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Original Article

Use of Complementary and Alternative Medicine During Pregnancy and the Postpartum Period: An Analysis of the National Health Interview Survey

Gurjeet S. Birdee, MD, MPH,[1] Kathi J Kemper, MD, MPH,[2] Russell Rothman, MD, MPP,[1] and Paula Gardiner, MD, MPH[3]

Abstract

Introduction: Complementary and alternative medicine (CAM) is commonly used among women, but few national data exist regarding CAM use during pregnancy or the postnatal period.
Methods: Data from the 2007 National Health Interview Survey were analyzed for women ages between the ages of 18 and 49 years who were pregnant or had children less than 1 year old. CAM use was identified based on standard definitions of CAM from the National Institutes of Health's National Center for Complementary and Alternative Medicine. CAM use among women who were pregnant or with a child less than 1 year was compared with the other similarly aged female responders. CAM use was examined among these women stratified by sociodemographics, health conditions, and conventional medicine use through bivariable and multivariable logistic regression models.
Results: Among pregnant and postpartum women from the ages of 19 to 49 years in the United States, 37% of pregnant women and 28% of postpartum women reported using CAM in the last 12 months compared with 40% of nonpregnant/non-postpartum women. Mind–body practices were the most common CAM modality reported, with one out of four women reporting use. Biological therapies, excluding vitamins and minerals, during the postpartum period were used by only 8% of women. Using multivariable regression modeling, we report no significant difference in CAM use among pregnant compared with non-pregnant women (adjusted odds ratio [AOR], 0.88; [95% confidence interval 0.65–1.20]), but lower CAM use among postpartum women compared with non-pregnant women (AOR 0.67; [0.52–0.88]), while adjusting for sociodemographics.
Conclusion: CAM use among pregnancy similar to women who are not pregnant, while postpartum CAM use decreases. Further evaluation of CAM therapies among pregnant and postpartum women is necessary to determine the costs and benefits of integrative CAM therapies in conventional care.

Introduction

Approximately 40% of adults in the United States use complementary and alternative medicine (CAM), with higher use among women than men.[1] In a study of data from the 2007 National Health Interview Survey (NHIS), Harrigan reported that of 2,673 women who interacted with any obstetrician/gynecologist for medical care, 31.8% reported CAM use, while only half of these women disclosed CAM use to a physician.[2] Harrigan did not specify how many of these women were pregnant or postpartum, and limited data exist regarding CAM use during pregnancy or the postpartum period in the United States.[3–5]

A 2010 systematic review on CAM use during pregnancy cited a broad prevalence ranging from 1% to 87%.[6] Authors noted that varying definitions of CAM may contribute to reported differences. Studies based on the Australian Longitudinal Study on Women's Health from 1996 to 2006 reported no differences between nonpregnant and pregnant women in CAM use over time.[7] Pregnant women tended to use CAM to relieve specific pregnancy related conditions including back pain, tiredness, and dysuria. Half of women reported seeing a CAM practitioner for pregnancy related conditions (neck pain, sciatica).[8] It is unknown if these trends hold true for women in the United States. Research is lacking on the efficacy and safety of CAM among pregnant and

[1]Departments of Internal Medicine and Pediatrics, Vanderbilt University School of Medicine, Nashville, Tennessee.
[2]Department of Pediatrics, Ohio State University College of Medicine, Columbus, Ohio.
[3]Department of Family Medicine, Boston University Medical School, Boston, Massachusetts.

postpartum women. For example, although almost 60% of pregnant women used a dietary supplement in one European study, limited data were available on safety and efficacy of supplements used.[9] Women's use of CAM may be affected by general attitudes and perceptions of CAM and conventional therapy during pregnancy. Women tend to avoid the adverse effects of pharmacotherapy[10] or other conventional therapy during pregnancy and postpartum.[11] In contrast, women who use CAM were more likely to perceive CAM as more natural, safe, and as effective to conventional care.[6]

Despite the lack of definitive effectiveness research, the use of CAM during pregnancy and postpartum is clinically relevant. For example, as new mothers transition to breastfeeding, botanical supplements may affect breast milk, which in turn may affect infant health.[12,13] According to the CDC, 49% of women 6 months postpartum and 27% of women 12 months postpartum reported breastfeeding.[14] It is unclear if breastfeeding women are less or more likely to use CAM therapies. Another example is low back pain which commonly affects pregnant women.[15] In the general population, back pain is the most common reason individuals seek CAM therapies.[1] CAM therapies are also frequently used for mood disorders in the general population,[1] though the role of CAM for women suffering postpartum depression is not clear.[16] With the effects of many CAM modalities on maternal and fetal health unknown, patterns of CAM utilization during pregnancy and after delivery are important to identify.

The primary purpose of this study was to examine CAM use among women who reported being pregnant or having a child within the past year. We hypothesized that CAM use among pregnant women would be less than the general female population because of the unknown safety of many CAM approaches during pregnancy and that botanical supplements would be the most common CAM modality. We also hypothesized that during the 1 year postpartum, when breastfeeding is common, CAM prevalence would be lower than for other women in the same age range. Based on prior studies of sociodemographic factors associated with CAM use, we anticipated that CAM use among pregnant and postnatal women would be highest among individuals who were younger, white, and had higher income or education.

Materials and Methods

We examined data from the 2007 NHIS which sampled 75,764 noninstitutionalized individuals about health conditions, conventional medicine use, and CAM use. NHIS was conducted face-to-face in English and/or Spanish and had a response rate of 76.5%. We analyzed data files from the 2007 NHIS, including the Family Core, Adult Core, Sample Child, and a special additional survey administered in 2007 Adult CAM Supplement.

The Family Core collects information regarding sociodemographics, health insurance, and healthcare access. The Adult Core collects information from a randomly selected individual in the household on health conditions including pregnancy status, healthcare utilization, and medical conditions. To identify pregnancy status, all women from the ages 18 to 49 years were asked, ''Are you currently pregnant? (Yes, No).'' To identify mothers with children less than 1 year of age, we utilized data from the Family Core questionnaire to identify women who had biological children less than 12 months of age in the household. We excluded children less than 12 months of age that were not identified as biological children in the same family. The Adult CAM Supplement asked individuals about use of 36 types of CAM therapies in the last 12 months as listed in Table 1.

For analysis, we selected women from 18 to 49 years as the study population. We combined CAM modalities into five categories as defined by the National Center for Complementary and Alternative Medicine (See Table 1)[17]: mind–body practices, biologically based, manipulative/movement based practices, whole medical systems and traditional healers, and energy medicine. We combined all CAM therapies into a single category for any CAM use in the previous 12 months. We excluded vitamins and minerals from the CAM category because these are commonly consumed by women during pregnancy and the postnatal period (e.g., prenatal vitamins).

Data derived from the Family Core including sociodemographics were categorized for analyses. For some sociodemographic covariates (race, education, and region), the sample size for subcategories were small ($n < 30$) by pregnancy status. Since these small sample sizes are not accurate for

Table 1. Complementary and Alternative Medicine Modalities Surveyed in National Health Interview Survey

CAM categories[a]	*Individual CAM Modalities*
Biological therapies	• Diets • Dietary supplements
Mind–body therapies	• Biofeedback • Deep Breathing Exercises • Hypnosis • Guided Imagery • Meditation • Progressive Relaxation • Qi Gong • Support Groups • Stress Management Classes • Tai Chi • Yoga
Manipulation and body-based practices	• Chiropractic/Osteopathic • Massage • Movement Therapies (Alexander Technique, Feldenkrais, And Pilates)
Whole medical system and traditional leaders	• Homeopathy • Naturopathy • Ayurveda • Curandero • Espiritista • Hierbero • Yerbera • Shaman • Botanica • Native American Healer/ Medicine Man Sobador
Energy medicine	• Energy healing

[a]Complementary and Alternative Medicine (CAM) Categories based on criteria defined by the National Institutes of Health National Center for Complementary and Alternative Medicine.

Table 2. Prevalence of CAM Use by Modality Among Women by Pregnancy and Postnatal Status

CAM modality	*All women* N = *7,290*		*Not pregnant or postnatal* n = *6,569*		*Pregnant* n = *269*			*Postnatal* n = *453*		
	Number in thousands	*%*	*Number in thousands*	*%*	*Number in thousands*	*%*	p-*Value*[a]	*Number in thousands*	*%*[a]	p-*Value*[a]
Any CAM use last 12 months	26,864	39.9	24,796	40.7	957	36.7	0.47	1,100	27.8	< 0.05
Biologically based therapies	11,410	17.5	10,659	17.2	429	17.3	0.86	315	8.2	< 0.05
Mind–body Practices	16,394	24.4	14,918	24.5	629	25.3	0.99	845	22.0	0.21
Manipulation and body-based practices	11637	17.3	10714	17.6	464	18.7	0.93	450	11.7	< 0.05

Prevalences reflect weight estimates based on the United States population in 2007.
[a]*p*-Values based on chi-squared test for for pregnant or postnatal versus not pregnant or postpartum.

reporting, we collapsed these covariates into the following categories to provide sufficient cell sizes for analyses and reporting: race (non-Hispanic white vs. other), education (high school graduate or less vs. more than high school), and geographic region (South vs. other). These categorizations are consistent with prior NHIS reports of CAM use being less prevalent among non-whites, lower education, and the South.[1] Age was analyzed as a continuous variable and also dichotomized (18–29 and 30–49 years). NHIS queries income based on the following categories: $0–$34,999, $35,000–$49,999, $50,000–$74,999, $75,000–$99,999, and $100,000 and over. Since CAM use is less prevalent among lower income populations, we presented the data by identifying low income as less than $35,000 based on the available categories. We categorized the following other covariates of interest *a priori* for analyses: health insurance (private vs. other including Medicaid, uninsured, and unknown); self-reported health status (excellent or very good versus good, fair, or poor); prescription medication use (yes, no); and difficulty affording medications (yes, no). We analyzed selected medical conditions based on clinical relevance to this population (yes, no): lower back pain, depression/anxiety, and sleep problems. Missing data on family income and personal earnings in the 2007 NHIS were imputed using multiple-imputation methodology.[18]

Global chi-squared tests of independence were used to compare any CAM use and major CAM categories among women from 18 to 49 years of age by pregnancy status and the presence of a child less than 1 year old in the household. We compared patterns of CAM use by sociodemographics, conventional medicine use, and selected medical conditions. We developed bivariate and multivariate logistic regression models to identify variables associated with overall CAM use among women currently pregnant and 1-year postpartum. For regression analyses, we selected variables with $p \leq 0.20$ in bivariable analyses for consideration into a multivariable model. Multivariable models were built with a backward elimination strategy retaining factors with $p \leq 0.05$. SAS-callable SUDAAN 9.1 (Research Triangle Institute, Research Triangle Park, NC) was used to obtain appropriate weighted national estimates for the United States population in 2007. This study was reviewed by the Vanderbilt Institutional Review Board and considered exempt from full board review.

Results

NHIS surveyed 7244 women in the United States between the ages of 19 and 49 years representing 66 million women nationally, of whom 3.8% ($n = 269$) were pregnant and 6.2% ($n = 453$) had a child within the last year. The median age of this sample was 33 years. Among all women in this age group, almost 39.9%—representing 25 million women—reported using any CAM in the last 12 months (Table 2). Pregnant women had similar rates of CAM use to nonpregnant women (36.7% versus 40.7%, $p = 0.47$). CAM use was significantly lower among postpartum women than nonpregnant women (27.8% versus 40.7%, $p < .05$).

Mind–body practices were the most common CAM modalities used by all women (24.4%), pregnant women (25.3%), and postpartum women (22.0%). We found no significant statistical differences in CAM use by modality among pregnant women. Biologically based therapies were less commonly used among postpartum women than by pregnant or all nonpregnant women (8.2% vs. 17.5% or 17.3% respectively, $p < .05$). Manipulation and body-based practices were also significantly used less by postpartum women than pregnant or all nonpregnant women (11.7% vs. 17.6% or 18.7% respectively, $p < .05$).

Table 3 reports the prevalence of CAM use by sociodemographics and selected medical conditions. CAM use among pregnant or postnatal women versus nonpregnant/postnatal women was significantly lower in women who were younger, lived in the South, lived in households with lower income or less education, and had non-private insurance (chi-squared statistic $p \leq 0.05$). Women within 1 year postpartum had no significant differences in CAM use by race, region, marital status, or type of insurance. CAM use was significantly higher among all women with self-reported anxiety or depression and sleep problems. Using multivariable regression modeling we found no significant difference in CAM use among women who were pregnant (adjusted odds ratio [AOR] 0.88, [95% confidence interval 0.65–1.20]), but lower use among women who were postpartum (AOR 0.67 [0.52–0.88]) while controlling for other sociodemographics (see Table 4).

Conclusion

The prevalence of CAM use is the same during pregnancy but less during the postpartum period as compared with

Table 3. Prevalence of CAM use Among Women Aged 18 to 49 Years by Pregnancy or Postnatal Status[a]

Characteristic	*All women* N = *7290*	*Not pregnant or postnatal* n = *6569*	*Pregnant* n = *269*	*Postnatal* n = *453*	p-*Value*[b]
Age (years)					≤0.05
18–30	37.6	39.4	35.3	24.2	
30–49	41.2	41.4	42.9	35.4	
Race					0.5
White	42.2	43.1	41.7	29.7	
Non-white	31.8	32.5	26.0[c]	25.3	
Region					0.25
Non-south	43.7	44.7	44.5	29.0	
South	33.5	34.2	29.0[c]	28.2	
Marital Status					
Married	40.1	40.9	38.6	32.8	0.88
Not married	39.9	40.8	38.3	19.9	
Household Income					≤0.05
<$35,000	31.8	33.1	22.0[c]	13.3	
≥$35,000	44.2	44.0	45.9	40.7	
Maternal education					≤0.05
More than high school	49.5	50.0	49.7	46.0	
High school or less	25.7	27.1	21.2[c]	12.7	
Insurance					0.86
Private	47.4	47.5	47.6	45.6	
Non-private	32.8	34.0	30.4	19.8	
Back Pain					0.46
Yes	53.3	54.7	47.1	41.4	
No	35.5	36.3	35.0	23.8	
Depression/Anxiety					
Yes	53.9	54.9	51.7[c]	43.2[c]	≤0.05
No	37.0	37.8	36.0	25.8	
Sleep					
Yes	54.3	55.8	46.4[c]	40.0	≤0.05
No	35.8	36.5	35.9	25.6	

[a]Prevalences reflect weight estimates based on the United States population in 2007.
[b]*p*-Values based on chi-squared test for pregnant or postnatal versus not pregnant or postpartum.
[c]Estimate not reliable or precise due to small sample number less than 30.

nonpregnant women, particularly in regard to biologically based, manipulation, and body-based therapies. One out of four women reported using mind–body practices regardless of being pregnant or postpartum. CAM use was highest among women who were white and who had a higher income and education, private insurance, and selected medical conditions including lower back pain, self-reported anxiety or depression, and sleep problems.

These results are consistent with other international research surveys of CAM use among women. For example, the Australian Longitudinal Study on Women's Health reported that 48% of pregnant women reported visiting a CAM practitioner and 52% reporting use of a CAM product.[19] In a longitudinal report from the same cohort, CAM use was noted to increase with age but did not differ significantly between pregnant and nonpregnant women.[7] These results are consistent with our regression model in which CAM use did not vary by pregnancy status.

Data from the Australian cohort and other epidemiological studies suggest that women may seek CAM to treat pregnancy related conditions such lower back pain,[3 19,20] anxiety, and depression.[21] We found a higher use of CAM among pregnant women with depression/anxiety and sleep problems, though after controlling for other sociodemographic factors, these differences were no longer significant. Emerging data suggests that mind–body therapies may be beneficial during pregnancy for anxiety[22] and depression.[23] Mind–body therapies may be especially attractive during pregnancy given concerns of potential adverse effects of psychotropic drugs on fetal development, low cost, and easy accessibility.[6,10,11]

In a population-based case-control study from the National Birth Defects Prevention Study, the reported prevalence of herbal use before and during pregnancy was 10.9% and 9.4% respectively,[24] which is lower than our results finding that biologically based therapies were used by 17.3%. It is unclear why the prevalence varies between our studies, but it may stem from different descriptions and questions of herbal use, ''Did you use any herbs or folk medicines to treat any medical conditions, to lose weight, or just to keep you healthy?'' (National Birth Defects Prevention Study) as compared with the question, ''During the past 12 months, have you taken any herbal supplements listed on this card?'' (National Health Interview Survey).

Table 4. Multivariable Regression of CAM Use Among Women Aged 18–49 Years

Characteristic	*Odds ratio*[a] *(95% confidence interval)*	p-*Value*
Pregnant		
No	1.00 (Reference)	0.86
Yes	0.88 (0.65–1.20)	
Postpartum		
No	1.00 (Reference)	0.0032
Yes	0.67 (0.52–0.88)	
Age (years)		
18–30	1.00 (Reference)	0.4954
30–49	1.05 (0.91–1.22)	
Race		
White	1.00 (Reference)	<0.0001
Non-white	0.69 (0.60–0.79)	
Region		
Non-south	1.00 (Reference)	<0.0001
South	0.68 (0.59–0.78)	
Household Income		
<$35,000	1.0 (Reference)	0.432
≥$35,000	1.17 (1.00–1.36)	
Parental education		
High school or less	1.00 (Reference)	<0.0001
More than high school	2.54 (2.20–2.93)	
Insurance		
Private	1.00 (Reference)	<0.0001
Non-private	0.76 (0.66–0.87)	

[a]Multivariable regression model with odds ratios adjusted for pregnancy/post-partum status, age, race, region, household income, parental education, and insurance.

Our finding of lower CAM use, specifically botanical, manipulation and body-based therapies, during the postpartum period is an important new finding. Mind–body practices were used at a rate similar to pregnancy and nonpregnancy periods. In the postpartum period, women may use CAM to treat postnatal depression and to support breastfeeding. Very limited high-quality evidence exists on CAM use for the treatment of postnatal depression.[25] Biological therapies have been used and studied for breastfeeding mothers as galactagogues[26] and to treat breast engorgement.[27] While historically herbal remedies have been used by breastfeeding women for centuries, very little data exists on safety for and effects on the newborn health.[26] The NHIS survey did not ask if women were breastfeeding, so we are unable to make a direct association of breastfeeding and CAM use. Decreased use may represent maternal concerns for biological therapies being transmitted to their infant via breast milk.

Our study has several limitations. As a cross-sectional study, we are unable to identify a causal associations related to CAM use and pregnancy or postpartum status. Secondly, our sample size was insufficient to look at specific medical conditions or biological therapies (e.g., herbs) related to CAM us among this population. Survey data is based on self-report and therefore prone to recall bias. The survey did not collect data on breastfeeding, which would have been very informative. There may be unidentified confounders, such as maternal parity, which affect CAM use that were not considered. The sample population was limited to English and Spanish speaking adults.

Many women use CAM throughout pregnancy and the postpartum period, though women use biologically based and manipulative therapies less postpartum. Future epidemiological studies of CAM during pregnancy and postpartum are necessary to identify specific reasons and potential benefits and risks. Clinical trials are needed to determine efficacy and safety for commonly used CAM therapies to help guide pregnant and postpartum women to promote health for themselves and their infants.

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Disclosure Statement

No competing financial interests exist.

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Address correspondence to:
Gurjeet Birdee, MD, MPH
Center for Health Services Research
Vanderbilt University Medical Center
Suite 6000 Medical Center East
Nashville, TN 37232

E-mail: gurjeet.birdee@vanderbilt.edu