TRADITIONAL AND INTEGRATIVE MEDICINE

Trad Integr Med, Volume 9, Issue 3, Summer 2024

Original Research

The Frequency of Medicinal Plant Usage during Pregnancy and possible Related Factors; A Cross-Sectional Study from Tehran, Iran

Azadeh Shabani[1,2], Hajar Nikbakht Fini[3,4]*, Zahra Farahani[2], Minoo Yaghmaei[5]

[1]Preventative Gynecology Research Center, Department of Gynecology and Obstetrics, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[2]Maternal, Fetal, and Neonatal Research Center, Family Health Research Institute, Tehran University of Medical Sciences, Tehran, Iran
[3]Department of Community and Family Medicine, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
[4]Deputy of Health, Iran University of Medical Sciences, Tehran, Iran
[5]Preventative Gynecology Research Center, Department of Gynecology and Obstetrics, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Received: 30 Jan 2024 **Revised:** 9 Apr 2024 **Accepted:** 12 Apr 2024

Abstract

Taking medicinal plants during pregnancy may be associated with geographical, socioeconomic, cultural, and individual factors. The present study was conducted to evaluate the frequency of medicinal plant usage and its influencing factors among pregnant mothers living in Tehran, Iran. A cross-sectional study was conducted (Tehran, Iran; 2019-2020). All pregnant women who attended the prenatal clinic were invited. A written consent was obtained from all subjects before enrolment. Data regarding medicinal plant consumption, the reasons for usage, the cause of preference, the source of advice, and the preparation route were gathered through an interview and the completion of a questionnaire. The recorded data were analyzed to assess the prevalence, indications, and factors influencing medicinal plant usage during pregnancy. Of 326 pregnant women, 105 (32.2%) used at least one, and 221 (67.8%) used no medicinal plant. The most consumed medicinal plant was ginger, followed by peppermint, thyme, frankincense, chicory, and saffron. The main reasons for usage were digestive disease and cold symptoms. The place of receiving prenatal care was the only significant factor affecting herbal medicine consumption (p=0.01). More analyses showed a relatively significant correlation between the participant's age and medicinal plants usage (p=0.05). The results also showed that belief in low adverse effects and high effectiveness of medicinal plants were the reasons for preference of herbal medicine usage. Furthermore, 37 subjects (35.0%) were informed by their family or friends, and 15 (14.3%) consumed medicinal plants on their data. Plants were mainly provided by herbal stores. The results showed a relatively frequent use of medicinal plants. The plants were mostly recommended by families and friends. Future studies with larger sample sizes are suggested to determine possible teratogenicity and safe doses.

Keywords: Plants; Medicinal; Pregnancy; Frequency

http://doi.org/10.18502/tim.v9i3.16528

Citation: Shabani A, Nikbakht Fini H, Farahani Z, Yaghmaei M. **The Frequency of Medicinal Plant Usage during Pregnancy and possible Related Factors; A Cross-Sectional Study from Tehran, Iran.** Trad Integr Med 2024;9(3):246-253. http://doi.org/10.18502/tim.v9i3.16528

*Corresponding Author: Hajar Nikbakht Fini
Department of Community and Family Medicine, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
E-mail: Nibakht.H@iums.ac.ir, hajarnikbakhtfini@gmail.com

Introduction

Medicinal plants are the most ancient substances that were consumed for medicinal objectives [1, 2]. Pregnant women all over the world use complementary and alternative medications (CAMs) including medicinal plants, besides conventional medicines [3-5]. Since the prevalence of CAMs usage are growing, there is a major concern regarding the potential toxicity of these drugs particularly those consumed during pregnancy and lactation periods [6,7].

Herbal medicines and herbal extracts are prevalently used due to an old belief regarding the safety of these medications with plant origin [8]. Furthermore, the availability of medicinal plants and their low costs might be the other reasons for their common usage [9,10]. Pregnancy-related ailments (heartburn, nausea, and vomiting) and pregnancy-unrelated complications (common cold and some kind of infections) are some of the indications that pregnant women may preferably use herbal medications [11,12]. The most commonly used medicinal plants in Iran and Middle Eastern countries are ginger, peppermint, chicory, chamomile, and thyme. This group of drugs is also highly used during pregnancy; however, their safety and safe doses are unclear [12].

Stimulation of uterine contraction, abortifacient activity, antiplatelet properties, and synergistic effects with antiplatelet drugs are some of the reported side effects associated with herbal products [13]. It should also be noticed that these products are usually purchased from stores (not from pharmacies), so, there is no strict control on their production and supply. This process may result in the presence of microbial or heavy metal contamination in herbal products [14,15]. In addition, herbal remedies are generally recommended by relatives and friends, not by healthcare providers, so, their consumptions are not usually recorded in patients' medical records [16].

Many investigations from different cities in Iran have determined the frequency, pattern, and various involving factors in the usage of herbal medicine during pregnancy [17-23]. To our knowledge, there are very few studies [23] from Tehran. It seems the status of taking herbal medications during pregnancy may be associated with many geographical, socioeconomic, cultural, and individual factors [24]. Hence, providing more complementary and informative data, the present study was conducted to evaluate the frequency, pattern, indications, and influencing factors of medicinal plant usage among pregnant mothers living in Tehran, Iran.

Materials and Methods

A prospective and cross-sectional study was conducted in two academic general hospitals affiliated with Shahid Beheshti University of Medical Sciences (Emam Hosein and Taleghani Hospitals, Tehran, Iran) from November 2019 to September 2020. All pregnant women at any gestational age attending the prenatal clinic were invited to participate. Subjects who refused to participate, or were unable to remember the names of consumed medicinal plants, mentally unstable, or foreigners (mainly Afghans) who could not speak Persian were excluded.

Before the study, residents of Family Medicine and Obstetrics were trained to perform the interviews, complete the questionnaires, and collect data.

A semi-structured questionnaire was implemented [23]. Based on experts' opinions, a few modifications were made to the questions to obtain more informative data regarding the reason for preference to use medicinal plants, the source of information or advice, and the source of preparation. Then, the questionnaire was validated with a group of expert perinatologists. To check the repeatability, through a pilot study, 15 pregnant women were tested. The intraclass correlation coefficient (ICC) index was measured to examine the internal validity. The implemented questionnaire was composed of different parts. The first part included questions about participants' socio-demographic characteristics, including age, education, occupation, nationality, residential status, and family size. The questions in the second part were related to obstetrical history, such as numbers of the gravidity, parity, abortion, planned or unplanned pregnancy, and mode of delivery. The third part included information related to consumed medicinal plants, such as names and reasons for usage. Probable indications of using medicinal plants like morning sickness, bloating, constipation, or flu-like symptoms were also asked. The questions of the final part were regarding the recommendation source, reasons for preference using herbal medicine, source of information about herbal medicine, or advice to use and source of preparation. Herbs with food usage were not considered in data entry.

All completed questionnaires were gathered and the recorded data were extracted and analyzed to assess the frequency, indications, and factors influencing medicinal plants usage during pregnancy.

Ethics approval

Ethics approval was obtained from the institutional review board of Shahid Beheshti University of Medical Sciences according to the Helsinki Declaration (IR.SBMU.MSP.REC.1398.904). A written consent was obtained from all subjects before enrolment.

Sample size

The sample size was determined using the community ratio formula, taking into account the following assumptions. The prevalence of drug use (P) during pregnancy was taken as 41% from a similar previous

study [25], taking into account the confidence interval (1-α) of 95% and the estimation error (d) of 10% for this sample volume ratio, the total number of pregnant women was estimated at 326.

Statistical analysis

Analysis was performed using SPSS software version 22. P values less than 0.05 are considered statistically significant. The findings of the study are represented by adjusted OR (aOR) and at 95% confidence interval (CI). Data were displayed as mean and standard deviation for quantitative variables and as frequency and percentage for qualitative variables. Also, a two-sample independent t-test was used to compare quantitative variables between the two groups, and the Chi-square test was used for qualitative variables. The logistic regression model was used to measure the relationships between the variables affecting the pattern of drug use.

Results

Out of 350 invited subjects, 24 were excluded because of dissatisfaction with participation or lack of knowledge about consumed medicinal plants. Finally, 326 pregnant women completed the questionnaire. The mean age of participants was 28±6.31 (Min: 12 and Max: 48) years. The majority of them were Iranian (77.3%), unemployed (91.70%), and lived in the cities (72.3%). Thirty women (9.0%) were illiterate, and 65 (29.6%) had a large family size (≥4).

Of all participants, 105 pregnant women (32.2%) used at least one, and 221 (67.8%) used no medicinal plants during pregnancy The used herbal medicines and reasons for usage are shown in table 1. Of 23 used medicinal plants during pregnancy, the most consumed plant was ginger, followed by peppermint, thyme, frankincense, chicory, and saffron. The declared main reasons for usage were gastric symptoms (nausea/morning sleekness, bloating, stomachache, and constipation), cold symptoms, the tendency to increase the neonate's intelligence quotient (IQ), and preventing neonatal jaundice. Saffron was also used to induce abortion and get warm.

Analysis of data showed no significant differences between the two groups (consumed and non-consumed herbal medicines) regarding demographic characteristics including age (p=0.06), educational status (p=0.14), occupation (p=0.52), the place of residency (p=0.21), nationality (p=0.32), and family size (p=0.47). Concerning the obstetrical factors, the place of receiving prenatal care was the only significant factor affecting herbal medicine consumption. Accordingly, more subjects who received prenatal care from midwifery offices had consumed medicinal plants (p=0.01). On the contrary, most women who attended academic hospitals did not consume medicinal plants (p=0.01). No significant differences were observed between the groups regarding other obstetrical factors like numbers of parity, abortion, pregnancy tendency,

Table 1. Frequency and reason of herbal medicine usage

	Medicinal plants	Number	Percent	Reason of usage
1	Ginger	25	7.66	Nausea, Morning sickness, cold symptoms
2	Peppermint	18	5.52	Stomachache, bloating
3	Thyme	16	4.90	Cough, cold symptom
4	Frankincense	13	3.98	Increasing neonate IQ
5	Chicory	11	3.37	Preventing neonatal jaundice
6	Saffron	10	3.06	Induced Abortion, Getting warm
7	Cinnamon	8	2.45	Bloating, Getting warm
8	Dermal oil (almond & olive)	8	2.45	Preventing skin Stretching and striae of
9	Four seeds	6	1.84	Cold symptom
10	Flaxseed	6	1.84	Constipation, stomachache
11	Garlic	6	1.84	Cold symptoms, Increasing neonate IQ, No
12	Pennyroyal	5	1.53	Cold symptoms
13	Borage	3	0.92	Sedative
14	Chamomile	2	0.61	Sedative
15	Green tee	2	0.61	No reason
16	Cumin	2	0.61	Bloating
17	Licorice	2	0.61	Stomach ache
18	Jujube	2	0.61	No reason
19	Musk willow	1	0.30	Sedative
19	Manna of hedysarum	1	0.30	-
20	Violet oil	1	0.30	Cold Symptoms
21	Cranberry	1	0.30	Well being
22	Plantago	0	0	-
23	Sage	0	0	-

Table 2. Comparison of demographic and obstetrical characteristics between two groups of consumed and non-consumed herbal medicines

Variables	Medicinal plant usage (n=105)	No medicinal plant usage (n=221)	p value
Age (Year; Mean±± SD)	29.44±5.90	28.01±6.47	0.06
Educational status			0.14
Illiterates	6(20%)	24(80%)	
Under diploma	40(29.6%)	95(70.4%)	
Diploma and higher	59(36.6%)	102(63.4%)	
Occupation			0.52
Employed	9(33.3%)	18(66.7%)	
Unemployed	96(32.1)	203(67.9%)	
Place of residency			0.21
Urban	(30.9%)71	(69.1%)159	
Suburb	(36.4%)32	(63.6%)56	
Nationality			0.32
Non-Iranian	(22.8%)13	(77.2%)44	
Iranian	86(34%)	166(65.8)	
Family size			0.47
1	(36.4%)8	(63.6%)14	
2	(37.1%)13	(62.9%)22	
3	(38%)19	(62%)31	
4≤	(29.7%)65	(70.3%)145	
Parity			0.81
1	(30.2%)35	(69.8%)81	
2	(33.7%)35	(66.3%)69	
≥3	(33.7%)33	(66.3%)65	
Pregnancy tendency			0.19
Planed			
Unplanned	(32.4%)47	(67.6%)98	
Unplanned but with willing	(37.5%)36	(62.5%)60	
	(25.0%)21	(75.0%)63	
Abortion history			0.42
No	(31.5%)58	(68.5%)126	
Yes	(33.8%)24	(66.2%)47	
Attempt duration to become pregnant (Month)			0.83
6≥	(31.1%)70	(68.9%)155	
6-12	(31.1%)14	(68.9%)31	
≥6	(35.7%)15	(64.3%)27	
Place of prenatal visit			
Midwifery office	(57.1%)12	(42.9%)9	0.01
Obstetric office	(37.9%)33	(62.1%)54	0.11
Health care center	(30.6%)44	(69.4%)100	0.32
Academic hospitals	(26.6%)47	(73.4%)130	0.01
Non-governmental hospitals	(50.0%)1	(50.0%)1	0.54
Time of first prenatal care visit (trimester)			0.46
First	(33.5%)82	(66.5%)163	
Second	(33.3%)6	(66.7%)12	
Third	(12.5%)1	(87.5%)7	
Frequency of prenatal visits			0.11
1-2	(23.1%)15	(76.9%)50	
3-4	(39.3%)22	(60.7%)34	
5≤	(35.5%)61	(64.5%)111	

between the groups regarding other obstetrical factors like numbers of parity, abortion, pregnancy tendency, attempt duration to become pregnant, place of receiving prenatal care, the time of first prenatal care visit, and the frequency of prenatal care visits (p>0.05). All detailed data are shown in table 2.

More analyses using the Logistic regression test showed a weak but not significant correlation between participant's age and taking medicinal plants; older participants used more herbal medicine during pregnancy (p=0.05). On the other hand, no correlations were observed between medicinal plant consumption and other variables like occupational or educational status, place of residency, nationality, parity, family size, and time of first prenatal care (p>0.05) (Table 3). Considering the reason for preference of medicinal plant, the results showed that belief in less adverse effects and more effectiveness of herbal medicine compared to conventional drugs, as well as, the good experience reported by the others were the main reasons (Table 4).

Table 3. Correlations between medicinal plant usage and several variables

Variable	aOR	CI (95%)	p value
Age	1.04	0.99-1.09	0.05
Education	1.16	0.86-1.57	0.32
Occupation	0.63	0.21-1.91	0.42
Family size	1.04	0.81-1.35	0.73
Time of first prenatal care	0.52	0.22-1.22	0.13
Parity	1.06	0.74-1.52	0.74
Nationality	1.04	0.9-1.21	0.57
Residential status	1.00	0.54-1.86	0.98

Table 4. Reason for medicinal plant use preference

Reasons	Number (n= 105)	(%)
Less adverse effects in comparison with conventional drugs	23	21.9
Good experience reported by family and friends report	19	18.0
More effective in comparison with conventional drugs	6	5.7
Availability (ease of access)	4	3.8
Low cost	2	1.9
Missing data/could not remember	55	52.3

Furthermore, investigating the source of information, the results showed 37 subjects (35%) were informed by their family or friends, and 15 (14.3%) consumed medicinal plants by own data. Other resources of information were books, magazines, herbal sellers (8:7.6%), medical doctors and midwives (14: 11.3%), googling (7: 6.6%), and others (5: 4.7%). The rest of the participants could not remember the sources of information. The results also showed that the source of procurement in 45.7% was herbal stores; while others declared different ways like self-provided, family members, and pharmacy. Several participants did not remember to report (Table 5).

Table 5. Source of medicinal plant preparation

Place of preparation	**Number (105)**	**(%)**
Herbal stores	48	45.7
Self-production	8	7.6
Family	4	3.8
Pharmacy	2	1.9
Clinician	2	1.9
Others/can't remember	41	39

Discussion

The results of the present study showed that the measure of medicinal plant usage among pregnant women was 32%. This rate is comparable with reported rates by the other studies. Studies demonstrated that the frequency rate of herbal medicinal usage during pregnancy in Middle Eastern countries was between 19% to 90%. Interestingly, both of these rates belong to two cities of Iran (19% in Ahvaz and 90% in Yazd [3,26]). Furthermore, other investigations showed a higher rate of herbal medicine consumption among pregnant mothers from Zambia [27] and a lower prevalence rate in developed countries [28].

Based on the results, ginger followed by peppermint,

thyme, frankincense, and chicory were the most frequently used medicinal plants. Ginger was commonly used to relieve gastrointestinal and common cold-related symptoms.

These findings are in line with the results of other studies that were carried out in the Middle East countries and Zambia [15,27]. Inconsistent with our results, a previous study from Tehran, Iran, in 2012 showed a different ranking sequence regarding frequently used herbal medications. Peppermint was the most, followed by frankincense, flix-weed seed, pennyroyal, ginger, and chicory [23]. The other study also showed that Asian pregnant women consumed peppermint more than ginger [29]. A study from Shiraz, Iran, in 2023 also showed chicory as the most used herbal medicine during pregnancy [20]. These diversities in the results may relate to differences in the sample sizes, drug consumption during different trimesters of pregnancy with various complications, number of gestations, etc. Our results demonstrated that pregnant women consumed frankincense to increase their infants' IQ and chicory to prevent neonatal jaundice. As there is not enough information about the possible teratogenic effects of chicory and frankincense during pregnancy; it seems more investigations are needed to assess their potential adverse effects. Moreover, the possibility of medicinal plant contamination with heavy metals is the other important subject that should be carefully considered [3]. Evidence has demonstrated that cadmium and lead concentrations in ginger and thyme samples may be above the safe values [30].

The results of the present study showed that gastrointestinal and common cold-related symptoms, followed by the preference to increase the child's intelligence and prevent neonatal jaundice, were the most common reasons for medicinal plant usage during pregnancy. These results are confirmed by the other studies conducted by John et al. and Hashem et al. [3,23]. In contrast to the results of other studies from Iran (Kazeroon) [31] and Asian countries [3], we could not show urinary tract infection as a frequent reason for taking herbal medicine during pregnancy. The finding of the present study also indicated inducing abortion was the reason for saffron consumption among the pregnant population. Compatible with this result, previous studies have shown the possible relationships between high doses of saffron and the risks of miscarriage and preterm birth [32,33]. On the other hand, this adverse effect was not reported by the other studies from Iran [23] or Asia [3]. These findings raise the need for further studies demonstrating the possible teratogenicity of saffron.

Concerning the obstetrical factors affecting medicinal plant consumption, the results showed that the place of receiving prenatal care was the only significant factor. More subjects who received prenatal care from midwifery offices had consumed herbal medicines. Confirming our results, previous studies showed that midwives who had self-experience of using CAMs or attending CAM workshops advised their clients more CAM remedies [34,35]. On the contrary, the lowest rate of herbal medicine usage was related to those who received prenatal care from academic hospitals. These results may be reflected in the differences in healthcare attitudes according to their relationship with the academic environment. It is supposed that because of inadequate evidence-based information, CAM and herbal medicines were not recommended in academic clinics and hospitals. According to the results, there was a weak but non-significant correlation between participant's age and taking medicinal plants. Moreover, no significant correlation was observed between educational status and herbal medicinal use. In line with our finding, an investigation from Iran could not find any relationship between herbal usage with the mother's age or educational level (31). In contrast to our findings, several studies from Iran, Ethiopia, and Indonesia demonstrated statically significant relationships between herbal usage and women's age or education [23,36,37].

Pregnant women who used medicinal plants, mostly believed it has fewer adverse effects compared to conventional drugs. This finding shows a need to precisely evaluate why mothers believe it has less adverse effects and more safety regarding the use of herbs during pregnancy that resulted in inappropriate consumption [18,38]. In addition, future randomized controlled trials are needed to determine safe doses of commonly used herbal medication, and pregnant women should be aware of possible drug toxicity. Compatible with our results, another study from Iran has demonstrated that the reason for "less adverse effects of herbal medicines in comparison with conventional medications" was the frequently reported belief among included pregnant women [23]. This belief may not be an evidence-based reason and may arise from lack of knowledge. Moreover, some people may believe in medicinal plants as food supplements, not drugs [39].

The main source of obtaining information related to the use of medicinal plant was family and friends. This finding was confirmed by a previous study conducted in Tehran, Iran [23]. Healthcare providers should be encouraged to inform pregnant women about using evidence-based resources. In contrast with our finding, an investigation by Sattari et al. (Tabriz, Iran) [18] showed that the majority of pregnant women were recommended to use herbs by their doctors. This diversity in findings may reflect the cultural, geographical, and distribution of prenatal care clinics.

According to the results, self-production and herbal shops were the most reported ways that our participants provided their medicinal plants. Previous stud-

ies have emphasized the possibility of herbal contaminations in products that have not been produced or sold under the supervision of the Iran food and drug administrators. Contamination with heavy metals or the presence of toxic amounts of cadmium and copper have been previously reported by former studies [3,40].

Conclusion

The results of this study showed the relatively frequent use of medicinal plants during pregnancy which were mostly recommended by families and friends. The most consumed medicine was ginger, followed by peppermint, thyme, frankincense, chicory, and saffron. The place of receiving prenatal care was the only significant factor affecting medicinal plant consumption. Medicinal plants were mainly provided from herbal stores. These findings highlight the necessity of awareness of medicinal plants use during pregnancy. Healthcare providers should be trained regarding herbal medicines' advantages, disadvantages, indications, safe doses, and contraindications. Pregnant women should also receive information from healthcare providers instead of their relatives. Compiling protocols and guidelines related to the administration of herbal medicines would be beneficial, particularly for healthcare providers who work in comprehensive or primary healthcare centers. Future cohort studies and randomized controlled trials with larger sample sizes and including more variables are suggested to determine possible teratogenicity and safe doses.

Conflict of Interests

The authors declare that there is no conflict of interest.

Acknowledgments

This study was supported by the Shahid Beheshti University of Medical Sciences. The authors appreciate their kind support.

References

[1] Widoyo H, Mohammed ZY, Ramírez-Coronel AA, Iswanto AH, Thattarauthodiyil U, et al. Herbal therapy in Covid-19: A systematic review of medicinal plants effective against Covid-19. Casp J Environ Sci 2023;21:1289-1298.

[2] Marrelli M. Medicinal plants. Plants (Basel, Switzerland). 2021;10:1355.

[3] John LJ, Shantakumari N. Herbal medicines use during pregnancy: a review from the Middle East. Oman Med J 2015;30:229-236.

[4] Ahmed SM, Nordeng H, Sundby J, Aragaw YA, de Boer HJ. The use of medicinal plants by pregnant women in Africa: a systematic review. J Ethnopharmacol 2018;224:297-313.

[5] Mekuria AB, Erku DA, Gebresillassie BM, Birru EM, Tizazu B, et al. Prevalence and associated factors of herbal medicine use among pregnant women on antenatal care follow-up at University of Gondar referral and teaching hospital, Ethiopia: a cross-sectional study. BMC complement Altern Med 2017;17:1-7.

[6] Allaire AD. Complementary and alternative medicine in the labor and delivery suite. Clin Obstet Gynecol 2001;44:681-691.

[7] Jasim SA, Abdelbasset WK, Jawad MA, Bokov DO, Thangavelu L, et al. Tramadol toxicity phytotherapy: The protective role of medicinal plants against tramadol toxicity. Casp J Environ Sci 2023;21:227-243.

[8] Baharvand Ahmadi B, Khajoei Nejad F, Papi S, Eftekhari Z. Phytotherapy for heart tonic: An ethnobotanical study in Dehloran city, Ilam province, western Iran. Casp J Environ Sci In Press.

[9] Kam PC, Barnett DW, Douglas ID. Herbal medicines and pregnancy: A narrative review and anaesthetic considerations. Anaesth Intensive Care 2019;47:226-234.

[10] Zargoush-Nasab A, Karimi E, Jalilian A, Bahmani M. Quantitative analysis of ethanol and methanol in herbal distillates distributed in ilam city in western iran using gas chromatography. Plant Biotechnol Persa 2023;5:33-38.

[11] Azaizeh H, Saad B, Cooper E, Said O. Traditional Arabic and Islamic medicine, a re-emerging health aid. Evid Based Complement Altern Med 2010;7:419-424.

[12] Heydarpour F, Heydarpour S, Dehghan F, Mohammadi M, Farzaei MH. Prevalence of medicinal herbs use during pregnancy in the world: a systematic review and meta-analysis. J Chem Health Risks 2022;12:183-196.

[13] Bernstein N, Akram M, Yaniv-Bachrach Z, Daniyal M. Is it safe to consume traditional medicinal plants during pregnancy? Phytother Res 2021;35:1908-1924.

[14] Organization WH. WHO guidelines for assessing quality of herbal medicines with reference to contaminants and residues: World Health Organization 2007.

[15] Mensah M, Komlaga G, Forkuo AD, Firempong C, Anning AK, et al. Toxicity and safety implications of herbal medicines used in Africa. Herb Med 2019;63:1992.

[16] Adams J. Growing popularity of complementary and alternative medicine during pregnancy and implications for healthcare providers. Expert Rev Obstet Gynecol 2011;6:365-366.

[17] Khadivzadeh T, Ghabel M. Complementary and alternative medicine use in pregnancy in Mashhad, Iran, 2007-8. Iran J Nurs Midwifery Res 2012;17:263.

[18] Sattari M, Dilmaghanizadeh M, Hamishehkar H, Mashayekhi SO. Self-reported use and attitudes regarding herbal medicine safety during pregnancy in Iran. Jundishapur J Nat Pharm Prod 2012;7:45-49.

[19] Yazdi N, Salehi A, Vojoud M, Sharifi MH, Hoseinkhani A. Use of complementary and alternative medicine in pregnant women: A cross-sectional survey in the south of Iran. J Integr Med 2019;17:392-395.

[20] Vardanjani HM, Steel A, Mofarrahi D, Jaladat AM, Amini F, et al. Use of complementary and alternative medicine and its related factors among pregnant women in Shiraz, South of Iran: A cross-sectional study. Iran J Nurs Midwifery Res 2023;28:53-59.

[21] Abdollahi F, Yazdani Chareti J. The relationship between women's characteristics and herbal medicines use during pregnancy. Women & Health. 2019;59(6):579-90.

[22] Ekrasarian S, Rostami F, Yazdani Charati J, Abdollahi F. Use of Medicinal Plants during Pregnancy in Pregnant Women in Sari, Iran. J Mazandaran Uni Med Sci 2017;26:341-345.

[23] Hashem Dabaghian F, Abdollahi Fard M, Shojaei A, Kianbakht

S, Zafarghandi N, et al. Use and attitude on herbal medicine in a group of pregnant women in Tehran. 2012;11:22-33.
[24] Illamola SM, Amaeze OU, Krepkova LV, Birnbaum AK, Karanam A, et al. Use of herbal medicine by pregnant women: What physicians need to know. Front Pharmacol 2020;10:1483.
[25] Alema NM, Semagn G, Melesse S, Araya EM, Gebremedhin H, et al. Patterns and determinants of prescribed drug use among pregnant women in Adigrat general hospital, northern Ethiopia: a cross-sectional study. BMC Pregnancy Childbirth 2020;20:624.
[26] Bouqoufi A, Lahlou L, Ait El Hadj F, Abdessadek M, Obtel M, et al. Prevalence, motivation, and associated factors of medicinal herbs consumption in pregnant women from Eastern Mediterranean Regional Office: a systematic review. Pharm Biol 2023;61:1065-1081.
[27] El Hajj M, Sitali DC, Vwalika B, Holst L. Herbal medicine use among pregnant women attending antenatal clinics in Lusaka Province, Zambia: A cross-sectional, multicentre study. Complement Ther Clin Pract 2020;40:101218.
[28] Kennedy D, Lupattelli A, Koren G, Nordeng H. Safety classification of herbal medicines used in pregnancy in a multinational study. BMC complement Altern Med 2016;16:102.
[29] Ahmed M, Hwang JH, Choi S, Han D. Safety classification of herbal medicines used among pregnant women in Asian countries: a systematic review. BMC complement Altern Med 2017;17:489.
[30] Karagözoğlu Y, KIRAN TR. Investigation of heavy metal contents in thyme (thymus vulgaris) and ginger (zingiber officinale) sold in bingöl herbalists. Mid Black Sea J Health Sci 2023;9(1):88-97.
[31] Tabatabaee M. Use of herbal medicine among pregnant women referring to Valiasr Hospital in Kazeroon, Fars, South of Iran. J Med Plants 2011;10:96-108.
[32] Ajam M, Reyhani T, Roshanravan V, Zare Z. Increased miscarriage rate in female farmers working in saffron fields: a possible effect of saffron toxicity. Asia Pac J Med Toxicol 2014;3:73-75.
[33] Bostan HB, Mehri S, Hosseinzadeh H. Toxicology effects of saffron and its constituents: a review. Iran J Basic Med Sci 2017;20:110-121.
[34] Mollart L, Skinner V, Adams J, Foureur M. Midwives' personal use of complementary and alternative medicine (CAM) influences their recommendations to women experiencing a postdate pregnancy. Women Birth 2018;31:44-51.
[35] Mollart L, Stulz V, Foureur M. Midwives knowledge and education/training in complementary and alternative medicine (CAM): A national survey. Complementary therapies in clinical practice. 2021;45:101473.
[36] Adane F, Seyoum G, Alamneh YM, Abie W, Desta M, et al. Herbal medicine use and predictors among pregnant women attending antenatal care in Ethiopia: a systematic review and meta-analysis. BMC Pregnancy Childbirth 2020;20:157.
[37] Elba F, Hilmanto D, Poddar S. Factors influencing the use of herbal medications during pregnancy at Public Health Center, Indonesia. J Public Health Res 2022;11.
[38] El Hajj M, Holst L. Herbal medicine use during pregnancy: a review of the literature with a special focus on sub-Saharan Africa. Front Pharmacol 2020;11:866.
[39] Moreira DdL, Teixeira SS, Monteiro MHD, De-Oliveira ACA, Paumgartten FJ. Traditional use and safety of herbal medicines. Revista Brasileira de Farmacognosia 2014;24:248-257.
[40] de Sousa Lima CM, Fujishima MAT, de Paula Lima B, Mastroianni PC, de Sousa FFO, et al. Microbial contamination in herbal medicines: a serious health hazard to elderly consumers. BMC Complement Med Ther 2020;20:17.