient sampling of children with chronic diseases to detect associations with CAM use. Some of the associations with CAM use we found were with medical symptoms rather than specific medical diagnoses, such as nausea/vomiting and abdominal pain.

Overall CAM use was associated with prescription medication use in the previous 3 months. Although not significantly associated with the use of biologically based therapies, this raises the potential for drug-herb interaction. Among adults, only half disclose their use of herbal and dietary supplements to a health care provider.<sup>24</sup> Pediatricians and pharmacists need to inquire about use of herbs and supplements when prescribing medications and actively monitor for adverse effects. Use of biologically based therapies was associated with health access difficulties, suggesting that parents may turn to CAM therapies when conventional health care is not readily available. Parental use of CAM is strongly associated with child CAM use. This may be a

consequence of parents' administering or encouraging CAM use for their child. Children also may model the health behavior of their parents and adopt CAM use. Parental use of CAM may predict which children use CAM as adults.

Our study has several limitations. The data were collected from an adult proxy in the household which is susceptible to recall bias. Also, the adult proxy may not have known that a child or teenager was using CAM. There may be types of CAM therapies that are used by children, but not specifically asked by the survey such as music therapy. Data regarding symptoms and medical conditions are based on self-report and may not meet standard clinical definitions. The number of children with specific chronic conditions was small; therefore, associations between CAM use and some chronic conditions may not be apparent. Associations with medical conditions and symptoms characterize pediatric CAM users, rather than indicate intentions to treat specific conditions. Despite these limitations, we used the most currently available data set from a national representative sample to describe the use of CAM among the pediatric population.

## CONCLUSIONS

CAM use is higher among adolescents, those living in the West, educated households, children whose parents use CAM, and prescription medication users. Health care providers need to inquire about CAM use in households and advise patients appropriately regarding clinical efficacy, or lack thereof, and potential adverse interactions with herbs-drugs. Parents' use of CAM may suggest that their children may be using CAM as well. More research is necessary to establish evidence for CAM therapies among children, in particular with mind-body techniques, biologically based therapies, and manipulation/body work. With more evidence of efficacy, physicians will be better able to guide patients to make safe and effective decisions regarding CAM use.

## ACKNOWLEDGMENTS

Dr Birdee is supported by Institutional National Research Service Award T32AT00051-06 from the National Institutes of Health. Dr Phillips is supported by Mid-Career Investigator Award K24-AT000589 from the National Center for Complementary and Alternative Medicine, National Institutes of Health.

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**When Consensus Is Not the Solution:** The Wall Street Journal (October 2009) recently printed the following quotation from a speech given by former British Prime Minister Margaret Thatcher. It is worth sharing in regard to the process of achieving consensus. “To me consensus seems to be the process of abandoning all beliefs, principles, values and policies in search of something in which no one believes, but to which no one objects—the process of avoiding the very issues that have to be solved, merely because you cannot get agreement on the way ahead. What great cause would have been fought and won under the banner ‘I stand for consensus?’” Perhaps this quote should have been shared during the health reform discussions in Congress.

Noted by JFL, MD

## Factors Associated With Pediatric Use of Complementary and Alternative Medicine

Gurjeet S. Birdee, Russell S. Phillips, Roger B. Davis and Paula Gardiner  
*Pediatrics* 2010;125;249-256; originally published online Jan 25, 2010;  
DOI: 10.1542/peds.2009-1406

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