

Use of Complementary and Alternative Medicine and its Related Factors among Pregnant Women in Shiraz, South of Iran: A Cross-Sectional Study

Abstract

Background: Women are known to use Complementary and Alternative Medicine (CAM) during pregnancy despite the subsequent potential unknown effects associated with its use. This study was performed to evaluate the use of CAM products and its related factors among pregnant women in Shiraz, Iran. **Materials and Methods:** This cross-sectional study of 365 pregnant women referred to obstetrics clinics affiliated to Shiraz University of Medical Sciences (Iran) was conducted in 2020. Sampling was performed in all three affiliated centers based on a probability, proportional to size protocol. Pregnant women were nominated using a systematic random sampling scheme using their health record numbers. A 20-item questionnaire was administered via in-person interviews and data on demographics, use of CAM products, reasons for use, and referral and information sources were collected. Binary logistic regression was applied and adjusted odds ratios were estimated. **Results:** CAM use was reported for recent pregnancies by 56.92% of participating women, with a significantly higher use in participants of low socioeconomic status ($\text{Chi}_2_1 = 5.12$; $p < 0.024$). The main reason for CAM use was having faith in the efficacy of CAM (72.73%). Reported CAM use was restricted to herbal preparations. Most of the women who used CAM (73.0%) did not report their CAM use to their doctor. **Conclusions:** There is a high rate of CAM use among pregnant women. More maternal care services during current pregnancy, parity, and general and pregnancy-related history of CAM use were correlated with CAM use. Mother–healthcare provider relationship should be improved in the field of CAM.

Keywords: Complementary therapies, integrative medicine, Iran, pregnancy

Introduction

The use of Complementary and Alternative Medicine (CAM) is increasing globally.^[1,2] Nearly 80% of the world population has been reported to select traditional medicine, and especially herbal medicine, as their primary healthcare.^[3] The prevalence of herbal medicine consumption is between 1 and 70% globally and it is about 19.2 to 90.2% in Iran.^[4,5] Users of CAM are predominantly female and believe CAM is safe which may explain the prevalence of its use among women for pregnancy-related health concerns.^[6,7] A research in Australia shows that the characteristics of pregnant women using herbal medicines vary according to the type of herbal medicine being used (e.g., herbal teas, tinctures, and essential oils).^[8] According to recent American research, the prevalence of use of nonprescription drugs and herbal medicine by pregnant women is more than 40%.^[9]

During the pregnancy period, women tend to use CAM including herbal medicine for a range of reasons such as decreasing the common discomforts of pregnancy (nausea and vomiting), improving symptoms not related to pregnancy (common cold), increasing essential nutrients intake, improving general health or immune system function; moreover, they select CAM due to its easier access compared to conventional treatments, and their cultural beliefs regarding traditional medicine.^[9-12] However, any medication must be used with care during the prenatal period,^[13] and as such these motivations must be tempered with clear evidence of safety and benefit.

Based on previous studies, some plants and herbal products have teratogens which are harmful for the fetus and many cause complications such as miscarriage or preterm labor.^[9,14-20] Gaps in knowledge about CAM use in pregnancy may

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contribute to adverse birth outcomes with some estimates suggesting that as many as 70% of unknown birth defects may be derived from insufficient safety research about CAMs and inadequate knowledge about CAM in the community.^[21,22] This is further exacerbated by known and potentially unknown herb-chemical product interactions, given that between 2.5% and 20.3% of pregnant women use herbal and chemical products concurrently.^[21] Many of the CAM products have not been involved in a qualitative standardization process, there is lack of information about the dosage recommended during the pregnancy period and these products do not have certain dosage recommendations for consumption.^[9,23]

Previous studies have shown a correlation between CAM use and level of education, ethnicity, rural/urban inhabitation, comorbidities, and gender.^[8,9,21] Although there are some studies about CAM use in Iranian pregnant women, there is no evidence on its correlation with other factors.^[5,19,20] Moreover, the dynamic behavior of the Iranian population regarding CAM use during time makes the monitoring of their CAM use inevitable. Thus, this study was conducted to examine the prevalence of and factors associated with CAM use among pregnant women in Shiraz, Iran.

Materials and Methods

In this cross-sectional study, the survey method was used. This study was conducted in all maternal-care centers affiliated to Shiraz University of Medical Sciences, Iran, including Shouhstari, Hafez, and Hazrat-e Zeinab between April and June 2020. The study participants included all pregnant women who were admitted to the mentioned maternal-care centers, were ≥ 18 years of age, had no history of any chronic diseases, and were Iranian and able to speak Persian. Participants with incomplete forms (defined as missing more than 20% of data) were excluded from the study.

The sample size was calculated at 380 individuals, assuming 5% type I error, 5% precision, 75% prevalence of CAM use,^[19] and a response rate of at least 85%. Sampling was undertaken using a stratified systematic random design. All three maternal-care centers affiliated to Shiraz University of Medical Sciences were considered, and sampling was conducted in these based on a Probability Proportional to Size (PPS) protocol—the share of sample participants selected from each center was equal to the share of pregnant women referring to that center. Pregnant women were selected using a systematic random sampling scheme based on their health record numbers. The number of pregnant women recorded in each center was divided by the number of samples needed in that center to obtain the sampling interval, and then, a patient record number was selected randomly using lottery method. Participants were selected by moving through the list of mothers' record numbers by the fixed sampling interval.

The study aims and procedures were explained to the selected women, and they were asked if they would participate in the study. Women who willingly signed the written consent forms were enrolled into the study. A 20-item researcher-made questionnaire was used to collect the data on use of CAM products during current pregnancy, any previous pregnancy, and nonpregnancy lifetime. The questionnaire items were related to the product type (five Yes/No questions), the possible side effects (eight questions scored on a 5-point Likert scale; no side effects, few side effects, limited side effects, relatively many side effects, and many side effects), reasons for consumption (three Yes/No questions), and the referral or recommendation sources (four Yes/No question). Reliability of the questionnaire was assessed in 100 pregnant women based on Cronbach's alpha (0.69). Face validity and content validity of the questionnaire were first assessed by medical experts in the field including six obstetricians, four midwives, and seven Persian medicine specialists. Content Validity Indices (CVI), including item-CVI and scale level CVI, were measured. Item-CVI ranged from 0.6 to 1.0 and scale level CVI was 0.89. Moreover, the content validity ratio was estimated at 0.81. Medical history (confirmed pregnancy complication and abortion or still birth), and sociodemographic (age, education level, place of residence, ethnicity, and socioeconomic status) and pregnancy-related data (planned pregnancy, order of pregnancy, and gestational age) were also collected. Data were collected through face-to-face interviews by trained nurses in a private room during routine maternal-care visits. The interviewers were three skilled nurses of 36–40 years of age (one assigned to each center) who had at least one pregnancy experience. The pregnant mothers received a cup of tea and a piece of chocolate during the interview. The average interview duration was 25 min. Some mothers were unable to complete the interview due to their pregnancy-related discomforts. Pregnant women were asked to answer all the questions, regardless of CAM use experience.

Descriptive statistics were used for data description. Mean and Standard Deviation (SD) were estimated for continuous variables. Frequency and relative frequency were estimated for categorical variables. The prevalence of CAM use (number of CAM users/study sample size) and its 95% Confidence Interval (CI) were estimated based on binomial distribution. Independent samples *t*-test and Chi-square test were used for univariate analyses. Multivariable regression was applied for binary logistic modeling. Variable selection was conducted based on a univariate *p* value of less than 0.3. Crude and adjusted odds ratio (aOR) and 95% CI were estimated. A two-sided *p* value of less than 0.05 was considered as statistically significant. Data were analyzed using Stata software (version 11.2; StataCorp LLC, College Station, TX, USA).

Ethical considerations

This study was approved by the Ethics Committee of Shiraz University of Medical Sciences (IR.sums.med.rec. 1395.s209). All participants provided signed informed consent before participating in the trial.

Results

The survey was completed by 365 pregnant women. The mean(SD) age of the participants was 29.30 (5.40) years and their mean(SD) gestational age was 31.41 (6.72) weeks. The prevalence of CAM consumption in their pregnancy was 56.92% [Table 1]. Relatives (friends and acquaintances) were reported to recommend CAM product use by 44.43% of participants [Figure 1]. Compared with nonusers, participants who used CAM were more likely to view CAM as safe ($\text{Chi}^2_1 = 19.74$; $p < 0.001$), effective ($\text{Chi}^2_1 = 9098$; $p = 0.002$), or accessible ($\text{Chi}^2_1 = 6.37$; $p = 0.012$) [Table 1].

The simultaneous use of CAM and chemical products was believed to cause side effects by 51.74% of participants. CAM use had significant association with the participants' opinions on CAM side effects ($\text{Chi}^2_5 = 15.28$; $p = 0.009$), and the side effects of chemical drugs ($\text{Chi}^2_1 = 8.20$; $p < 0.001$; Figure 1). Most of the participants (79.0%) using CAM believed that upon the simultaneous use of CAM and chemical drugs, one should change the dose of the chemical drugs [Figure 1].

The most common herbs used were chicory (33%), date (18%), frankincense (17%), thyme (16%), and

flixweed (14%), with 61.3% of women reporting up to three herbal plants. The history of CAM use in pregnant women is demonstrated in Table 1. In 86.8% of participants, the doctor or the health care provider had not asked any questions about the consumption of CAM as part of routine antenatal care and 73.0% of CAM users did not disclose their CAM product use to their doctor or health care provider. There was not a statistically significant relationship between medical staff query and CAM consumption ($p = 0.575$). The rate of self-declaration of the pregnant women was 27% which again did not indicate any significant relationship between this indicator and CAM consumption ($p = 0.710$).

Women were most likely to report using CAM in their current pregnancy if they had a history of CAM use, either in previous pregnancies (aOR = 9.8; $p < 0.001$) or more generally (aOR = 2.2; $p < 0.001$) [Table 2]. The most common reasons for using CAM reported by participants were to improve their general condition (52%), manage digestive problems (44%), and increase Intelligent Quotient (IQ) of the babies (33%). Approximately half (51.83%) of all participants believed using CAM had been effective for them and only 1% believed that they had experienced negative effects due to CAM use.

Discussion

The main findings of the study indicate that the main reason for pregnant women in Shiraz to use CAM is their belief in CAM's effectiveness and their interest in using

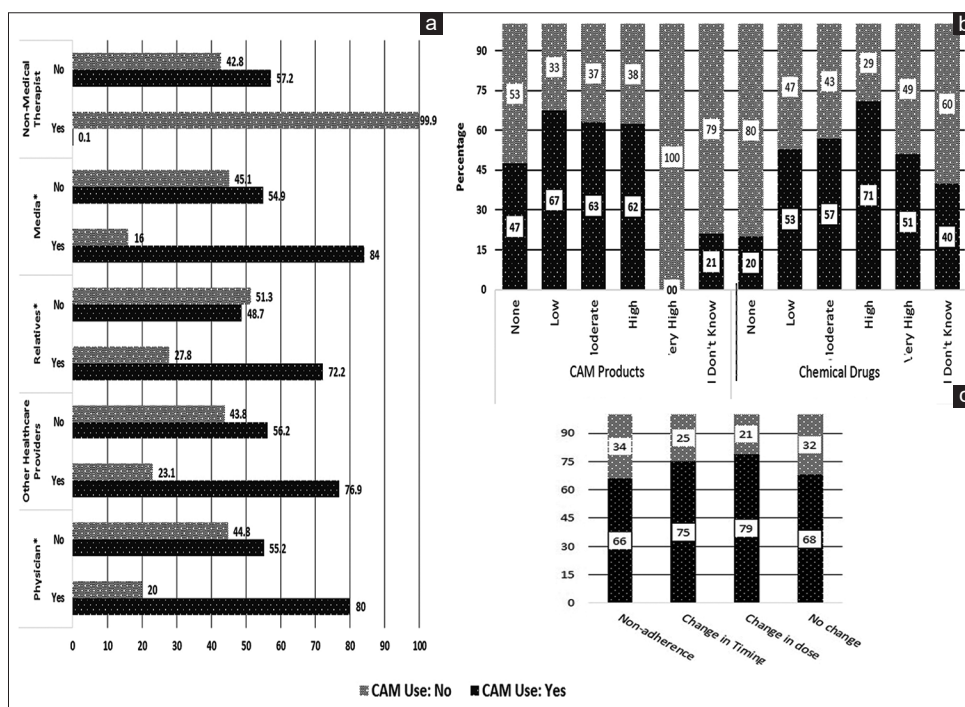


Figure 1: Percentage of complementary and alternative medicine (CAM) use in pregnant women according to different sources of recommendation to use/avoid CAM (a); Percentage of CAM use according to their viewpoints regarding adverse effects of CAM and chemical drugs (b); Percentage of CAM use according to their viewpoints regarding the effect of CAM use on prescribed chemical drugs consumption (c)

Table 1: Participants' demographic characteristics (A), participants' viewpoints regarding the use of CAM (B), and history of CAM use in the pregnant women (C)

| Variables | CAM* users n (%), n=206 | CAM Nonusers n (%), n=156 | Statistic _{df} ***, p |
|---|----------------------------|------------------------------|-----------------------------------|
| Section A: Demographic characteristics**** | | | |
| Education level | | | |
| Diploma and prediploma | 152 (54.87) | 125 (45.13) | 0.088 |
| Academic level | 54 (64.28) | 30 (35.72) | |
| Place of residence | | | Chi2 ₁ =7.20 |
| Urban | 162 (61.13) | 103 (38.87) | 0.007 |
| Rural | 44 (45.36) | 53 (54.64) | |
| Ethnicity | | | |
| Fars | 151 (59.22) | 104 (40.78) | 0.172 |
| Other | 55 (51.40) | 52 (48.60) | |
| SES**** | | | Chi2 ₁ =5.12 |
| High | 42 (46.67) | 48 (53.33) | 0.022 |
| Low | 164 (60.29) | 108 (39.71) | |
| Planned pregnancy | | | |
| Yes | 130 (54.39) | 109 (45.61) | 0.083 |
| No | 75 (64.10) | 42 (35.90) | |
| Order of Pregnancy | | | |
| 1 | 63 (58.88) | 44 (41.12) | 0.201 |
| 2 | 75 (61.98) | 46 (38.02) | |
| >=3 | 67 (51.15) | 64 (48.85) | |
| Abortion or still birth | | | Chi2 ₁ =5.502 |
| Yes | 59 (48.36) | 63 (51.64) | 0.019 |
| No | 147 (61.25) | 93 (38.75) | |
| Pregnancy complication | | | |
| Yes | 33 (56.90) | 25 (43.10) | 0.991 |
| No | 173 (56.91) | 131 (43.09) | |
| Gestational age Mean (SD)** | 31.35 (6.08) | 30.75 (7.55) | 0.404 |
| Section B: Participants' viewpoints about the Use of CAM [§] | | | |
| Reasons | | | |
| CAM products are inexpensive | | | Chi2 ₁ =3.84 |
| Yes | 5 (1.41) | 0 (0) | 0.050 |
| No | 201 (56.30) | 156 (43.70) | |
| CAM products are accessible | | | Chi2 ₁ =6.37 |
| Yes | 174 (60.21) | 115 (39.79) | 0.012 |
| No | 32 (43.84) | 41 (56.16) | |
| CAM is safe | | | Chi2 ₁ =19.74 |
| Yes | 75 (75.76) | 24 (24.24) | < 0.001 |
| No | 131 (49.81) | 132 (50.19) | |
| CAM is effective | | | Chi2 ₁ =9.98 |
| Yes | 56 (72.73) | 21 (27.27) | 0.002 |
| No | 150 (52.63) | 135 (47.37) | |
| Personal interest in CAM use | | | |
| Yes | 23 (67.65) | 11 (32.35) | 0.181 |
| No | 183 (55.79) | 145 (44.21) | |
| Section C: History of CAM use [§] | | | |
| History of CAM use in previous pregnancy | | | Chi2 ₁ =54.59 |
| Yes | 92 (86.79) | 14 (13.21) | < 0.001 |
| No | 114 (44.53) | 142 (55.47) | |
| Ever CAM use | | | Chi2 ₁ =16.78 |
| Yes | 138 (66.03) | 71 (33.97) | <0.001 |
| No | 68 (44.44) | 85 (55.56) | |

Contd...

Table 1: Contd...

| Variables | CAM* users n (%), n=206 | CAM Nonusers n (%), n=156 | Statistic _{df} ***, p |
|------------------------------------|----------------------------|------------------------------|-----------------------------------|
| Experience of effective use of CAM | | | Chi2 _{df} =4.18 |
| Yes | 120 (61.86) | 74 (38.14) | 0.041 |
| No | 86 (51.19) | 82 (48.81) | |

*CAM: Complementary and alternative medicine; **SD: Standard deviation; ***df: Degree of freedom; ****SES: Socioeconomic status; *****Based on the Iran data portal (<https://irandataportal.syr.edu/>). ⁵Percentages are calculated in row throughout the Section B and Section C

Table 2: The prevalence of factors associated with complementary and alternative medicine use among pregnant women in Shiraz, Iran, 2020

| Factor | Crude OR* (95% CI**) | Adjusted OR (95% CI) |
|--|-------------------------|-------------------------|
| Number of healthcare visits during current pregnancy | 1.04 (1.00, 1.08) | 1.05 (1.00, 1.10) |
| Number of parity | 0.65 (0.52, 0.78) | 0.71 (0.57, 0.88) |
| History of CAM*** use (generally) | 2.10 (1.30, 3.44) | 2.17 (1.34, 3.49) |
| History of CAM use in previous pregnancies | 9.70 (5.00, 18.65) | 9.78 (5.10, 18.75) |

*OR: Odds ratio; **CI: Confidence interval;

***CAM: Complementary and alternative medicine

CAM, while their awareness of CAM's side effects did not influence the rate of consumption. The finding of the current study is in conflict with the results of other studies in Iran which report CAM's availability and low cost as the main reason for using CAM.^[10,24-26] We found that 56.92% of pregnant women use CAM, while the rate of CAM use during pregnancy in China^[27] and California^[28] have been reported as 43.5% and 13%, respectively. In California, herbal products are used with the name of supplements. It seems that the different cultures and traditions, diversity in the geographic region, and the availability of the herbal medicine result in different findings on CAM use. Overall, the sample size, the type of the data gathering tool, and the sampling method have made a difference in the results reported.^[20,29-32]

Our study also found that the rate of consumption in participants who believed CAM has serious side effects was higher than those who believed CAM was safe, which was in conflict with the results of another study that found a lower number of participants believed in the harmfulness of CAM (32.3%) compared to those who reported its use safe (39.8%).^[33] In the current study, more than half of the participants reported self-prescribing CAM, which was in line with the findings of previous Iranian studies which report the prevalence of self-prescription between 51.9% and 68.1%.^[24,25,34] However, there were other Iranian researches that reported the rates of self-prescription as much lower^[35,36] or higher^[37] than the rate determined in our study. Ethnobotany and traditional recommendations of each region could justify this difference in various parts of Iran.

We identified a number of factors which may predict CAM use by pregnant women in Shiraz. Pregnant mothers living in urban areas and with a lower socioeconomic status used more types of CAM which is in line with the findings of research in north-east^[25] and central Iran.^[38]

As observed in the current study, relatives have been identified in previous research as the main source of encouragement for participants to use CAM in the Middle East.^[4,24-26,35,37] This may be due to the strength of family bonds within cultures in this region; however, informal information sources have also been reported for pregnant women in Western countries.^[39] As informal sources of information on CAM use are common in both developed and developing countries, educational programs and improvement of media literacy should be considered in general.

While in the current study the strongest reasons for using CAM were improving general condition and managing digestive problems, other Iranian researches suggested that women may also use CAM during pregnancy to reduce cold symptoms and manage digestive problems.^[24-26,31,35,36] In Egypt and Oman, reducing pregnancy-related nausea and improving cold symptoms have also been reported, respectively, as the main reasons of using herbs.^[29,40] Consequently, the reasons for CAM use during pregnancy could be related to geographical and traditional beliefs.

The herbs that were mostly used in the current study were chicory, frankincense, and thyme. The herbal medicines reportedly used by pregnant women from other cities in Iran differ from these and include ginger, mint, and chicory in Yazd,^[31] thyme, meant, and green tea in Bojnourd,^[25] tea and frankincense in Tehran,^[26] borage flowers in Shahrekord,^[24] ajwain, thyme, and basil in Kazeroon,^[36] and thyme, olive oil, and green tea in Ahvaz.^[35] In Western European countries, herbs such as chamomile, liquorice, fennel seeds, ginger, cranberry, and raspberry leaves are more commonly used by pregnant women.^[41,42] These differences may reflect variations in traditional and folk knowledge, and practices in the various cultures and locations. The plants most commonly used and the reasons for their consumptions differ between Iran and other countries, which may be due to different philosophical viewpoints toward life and health,^[43] and variations in socioeconomic and sociocultural influences,^[4,44] in addition to their different geographic regions resulting in accessibility to different herbal products.

Our study found that only one in four women using CAM during pregnancy disclosed their use to their doctor. This is a lower rate of disclosure than reported in studies in other countries including the US (50–51.8%)^[45,46] and Saudi Arabia.^[47] However, other researches in Iraq (0.5%)^[48] and Nairobi (12.5%)^[49] reported much lower rates of CAM use disclosure to physicians by pregnant women. The reasons behind such regional differences in disclosure rates is unknown; however, it is interesting to note that US disclosure rates were previously much lower (<1%)^[45] and, as such, suggests that disclosure behaviors can be changed. Known reasons for nondisclosure of CAM use include lack of inquiry from medical providers, the fear of being instructed to discontinue CAM use by the doctor or the health provider, the fear of being judged, public negligence toward the use of CAM during pregnancy, and lack of enough information.^[46] As this was a retrospective study, information bias might have occurred. It is recommended that future studies focus, first, on pre-pregnancy trainings to give some information to pregnant women, and then, examine the effect of increasing pregnant women's awareness about using CAM by the health system. Another limitation of our study was the nature of self-reported data. Self-reported data may be vulnerable to several biases such as prestige and recall bias. Therefore, interpretation of some of the study results such as the rate of side effect reported for CAM use should be done with caution. It seems that continuous educational programs to promote the rate of CAM use disclosure among pregnant mothers are mandatory. Interventions that address such concerns among pregnant women in Iran may serve to increase disclosure rates; however, detailed sociological research is needed to better understand this issue within the target population.

Conclusion

Based on the current study, the main reason for pregnant women's use of CAM in Iran is the participant's belief in CAM and their interest in using it. Increased awareness about CAM's side effects influenced CAM consumption in this population insignificantly. As there is no limitation for using herbal medicine in many countries across the globe, these herbal medicines are available for use by those who intend to use them. As pregnant women receive information from nonprofessional sources and they do not inform their doctors or health care providers about the herbal medicines they use, it becomes vital for the doctors and health care providers to ask pregnant women if they use herbal medicines. Moreover, it is necessary to increase the awareness of women about using herbal medicines before they start their pregnancy period.

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Conflicts of interest

Nothing to declare.

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