

# Trend and pattern of herb and supplement use among pregnant women in the United States: findings from the 2002, 2007, and 2012 US National Health Interview Surveys



**OBJECTIVE:** The use of complementary and alternative medicine (CAM) in the United States has rapidly gained popularity in the last half century.<sup>1</sup> Herbs and dietary supplements are among the most widely used form of CAM.<sup>2</sup> Females used CAM more frequently and were more likely to self-administer CAM therapies and products.<sup>3</sup> However, the pattern of herbal medicine use among pregnant women from a national perspective remains unclear. Moreover, as many as 25% of the users do not disclose the use of herbs and supplements to their physicians.<sup>4</sup> The high prevalent use and low disclosure rate could become a potential risk for pregnant women and fetuses. Therefore, the purpose of this study was to examine the prevalence and trend of herb and supplement use among US pregnant women over a 10-year period.

**STUDY DESIGN:** Conducted by the National Center for Health Statistics,<sup>5</sup> the National Health Interview Survey (NHIS) is a publicly available annual health survey that includes supplementary questionnaires to collect data regarding CAM use in 2002, 2007, and 2012. Our study used the 3-wave surveys to investigate herb and supplement use among pregnant women of reproductive age.

Female respondents who answered yes to the self-reported questionnaire, “Are you currently pregnant?” and were between the ages of 18 to 40 years became our study population.<sup>5</sup> For the dependent variable, respondents were asked, “During the past 12 months, have you taken any herbal or

other nonvitamin supplements listed on this card for yourself?”<sup>5</sup> Respondents who answered yes to the question were then asked to choose specific herbs and supplements.

The survey sample was weighted to obtain national estimates by using the PROC SURVEY procedure (SAS, v. 9.4; SAS Institute, Cary, NC). The Wald  $\chi^2$  test was used to examine the difference of herb and supplement use between pregnant and nonpregnant women of reproductive age. The NHIS is a deidentified, publically available data set and the study did not require institutional review board review.

**RESULTS:** In 2002, 315,774 (13.6%) pregnant women and 8.6 million (20.4%) nonpregnant women reported using herbs and supplements. The prevalence increased to 417,222 (16.7%) for pregnant women but decreased to 6.9 million (16.2%) for nonpregnant women in 2007. Most recently in 2012, the prevalence slightly decreased to 342,164 (15.4%) for pregnant women, and the prevalence remained stable at 7 million (15.9%) for nonpregnant women (Table).

The top 5 most frequently used herbs and supplements among pregnant women of reproductive age (18-40 years) in 2002 were echinacea (41.7%), ginseng (19.8%), ragweed or chamomile (15.9%), ginkgo biloba (12.7%), and peppermint (12%). In contrast, the most frequently used herbs and supplements among pregnant women of reproductive age (18-40 years) in 2012 were fish oil (69.1%), melatonin (27.4%), probiotics or prebiotics (25.9%), acai (21.2%), and cranberry (19.8%).

**TABLE**  
Use of herbal and nonvitamin supplements in past 12 months by US pregnant and nonpregnant women of reproductive age

	Pregnant <sup>a</sup>				Nonpregnant <sup>b</sup>				P <sup>c</sup>
	Sample n	Est. N <sup>c</sup>	% <sup>c</sup>	95% CI	Sample n	Est. N <sup>c</sup>	% <sup>c</sup>	95% CI	
Used any herbs or nonvitamin supplements in past 12 mo in 2012 <sup>d,e</sup>	40	342,164	15.4	11.1–19.8	1067	7,001,511	15.9	14.7–17.2	>.05
Used any herbs or nonvitamin supplements in past 12 mo in 2007	33	417,222	16.7	11.2–22.2	669	6,945,603	16.2	14.8–17.6	>.05
Used any herbs or nonvitamin supplements in past 12 mo in 2002 <sup>d,e</sup>	51	315,774	13.6	9.6–17.5	1376	8,620,784	20.4	19.3–21.5	<.01

CI, confidence interval.

<sup>a</sup> Weighted number of pregnant women (year): 2,325,700 (2002), 2,500,687 (2007), and 2,217,213 (2012); <sup>b</sup> Weighted number of nonpregnant women (year): 42,247,062 (2002), 42,916,166 (2007), and 43,927,376 (2012); <sup>c</sup> Proportions based on weighted prevalence estimates, P values for Wald  $\chi^2$  test; <sup>d</sup> Percent change of herb and supplement use (2002 and 2012) among pregnant women P > .05; <sup>e</sup> Percent change of herb and supplement use (2002 and 2012) among nonpregnant women P < .05.

Chung et al. Herb and supplement use among pregnant women in the US. Am J Obstet Gynecol 2017.

**CONCLUSION:** The trend of herb and supplement use in the past decade appeared to be increasing among pregnant women. This increase may be attributed to some women's desire for more control over their medications during pregnancy. Some women may avoid traditional pharmaceutical products in favor of herbs and supplements with the belief that they are more natural and hence safer for the fetus.

The NHIS queried different herbs and supplements in different years (2002, 2007, and 2012).<sup>3</sup> Although the query was slightly different from each survey year, we still observed a shift in preferences and popularity of herbs and supplements over time from 2002 through 2012. Knowledge of herb and supplement use is necessary to better equip physicians to help counsel their pregnant patients on integrating herbs and supplements safely throughout their pregnancy. ■

#### ACKNOWLEDGMENT

We thank Ms Ching-Yuan Chang for her guidance and help in SAS programming.

Scott Chung, BA  
Tiffany Yeh, MS  
College of Medicine  
Penn State University  
Hershey, PA

Chung-Hsuen Wu, PhD  
School of Pharmacy  
College of Pharmacy  
Taipei Medical University  
Taipei, Taiwan  
[chunghwu@tmu.edu.tw](mailto:chunghwu@tmu.edu.tw)

Mr Chung and Ms Yeh contributed equally to this letter.

The authors report no conflict of interest.

#### REFERENCES

1. Kessler RC, Davis RB, Foster DF, et al. Long-term trends in the use of complementary and alternative medical therapies in the United States. *Ann Intern Med* 2001;135:262-8.
2. Tindle HA, Davis RB, Phillips RS, Eisenberg DM. Trends in use of complementary and alternative medicine by US adults: 1997-2002. *Altern Ther Health Med* 2005;11:42-9.
3. Wu CH, Wang CC, Tsai MT, Huang WT, Kennedy J. Trend and pattern of herb and supplement use in the United States: results from the 2002, 2007, and 2012 national health interview surveys. *Evid Based Complement Alternat Med* 2014;2014:872320.
4. Jou J, Johnson PJ. Nondisclosure of complementary and alternative medicine use to primary care physicians: findings from the 2012 National Health Interview Survey. *JAMA Intern Med* 2016;176:545-6.
5. National Center for Health Statistics (NCHS). 2012 National Health Interview Survey (NHIS) public use data release: NHIS survey description. Available at: [ftp://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Dataset\\_Documentation/NHIS/2012/srvydesc.pdf](ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2012/srvydesc.pdf). Accessed on July 13, 2016.

© 2016 Elsevier Inc. All rights reserved. <http://dx.doi.org/10.1016/j.ajog.2016.11.1019>

## Characterizing women with interest in uterine transplant clinical trials in the United States: who seeks information on this experimental treatment?



**OBJECTIVE:** Until the first birth from uterine transplantation reported in 2015,<sup>1</sup> uterine factor infertility (UFI) was considered an incurable diagnosis. UFI can result from congenital causes, such as Mayer-Rokitansky-Küster-Hauser syndrome, or acquired causes, such as hysterectomy.<sup>2</sup> This novel surgical approach may provide women who are affected by UFI with an opportunity to carry their own biologic child when adoption, foster care, or gestational surrogacy are either not available or not desirable. After the initial promising results of the Swedish clinical trial, interest in human uterine transplantation worldwide has increased.<sup>3</sup> Our team recently published our own practical experience in designing and implementing the first human uterine transplant clinical trial in the United States, which included a discussion of the ethical considerations relevant to this undertaking.<sup>4</sup> The objective of this study is to describe the characteristics of women with UFI who were screened for our clinical trial. These data may provide important insights

into women who are contemplating uterine transplantation protocols.

**STUDY DESIGN:** Our clinical trial was approved by the Institutional Review Board at the Cleveland Clinic in September 2015. This research protocol is funded internally to perform 10 deceased donor uterine transplants in women with UFI. The applicants described here independently contacted our institution regarding the protocol; there was no advertising or recruiting for our clinical trial aside from the listing on [Clinicaltrials.gov](http://Clinicaltrials.gov) (identifier: NCT02573415). In this study, we report demographic data and descriptive characteristics of our screened candidates.

**RESULTS:** Over 250 reproductive-aged candidates contacted our institution to obtain further information. Of these, 239 candidates were included for initial screening over 7 months. The mean age of the women who were screened was 31 years