

# Evaluation of herbal medicine use in the obstetric and gynecology department

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## ABSTRACT

**Background and Aims:** Pregnancy is a sensitive period for all synthetic and herbal treatment options. This study aims to classify the herbal medicines used during pregnancy and to determine their usage rates, side effects, and risks, according to safety conditions.

**Methods:** This study was conducted using survey questions directed to pregnant women receiving treatment in the Obstetrics and Gynecology Department.

**Results:** 194 people participated in the study. 63 people (32.4%) used 31 different herbal medicines during pregnancy. Commonly used medicines were: *Mentha* sp. - *Citrus limonum*, *Tilia* sp. and *Matricaria chamomilla*. Herbal medicines were classified in four groups according to their effects, risk and safety during pregnancy. Accordingly, nine herbal medicines were classified as potentially harmful for use in pregnancy at a usage rate of 20.43%. These are mainly *Jasminum* sp. and *Foeniculum vulgare*.

**Conclusion:** The findings of this study showed that the use of herbal medicines is common during pregnancy and that potentially harmful herbal medicines are used at high rates during this time. Patients get information about herbal medicines used during pregnancy from unreliable sources. Health care providers should have information about the potential benefits/harms of herbal medicines when used during pregnancy.

**Keywords:** Herbal medicine, pregnancy, Obstetrics and Gynecology, safety

## INTRODUCTION

The history of treating health issues with herbs is as old as human history. Despite the development of new treatment methods today, people are looking for different options when it comes to health care, due to the influence of developing communication networks and various environmental factors. These alternative options mostly include herbal medicines, which the public considers natural and harmless. Declining confidence in synthetic drugs, the idea that synthetic drugs are harmful and that medicines obtained from plants are completely harmless, and the media offering unreliable information are the main reasons for the increasing use of herbal medicines (Mosihuzzaman & Choudhary, 2008). However, due to the chemicals they contain, plants can affect many systems in the body, changing biochemical events and causing undesirable results (Dülger, 2012; Patel & Gohil, 2007; Skalli, Zaid, & Soulaymani, 2007).

While pregnant women are careful about the potential risks of conventional drug consumption, they have little information about the harmful effects of herbal medicines. Information on the potential harm of many herbal medicines in pregnancy is

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limited. Some herbal medicines are teratogenic in human and animal models, so pregnant women are at risk from the use of herbal medicine. Based on this information, it is recommended to avoid herbal medicines during pregnancy (Ernst, 2002; Tabatabaee, 2011).

Herbal medicines are any plant-derived medicines taken in any form, as a preventive or a healing treatment (e.g. leaves, roots, flowers) (Muñoz Balbontín, Stewart, Shetty, Fitton, & McLay, 2019). Herbal medicines can come in the form of raw drugs, teas and pharmaceutical formulation medicines obtained from plants, according to the WHO (World Health Organization, 2004). Although herbal medicines have been used by people in Asia, Africa and Latin America for centuries, it has been noted that their use has also increased in the Western world in recent years (Koren, Randor, Martin, & Danneman, 1990).

Women are cited as the main users of herbal medicines for both health protection and the treatment of disease (Eardley et al., 2012; Hunt et al., 2010). This widespread use continues during pregnancy. In Africa, Australia, Europe, England and the United States, 10% to 74% of pregnant women are reported to be using herbal medicines (Adams et al., 2009; Kennedy, Lupattelli, Koren, & Nordeng, 2016; Laelago, Yohannes, & Lemango, 2016). Such medicines are widely used as a method of treatment during pregnancy. In a study in which the use of herbal medicines was found to be 89% in 2,673 pregnant women, it was stated that 126 herbal medicines were used. According to the risk groups, 27 of these 126 plants used during pregnancy are classified as contraindicated, 28 are safe, and the rest should be used carefully during pregnancy (Kennedy et al., 2016). In a study conducted in a hospital in Iran, it was reported that 30.8% of 513 pregnant women used herbal medicine. Most herbal medicine use occurs in the first trimester. It was found that 87.3% of herbal medicine recommendations were made by the family. Based on these results, it was emphasized that doctors should be concerned about the use of herbal medicines in pregnant women and the possible side effects and harm of these uses (Tabatabaee, 2011).

In a study evaluating the use of herbal medicines among pregnant women in Turkey, it was found that 47.3% of 366 pregnant women used at least one herbal medicine. Linden, mint-lemon and ginger are the first three plants used in the treatment of colds and influenza. More than half of pregnant women started using herbal medicines without consulting anyone, and the rate of consultation with health care professionals was low. Herbal medicines are frequently used in the treatment of nausea, vomiting, constipation, pain control and colds, but there is insufficient data on their effects on the health of the mother and baby during pregnancy (Kissal, Çevik Güner, & Batkın Ertürk, 2017).

An increase in the use of herbal medicines has been observed all over the world. The use of herbal medicines is especially of concern in pregnant women due to safety and lack of adequate data. Although the current data does not support herbal use during pregnancy, the use of such medicines in pregnant

women is present at varying frequencies. There are many underlying reasons for choosing these medicines, such as lack of knowledge, difference in level of education, widespread advertisements in the media, and lack of information about the subject by health professionals.

There are few studies in Turkey on herbal medicine use rates, safety data and other issues during pregnancy. It is important to determine the rates of use of such medicines during pregnancy and to ensure that the consulted health professionals have information about the effects and side effects of these medicines. There are several ways to obtain information about herbal medicines that are not based on evidence. This study aims to determine which herbal medicines are used in pregnancy, and what their usage rates are. It also aims to examine the effects and risks of such medicines on pregnancy, and to classify them according to safety conditions and evaluate the sources of thought and information about herbal medicines.

## MATERIALS AND METHODS

This study was conducted to get information about the use of herbal medicine during pregnancy in women who have had at least one child or who were given pre- and postnatal care in the Department of Obstetrics and Gynecology (OGD). It is a descriptive study conducted by means of a survey directing questions to pregnant women. The place where the study was conducted is a private hospital with 72 beds, 10 of which belong to the OGD.

The definition of herbal medicines was briefly explained to the participants prior to the survey. After the study was announced, oral or written enlightened consent was obtained from the women who agreed to participate. Data were collected through face-to-face interviews with pregnant women together with the researcher and service representative midwife. Survey questions consisted of three parts. The first part of the survey included questions about the patients' chronic illness, allergies, smoking, and alcohol habits. The second section of the survey included questions for those who had used herbal medicine during pregnancy, including questions to obtain information about the duration of use, where the medicine had been obtained, the cost of the medicine, and whether there had been any side effects or not. In the last part, a total of 48 questions were included, along with sociodemographic questions. The survey was prepared by the researchers in the light of the literature review. Average time to complete the survey was 10-15 minutes. The study began after receiving approval from the Istanbul Medical Faculty Clinical Research Ethics Committee No:21 dated 22.12.2017. The survey began on January 15, 2018, and when a sufficient sample size was obtained data collection ended on March 15, 2018. The study population was calculated based on the number of patients in the 2017 OGD, obtained from hospital records. For the 2-month study, the study population was determined as 348. The following values were calculated: Confidence level: 95%, Confidence Interval: 5, Population: 348. The required number of samples was calculated as 183 (<https://www.surveysystem.com/sscalc.htm>). 194 people were in-

cluded in the study. Pregnant women over the age of 18 with at least one child and staying in the OGD were included in the study. Those who could not answer the questions were not included in the study.

The SPSS 15.0 for Windows Evaluation Version program was used to evaluate statistical data. All data obtained in the study were coded through programs, and statistical information such as frequency, descriptive information, and inter-variable relationships were evaluated. Ordinal and nominal data are given in n (%). A chi-square test was used in the analysis of categorical variables. The results were evaluated at 95% confidence intervals and significance levels of  $p < 0.05$ .

Various reference sources were used to classify the safety of identified herbal medicines. The following resources were used as primary resources: Herbal Medicines in Pregnancy & Lactation (Mills, Dugoua, Perri, & Koren, 2006), Botanical Safety Handbook (Second Edition American Herbal Medicines Association's), PDR for Herbal Medicines (Gruenwald et al., 2000), Kennedy et al., 2016 and Ahmed, Hwang, Choi, & Han, 2017. Other references not listed in the above mentioned sources were scanned for herbal medicines.

In case of incompatible information in the sources, newer studies on the safety classification of herbal medicines used during pregnancy (Kennedy et al., 2016 and Ahmed et al., 2017) were used as primary reference sources, followed by the Herbal Medicines in Pregnancy & Lactation (Mills et al., 2006), Botanical Safety Handbook (Second Edition American Herbal Medicines Association's) resources. If any of the herbal medicines were not listed in the reference sources, PubMed/MEDLINE was consulted.

Evidence from human studies was used when classifying the safety of herbal medicines. If a herbal medicine consisted of two or more plants, each plant was evaluated separately and the herbal medicine classified as a single medicine. Based on two recent studies, herbal medicines were divided into four groups (Ahmed et al., 2017; Kennedy et al., 2016). The definitions of the categories in this classification are presented in Table 1. In this study, herbal medicine names were evaluated according to the patient's declaration and the scientific name of the herbal medicine was determined through the Turkish name. For species known with the same name without species distinction, only the genus name is given.

## RESULTS AND DISCUSSION

Today, herbal medicines are very popular in the world. However, as in many areas, there is a lack of information on the use of herbal products about the prevalence, safety, and potential negative effects during pregnancy. This study examined the perspectives of pregnant women on herbal medicines, the prevalence of use during pregnancy, fact-based information on the use of herbal medicines according to risk and safety warnings, the sources from which patients received information and other factors related to the use of herbal medicines.

A total of 194 pregnant women participated in this survey. The age range was mainly between 25-30 (38.6%). The median age $\pm$ SD was 28.2 $\pm$ 5.49. Participants were mostly primary school graduates (43.8%), most of whom were housewives (76.2%) with health insurance (92.8%). The stated preference of 66% of the participants when they got sick was to go to hospital. Further socio-demographic information about the participants is given in Table 2.

**Table 2: Socio-demographic information of the participants.**

	Frequency	Rate (%)
<b>Gender</b>		
Woman	194	100
<b>Age</b>		
Average $\pm$ SD	28.2 $\pm$ 5.49	
<b>Education Status</b>		
Not literate	4	2.1
Primary school	85	43.8
High school	72	37.1
University	33	17
<b>Social Insurance Status</b>		
Yes	180	92.8
No	14	7.2
<b>Working Status</b>		
Not working	148	76.3
Working	46	23.7
<b>Habits</b>		
No	152	78.4
Smoking	39	20.1
Alcohol	3	1.5
<b>Health Institution Preference</b>		
Family doctor	128	66
Hospital	64	33
Self Treatment	2	1

**Table 1: Safety classification of herbal medicines used during pregnancy.**

Classification	Description
<b>Safe to use in pregnancy</b>	Available human evidence suggests the herb can be safely used in pregnancy
<b>Use with caution</b>	Available human evidence for the herb is limited so it should not be used without consulting a qualified health care practitioner
<b>Potentially harmful to use in pregnancy</b>	Available evidence has shown adverse impacts on pregnant woman or fetus following the use of the herb
<b>Information unavailable</b>	No reference was found regarding use of the herb in pregnancy

According to our results, 63 (32.4%) of 194 pregnant women used 31 different herbal medicines during pregnancy and these herbal remedies were used frequently. The use of herbal remedies during pregnancy varies by country or region. A survey of 400 Norwegian women shows that 36% of pregnant women have used herbal medicines during pregnancy and the average was 1.7 products (Nordeng & Havnen, 2004). In a similar study, this percentage was found to be 27.8% in Italy (Cuzzolin et al., 2010). In a study in Iran, 30.8% of 513 pregnant women were shown to use herbal medicine (Tabatabaee, 2011). Another study gives a meta-analysis showing that more than a quarter (28.9%) of the participants had used some herbal medicines (Kennedy, Lupattelli, Koren, & Nordeng, 2013). Another study involving 2,729 participants from Asian countries showed that 1,283 women (47.01%) used one or more herbal medicines during pregnancy. (Ahmed et al., 2017). Among 557 mothers who gave birth in a hospital in Scotland, the rate of herbal medicine use was 61.4% (Pallivalapila et al., 2015). A study conducted in Turkey found that 47.3% of 366 pregnant women used at least one herbal medicine (Kissal et al., 2017).

We evaluated the sociodemographic and other characteristics of pregnant women who used and who did not use herbal medicines during pregnancy with the Chi-square test. For people who have social insurance ( $p: 0.016$ ) or prefer to use herbal products in self-treatment ( $p < 0.001$ ), or have a habit of using herbal products in their life at times other than pregnancy ( $p < 0.001$ ), the rate of using herbal products during pregnancy is higher than for others, and it was found that there was a statistically significant difference between these. There was no statistically significant difference between the use of herbal medicines and the level of education, age, employment status and profession ( $p > 0.05$ ). Other details are shown in Table 3.

A study in Turkey shows that the level of education, employment status and family culture represent a statistically significant difference (43.7%) in the use of herbal medicines during pregnancy ( $p < 0.05$ ). However, the relationship between age, social security, income, number of pregnancies and use of herbal medicines during pregnancy was not statistically significant (Kissal et al., 2017).

In a study of 400 pregnant Norwegian women a statistically significant difference was only found in the age group of 36 years and younger for the use of herbal medicines during pregnancy. ( $p: 0.048$ ) (Nordeng & Havnen, 2004). A study of 392 pregnant women in Italy found statistical significance between those who used herbal medicines and those who did not, in terms of living in the countryside ( $p: 0.001$ ) and being in the 31-40 age range ( $p: 0.009$ ) (Cuzzolin et al., 2010). A study of 530 pregnant women in Iran found that the relationship between the use of herbal medicines during pregnancy and age, occupation and place of residence has no statistical significance. (Tabatabaee, 2011). A multinational study found statistical significance between the use of herbal medicines during pregnancy and the education level and sources of information or recommendations ( $p < 0.05$ ), but there was no statistical significance between age and occupation (Kennedy et al., 2016).

As mentioned in various studies, there are many variables that lead to statistically significant differences in the use of herbal medicines during pregnancy. In addition to the median age of the participants, factors such as region, as well as cultural and knowledge levels, may also influence this difference. According to the statistically significant differences observed in this study, it can be concluded that pregnant women who have a habit of using herbal medicines outside the pregnancy, who have a habit of self-medication and those who prefer herbal medicines in self-medication, continue these habits during pregnancy. There is no data in the literature related to these conditions, which were determined significantly different in this study. In some countries the gestational age is higher than in our country. In this study the median age of pregnant women is lower, which may explain the reason why age is not a significant factor. Most studies point to profession as a factor, but we concluded in our study that profession does not make a significant difference in the use of herbal medicines during pregnancy. All these results make it difficult to summarize the related factors. In this study, we found that participants used 31 different herbal remedies during pregnancy. The most commonly used herbal medicines during pregnancy are: *Mentha* sp., *Citrus limon* (12.2%), *Tilia* sp. (12.2%), *Matricaria chamomilla* (6.6%), *Caryophyllus aromaticum* (6.6%) and *Jasminum* sp. (6.6%). Other herbal medicines and the percentage of use are shown in Table 4. The most used plants during pregnancy, determined in a study conducted in Norway, are echinacea (22.9%), iron-rich herbal remedies (11.9%), ginger (10.4%) and chamomile (9%), ginger (10.4%) and chamomile (9%) (Nordeng & Havnen, 2004). In a study in Italy, chamomile (44%), licorice (13.8%), and fennel (11.9%) were listed as the most commonly used herbal medicines during pregnancy (Cuzzolin et al., 2010). 258 women who used herbal medicines during pregnancy stated that the herbal medicines they used were ginger (55.8%), garlic (69.8%), and eucalyptus (11.6%) (Laelago et al., 2016). As a result, 31 different herbal medicines were identified in a study involving eight cross-sectional studies from seven different Asian countries (2729 participants). Accordingly, *Mentha piperita* (22.8%), *Pimpinella anisum* (14.7%), *Boswellia sacra* (12.9%), *Descurainia sophia* (12.2%) and *Zingiber officinale* (11.5%) are mentioned as the most commonly used herbal medicines (Ahmed et al., 2017). In a study conducted in Turkey, linden (23.2%), mint-lemon (20.2%), and rosehip (6.3%) are the three most commonly used herbal medicines during the first and second trimesters of pregnancy. During pregnancy, 4.9% of women were found to use ginger, 3.3% chamomile, 1.9% cranberries, 1.6% blueberries and 1.4% raspberries. Echinacea and tutrix (0.3%) were the least used during pregnancy (Kissal et al., 2017).

As seen in the studies mentioned above, the order and scope of use of herbal medicines used during pregnancy varies. In this study, *Mentha* species-*Citrus limon*, *Tilia* sp., *Matricaria chamomilla* were shown to be widely used as herbal medicines during pregnancy.

Physical symptoms associated with pregnancy are usually nausea/morning sickness, heartburn, constipation, frequent urination, back pain and headache (Skouteris et al., 2008). Herbal

**Table 3: Comparison of attitude and demographic characteristics of participants according to the use of herbal medicines during pregnancy**

Features	Those Who Do Not Use Herbal Medicine During Pregnancy	Herbal Medicine Users During Pregnancy	p value
<b>Total</b>	131 (67.6%)	63 (32.4%)	
<b>Do you treat yourself when you get sick?</b>			<0.001
No	56	8	
Yes	75	55	
<b>Do you prefer herbal medicines for self treatment?</b>			<0.001
No	59	4	
Yes	72	59	
<b>Do you know that herbal medicines can be harmful?</b>			0.598
No	78	40	
Yes	53	23	
<b>Are herbal medicines more useful than other medicines?</b>			0.122
No	46	15	
I do not know	49	33	
Yes	36	15	
<b>Do you use herbal medicines besides at times other than during pregnancy?</b>			<0.001
No	74	3	
Yes	57	60	
<b>Education Status</b>			0.422
Not literate	4	0	
Primary school	59	26	
High school	48	24	
University	20	13	
<b>Working Status</b>			0.068
No	105	43	
Yes	26	20	
<b>Social insurance</b>			0.016
No	11	3	
Yes	120	60	
<b>Profession</b>			0.143
Housewife	102	43	
Self-employment	22	12	
Teacher	1	1	
Other	6	7	
<b>Age</b>			0.633
18-25	37	15	
26-30	48	31	
31-35	27	13	
> 35	19	4	

medicines used during pregnancy are probably intended to treat these symptoms. The fact that many herbal medicines are both affordable and readily available also increases their use in the treatment of pregnancy-related symptoms. Studies report a wide variety of symptoms for which herbal medicines are used by women during pregnancy. Many different symptoms, such as nausea/vomiting, abdominal pain, respiratory problems, cold and flu and bloating are mentioned as the most common reasons for using herbal medicines (Ahmed et al.,

2017). The most commonly reported symptoms in the study in Norway are colds and respiratory disease (20.4%), nutritional disorder (14.2%) and skin diseases (13.3%). The most common symptoms of pregnancy are increased nausea and uterine tone (Nordeng & Havnen, 2004). A study in Ethiopia found that 258 people were indicated as suffering from nausea (31.8%), vomiting (16.3%), abdominal pain (24.8%), colds (71.7%), and malaria (3.1%) (Laelago et al., 2016).

Table 4 : Herbal medicines used during pregnancy and number of people using them.

Herbal medicine	Frequency*	Rate (%)
<i>Mentha sp.- Citrus limonum</i> (mint-lemon)	13	12.26
<i>Tilia sp.</i> (linden)	13	12.26
<i>Matricaria chamomilla</i> (chamomile)	7	6.6
<i>Caryophyllus aromaticum</i> (clove)	7	6.6
<i>Jasminum sp.</i> (jasmine flower)	7	6.6
<i>Ceratonia siliqua</i> (carob molasses)	6	5.66
<i>Sambucus nigra</i> (elderberry)	6	5.66
<i>Camellia sinensis</i> (green tea)	6	5.66
<i>Foeniculum vulgare</i> (fennel)	5	4.71
<i>Zingiber officinale</i> (ginger)	4	3.77
<i>Citrus limonum</i> (lemon)	4	3.77
<i>Cinnamomum sp.</i> (cinnamon)	4	3.77
<i>Nigella sativa</i> (black seed oil)	2	1.88
<i>Petroselinum crispum</i> (parsley)	2	1.88
<i>Stipites cerasorum</i> (cherry stalk)	2	1.88
<i>Calendula officinalis</i> (calendula flower)	2	1.88
<i>Salvia sp.</i> (sage)	2	1.88
<i>Hibiscus sabdariffa</i> (hibiscus)	1	0.94
<i>Lycopodium clavatum</i> (matchstick)	1	0.94
<i>Aesculus hippocastanum</i> (horse chestnut seed)	1	0.94
<i>Centella asiatica</i> (gotu kola)	1	0.94
<i>Persea americana</i> (avocado)	1	0.94
<i>Ananas comosus</i> (pineapple)	1	0.94
<i>Linum usitatissimum</i> (flaxseed)	1	0.94
<i>Malus communis</i> (apple tea)	1	0.94
<i>Capsella bursa-pastoris</i> (shepherd's purse)	1	0.94
<i>Platanus sp.</i> (sycamore leaves)	1	0.94
Mirtillin Mulberry Leaf Herbal Mixture Capsule**	1	0.94
Asparagus Forte**	1	0.94
Ezicof Syrup**	1	0.94
Garliva Black Garlic Tea**	1	0.94
<b>Total</b>	<b>106</b>	<b>100</b>

\*Some women have used more than one herbal medicine.

\*\*Mirtillin Mulberry Leaf Herbal Mixture Capsule: Mulberry Leaf, Black Seed, Goatscottle, *Momordica charantia*, Black Chicory, Blueberry Leaf, Cinnamon (<https://www.lokmanavm.com/miritilin-dut-yaprakli-bitkisel-kapsul-atasagun> Access Date: 14.10.18).

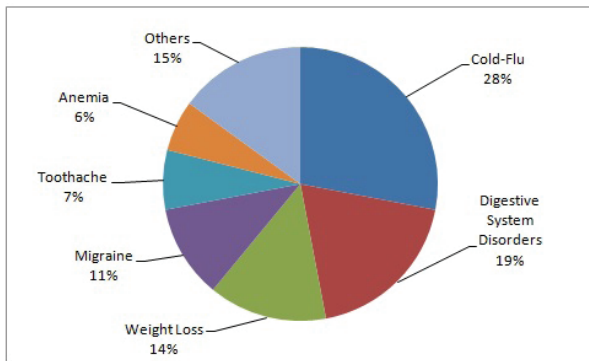
\*\*Asparagus Forte: *Asparagus sp.* includes (<https://tr.pinterest.com/pin/444871269417102751/> Access Date: 01.06.2020)

\*\*Ezicof Syrup: *Glycyrrhiza glabra*, *Adhatoda vasica*, *Hysopus officinalis*, *Ephedra vulgaris*, *Abrus precatorius*, *Viola odorata*, *Ocimum tenuiflorum*, *Piper nigrum*, *Morus nigra* (<https://phytocon.com.pk/index.php/project/syrup/> Access Date: 14.10.18).

\*\*Garliva Black Garlic: Each tablet contains 500 mg *Allium sativum* extract (<http://garliva.com/garliva-urunleri.html> Access Date: 14.10.18).

This study shows that pregnant women mainly used herbal medicines for cold and flu symptoms (28%), digestive disorders (nausea, vomiting, diarrhea, constipation) (19%), weight

loss (14%) or migraine (11%). Other uses are shown in Figure 1. As mentioned in other studies, the most common reasons for the use of herbal medicine during pregnancy were nau-



**Figure 1.** The main indications for herbal medicine use during pregnancy.

sea, vomiting, respiratory system disorders and colds (Kennedy et al., 2013). In this study, we found different usages for similar symptoms. Unlike other studies, weight loss and migraines were identified as reasons for the use of herbal medicines. Pregnant women used herbal medicines mostly (74%) as herbal tea once a day (61%). The cost of herbal medicines varied between 25-50 Turkish lira (44%). Other properties of the herbal medicines used are shown in Table 5. Almost half of the herbal medicines are in the range of 25-50 TL, which makes these medicines more affordable and increases their widespread use. The opinion that herbal products are cheap and accessible is a common thought among pregnant women (Ahmed et al., 2017). Another interesting situation is that the form in which herbal medicines are taken (tea, tablet, etc.) was not questioned in detail in some studies (Kennedy et al., 2013).

According to our study, 63% of those who used herbal medicines during pregnancy (40 people) did not know that herbal medicines have possible harmful side effects just like pharmaceutical drugs. The percentage of those who believe that herbal medicines are more effective than other medicines is 23.8%. The sources of information regarding herbal medicines are mainly the TV (30.2%) and the internet (28.9%). Other sources were identified as pharmacists (15%), neighbors (13.1%) and doctors (5.2%). The participants in our study tend to purchase these medicines from the pharmacy (42%) and herbalist shop (40%). The percentage of research (87%) regarding the herbal medicines they use is high. It is estimated that 57% of pregnant women who use herbal medicines during pregnancy inform their doctor. They said they benefited from the medicines they used (77%), believed in the treatment power of plants at a moderate level (46%) and did not suffer from any side effects (89%). Other important findings from the survey questions are shown in Table 5.

In a study conducted in Turkey, the thoughts of pregnant women about the use of herbal medicines were evaluated. According to this study, a high percentage (58.7%) stated that they used the medicine without obtaining the advice of anyone, and 25.7% stated that they used it on the advice of friends or relatives. Mostly, they received information from clinicians (68.3%) and nurses (22.4%). The percentage of those who thought that herbal medicines were safer than drugs was 36.1%, and the percentage of those who thought that herbal

**Table 5: Opinions and behaviors of those who use herbal medicines during pregnancy.**

Finding	Rate (%)
<b>Herbal medicine use during pregnancy</b>	63 (32%)
<b>Do herbal medicines have harmful side effects like some other medicines</b>	
Yes	37%
No	63%
<b>Information/suggestion sources about herbal medicines</b>	30.2%
TV	28.9%
Internet	15%
Pharmacist	13.1%
Neighbor	5.2%
Doctor	7.6%
Other	
<b>The place where herbal medicines are supplied</b>	42%
Pharmacy	40%
Herbalist shop	18%
Market	
<b>Have you done research on the herbal medicines used?</b>	87%
Yes	13%
No	
<b>Is the doctor aware that the patient is using herbal medicines?</b>	
Yes	57%
No	43%
<b>Thoughts about the herbal medicine they use</b>	
I saw benefit	77%
I do not know	12%
Other	11%
<b>Therapeutic power of herbal medicines used</b>	
Low	11%
Moderate	46%
High	43%
<b>Do you experience any side effects from the herbal medicine you use?</b>	11%
Yes	89%
No	
<b>Frequency of using herbal medicine</b>	
1 per day	61%
2 per day	33%
Other	6%
<b>When do you use the herbal medicine?</b>	
Every day	45%
When I get sick	55%
<b>What is the cost of the herbal medicine used?</b>	
0-25 Turkish liras	43%
25-50 Turkish liras	44%
50-75 Turkish liras	13%
<b>Form of herbal medicine used*</b>	
Herbal tea	74%
Tablet	14%
Syrup	7%
Other	5%

\*Some women expressed more than one herbal medicine form.

medicines could be harmful to both the mother and the baby was 54.6% (Kissal et al., 2017). Most countries have easy access to herbal medicines without a prescription. For this reason, many women use herbal remedies without consulting anyone or on the recommendation of family and/or friends. The level of use of herbal medicines on the recommendation of a health specialist is quite low (Kennedy et al., 2016). In a study showing the distribution of sources of advice on the use of herbal medicines by region (Europe, America, Australia), 28.6% of women used herbal medicines on their own initiative, while the percentage of those who consulted family and friends was 16.8%. Other informal sources of advice in this regard were the Internet (11.3%) and magazines and the media (3.3%). Medical doctors (21.6%) were listed as the second highest source of information (Kennedy et al., 2013).

In different countries, the use of herbal medicines on the recommendation of a medical doctor was observed as very low in this study. In Turkey, the proportion of doctors who prefer to prescribe herbal medicines as a way of treatment is low (Renda et al., 2018). For this reason, it is seen that medical doctors are lacking in sufficient information and recommendations regarding the use of herbal medicines. In addition, lack of information and communication difficulties of consulted health professionals are possible causes. Depending on cultural differences, information/advice sources are also found to be family, relatives, neighbors (82.9%), but this study shows that these sources of information have a lower percentage (13.1%) than was observed in another study (Laelago et al., 2016). The places where herbal medicines are distributed are mostly markets (41.5%) but one study shows that they are also distributed in pharmacies (36.7%) (Cuzzolin et al., 2010; Laelago et al., 2016). The preference of pharmacies is important both in terms of health counseling and in terms of trust. In this study, it was seen that more than half of

the pregnant women informed their doctors about the use of herbal medicines. In another study, 51.8% reported this use to their doctors (Harrigan, 2011). As noted in this study, those who used herbal medicines in pregnancy stated that they benefited heavily (74.3%) and did not experience an unexpectedly harmful effect (91.9%) (Cuzzolin et al., 2010; Laelago et al., 2016). In the light of these results, pregnant women should be informed about the possible harmful effects of herbal medicines. Healthcare professionals need to create the necessary follow-up and raise sufficient awareness in this regard. Herbal medicines, which were found to be used by patients during pregnancy in this study, were classified according to the potential risks and warnings mentioned in the literature. Our study aimed to raise awareness about the prevention of possible side effects with this classification created about the safety of herbal medicines during pregnancy. Since there is not enough data regarding how safe such medicines are for use during pregnancy, it is recommended that pregnant women avoid risky herbal medicines and use safer herbal medicines under the supervision of a qualified healthcare specialist.

In this study, we evaluated the data of 31 different herbal drugs used in any period of pregnancy. The herbal medicines used during pregnancy were divided into four groups according to the safety data of pregnancy. Out of 31 different herbal medicines used during pregnancy, five (16.1%) were "safe to use in pregnancy", five (16.1%) showed the need to "use with caution", nine (29%) were "potentially harmful to use in pregnancy" and 12 (38.8%) came in the category of "information unavailable". Rates of use for all these categories were as follows: Safe to use in pregnancy (29.36%), Use with caution (8.60%), Potentially harmful to use in pregnancy (20.43%), Information unavailable (41.60%). Descriptions and details of the herbal medicines used are shown in Table 6 and Figure 2.

**Table 6: Safety classification of identified herbal medicines.**

Classification	Description	References
Safe to use in pregnancy	Available human evidence suggests the herb can be safely used in pregnancy	
<b>Camellia sinensis</b>	Pregnant women who consume 375 mg or more of caffeine per day may have an increased risk of spontaneous abortion. In those who consumed eight or more cups during their pregnancy, the stillbirth rate is 2 times higher than those who did not use it in pregnancy. Pregnant women who consume 600 mg or more of caffeine daily have a higher risk of low-weight birth. It can be used safely as a medium amount of tea.	(Kennedy et al., 2016; Mills, Dugoua, & Perri, 2006)
<b>Garliva Black Garlic Tea</b>	<i>Allium sativum</i> ; There is no definite information about spontaneous abortion, risk of malformation, teratogenicity to the fetus. It has emenagogue effect.	(Ahmed et al., 2017; Demirezer, Ersöz, Saraçoğlu, & Şener, 2011; Ernst, 2002; Mills et al., 2006; Yıldırım, Desdicioglu, & Kara, 2016)
<b>Matricaria chamomilla</b>	It can cause various allergic reactions. It can be safely used in moderate amounts as tea, but it can function as a uterine stimulant, so high doses should be avoided. Long-term use is associated with early narrowing of the fetal ductus arteriosus .	(Ahmed et al., 2017; Demirezer et al., 2011; Kennedy et al., 2016; Shinde, Patil, & Bairagi, 2012)



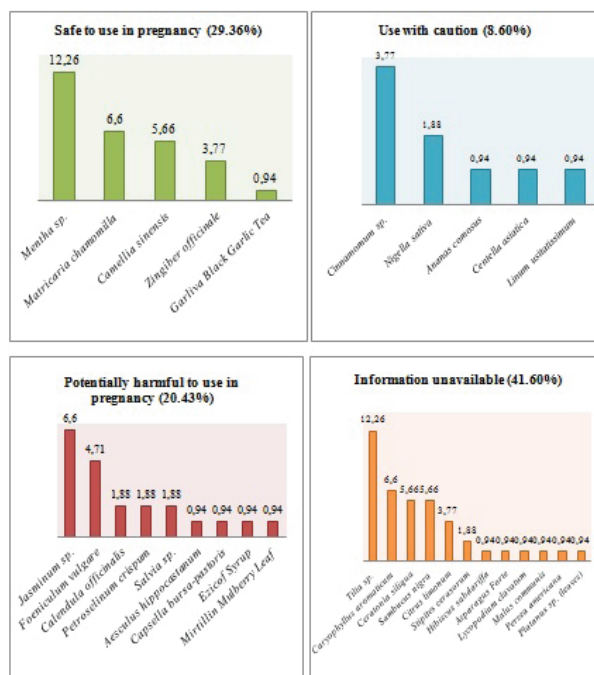
Table 6: Continue.		
Classification	Description	References
<b>Mentha sp.</b>	It is one of the herbs used in the treatment of nausea. When used as a tea, it did not show any harmful effects to the mother or fetus. Overdose should not be taken due to emenagogue effect.	(Demirezer et al., 2011; Gardner & McGuffin, 2013; Gruenwald et al., 2000; Kennedy et al., 2016; Mills et al., 2006)
<b>Zingiber officinale</b>	It has been stated that it has no teratogenic, embryotoxic, effects and is unlikely to cause spontaneous abortion.	(Ahmed et al., 2017; Demirezer et al., 2011; Gruenwald et al., 2000; Kennedy et al., 2016; Mills et al., 2006)
Use with caution	Available human evidence for the herb is limited so it should not be used without consulting a qualified health care practitioner.	
<b>Ananas comosus</b>	It may have an uterotonic effect.	(Monji et al., 2016)
<b>Centella asiatica</b>	It is stated to be low constructive and change the menstrual cycle. It should not be used during pregnancy due to the emenagogue effect. It should not be used during pregnancy without medical advice.	(Ernst, 2002; HMPC, 2010)
<b>Cinnamomum sp.</b>	There is insufficient information about its benefits and risks. It should not be used during pregnancy. Animal evidence suggests the possibility of fetal malformation of essential oil.	(Gardner & McGuffin, 2013; Kennedy et al., 2016; World Health Organization, 1999)
<b>Linum usitatissimum</b>	It has emenagogue effect. It has estrogenic/antiestrogenic effects. Causes low birth weight. Due to its estrogenic effect, it is considered as a potential antifertil plant. It is not recommended for use since it has insufficient safety knowledge about its use in general.	(Demirezer et al., 2011; Ernst, 2002; HMPC/EMA, 2006; Mills et al., 2006)
<b>Nigella sativa</b>	There are not enough scientific reports in humans about use and safety during pregnancy. Consumption of hot extracts of fruit in large amounts has a low constructive effect in pregnant women.	(Ahmed et al., 2017; Paarakh, 2010)
Potentially harmful to use in pregnancy	Available evidence has shown adverse impacts on pregnant woman or fetus following the use of the herb.	
<b>Aesculus hippocastanum</b>	It is toxic to use in its raw form, it can be lethal. Various clinical studies have been conducted on the use of horse chestnut extract in pregnant women. No adverse effects on fetal development have been reported when doses ranged from 480 to 600 mg (standardized to 100 mg aescin) daily for 2 to 4 weeks.	(Gardner & McGuffin, 2013; Mills et al., 2006; Nordeng & Havnen, 2004)
<b>Capsella bursa-pastoris</b>	It is emenagogue and low constructive. It is not recommended to use as there is no clear data on remediceineive toxicity and use in pregnancy.	(Ernst, 2002; Kennedy et al., 2016; Wharf & Kingdom, 2011)
<b>Calendula officinalis</b>	It is emenagogue and low constructive. It should not be used in pregnancy due to there is no information about its teratogenicity.	(Edwards, da Costa Rocha, Williamson, & Heinrich, 2015; Ernst, 2002; WHO Monographs On Selected Medicinal Plants Vol. 2., 2002)
<b>Ezicof Syrup</b>	<i>Glycyrrhiza glabra</i> can cause premature birth. It is not recommended during pregnancy due to possible changes in hormone levels and a relationship with preterm birth. <i>Ephedra</i> sp. Is reported to cross the placenta, stimulating the uterus.	(Ahmed et al., 2017; Demirezer et al., 2011; Ernst, 2002; Gruenwald et al., 2000; Mills et al., 2006)
<b>Foeniculum vulgare</b>	May cause allergic reactions, uterine contractions, miscarriages or premature births. It has emenagogue effect. Although its teratogenic effect has not been proven, it is more appropriate not to use it because of its estrogenic effects. It also has hypoglycemic, hypolipidemic and hypothyroid properties.	(Ahmed et al., 2017; Ernst, 2002; Gardner & McGuffin, 2013; Kennedy et al., 2016; Rahimi & Ardekani, 2013; Shinde et al., 2012)
<b>Jasminum sp.</b>	It should not be used in pregnancy due to its uterine stimulating and emenagogue effects.	(Evans, 2009)

<b>Table 6: Continue.</b>		
<b>Classification</b>	<b>Description</b>	<b>References</b>
<b>Mirtillin Mulberry Leaf Herbal Mixture Capsule</b>	There is no known problem with the use of the <i>Taraxacum officinale</i> during pregnancy. <i>Vaccinium myrtillus</i> should not be used during pregnancy. <i>Momordica charantia</i> has emenagogue and abortion effects.	(Demirezer et al., 2011; Ernst, 2002; Mills et al., 2006; Nordeng & Havnen, 2004)
<b>Petroselinum crispum</b>	It is an estrogenic, uterine stimulating and emenagogue herb with a risk of abortion. It can cause birth defects.	(Mills et al., 2006; Mills & Bone, 2005; Shinde et al., 2012)
<b>Salvia sp.</b>	It should not be used in pregnancy due to its potential toxicity and low constructive effect. It has emenagogue effect.	(Ahmed et al., 2017; Ali-Shtayeh, Jamous, & Jamous, 2015; Demirezer et al., 2011; Edwards et al., 2015; Ernst, 2002; Kennedy et al., 2016)
Information unavailable	No reference was found regarding use of the herb in pregnancy.	
<b>Caryophyllus aromaticum</b>	There is no information regarding its use and safety conditions during pregnancy.	
<b>Ceratonia siliqua</b>	There is no information regarding its use and safety conditions during pregnancy.	
<b>Citrus limonum</b>	There is no information regarding its use and safety conditions during pregnancy.	
<b>Hibiscus sabdariffa</b>	It is not recommended for use during pregnancy due to the fact that its safety cannot be determined and sufficient information cannot be found.	(Edwards et al., 2015)
<b>Asparagus Forte</b>	There is no information regarding its use and safety conditions during pregnancy.	(Gardner & McGuffin, 2013)
<b>Lycopodium clavatum</b>	There is no information regarding its use and safety conditions during pregnancy.	
<b>Malus communis (tea)</b>	There is no information regarding its use and safety conditions during pregnancy.	
<b>Persea americana</b>	There is no information regarding its use and safety conditions during pregnancy.	
<b>Platanus sp. (leaves)</b>	There is no information regarding its use and safety conditions during pregnancy.	
<b>Sambucus nigra</b>	Its use is not recommended during pregnancy, since its safety cannot be determined.	(Edwards et al., 2015; Nordeng & Havnen, 2004; WHO Monographs On Selected Medicinal Plants Vol. 2., 2002)
<b>Stipites cerasorum</b>	There is no information regarding its use and safety conditions during pregnancy.	
<b>Tilia sp.</b>	There is not enough data for use in pregnancy. In limited use in women, no increase in malformation or other harmful effects on the fetus.	(Demirezer et al., 2011; HMPC, 2012; Mills & Bone, 2005)

In a study that investigated the use of herbal medicines in 2673 pregnant women, it was stated that 126 herbal medicines were used. The study showed that 27 of 126 plants used during pregnancy were classified as contraindicated, 28 of them were safe and the rest were used carefully during pregnancy (Kennedy et al., 2016). In another study involving 2729 participants, 13 of the 33 herbal medicines identified were safe for use, five were reported as needing to be used with care, 8 were potentially harmful during pregnancy and 7 were information unavailable about safety in pregnancy

pregnancy and 7 were not available in the literature on (Ahmed et al., 2017).

In our study, the distribution of herbal medicines used in pregnancy according to the risk and safety classification was found to be close to the usage rates in the literature. As in other studies, herbal medicines in the "Potentially harmful to use in pregnancy" (20.43%) category are highly used. Most of the herbal medicines used are classified in the "Information unavailable" (41.60%) category due to insufficient data on herbal medicine use during



**Figure 2.** The ratio of herbal medicines used in pregnancy by the number of people using it.

pregnancy. When compared with studies from different regions, our study also shows the differences in herbal medicines by means of categories. In this study, the most used medicine in the "Potentially harmful" category is *Jasminum* sp. (6.6%), but in another study *Salvia* sp. (12.2%) was shown to be the most used herbal medicine in this group (Ahmed et al., 2017).

While studying the use of herbal medicines during pregnancy, it was found that the information in the current literature is insufficient. To maintain safety in pregnant women, it should be recommended that the use of these drugs be completely prevented during pregnancy or not used without the supervision of a qualified medical professional, as information is limited.

Due to pregnancy being a time of possible risk for some mothers, the use of potentially harmful herbal medicines at 20.43% requires an even more attentive approach to this issue. Medical doctors, pharmacists and other health professionals should constantly inform pregnant women in this regard, and they should constantly be monitored and given sufficient information. During the follow-up process, the use of herbal medicine should be questioned.

The limitation of the study is to determine the scientific names of the plants according to the information provided by the patients and to give the names of the species according to the Turkish names. Latin names are included in the text of the study, with the Turkish names indicated by the patients in parentheses, but it should be noted that many genera and species names in this study can also be used for other species and genera names. The genus name has been used to describe species named with the same names. The Turkish names of the commonly used plants are indicated as the species name. Due to the fact that this study was a survey study, no information was obtained about the possible side effects of the plants

used by patients during pregnancy. In future studies, these deficiencies can be eliminated by paying attention to this issue. Another limitation of the study is that it does not question in which trimester of pregnancy herbal medicines were used.

## CONCLUSION

Our study determined that approximately one in three pregnant women used herbal medicines during pregnancy. The study shows that the herbal medicines most used in pregnancy are placed into three categories, namely, 'safe,' 'potentially harmful' and 'insufficient data.' When we evaluated the effects of herbal medicines on pregnancy, we concluded that potentially harmful herbal medicines are used at a high rate and most herbal medicines do not have sufficient safety data. While the sources of information and advice about herbal medicine are predominantly social media such as TV and the internet, which are not evidence-based, their use rates in pharmacy and doctor consultancy are low. Due to insufficient information about the use of herbal medicines in pregnancy, herbal medicines that are used based on unofficial sources become more harmful. Recently, herbal medicines have been advertised through the TV and the Internet as "miracles," "natural," "harmless" and "cheap" and such advertising does not reflect the reality that these medicines could threaten people's health. Information sharing that does not reflect such facts should be prevented and users should be informed by official health professionals. Although much research has been done on herbal medicines, the fact that one in three pregnant women use herbal medicines reveals that the right sources cannot be reached.

This study has contributed to studies in a small number of these issues in Turkey. We investigated and evaluated the use of herbal medicines in pregnancy from a multi-faceted perspective such as prevalence, risk classification, thoughts, and factors affecting use. As can be seen in this study, there is a lack of information about the possible risks, related issues, and the prevalence of herbal medicine use in pregnancy. These deficiencies can be overcome with more detailed, controlled, clinical studies.

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**Ethics Committee Approval:** This study was approved by the Clinical Research Ethical Committee of the Istanbul University, Istanbul Faculty of Medicine (No: 21 dated 22.12.2017).

**Informed Consent:** Written consent was obtained from the participants.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Conception/Design of Study- Y.E.A., E.A.; Data Acquisition- Y.E.A.; Data Analysis/Interpretation- Y.E.A., E.A.; Drafting Manuscript- Y.E.A.; Critical Revision of Manuscript- E.A.; Final Approval and Accountability- Y.E.A., E.A

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## REFERENCES

- Adams, J., Lui, C. W., Sibbritt, D., Broom, A., Wardle, J., Homer, C., & Beck, S. (2009). Women's use of complementary and alternative medicine during pregnancy: A critical review of the literature. *Birth*, 36(3), 237–245. <https://doi.org/10.1111/j.1523-536X.2009.00328.x>
- Ahmed, M., Hwang, J. H., Choi, S., & Han, D. (2017). Safety classification of herbal medicines used among pregnant women in Asian countries: A systematic review. *BMC Complementary and Alternative Medicine*, 17(1). <https://doi.org/10.1186/s12906-017-1995-6>
- Ali-Shtayah, M. S., Jamous, R. M., & Jamous, R. M. (2015). Plants used during pregnancy, childbirth, postpartum and infant healthcare in Palestine. *Complementary Therapies in Clinical Practice*, 21(2), 84–93. <https://doi.org/10.1016/j.ctcp.2015.03.004>
- Cuzzolin, L., Francini-Pesenti, F., Verlato, G., Joppi, M., Baldelli, P., & Benoni, G. (2010). Use of herbal medicines among 392 Italian pregnant women: Focus on pregnancy outcome. *Pharmacoeconomics and Drug Safety*, 19(11), 1151–1158. <https://doi.org/10.1002/pds.2040>
- Demirezer Ö., Ersöz T., Saraçoğlu İ., & Şener B. (Eds.). (2011). *FFD Monografileri, Tedavide Kullanılan Bitkiler* (Vol. 2) [FFD Monographs, Plants Used in Treatment]. MN Medical & Nobel Tip Kitabevi.
- Dülger, G. (2012). Bitkisel ilaçlar ve ilaç etkileşimleri [Herbal medicines and drug interactions]. *Marmara Pharmaceutical Journal* (Vol. 16, Issue 1, pp. 9–22). <https://doi.org/10.12991/201216415>
- Eardley, S., Bishop, F. L., Prescott, P., Cardini, F., Brinkhaus, B., Santos-Rey, K., Vas, J., Von Ammon, K., Hegyi, G., Dragan, S., Uehleke, B., Fønnebo, V., & Lewith, G. (2012). A systematic literature review of complementary and alternative medicine prevalence in EU. *Forschende Komplementärmedizin* (Vol. 19, Issue SUPPL 2, pp. 18–28). <https://doi.org/10.1159/000342708>
- Edwards, S. E., da Costa Rocha, I., Williamson, E. M., & Heinrich, M. (2015). Phytopharmacy: An Evidence-Based Guide to Herbal Medicinal Medicines. In *Phytopharmacy: An Evidence-Based Guide to Herbal Medicinal Medicines*. <https://doi.org/10.1002/9781118543436>
- Ernst, E. (2002). Herbal medicinal medicines during pregnancy: Are they safe? In *BJOG: An International Journal of Obstetrics and Gynaecology* (Vol. 109, Issue 3, pp. 227–235). John Wiley & Sons, Ltd. <https://doi.org/10.1111/j.1471-0528.2002.t011-1-01009.x>
- Evans, M. (2009). Postdates pregnancy and complementary therapies. *Complementary Therapies in Clinical Practice*, 15(4), 220–224. <https://doi.org/10.1016/j.ctcp.2009.09.002>
- Gardner, Z., & McGuffin M. (Eds.). (2013). *American Herbal Medicines Association's Botanical Safety Handbook*. CRC Press.
- Gruenwald, J., Brendler, T., Christof Jaenicke, B., Mehta, M., Fleming, T., Deutsch, M., Lori Murray Christine Wyble, C., & Hamid, M. (2000). *PDR for Herbal medicines*
- Harrigan, J.T. (2011). Patient disclosure of the use of complementary and alternative medicine to their obstetrician/gynaecologist. *Journal of Obstetrics and Gynaecology*, 31(1), 59–61. <https://doi.org/10.3109/01443615.2010.531303>
- Committee on Herbal Medicinal Products/European Medicines Agency. (2006). *Assessment report on Linum usitatissimum L., semen*. EMEA/HMPC/167395/2006 (Issue October).
- Committee on Herbal Medicinal Products. (2010). *Assessment report on Centella asiatica (L.) Urban, herba*.
- Committee on Herbal Medicinal Products. (2012). *Assessment report on Tilia cordata Miller, Tilia platyphyllos Scop., Tilia x vulgaris Heyne or their mixtures, flos. 44*
- Hunt, K. J., Coelho, H. F., Wider, B., Perry, R., Hung, S. K., Terry, R., & Ernst, E. (2010). Complementary and alternative medicine use in England: Results from a national survey. *International Journal of Clinical Practice*, 64(11), 1496–1502. <https://doi.org/10.1111/j.1742-1241.2010.02484.x>
- Kennedy, D. A., Lupattelli, A., Koren, G., & Nordeng, H. (2016). Safety classification of herbal medicines used in pregnancy in a multinational study. *BMC Complementary and Alternative Medicine*, 16(1), 1–9. <https://doi.org/10.1186/s12906-016-1079-z>
- Kennedy, Deborah A., Lupattelli, A., Koren, G., & Nordeng, H. (2013). Herbal medicine use in pregnancy: Results of a multinational study. *BMC Complementary and Alternative Medicine*, 13. <https://doi.org/10.1186/1472-6882-13-355>
- Kissal, A., Çevik Güner, Ü., & Batkın Ertürk, D. (2017). Use of herbal medicine among pregnant women in Turkey. *Complementary Therapies in Medicine*, 30, 54–60. <https://doi.org/10.1016/j.ctim.2016.11.001>
- Koren, G., Randor, S., Martin, S., & Danneman, D. (1990). Maternal Ginseng Use Associated With Neonatal Androgenization. In *JAMA: The Journal of the American Medical Association* (Vol. 264, Issue 22, p. 2866). <https://doi.org/10.1001/jama.1990.03450220028007>
- Laelago, T., Yohannes, T., & Lemango, F. (2016). Prevalence of herbal medicine use and associated factors among pregnant women attending antenatal care at public health facilities in Hossana Town, Southern Ethiopia: Facility based cross sectional study. *Archives of Public Health*, 74(1), 1–8. <https://doi.org/10.1186/S13690-016-0118-Z>
- Mills, E., Dugoua, J.-J., Perri, D., & Koren, G. (2006). Herbal Medicines in Pregnancy and Lactation. In *Herbal Medicines in Pregnancy and Lactation*. CRC Press. <https://doi.org/10.1201/b13984>
- Mills, S. Simon Y., & Bone, K. (2005). *The essential guide to herbal safety*. Elsevier Health Sciences.
- Monji, F., Adaikan, P. G., Lau, L. C., Bin Said, B., Gong, Y., Tan, H. M., & Choolani, M. (2016). Investigation of uterotonic properties of Ananas comosus extracts. *Journal of Ethnopharmacology*, 193, 21–29. <https://doi.org/10.1016/j.jep.2016.07.041>
- Moshazzaman, M., & Choudhary, M. I. (2008). Protocols on safety, efficacy, standardization, and documentation of herbal medicine (IUPAC technical report). *Pure and Applied Chemistry*, 80(10), 2195–2230. <https://doi.org/10.1351/pac200880102195>
- Muñoz Balbontín, Y., Stewart, D., Shetty, A., Fitton, C. A., & McLay, J. S. (2019). Herbal medicinal medicine use during pregnancy and the postnatal period: A systematic review. In *Obstetrics and Gynecology* (Vol. 133, Issue 5, pp. 920–932). Lippincott Williams and Wilkins. <https://doi.org/10.1097/AOG.0000000000003217>
- Nordeng, H., & Havnen, G. C. (2004). Use of herbal drugs in pregnancy: A survey among 400 Norwegian women. *Pharmacoeconomics and Drug Safety*, 13(6), 371–380. <https://doi.org/10.1002/pds.945>
- Paarakh, P. M. (2010). Nigella sativa Linn.- A comprehensive review. In *Indian Journal of Natural Medicines and Resources* (Vol. 1, Issue 4, pp. 409–429).
- Pallivalapila, A. R., Stewart, D., Shetty, A., Pande, B., Singh, R., & McLay, J. S. (2015). Use of complementary and alternative medicines during the third trimester. *Obstetrics and Gynecology*, 125(1), 204–211. <https://doi.org/10.1097/AOG.0000000000000596>
- Patel, J., & Gohil, K. (2007). Herb-drug interactions: A review and study based on assessment of clinical case reports in literature. *Indian Journal of Pharmacology*, 39(3), 129. <https://doi.org/10.4103/0253-7613.33432>
- Rahimi, R., & Ardekani, M. R. S. (2013). Medicinal properties of Foeniculum vulgare Mill. in traditional Iranian medicine and modern phytotherapy. In *Chinese Journal of Integrative Medicine* (Vol. 19, Issue 1, pp. 73–79). <https://doi.org/10.1007/s11655-013-1327-0>

- Renda, G., Yaşar, Y. K., Yılmaz, E., Sanrı, H., Dilaver, İ., Demirtaş, Y., Çan, G., & Sezen, F. S. (2018). *Aile hekimleri ve eczacıların bitkisel ürün kullanımına yaklaşımları: Trabzon ilinde pilot çalışma* [Approaches of family physicians and pharmacists to the use of herbal medicines : a pilot study in Trabzon]. *22*(3), 141–156. <https://doi.org/10.15511/tahd.18.00341>
- Shinde, P., Patil, P., & Bairagi, V. (2012). HERBS IN PREGNANCY AND LACTATION: A REVIEW APPRAISAL. *IJPSR*, *3*(9), 3001–3006.
- Skalli, S., Zaid, A., & Soulaymani, R. (2007). Drug interactions with herbal medicines. In *Therapeutic Drug Monitoring* (Vol. 29, Issue 6, pp. 679–686). <https://doi.org/10.1097/FTD.0b013e31815c17f6>
- Skouteris, H., Wertheim, E. H., Rallis, S., Paxton, S. J., Kelly, L., & Milgrom, J. (2008). Use of complementary and alternative medicines by a sample of Australian women during pregnancy. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, *48*(4), 384–390. <https://doi.org/10.1111/j.1479-828X.2008.00865.x>
- Tabatabaee, M. (2011). Use of herbal medicine among pregnant women referring to Valiasr Hospital in Kazeroon, Fars, South of Iran. *Journal of Medicinal Plants*, *10*(37), 96–108.
- Wharf, C., & Kingdom, U. (2011). *Assessment report on Capsella bursa-pastoris (L.) Medikus, herba*. *44*(November 2010).
- *WHO Monographs On Selected Medicinal Plants Vol. 2.* (Vol. 2). (2002).
- World Health Organization. (1999). WHO monographs on selected medicinal plants. *Essential Medicines and Health Medicines Information Portal*, *1*, 183–194.
- World Health Organization. (2004). New WHO guidelines to promote proper use of alternative medicines. *Who*, 2002–2004.
- Yıldırım, M., Desdicioglu, R., Kara, H., & Yavuz Avsar, A. F. (2016). Gebelikte Bitkisel Ürünlerin Kullanımı [Herbal Medicine Use in Pregnancy]. *Ankara Medical Journal*, *16*(2). <https://doi.org/10.17098/amj.70285>