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The use of Complementary and Alternative Medicine in pregnancy: data from the Avon Longitudinal Study of Parents and Children (ALSPAC)

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Objectives

To report the frequency of Complementary and Alternative Medicine (CAM) use by a population of pregnant women in the UK.

Design

Four postal self-completion questionnaires completed at 8, 12, 18 and 32 weeks' gestation provided the source of CAMs used. Questions asked for written descriptions about the use of any treatments, pills, medicines, ointments, homeopathic medicines, herbal medicines, supplements, drinks and herbal teas.

Setting

An observational, population-based, cohort study of parents and children of 14541 pregnant women residing within the former county of Avon in south-west England. Data was available for 14115 women.

Results

Over a quarter (26.7%; n=3774) of women had used a CAM at least once in pregnancy, the use rising from 6% in the 1st trimester to 12.4% in the 2nd to 26.3% in the 3rd. Herbal teas were the most commonly reported CAM at any time in pregnancy (17.7%; n=2499) followed by homeopathic medicine (14.4%; n=2038) and then herbal medicine (5.8%; n=813). The most commonly used herbal product was chamomile used by 14.6% of women, the most commonly used homeopathic product was Arnica used by 3.1% of women. Other CAMs (osteopathy, aromatherapy, acupuncture/acupressure, Chinese herbal medicine, chiropractic, cranial sacral therapy, hypnosis, non-specific massage and reflexology) accounted for less than 1% of users.

Conclusions

CAM use in pregnancy, where a wide range of CAMs has been assessed, has not been widely reported. Studies that have been conducted report varying results to this study (26.7%) by between 13.3% and 87% of pregnant women. Survey results will be affected by a number of factors namely the inclusion/exclusion of vitamins and minerals, the timing of data collection, the country of source, the number of women surveyed, and the different selection criteria of either recruiting women to the study or of categorising and identifying a CAM treatment or product.

Introduction

Women are the most frequent users of Complementary and Alternative Medicine, (CAM), [1-6] compared to men they are more likely to use CAM and to self-treat using CAM products and therapies. [7] It would not be surprising that they would continue to use them in pregnancy where the prevalence of CAM has been reported to be as high as 87%. [8] Studies have shown that CAM products in pregnancy are most often used for the relief of nausea, vomiting, [7, 9-10] anxiety, stress, depression, backache, labour induction, headaches, migraine, urinary tract problems, cough/cold and indigestion. [11-13]

Women may choose CAM in pregnancy to have control over their own health care, to continue a preferred way of treating their health, to use more natural (and hence perceived safer) treatment options in pregnancy and child birth, [5, 9, 14] or to select a treatment choice not covered by conventional medicine such as herbal raspberry leaf [15] or homeopathic *Caullophylum* [16] to prepare the womb and cervix for childbirth. Many studies confirm that herbal medicine, homeopathy, aromatherapy, reflexology, massage and acupuncture are popular CAM treatments employed by pregnant women. [6, 11-12, 17] Of these, herbal medicine is the individual CAM most often used in pregnancy [9, 13, 18] and is the CAM most likely to be recommended by midwives. [13, 19]

We sought to ascertain how many women within the Avon Longitudinal Study of Parents and Children (ALSPAC – otherwise known as ‘The Children of the 90s’) [20] in the south-west of England had taken or used a CAM in pregnancy. The study enrolled more than 14,000 women during pregnancy in 1991 and 1992. The women were not rewarded for their time in taking part but were informed on enrolment that the benefits in participating would be for future generations. The use of conventional medication in pregnancy by the same cohort of pregnant women was previously reported by Headley et al; [21] 83% of women had taken a conventional medicine during pregnancy and paracetamol was the most frequently reported substance. Only 7.6% of women did not report taking any medicinal product throughout the whole of their pregnancy. This research is, to our knowledge, the largest sample of pregnant women surveyed both for CAM and conventional medicine use and is the first time the use of CAM in pregnancy by a UK population has ever been quantified.

Materials and Methods

The Avon Longitudinal Study of Parents and Children (ALSPAC), [20] is a population-based cohort study, designed to investigate the determinants of development, health and disease throughout childhood and beyond. Data has been collected regarding many aspects of the families' health, well-being, social, demographic, environmental and genetic features. Pregnant women resident in the former county of Avon in the south-west of England who had an expected date of delivery between 1st April 1991 and 31st December 1992 were eligible to take part. Of 14541 women enrolled, 14115 returned questionnaires completed during the ante-natal period. Ethical approval for the study was obtained from the ALSPAC Law and Ethics Committee and the three local research ethics committees.

The mother completed four self-completion questionnaires during pregnancy at 8, 12, 18 and 32 weeks gestation. The source of CAM information was obtained from questions regarding the use of medications, ointments, drinks, teas and treatments from early to late pregnancy (Table 1). The results from the 8 and 12 week questionnaires were combined for the 1st trimester, week 18 relates to the 2nd trimester and week 32 to the 3rd.

All questions asked for a written description of the products or treatments used. The descriptions were keyed as free text responses, and identified and categorised as a CAM by a Research Assistant/Homeopath (JLB), a Medical Herbalist (JRG) and a Consultant Homeopath (EAT). The frequencies of herbal products were separated into either herbal teas or herbal medicines. The frequencies of CAMs were from the coded text answers and the tick box responses (either 'yes' or 'no') relating to the specific homeopathic questions at week 18 (question 5) and week 32 (question 9), and the herbal tea question at week 32 (question 11). Any 'yes' tick box response with an inaccurate description of a homeopathic product or a herbal tea was recoded to 'no'.

Statistical methods

All data was analysed using SPSS v. 15. The associations between CAM use and mother's age at delivery, employment status, ethnicity, education, housing tenure, marital status and social class were performed using chi-squared tests.

Results

All CAMs

A total of 3774 women (26.7%) used a CAM at least once during pregnancy (Table 2). The use of CAM increased from 6% in the 1st trimester, to 12.4% in the 2nd, to 26.3% in the 3rd trimester.

Table 3 presents the frequency of CAM treatments reported during each trimester and for pregnancy overall (any use in pregnancy). Herbal medicine was the most commonly reported CAM in the 1st trimester (2.4%), homeopathic medicine was the most used CAM in the 2nd trimester (9.8%) and herbal tea was the most used CAM in the 3rd (18.5%). Throughout the whole of pregnancy, herbal teas were the most commonly

reported CAM at any time (17.6%), followed by homeopathy (14.4%) and then herbal medicine (5.7%).

Herbal teas and herbal medicine

The use of herbal tea was considerably higher in the 3rd trimester (18.5% compared to 2.3% in the 1st trimester and 3.6% in the 2nd) while herbal medicine use remained fairly constant throughout pregnancy (from 2.4% in early pregnancy to 3.3% in middle pregnancy to 3.2% in later pregnancy). (Table 3). The most commonly reported herbal product in the 1st and 2nd trimesters was evening primrose oil (7.8% and 4.4% respectively), chamomile was the most commonly used herbal product in the 3rd trimester (14.6%). The most popular herbal products used at any time were chamomile (14.6% of all CAM users), followed by peppermint (14.2%), raspberry leaf (11.8%), and rosehip (7.3%). (Table 4)

Homeopathic medicine

Homeopathic medicine use increased steadily during pregnancy from 1.8% of women in the 1st trimester to 9.8% in the 2nd to 12.8% in the 3rd (Table 3). By trimester, the most commonly used homeopathic product was Ipecac in the 1st trimester (4.9%), and Arnica (tablets and cream) in both the 2nd and 3rd trimesters (5.4% and 1.4% respectively) (Table 4). The three most popular homeopathic products used at any time in pregnancy were Arnica (tablets and cream) (3.1% of all CAM users), followed by Ipecac (1.9%), and Calendula (tablets and cream) (1.4%) (Table 4).

Aromatherapy oils

Few women reported the use of aromatherapy oils during pregnancy (<1.0%) (Table 3). Lavender oil was the most often used oil at each trimester of pregnancy (0.7%, 0.6% and 0.3% respectively). The most popular oils used at any time were lavender (0.5%), followed by eucalyptus (0.4%), and peppermint/spearmint (0.3%). (Table 4).

All other CAMs

Osteopathy was used by 15 (0.11%) of women, acupuncture/acupressure by 7 women (0.05%), reflexology, cranial sacral therapy, hypnosis and massage were used between 1 to 3 women for each therapy. Use of Chinese herbal medicine remained constant throughout pregnancy by 4 to 6 women within each pregnancy trimester and by 12 (0.08%) women overall at any time (Table 3).

Socio-demographic characteristics

The use of CAM increased with the age of the mother with older mothers more likely to have used a CAM than younger mothers (43.5% of CAM users were aged 35-40+ compared to 34.9% aged 30-34 years, 25% aged 25-29 years and 15.2% aged 24 and under). CAM users were more likely to be working mothers (34.2%) compared to 28.4% who were unemployed, or not working due to ill health retirement or being on a training scheme (26.8%). More non-white mothers (40.2%) compared to white mothers (29.3%) had taken a CAM and just over half (54.2%) of all mothers who had taken a CAM were educated to degree level, the highest educational level, compared to 13.9%

who had achieved a CSE (Certificate of Secondary Education), the lowest type of educational qualification. CAM users were more likely to own their own homes (30.3%) compared to 29.2% who privately rented a home or 13.5% who rented a home from the local council. CAM users were also more likely to be married (28.8%) compared to 26.9% who were widowed/divorced/separated or never married (22.7%). More CAM users (51.6%) were of the highest Social Class rating (I – higher professional and managerial occupations) compared to 17.9% who were of the lower Social Class rating (V – unskilled occupations). (Table 5)

Discussion

In this study representing a UK population, out of 14115 women, 26.7% had reported using a CAM at least once during pregnancy. Herbal teas and homeopathic medicine accounted for the largest use by 17.6% and 14.4% respectively of this pregnancy sample whilst herbal medicine was used by 5.7% of women. The use of any herbal product (herbal tea and herbal medicine combined) was reported by 20% of pregnant women. Chamomile was the most commonly reported herbal product at any time in pregnancy (14.6% of all CAM users) and Arnica (tablets and cream) was the most often used homeopathic product taken at any time in pregnancy (3.1% of all CAM users).

Whilst the format of the CAM questions (requiring a text description of the actual products used) enabled accurate identification and categorisation of the individual CAM products taken, the survey results may have been influenced by a number of factors. Recall bias may have been an issue for the respondents but as the questionnaires were administered at 4 time points during pregnancy the maximum time period that women were asked to recall CAM use was ‘within the last 3 months’. The wording of the questions to capture CAM use may have favoured the reporting of products that could either be ‘taken’ or ‘used’ and, as such, some ‘applied’ CAM treatments such as acupuncture, hypnosis, or reflexology may have been under-reported. Similarly, the wording of the questions asking to ‘remember to include any homeopathic or herbal preparations’, may have made the questions suggestive, and by not always having the same questions and exact wording of the questions repeated at each time point may have lead to uncertainty or bias of reporting CAMs within each pregnancy trimester. Also we did not know the intention of CAM use and whether the mothers were always looking for a medicinal action. Those women who had taken herbal teas may have done so as a substitute to caffeinated beverages or simply because they liked the taste rather than for any specific treatment or effect.

The use of CAM in pregnancy *as a whole* (where a range of CAMs have been assessed) has not been widely reported [12], those studies that have been conducted report varying results to ours (26.7%). One study in Australia reported CAM use as high as 87%. [8] A Canadian study of women suffering from nausea and vomiting in pregnancy and their use of CAM reported use by 61% of women; [9] three US studies have reported CAM use by 13.3% [22] 31.3% [11] and 48% of women. [23] The variance in reported prevalence could be explained by a number of factors, namely, the timing of data collection (either prospectively during pregnancy or retrospectively at a later time), the country of source, the number of women surveyed, and the different selection criteria of either recruiting women to the study or of categorising and identifying a CAM treatment or product. Ranzini et al [11] selected women to their study on the basis of whether they had used a CAM product for the treatment of nausea and vomiting in pregnancy.

Hollyer et al, [9] included vitamins, minerals and health supplements within their selection criteria of a CAM product whereas Gibson et al [22] included the therapies of aromatherapy, meditation/relaxation, chiropractic, yoga, acupressure, therapeutic touch, homeopathy, acupuncture, reflexology and herbal medicine within their selection criteria.

Some CAMs can be wrongly identified and some can be categorised into more than one form of treatment and these factors will affect survey results. A study looking at herbal remedies used during pregnancy [24] categorised lavender as a herbal product whereas lavender could also be categorised and counted as an aromatherapy product. When we studied the use of homeopathic products to age 8.5 years by the children in the ALSPAC cohort [25] 10% of the products described by the parents had been wrongly identified as a homeopathic one; herbal products were most likely to be confused as a homeopathic product. As a consequence, studies that use only tick box choices to elicit CAM use run the risk of survey respondents incorrectly identifying and/or categorising a CAM product.

Discounting vitamins and minerals, the majority of studies confirm, like ours, that herbal products (teas and medicines) are the CAM most often used during pregnancy. Herbal medicine is also the CAM that has been most researched during pregnancy. [11, 18-19, 22, 26-27] The use of herbal products in pregnancy appears to be frequent and widespread worldwide. It has been reported in Italy to be as high as 70.7%, [28] and in Australia to be between 14% [29] and 36%. [26] A US study reported that 9.1% of pregnant women had used a herbal supplement, [22] and in Nigeria 12% of pregnant women had reported the use of herbs native to that country. [30] Finally a South African study reported the use of herbal products by 55% of pregnant women. [31] The use of herbal medicines by expectant women in the UK was reported by a recent study where 578 women were surveyed for their use of herbal remedies. Of those women surveyed 334 (57.8%) had used a herbal product during pregnancy and the most often used herbal products were ginger, cranberry and raspberry leaf. [24]

Within other studies reporting the frequency of herbs used in pregnancy, chamomile, like our study, was one of the most commonly used herbs. [19, 22-23, 26, 32] With ginger and peppermint, it is one of the most frequently used herbs to treat morning sickness. [32] Chamomile is traditionally taken as a herbal tea to reduce anxiety, aid sleep, and help alleviate gastrointestinal symptoms. [33] Research has shown it has anti-inflammatory, antibacterial and sedating properties. [34] Two studies investigating the reasons for herbal use in pregnancy found that chamomile was taken for relaxation and to help sleep [24, 26] and to aid digestion and help alleviate the symptoms of nausea. [26] The study by Forster et al [26] found that 83% of women who had taken chamomile for relaxation, calming, to help sleep, aid digestion and nausea had found that it had helped their symptoms.

Homeopathy has been shown to be commonly used during pregnancy [35] but data on the actual frequency of its use is limited. 14.4% of users in the current study is similar to another UK study that reported use by 10% of women.[17] Little is known about how often individual homeopathic products have been used during pregnancy. Arnica (tablet and cream) was the remedy most often used at any time in pregnancy by this pregnancy sample. It is a popular first aid remedy for soft tissue bruising and trauma; its anti-haemorrhagic effects have been researched in pregnancy for reducing postpartum blood

loss [36] and it is recommended as a remedy following childbirth to reduce bruising, swelling and pain. [35]

Aromatherapy, the fourth most used CAM within this study, is generally used for relaxation, stress and well-being. [37] Some oils such as cinnamon, clove, and lemon have been shown to have antibacterial and antiseptic properties. [38] Little research (if any) has been conducted on the frequency of aromatherapy use during pregnancy, however, a few studies have been conducted in relation to its effects on antenatal stress and anxiety, pregnancy well-being and clinical effectiveness. [39-41] An audit conducted in 2002 on a UK Maternity Unit showed that aromatherapy oils had a positive effect in normalising childbirth and increasing mothers' satisfaction of their experience of labour, [42] and in another study, lavender oil used as a bath additive, showed a positive effect in reducing perineal discomfort following childbirth. [41]

The research presented here suggests that women are using CAM as part of a self care approach which could be encouraged in a modern and sustainable health care system. A self care website which also guides people through some of the evidence about safety and effectiveness has been launched by the University of Westminster. [43] Further research is needed to continue to develop the evidence base for non-pharmaceutical approaches which become an important resource for symptom control in pregnancy especially as many articles conclude that evidence-based research is lacking into the effects of taking CAMs in pregnancy, either singularly, or when combined with other medications. [18, 24, 44-47]

Whilst conventional medicines are seen as being potentially more harmful to the fetus, [48] many medications such as antacids, analgesics and antibiotics are still widely used at this time [21, 48-49] as is the concomitant use of combining different forms of medications namely over-the-counter products, conventional medicines and herbal medicines. [18, 45-46, 50-51] ALSPAC has collected pertinent information on maternal health throughout and following pregnancy, and on the health of the baby during pregnancy, at birth and into adulthood. Suggested further research could be directed into the numbers and types of medications taken when combined with herbal and homeopathic products in pregnancy and into the effects (with emphasis on safety) of taking these products, either singularly or concomitantly, with conventional medicines at this time.

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References

1. Thomas, K. and P. Coleman, *Use of complementary or alternative medicine in a general population in Great Britain*. Journal of Public Health, 2004. **26**: p. 152-157.
2. Tiran, D., *Complementary therapies in pregnancy: midwives' and obstetricians' appreciation of risk*. Complementary Therapies in Clinical Practice, 2006. **12**: p. 126-131.
3. Adams, J., G. Easthope, and D. Sibbritt, *Exploring the relationship between women's health and the use of complementary and alternative medicine*. Complementary Therapies in Medicine, 2003. **11**: p. 156-158.
4. Beal, M., *Women's use of complementary and alternative therapies in reproductive health care*. Journal of Nurse-Midwifery, 1998. **43**: p. 224-234.
5. Ernst, E., *Herbal medicinal products during pregnancy: are they safe?* British Journal of Obstetrics and Gynaecology, 2002. **109**(3): p. 227-35.
6. Smith, C.A. and S. Cochrane, *Does acupuncture have a place as an adjunct treatment during pregnancy? A review of randomized controlled trials and systematic reviews*. Birth (Berkeley, Calif), 2009. **36**(3): p. 246-53.
7. Murphy, P., *Alternative therapies for nausea and vomiting of pregnancy*. Obstetrics & Gynecology, 1998. **91**(1): p. 78-81.
8. Gaffney, L. and C. Smith, *Complementary and alternative medicine in obstetrics*. Birth Issues, 2004. **13**: p. 43-50.
9. Hollyer, T., et al., *The use of CAM by women suffering from nausea and vomiting during pregnancy*. BMC Complementary and Alternative Medicine 2002. **2**: p. 5.
10. Tiran, D., *Complementary therapies for nausea in pregnancy*. Modern Midwife, 1996. **6**(3): p. 19-21.
11. Ranzini, A., A. Allen, and Y. Lai, *Use of complementary medicines and therapies among obstetric patients*. Obstetrics & Gynecology, 2001. **Suppl. 4**: p. S46.
12. Skouteris, H., et al., *Use of complementary and alternative medicines by a sample of Australian women during pregnancy*. Australian & New Zealand Journal of Obstetrics & Gynaecology, 2008. **48**: p. 384-390.
13. Allaire, A. and S. Wells, *Complementary and Alternative Medicine in Pregnancy: A Survey of North Carolina Certified Nurse-Midwives*. Obstetrics & Gynecology 2000. **95**: p. 19-23.
14. Low Dog, T., *The use of botanicals during pregnancy and lactation*. Alternative Therapies in Health and Medicine, 2009. **15**(1)(Jan-Feb): p. 54-8. (Review).
15. Simpson, M., et al., *Raspberry leaf in pregnancy: its safety and efficacy in labor*. Journal of Midwifery & Women's Health, 2001. **46**(2): p. 51-9.
16. Summers, L., *Methods of cervical ripening and labor induction*. Journal of Nurse-Midwifery, 1997. **42**(2): p. 71-85.
17. Tiran, D., *Complementary strategies in antenatal care*. Complementary Therapies in Nursing and Midwifery, 2001. **7**(1): p. 19-24.
18. Conover, E.A., *Herbal agents and over-the-counter medications in pregnancy*. Best Practice & Research. Clinical Endocrinology & Metabolism, 2003. **17**(2): p. 237-51.
19. Pinn, G. and L. Pallett, *Herbal medicine in pregnancy*. Complementary Therapies in Nursing and Midwifery, 2002. **8**(2): p. 77-80.
20. Golding, J., et al., *ALSPAC - The Avon Longitudinal Study of Parents and Children I. Study Methodology*. Paediatric and Perinatal Epidemiology, 2001. **15**: p. 74-87.

21. Headley, J., et al., *Medication use during pregnancy: data from the Avon Longitudinal Study of Parents and Children*. European Journal of Clinical Pharmacology, 2004. **60**: p. 355-361.
22. Gibson, P., R. Powrie, and J. Star, *Herbal and alternative medicine use during pregnancy: a cross-sectional survey* Obstetrics & Gynecology, 2001. **97**(4): p. S33-S45.
23. Thurer, K., et al., *The use of complementary and alternative medicine: a postpartum survey*. Obstetrics & Gynecology, 2003. **101**(4 (Suppl)): p. S87.
24. Holst, L., et al., *The use and the user of herbal remedies during pregnancy*. Journal of Alternative and Complementary Medicine, 2009. **15**(7): p. 787-92.
25. Thompson, E.A., J.L. Bishop, and K. Northstone, *The use of homeopathic products in childhood: data generated over 8.5 years from the Avon Longitudinal Study of Parents and Children (ALSPAC)*. Journal of Alternative and Complementary Medicine, 2010. **16**(1): p. 69-79.
26. Forster, D.A., et al., *Herbal medicine use during pregnancy in a group of Australian women*. BMC Pregnancy and Childbirth, 2006. **6**: p. 21.
27. Allaire, A.D., *Complementary and alternative medicine in the labor and delivery suite*. Clinical Obstetrics and Gynecology, 2001. **44**(4): p. 681-91.
28. Gori, L., et al., *Use of herbal products among pregnant women in Empoli Sanitary District*. Evidence-Based Complementary and Alternative Medicine, 2007. **4**: p. 59-64.
29. Lin Zhang, A., et al., *A population survey on the use of 24 common medicinal herbs in Australia*. Pharmacoepidemiology and Drug Safety, 2008. **17**: p. 1006-1013.
30. Gharoro, E.P. and A.A. Igbafe, *Pattern of drug use amongst antenatal patients in Benin City, Nigeria*. Medical Science Monitor, 2000. **6**(1): p. 84-7.
31. Mabina, M.H., J. Moodley, and S.B. Pitsoe, *The use of traditional herbal medication during pregnancy*. Tropical Doctor, 1997. **27**(2): p. 84-6.
32. Wilkinson, J., *What do we know about morning sickness treatments? A literature survey*. Midwifery, 2000. **16**: p. 224-228.
33. Bent, S., *Herbal medicine in the United States: review of efficacy, safety, and regulation: grand rounds at University of California, San Francisco Medical Center*. Journal of General Internal Medicine, 2008. **23**(6): p. 854-9.
34. Wang, Y., et al., *A metabonomic strategy for the detection of the metabolic effects of chamomile (*Matricaria recutita* L.) ingestion*. Journal of Agricultural and Food Chemistry, 2005. **53**(2): p. 191-6.
35. Katz, T., *The management of pregnancy and labour with homoeopathy*. Complementary Therapies in Nursing and Midwifery, 1995. **1**(6): p. 159-64.
36. Oberbaum, M., et al., *The effect of the homeopathic remedies *Arnica montana* and *Bellis perennis* on mild postpartum bleeding - a randomized, double-blind, placebo-controlled study - preliminary results*. Complementary Therapies in Medicine, 2005. **13**(2): p. 87-90.
37. Bastard, J. and D. Tiran, *Aromatherapy and massage for antenatal anxiety: its effect on the fetus*. Complementary Therapies in Clinical Practice, 2006. **12**(1): p. 48-54.
38. Prabuseenivasan, S., M. Jayakumar, and S. Ignacimuthu, *In vitro antibacterial activity of some plant essential oils*. BMC Complementary and Alternative Medicine, 2006. **6**: p. 39.
39. Tiran, D. and H. Chummun, *Complementary therapies to reduce physiological stress in pregnancy*. Complementary Therapies in Nursing and Midwifery, 2004. **10**(3): p. 162-7.

40. Mousley, S., *Audit of an aromatherapy service in a maternity unit*. *Complement Ther Clin Pract*, 2005. **11**(3): p. 205-10.
41. Dale, A. and S. Cornwell, *The role of lavender oil in relieving perineal discomfort following childbirth: a blind randomized clinical trial*. *Journal of Advanced Nursing*, 1994. **19**(1): p. 89-96.
42. Mousley, S., *Audit of an aromatherapy service in a maternity unit*. *Complementary Therapies in Clinical Practice*, 2005. **11**(3): p. 205-10.
43. *Self-care Library*. [cited 2011 13 July 2011]; Available from: <http://selfcare-library.info/>.
44. Ernst, E., *Herb-drug interactions: potentially important but woefully under-researched*. *European Journal of Clinical Pharmacology*, 2000. **56**(8): p. 523-4.
45. Werler, M.M., et al., *Use of over-the-counter medications during pregnancy*. *American Journal of Obstetrics and Gynecology*, 2005. **193**(3 Pt 1): p. 771-7.
46. McKenna, L. and M. McIntyre, *What over-the-counter preparations are pregnant women taking? A literature review*. *Journal of Advanced Nursing*, 2006. **56**(6): p. 636-45.
47. Gaffney, L. and C.A. Smith, *Use of complementary therapies in pregnancy: the perceptions of obstetricians and midwives in South Australia*. *Australian & New Zealand Journal of Obstetrics & Gynaecology*, 2004. **44**(1): p. 24-9.
48. Cragan, J.D., et al., *Ensuring the safe and effective use of medications during pregnancy: planning and prevention through preconception care*. *Maternal and Child Health Journal*, 2006. **10**(5 Suppl): p. S129-35.
49. Henry, A. and C. Crowther, *Patterns of medication use during and prior to pregnancy: the MAP study*. *Australian & New Zealand Journal of Obstetrics & Gynaecology*, 2000. **40**: p. 154-172.
50. Moussally, K., D. Oraichi, and A. Berard, *Herbal products use during pregnancy: prevalence and predictors*. *Pharmacoepidemiology and Drug Safety*, 2009. **18**(6): p. 454-61.
51. Refuerzo, J.S., et al., *Use of over-the-counter medications and herbal remedies in pregnancy*. *American Journal of Perinatology*, 2005. **22**(6): p. 321-4.

Table 1
Source of CAM data during pregnancy in ALSPAC

Time point (number responded)	Question
8 weeks (n=13548)	1 Name any pills, medicines and ointments (including homeopathic and herbal preparations) you have taken or used since the beginning of this pregnancy
	2 At present how much of the following do you usually drink in a day - other drinks
12 weeks (n=12452)	3 Are there any problems for which you have regular treatment or medicine?
18 weeks (n=13194)	4 During this pregnancy have you been taking supplements?
	5 Do you ever take homeopathic medicines?
	6 Name any pills, medicines and ointments (including homeopathic and herbal preparations) you have taken or used in the past 3 months
	7 At present how much of the following do you usually drink in a day: - other drinks
32 weeks (n=12421)	8 In the last 3 months have you been taking supplements or diet foods?
	9 Do you ever take homeopathic medicines?
	10 Name any pills, medicines and ointments (including homeopathic and herbal preparations) you have taken or used in the past 3 months
	11 Do you drink herbal teas?

Table 2
Use of any CAM during pregnancy

Time point	n / total	%	95% CI
1 st trimester	824 / 13777	6.0	(5.6, 6.4)
2 nd trimester	1639 / 13194	12.4	(11.9, 13.0)
3 rd trimester	3269 / 12421	26.3	(25.6, 27.1)
Any time	3774 / 14115	26.7	(26.0, 27.5)

Table 3

Frequency of use of individual CAM treatments at various time points during pregnancy (numbers in bold indicate the most commonly reported treatments within each time period)

Treatment	1 st trimester		2 nd trimester		3 rd trimester		Any use in pregnancy	
	n/13777	%	n/13194	%	n/12421	%	n/14115	%
Herbal tea*	314	2.3	478	3.6	2300	18.5	2490	17.6
Homeopathic medicine	248	1.8	1289	9.8	1586	12.8	2032	14.4
Herbal medicine*	326	2.4	433	3.3	401	3.2	807	5.7
Aromatherapy	12	0.09	40	0.30	34	0.27	72	0.51
Osteopathy	15	0.11	-	-	-	-	15	0.11
Chinese Herbal Medicine	4	0.03	6	0.05	4	0.03	12	0.08
Chiropractic	10	0.07	-	-	-	-	10	0.07
Acupuncture/acupressure	6	0.04	2	0.02	-	-	7	0.05
Reflexology	2	0.01	1	0.01	-	-	3	0.02
Cranial Sacral Therapy	1	0.01	-	-	-	-	1	0.01
Hypnosis	1	0.01	-	-	-	-	1	0.01
Massage	1	0.01	-	-	-	-	1	0.01
Naturopathy	-	-	1	0.01	-	-	1	0.01
* Any herbal product	602	4.4	692	5.2	2487	20.0	2818	20.0

Table 4:
Frequency of use of the *most commonly* reported CAM products at various time points during pregnancy (numbers in bold indicate the most commonly reported products within each time period).
Percentages are calculated from the total number of CAM users at each time point.

CAM product	1 st trimester		2 nd trimester		3 rd trimester		Any use in pregnancy	
	n/824	%	n/1639	%	n/3269	%	n/3774	%
Herbal (medicines & teas)								
Chamomile	31	3.8	30	1.8	530	16.2	551	14.6
Peppermint/mint	40	4.9	38	2.3	511	15.6	537	14.2
Raspberry leaf	41	5.0	49	3.0	415	12.7	444	11.8
Rosehip	12	1.5	8	0.5	264	8.1	274	7.3
Senna	58	7.0	52	3.2	34	1.0	112	3.0
Evening Primrose oil	64	7.8	72	4.4	41	1.3	109	2.9
Ginger	40	4.9	47	2.9	13	0.4	81	2.1
Fennel	1	0.1	1	0.1	68	2.1	68	1.8
Floradix® ¹	29	3.5	40	2.4	9	0.3	53	1.4
Night Time tea ²	-	0.0	2	0.1	46	1.4	48	1.3
Garlic	23	2.8	32	2.0	20	0.6	47	1.2
Jasmine green tea	1	0.1	2	0.1	42	1.3	42	1.1
Herbal cough medicine	13	1.6	23	1.4	5	0.2	33	0.9
Ginseng	10	1.2	17	1.0	9	0.3	30	0.8
Lemon Verbena	1	0.1	-	0.0	24	0.7	25	0.7
Homeopathic								
Arnica tablets & cream	17	2.1	89	5.4	46	1.4	117	3.1
Ipecac	40	4.9	52	3.2	36	1.1	72	1.9
Calendula tablets & cream	19	2.3	35	2.1	20	0.6	52	1.4
Bach Flower remedies & cream ³	9	1.1	28	1.7	19	0.6	45	1.2
Pulsatilla	7	0.8	18	1.1	25	0.8	38	1.0
Nux-vomica	19	2.3	29	1.8	23	0.7	37	1.0
New Era Hay Fever ⁴	5	0.6	20	1.2	12	0.4	31	0.8
Sepia	11	1.3	18	1.1	15	0.5	26	0.7
Chamomilla tablets & tincture	8	1.0	8	0.5	11	0.3	24	0.6
Aconite	6	0.7	14	0.9	8	0.2	20	0.5
Caulophyllum	1	0.1	6	0.4	12	0.4	17	0.5
Nelsons Pollena ⁵	6	0.7	5	0.3	11	0.3	17	0.5
Phosphorus	5	0.6	12	0.7	6	0.2	14	0.4
Weleda Mixed Pollen ⁶	3	0.4	9	0.5	7	0.2	14	0.4
Sulphur	2	0.2	9	0.5	8	0.2	12	0.3
Aromatherapy								
Lavender	6	0.7	10	0.6	11	0.3	20	0.5
Eucalyptus	3	0.4	7	0.4	7	0.2	15	0.4
Peppermint/spearmint	-	0.0	5	0.3	6	0.2	10	0.3

Neroli	2	0.2	1	0.1	3	0.1	5	0.1
Chamomile	1	0.1	2	0.1	2	0.1	4	0.1

- ¹ Liquid multi-vitamin supplement and herbs. Salus-Haus, Bavaria, Germany
² Blended tea of herbs, flowers, fruits and spices. Heath and Heather Ltd., Merseyside, England
³ A. Nelsons and Co. Ltd, Wimbledon, London, England
⁴ Homeopathic product for the symptomatic relief of hay fever. New Era Laboratories Ltd., Hull, England
⁵ Homeopathic product for the symptomatic relief of hay fever. A. Nelsons and Co. Ltd, Wimbledon, London, England
⁶ Homeopathic product for the symptomatic relief of hay fever. Weleda UK Ltd., Ilkeston, Derbyshire, England

Table: 5
Socio-demographic characteristics of CAM use in pregnancy (ever reported)

	CAM use (26.7%; n=3774)		Non-CAM use (73.3%; n=10341)	
	n	%	n	%
Age at delivery				
<20-24	490	15.2	2739	84.8
25-29	1326	25.0	3984	75.0
30-34	1320	34.9	2463	65.1
35-40+	595	43.5	772	56.5
	$X^2=545.46$ (p<0.001)			
Employment status				
Working (full/part-time, self-employed)	1636	34.2	3154	65.8
Unemployed	126	28.4	318	71.6
Not working (ill health, retirement, on training scheme)	1391	26.8	3801	73.2
	$X^2=64.80$ (p<0.001)			
Ethnicity				
White	3495	29.3	8432	70.7
Non-white	129	40.2	192	59.8
	$X^2=17.77$ (p<0.001)			
Highest educational qualification				
Degree (highest)	860	54.2	727	45.8
A (Advanced) level	1163	42.0	1608	58.0
O (Ordinary) level	1054	24.7	3219	75.3
Vocational qualification	226	18.6	989	81.4
CSE (Certificate of Secondary Education) (lowest)	347	13.9	2147	86.1
	$X^2=1079.40$ (p<0.001)			
Housing tenure				
Owned/mortgaged	2959	30.3	6798	69.7
Rented from council/housing association	288	13.5	1850	86.5
Privately rented	421	29.2	1019	70.8
	$X^2=252.32$ (p<0.001)			
Marital status				

Never married	582	22.7	1982	77.3
Widowed/divorced/separated	217	26.9	591	73.1
Married	2888	28.8	7131	71.2
		$X^2=38.60$ (p<0.001)		
Social class (based on occupations)*				
I (Professional) (highest)	305	51.6	286	48.4
II (Intermediate)	1331	42.4	1811	57.6
III (Skilled non-manual)	1078	25.2	3196	74.8
III (Skilled manual)	176	22.5	607	77.5
IV (Partly skilled)	222	22.6	761	77.4
V (Unskilled) (lowest)	40	17.9	184	82.1
		$X^2=445.44$ (p<0.001)		

* Standard Occupational Classification. London: Her Majesty's Stationery