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# The use of anise during the perinatal period: A modern study in Cypriot women

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## Abstract

**Background**: Herbal medicine has played a significant role in women's health, particularly in treating conditions such as menorrhea, postpartum issues, pregnancy-related ailments, birth control, and childbirth. During pregnancy, herbal medications are commonly used to manage symptoms like vomiting, nausea, and vaginal infections, and to facilitate labor. Anise is considered probably safe during pregnancy when consumed in amounts typically found in food. However, there is limited reliable information on the safety of anise when taken in medicinal amounts during pregnancy.

**Aim**: This study aimed to determine the prevalence of alternative medicine (AM) use, specifically focusing on the effects of anise in pregnant and breastfeeding women. Additionally, the study assessed the effectiveness and side effects of anise and the behavior and experiences of pregnant and breastfeeding women regarding its use.

**Materials and Methods:** A cross-sectional survey was conducted among women of childbearing age in a specific region of Cyprus. Data were collected using a semi-structured questionnaire administered through a 30-minute face-to-face interview. Ethical approval was obtained from the Cyprus National Bioethics Committee. The study spanned three months in 2022 (July to September). Data were analyzed using SPSS software, with descriptive values expressed as numbers (n), percentages (%), means (mean), standard deviations (SD), and medians (median).

**Results**: Of the 218 women initially approached, 200 consented to participate, yielding a participation rate of 91.74%. The mean age of the participants was 31.45 years (SEM 1.483, range 19–44 years). On average, 51% of women reported using herbs during pregnancy, while 49% did not. Herb use to induce childbirth was higher at 60.5% compared to 51% during pregnancy. For newborns, 60.5% of participants used herbs externally, whereas 39.5% did not. Regarding the benefits of herbal baths for newborns' skin, 34% agreed, 0.5% disagreed, and 65.5% had no knowledge. Among women using anise before, during, and after pregnancy, 47% used it for abdominal colic, while 4% used it as an absorbent.

**Conclusion**: The use of plant medicines is prevalent among women during pregnancy, labor, the puerperium, and breastfeeding. The findings underscore the need for educational programs targeted at healthcare professionals, pregnant and breastfeeding women, and the general public on the appropriate use of herbal medicines during antenatal and peripartum periods, breastfeeding, and infant care.

**Keywords:** Herbs; Anise; Pregnancy; Labour; Lactation; Breastfeeding; Postpartum; Pimpinella Anisum.

## 1. Introduction

In the past two decades, the use of Alternative Medicine (AM), defined as a broad healthcare practice not fully integrated into the dominant health system [1], has grown dramatically worldwide. Herbal medicines, recognized for their benefits,

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have been widely adopted across various societies, becoming one of the top complementary alternative therapies for many years [2]. This widespread recognition has led to an increase in their usage across almost every country.

Herbal medicine has played a crucial role in women's health, addressing conditions such as menorrhea, postpartum issues, pregnancy, birth control, and childbirth. During pregnancy, herbal medications are commonly used to manage symptoms like vomiting, nausea, and vaginal infections, and to facilitate labor [3]. Additionally, medicinal plants have been utilized for other conditions, such as skin disorders and respiratory problems [4]. However, there is a lack of documented information regarding the toxicity of medicinal plants at large doses [5].

While limited information is available on the effects and safety of using herbal medicine during pregnancy, childbirth, or breastfeeding, [6], some studies have reported that Traditional Chinese Medicine (TCM) is used by many women during pregnancy to relax, control their emotions and health decisions, and increase the likelihood of having a normal birth [7].

The recommendation to use AM often comes from various sources, including healthcare providers, medical practitioners, pharmacists, [8] and even family members who have benefited from them [9]. Herbal medicines are easily accessible, require no prescription, are less invasive, and cause minimal discomfort. AM is considered a natural medicine, potentially less harmful than conventional medicines that might pass into breast milk and harm the baby [10].

Despite the widespread use of herbal medicine, pregnant and breastfeeding women often avoid informing their doctors or physicians about using AM, possibly due to fear of ridicule or negative attitudes from healthcare professionals [11]. This lack of communication can delay necessary treatments or interfere with prescription medications, risking the health of both mother and baby.

The use of certain herbs depends primarily on their perceived benefits and effectiveness. This study aimed to determine the frequency of AM use, specifically the effects of anise in pregnant and breastfeeding women. It also examined the effectiveness and side effects of anise and the behavior of pregnant and breastfeeding women regarding its use, and reported changes observed after using anise. The results of this study, based on a questionnaire administered to pregnant, breastfeeding, and postpartum women, aim to inform and guide future research.

## 2. Literature review

The concept of traditional herbal medicine has garnered increasing interest from traditional herbalists and the scientific community worldwide. According to the World Health Organization (WHO), 80% of the world's population, particularly in developing countries, utilizes various forms of alternative medicine (AM) for primary healthcare [12].

During pregnancy, women experience numerous physical and physiological changes, leading to problems such as nausea, vomiting, constipation, and heartburn [13]. Pregnant women often opt for natural Traditional Chinese Medicine (TCM) instead of prescription drugs to manage these changes, primarily due to concerns about protecting the fetus [14].

The use of alternative medicine (AM) for treating maternal complications has been reported across various populations, showing a wide range of prevalence from 7% to 55%, depending on geographical, socio-cultural, and ethnic factors [3, 18]. In several studies, more than half of the pregnant women in Alexandria, Egypt, reported the effectiveness of AM in alleviating pregnancy-related symptoms [19]. This prevalence is even higher in regions where herbal medicine is the preferred treatment, such as in Côte d'Ivoire, where 90.3% of pregnant women use AM during pregnancy [20].

Studies have identified the most frequently used AM by pregnant women, including anise, fenugreek oil, ginger, cranberry, chamomile, licorice, fennel, aloe, valerian, echinacea, almond oil, propolis, and castor oil [14, 18, 19]. AMs are preferred over pharmaceuticals due to the belief that traditional medicine is safer than modern medicine. Despite limited information on their safety and efficacy, pregnant women continue to use AMs, sometimes accepting the associated adverse effects [18, 21, 22].

The use of AM during pregnancy can lead to unclear outcomes or serious complications for the fetus [23, 24]. Risks and long-term adverse effects on maternal and fetal health may include maternal morbidity, mortality, neonatal morbidity, malignancy, inflammation, and gastrointestinal diseases [25, 26]. Adverse effects have been reported, such as constipation after drinking herbal tea containing a mixture of herbs, or rash and itching after the topical application of aloe or almond oil [18]. Researchers have highlighted possible side effects of certain herbal medicines during pregnancy, including fenugreek (Trigonella foenum-graecum), bitter gourd (Peganum harmala L.), nigella (Nigella sativa L.), and rosemary (Rosmarinus officinalis L.) [27, 28, 29].

The usefulness of AM in various aspects of women's health, such as fertility, menorrhea, birth control, pregnancy, childbirth, postpartum health care, and lactation, including infant care, has been documented across various ethnic groups [30, 31, 32, 33, 34, 35, 36]. However, the toxicity of many herbal products remains unexplored [37].

Herbal products used by pregnant women may address pregnancy-related health issues such as nausea and vomiting [38, 40], vaginal candida infection [38], nutritional needs [41], and facilitating labor [40], or they may be used for unrelated health issues like respiratory illnesses or skin conditions [41]. The recommendation to use AM during pregnancy has been observed to come from various sources, including health professionals, natural or alternative medicine practitioners, pharmacists, mass media sources [39], friends, relatives [39, 40, 41], or the pregnant women's own knowledge and experience [39, 42].

During pregnancy, childbirth, and postpartum health care, traditional medicine often relies on specific herbs for their beneficial effects, such as contracting the uterine muscle, facilitating labor, removing the retained placenta, and managing postpartum hemorrhage [43].

### 2.1. Aniseed

Pimpinella anisum, commonly known as anise, belongs to the Apiaceae family and is widely used in traditional medicine for various purposes [44].

Anise has been shown to have a relaxing effect, as demonstrated in in vitro tests on isolated guinea pig tracheal chains [45]. The study by Boskabady and Ramazani-Assari revealed that aqueous and ethanolic extracts, essential oil, and theophylline all exhibited significant relaxing effects compared to the control group. The findings suggested that the relaxing effect of anise is due to its inhibitory action on muscarinic acetylcholine receptors [45]. These results may support the traditional use of anise as a relaxant during different stages of pregnancy and for infant care. However, there is no available information on the safety of anise when taken orally by children in medicinal amounts [46].

Ali-Shtayeh et al. reported that Pimpinella anisum and S. fruticosa are among the most commonly used plants for infant health care, primarily to treat colic, and flatulence, and for their relaxing properties. Orally administered aniseed is used to treat indigestion, flatulence, rhinorrhea (runny nose), and as an expectorant. It also has diuretic properties and can increase appetite. Anise is utilized to promote lactation and facilitate childbirth. Topically, anise is used to treat lice, scabies, and psoriasis [46].

The use of anise during pregnancy is considered probably safe when consumed in amounts typically found in food. However, there is limited reliable information on the safety of anise when taken orally in medicinal amounts during pregnancy [46]. Using anise in small amounts, such as in herbal tea, is deemed safer during pregnancy due to relatively low exposure [47].

#### *2.1.1. Side effects of anise*

When anise is applied topically, particularly in combination with other herbs, it may cause local itching. In allergic individuals, inhalation or ingestion of anise can lead to nasopharyngeal conjunctivitis, asthma, and allergic shock [46]. Due to the potential risk of inducing premature labor, the use of essential oil and concentrated aniseed is not recommended during pregnancy [47].

### 2.2. Purpose and individual objectives

This study aims to evaluate the significance of using anise as a dietary supplement and enhancer, particularly during pregnancy, labor, postpartum, and breastfeeding. This is particularly relevant as many women prefer to avoid pharmaceuticals during these periods. Based on the survey results, we are convinced that there is a need to educate women on minimizing medication use.

*Objectives*

- To investigate the level of knowledge among women about the use of herbs, especially anise.
- To examine the specific cases in which herbs, particularly anise, were used and the reasons for their use.
- To assess the opinions, beliefs, and attitudes of Cypriot women regarding the use of herbs during pregnancy, labor, delivery, and breastfeeding.

## 3. Materials and Methods

Our study used a cross-sectional survey of women from different reproductive age groups living in a specific area of Cyprus, Limassol. Data were collected through a semi-structured questionnaire administered via a 30-minute face-to-face interview. Before the survey, participants were thoroughly informed about the purpose of the questionnaire, the focus of the research, and its objectives. Specifically, it was explained that the study aimed to investigate the effects of herbal medicines, particularly anise, during different stages of pregnancy, childbirth, and infant healthcare. All participants were assured that their information would remain strictly confidential and be used solely for research purposes.

Ethical approval for the study was obtained from the Cyprus National Bioethics Committee. Participants interested in joining the study were asked to sign a consent form. The study was conducted over three months in 2022 (July to September). The majority of the questions had pre-formulated answers.

### 3.1. Statistical Analysis

Data were analyzed using SPSS software, with descriptive values expressed as numbers (n), percentages (%), mean (mean), standard deviation (SD), and medians (median).

## 4. Results

Out of the 218 women initially approached, 200 consented to participate in the study, resulting in a participation rate of 91.74%. The participants had a mean age of 31.45 years (Standard Error of the Mean, SEM = 1.483), with an age range of 19 to 44 years (Table 1).

The distribution of participants by age group is as follows: 13.5% were under 25 years old, 22.5% were between 26 and 29 years old, 42.5% were between 30 and 35 years old, 15% were between 36 and 39 years old, and 6.5% were over 40 years old (Table 1).

**Table 1** Age Distribution of Study Participants

| Age (Years) | n (%) |
|---|---|
| <25 | 27 (13.5) |
| 26-29 | 45 (22.5) |
| 30-35 | 85 (42.5) |
| 36-39 | 30 (15) |
| ≥40 | 13 (6.5) |

The educational background of the study participants reveals that the majority held a postgraduate degree (36.5%), while a minority had obtained a PhD (1.5%). Notably, 74% of participants had completed education beyond the high school level, including university degrees, master's degrees, and PhDs. In contrast, 26% of the participants had completed only high school or had alternative educational backgrounds (Table 2).

**Table 2** Educational Attainment of Study Participants

| Educational status | n (%) |
|---|---|
| High school graduate | 35 (17.5) |
| University degree | 72 (36) |
| Master degree | 73 (36.5) |
| PhD | 3 (1.5) |
| Other | 17 (8.5) |

This table (Table 3) presents the family status of the women who participated in the survey. Among the participants, 73% were married, 8.5% were single, 5% were separated, and 13.5% were living with a partner. The majority of participants were either married or in a partnership, accounting for 81.5% of the sample, whereas 18.5% were single or separated.

**Table 3** Family Status of Study Participants

| **Marital status** | **n (%)** |
|---|---|
| Married | 146 (73) |
| Single | 17 (8.5) |
| Divorced | 10 (5) |
| Companionship | 27 (13.5) |

The majority of women were employed in the private sector (55.5%), while a smaller proportion worked as freelancers (5.5%). Overall, 74.5% of participants were employed in various capacities, including civil service, private sector positions, or freelance work. In contrast, 18.5% were not employed, including those engaged in housework or who were unemployed. Additionally, 7% of participants were employed in unspecified roles (Table 4).

**Table 4** Employment Status of Study Participants

| **Employment situation** | **n (%)** |
|---|---|
| Civil servant | 27 (13.5) |
| Private Employee | 111 (55.5) |
| Freelancer | 11 (5.5) |
| Housework | 18 (9) |
| Unemployed | 19 (9.5) |
| Other | 14 (7.0) |

The survey included questions assessing the emotional state of pregnant women. When asked whether they had ever considered self-harm, 2% of respondents indicated that they had contemplated it a few times, 6.5% reported that they had rarely thought about it, and 91.5% stated that they had not considered self-harm at all (Table 5).

**Table 5** Frequency of Self-Harm Thoughts Among Pregnant Women

| **Hurt me** | **n (%)** |
|---|---|
| Some times | 4 (2) |
| Seldom | 14 (6.5) |
| Never | 184 (91.5) |

In the survey, the majority of women reported using herbs in their daily lives, with 71% indicating regular use. In contrast, 29% of participants reported that they do not use herbs (Table 6).

**Table 6** Frequency of Herbal Use Among Study Participants

| **Use herbs** | **n (%)** |
|---|---|
| Yes | 142 (71) |
| No | 58 (29) |

The table illustrates the sources through which participants were informed about herbal use. A total of 38.8% of the sample received information from health professionals, including midwives, pharmacists, and doctors. In contrast, 35.4% were informed through newspapers, magazines, the internet, or books. Additionally, 6% were informed by relatives or friends, 6% by herbalists, and 0.5% reported not receiving information from any source. Notably, 13.4% of the participants reported not using herbs at all. The data reveal a significant disparity between the influence of doctors (14.4%) and midwives (3.0%) on participants, although the combined percentage of information from health professionals (38.8%) surpasses that from print and online media (35.4%) (Table 7).

**Table 7** Sources of Information on Herbal Use Among Study Participants

| **Whence are you getting information regarding the use of herbs?** | **n (%)** |
|---|---|
| Midwife | 6 (3.0) |
| Pharmacist | 43 (21.4) |
| Newspapers/magazines | 3 (1.5) |
| Herbalist | 12 (6.0) |
| Relative/Friend | 12 (6.0) |
| Internet | 49 (24.4) |
| Doctor | 29 (14.4) |
| Books | 19 (9.5) |
| No one | 1 (0.5) |
| I do not use herbs | 27 (13.4) |

The table below outlines the various forms in which herbs are utilized by the study participants. The majority of participants used herbs in infusion form (34.8%), while the least commonly used form was tincture (0.5%). Other forms included ointments (19.9%), decoctions (13.4%), extracts (7.5%), herbal baths (5.5%), oils (3.5%), capsules (3.5%), and syrups (2.5%). Additionally, 9.0% of participants did not provide an answer or were not aware of the form used (Table 8).

**Table 8** Forms of Herbal Use Among Study Participants

| **The form of herbs used** | **n (%)** |
|---|---|
| Ointment | 40 (19.9) |
| Decoction | 27 (13.4) |
| Extract | 15 (7.5) |
| Tincture | 1 (0.5) |
| Infusion | 70 (34.8) |
| Herbal Bath | 11 (5.5) |
| Oil | 7 (3.5) |
| I do not know / I do not answer | 18 (9.0) |
| Capsule | 7 (3.5) |
| Syrup | 5 (2.5) |

According to the survey, 75.6% of the participants believe that medicinal herbs are a preferable treatment option for addressing health problems during pregnancy and the postpartum period compared to pharmaceuticals. Conversely, 24.4% of the respondents do not consider medicinal herbs to be a safer alternative (Table 9).

**Table 9** Preferences for Medicinal Herbs versus Pharmaceuticals for Treating Health Issues During Pregnancy and Postpartum

| **Treatment of any health problems during pregnancy & postpartum is best carried out with medicinal herbs instead of medication.** | **n (%)** |
|---|---|
| Agree | 152 (75.6) |
| Disagree | 48 (24.4) |

The table illustrates that approximately 51% of women use herbs during pregnancy, with a relatively small variance compared to the 49% who do not use them. In contrast, a higher percentage of women (60.5%) report using herbs to induce childbirth, surpassing the 51% who use herbs during pregnancy (Table 10).

**Table 10** Use of Herbs During Pregnancy and Childbirth

| **Use of herbs during pregnancy** | **n (%)** |
|---|---|
| Yes | 102 (51) |
| No | 98 (49) |
| **Use of herbs to induce labor** | **n (%)** |
| Agree | 121 (60.5) |
| Disagree | 76 (39.5) |

Among the study participants, 60.5% reported using herbs for external applications on newborns, whereas 39.5% did not use herbs for this purpose. Regarding the effects of herbal baths on newborns' skin, 34% of women believed that such baths are beneficial, 0.5% disagreed, and 65.5% indicated that they lacked sufficient knowledge on the subject. In terms of whether herbal baths help relax newborns before bedtime, 43.5% of women thought they were effective, while 56.5% were uncertain about their impact (Table 11).

**Table 11** Use of Herbs and Herbal Baths for Newborns

| **Herbs for newborns** | **Agree n (%)** | **Disagree n (%)** | **I don't know n (%)** |
|---|---|---|---|
| Used for external usage | 121 (60.5) | 79 (39.5) | - |
| Herbal baths, a beneficial effect on the skin | 68 (34) | 1 (0,5) | 131 (65.5) |
| Herbal baths can relax newborns before bedtime | 87 (43.5) | - | 113 (56.5) |

The data reveal the smoking behaviors of the sample of 200 women, both before and during pregnancy. Among the participants, 23 women (11.5%) reported smoking during pregnancy, while 55 women (27.4%) ceased smoking due to their pregnancy. Additionally, 122 women (61.1%) had never smoked. Of the 108 women (53.8%) who were smokers, 71 (35.3%) had quit smoking due to breastfeeding, 12 (6%) continued smoking while breastfeeding, 9 (4.5%) smoked without breastfeeding, and 16 (8%) did not breastfeed for other reasons. The remaining 92 women (46.2%) were non-smokers (Table 12).

**Table 12** Smoking Behavior Before and During Pregnancy

| **Smoking before & during pregnancy** | **n (%)** |
|---|---|
| I was smoking | 23 (11.5) |
| I smoked but stopped during pregnancy | 55 (27,4) |
| I never smoked | 122 (61.1) |
| **If you are a smoker, what is your attitude to breastfeeding?** | **n (%)** |
| I don't smoke because I am breastfeeding | 71 (35.3) |
| I smoke & breastfeed | 12 (6) |
| I smoke & don't breastfeed | 9 (4.5) |
| I don't breastfeed for other reasons | 16 (8) |

Comparing Table 13 with Table 12, it is evident that among the 70% of women who breastfeed, 35.3% ceased smoking due to their breastfeeding status (Table 12, Table 13).

Comparing the results presented in Table 13 with those in Tables 14 and 15, it is observed that among the 70% of participants who are breastfeeding, only 4.1% (as shown in Table 14) and 5% (as indicated in Table 15) reported using anise either as a lactation aid or as a milk replacer.

**Table 13** Comparison of Smoking Cessation Reasons Among Breastfeeding Women

| **Breastfeeding** | **n (%)** |
|---|---|
| Yes | 140 (70) |
| No | 60 (30) |

Table 14 details the sociodemographic characteristics of the participants, revealing that 87.9% of women used anise during pregnancy or postpartum. The purposes for which anise was used varied and included: cooking, general use, pregnancy-related applications, postpartum care, breastfeeding, neonatal care, and various combinations such as cooking & general use, general use & all pregnancy-related and neonatal care, cooking & breastfeeding, baby care, and other combinations (Table 14).

Among the women who use anise, the majority (34.7%) employed it for general purposes. In contrast, a smaller proportion (2.0%) used anise for specific combinations such as general use & all pregnancy-related and neonatal care, cooking & breastfeeding, and baby care (Table 14).

Additionally, the data indicate that anise was used during pregnancy by only 3.1% of the participants, a lower rate compared to its use for postpartum care, breastfeeding, neonatal care, and various combined purposes such as general use & all pregnancy-related activities, cooking & breastfeeding, and baby care (Table 14).

**Table 14** Anise Usage Patterns Among Participants

| **Anise use** | **n (%)** |
|---|---|
| No use | 14 (7.3) |
| I don't know | 9 (4.7) |
| Cooking | 45 (23.3) |
| General use | 67 (34.7) |
| Pregnancy | 6 (3.1) |
| Postpartum | 4 (2.1) |

| | |
|---|---|
| Breastfeeding | 8 (4.1) |
| Neonatal care | 16 (8.3) |
| Cooking & General use | 12 (6.2) |
| General use & everything related to Pregnancy & Neonatal | 2 (1.0) |
| Cooking & Breastfeeding, baby care | 2 (1.0) |
| General Use, Pregnancy & Newborn Care | 8 (4.1) |

Among women who used anise before pregnancy, during pregnancy, or postpartum, the majority (47%) reported using it to address abdominal colic. A smaller percentage (4%) used anise for its absorbent properties. When considering all purposes for which anise was used, including abdominal colic, absorbent, lactogenic, abortifacient, and other uses, 69.5% of women identified specific uses for the herb. However, a substantial portion, 30.5%, either did not know their reason for using anise or did not use it at all (Table 15).

**Table 15** Reasons for Anise Use Before, During, and After Pregnancy

| **Use anise before pregnancy, during pregnancy and postpartum** | **n (%)** |
|---|---|
| I have not to use | 46 (23) |
| Abdominal colic | 94 (47) |
| Absorbent | 8 (4) |
| Lactome producer | 10 (5) |
| I don't know | 15 (7.5) |
| Other | 17 (8.5) |
| Abdominal Convenient and Abortifacient | 10 (5) |

## 5. Discussion

Despite extensive research on the use of herbal medicines, this study found that 71% of participants used fewer than one type of herbal remedy during the antenatal, perinatal, and lactation periods for various medicinal purposes.

In this study, 218 pregnant women were approached, of whom 200 consented to participate, resulting in a participation rate of 91.74%. The socio-demographic characteristics of these participants are detailed as follows:

The mean age of the participants was 31.45 years, with a standard error of the mean (SEM) of 1.483, and an age range of 19 to 44 years. The majority of participants held advanced educational qualifications, with 36.5% possessing a master's degree and 1.5% holding a doctoral degree. In total, 74% of the participants had achieved a university-level education (including bachelor's, master's, or doctoral degrees), compared to 26% who had completed only high school or had alternative educational backgrounds.

Regarding marital status, 73% of the women were married, 8.5% were single, 5% were divorced, and 13.5% were partnered. Thus, 81.5% of the participants were either married or had a partner, while 18.5% were single (either divorced or never married).

Concerning employment status, the majority of participants were employed in the private sector (55.5%), whereas a smaller proportion were self-employed (5.5%). In total, 74.5% of the respondents were employed (including public servants, private employees, and self-employed individuals), in contrast to 18.5% who were not employed (engaged in home duties or unemployed). An additional 7% did not specify their employment status.

Our study revealed a notably higher prevalence of herbal medicine use compared to other research. Specifically, 71% of the participants reported using herbal remedies at some point in their lives, while only 29% had never used them.

This contrasts with findings from other studies, where herbal use was reported at lower rates: 59% in the United Kingdom [48], 27.3% in Egypt [19], 67.5% in Nigeria [49], 53.7% in Iraq [50], and 39.7% in Norway [4].

The most common herbs used across studies were found to be anise, peppermint, sage, chamomile and cinnamon, which is consistent with the study conducted in Palestine in 2013, in which anise and chamomile were the most commonly reported herbs used by pregnant women in Palestine and Egypt [19]. Peppermint is notably prevalent in Turkey [51]. Conversely, ginger emerged as the most frequently reported herb in the UK and Norway [4, 49]. Additionally, red mulberry leaf is widely used in some countries as an herbal tea during pregnancy, primarily for its purported labor-stimulation effects [52, 55]. These variations in herb usage across different countries may be attributed to cultural practices involving herbs as common dietary ingredients, flavoring agents, or preservative measures [53, 54, 55, 56].

In our study, 75.6% of participants believed that addressing health issues during pregnancy and postpartum is more effectively managed with herbal remedies than with pharmaceutical preparations. Conversely, 24.4% of participants did not view herbal remedies as a safer alternative.

In Palestine, there is a prevalent belief that anise facilitates childbirth, a tradition rooted in cultural practices. However, current scientific evidence does not support the efficacy of anise in easing labor. Systematic reviews and meta-analyses [57] have indicated that while some herbal medicines may be effective for labor induction, the quality of available data is insufficient to conclusively determine their safety [57, 58].

Moreover, other surveys have highlighted that certain herbs are considered unsuitable for use during pregnancy. For instance, sage in high doses is generally avoided due to its potential risk of miscarriage, and concentrated anise is believed to potentially induce premature labor. Thyme, when used in excessive amounts, is also recommended to be avoided, particularly in early pregnancy, due to concerns about its possible association with miscarriage [59].

In this study, participants demonstrated a broad awareness of the various forms in which herbs are utilized. The most commonly reported form of herbal use was as a decoction, cited by 34.8% of respondents. In contrast, tinctures were used by only 0.5% of participants. Other reported forms included ointments (19.9%), extracts (13.4%), herbal baths (5.5%), oils (3.5%), capsules (3.5%), and syrups (2.5%). Additionally, 9.0% of participants either did not respond or were unsure of the form of herbal use.

The study found that 51% of pregnant women utilized herbs during pregnancy, showing a slight deviation from the 49% who did not use herbs. Additionally, 60.5% of participants supported the use of herbs for labor induction.

In terms of newborn care, 60.5% of women indicated they would use herbs for external applications, while 79% did not. Regarding the use of herbal baths for newborns, 34% of women believed that these baths have a beneficial effect on the skin, 0.5% disagreed, and the majority (65.5%) were unsure. When asked about the potential for herbal baths to relax newborns before bedtime, 43.5% of women thought they were helpful, whereas 56.5% were uncertain about their efficacy.

The study revealed that 87.9% of participants utilized anise during pregnancy or delivery for various purposes, including cooking, general use, pregnancy, postpartum, breastfeeding, and newborn care. Among these women, 34.7% reported using anise for general purposes, while a smaller proportion (2.0%) used it for specific combinations such as general use related to pregnancy and newborn care, cooking and breastfeeding, and infant care.

The use of anise during pregnancy was reported at a lower rate (3.1%) compared to its use during postpartum, breastfeeding, and newborn care, as well as general uses related to pregnancy and newborn care.

Regarding the specific uses of anise, the majority (47%) of women used it for abdominal colic, while a smaller group (4%) used it for digestive issues. Overall, 69.5% of women used anise for various purposes such as alleviating abdominal colic, improving lactation, or as an abortifacient. Nonetheless, 30.5% of the sample either did not know or did not use anise for any of these purposes.

The frequency of herbal use among pregnant and lactating women is on the rise globally [51, 60, 61, 62]. For instance, one study reported that 38.7% of women used herbs throughout pregnancy, while 49.1% used them prior to pregnancy. These findings are consistent with the broader literature, which shows variable rates of herbal use during pregnancy, ranging from as low as 13.8% to as high as 63.0% [48, 60, 61, 63, 64, 65].

In the study by Kaygusuz et al. [6], 63.2% of breastfeeding mothers reported using herbs, which is notably higher than the 38.7% of pregnant women using herbs. Additionally, 17.1% of these nursing mothers had also used herbs during their pregnancy. Similarly, Chuang et al. [66] found in their Taiwanese study that herbal use was prevalent among 33.6% of pregnant women and 87.7% of postpartum women. This suggests that herbal use is more common during breastfeeding compared to pregnancy. Other studies also reflect this trend, with rates of herbal use among breastfeeding mothers reported as 59.9% in Australia [10] and 52.5% in Italy [67].

Other herbs used by nursing mothers to increase breast milk were peppermint, anise, sage, green tea, and linden. The main reason for breastfeeding mothers to use herbs was to increase breast milk (82.3%) and the second was to reduce the pain of colic and gas in infants (35.4%). Other reasons were to reduce pain after childbirth and speed up recovery (15.6%), improve the taste and quality of breast milk (15.6%), reduce bleeding and clean the uterus (10 .4%), and the treatment of nipple cracks (10.4%) [6]. Similar results were seen in previous studies where nursing mothers used the herb for problems that occurred after breastfeeding or postpartum [10, 67, 68]. Mothers used cumin and fennel, mostly fennel, to reduce gas in their babies. Licorice root, chamomile, peppermint, and sage tea have been used by nursing mothers to reduce postpartum pain and speed recovery, while peppermint, dill, anise, lemon balm leaves, licorice root, linden, and garlic to improve the taste and quality of breast milk [6].

An important finding of this study was that most women obtained information about herbal use from the Internet. This finding aligns with other research indicating that many pregnant women receive their information about herbs primarily from herbalists and frequently purchase herbal products online [69]. Additionally, it was reported that a substantial number of women rely on personal experience or advice from relatives and friends for their herbal use [70].

Despite these insights, our study has several limitations. The primary limitation was the use of convenience sampling, which may affect the generalizability of the results. Although online surveys are advantageous for their cost-effectiveness, accessibility, and time efficiency [71], this method also limits the representativeness of the sample. Furthermore, our study was conducted in a specific geographic location – Limassol - which may not fully capture the diversity of herbal use practices across other regions.

## *6.* Conclusion

Plant medicines are frequently used by women during pregnancy, labor, the puerperium, and breastfeeding. However, there is limited evidence regarding their safety and efficacy. The current literature lacks sufficient data to provide accurate assessments of the safety of specific herbs. To address these gaps, it is essential to conduct rigorously designed blinded Phase I clinical trials to guide recommendations and enhance our understanding of these products.

Our survey data underscore the critical need for educational programs targeting health professionals, pregnant and breastfeeding women, and the broader community. These programs should focus on the appropriate use of herbal remedies during the antenatal and peri-partum periods, breastfeeding, and infant care. Educating women of reproductive age about the potential risks and benefits of herbal use is crucial, with particular attention to the possible hazards associated with homeopathic remedies.

Midwives play a pivotal role in this educational effort. They should provide accurate information about the safe use of herbs, with a focus on aniseed. Educational initiatives should be integrated into antenatal care courses and include in-service training for midwives to enhance their knowledge and skills. Additionally, creating informative short videos on social media platforms (such as Facebook, Instagram, and TikTok) could effectively disseminate information and promote safe herbal practices.

## Compliance with ethical standards

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## References

[1] World Health Organization. WHO traditional medicine strategy. 2014-2023. Geneva: World Health Organization; 2013. 76 p. https://www.who.int/publications/i/item/9789241506096

[2] Barnes PM, Bloom B, Nahin RL, National Center for Health Statistics (U.S.). Complementary and alternative medicine use among adults and children: United States, 2007. Hyattsville, MD: Dept. of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics; 2008, 10:(12):1-23 p. https://pubmed.ncbi.nlm.nih.gov/19361005/

[3] Dugoua JJ. Herbal medicines and pregnancy. J Popul Ther Clin Pharmacol. 2010;17(3):e370-3788. https://pubmed.ncbi.nlm.nih.gov/21041871/

[4] Nordeng H, Bayne K, Havnen GC, Paulsen BS. Use of herbal drugs during pregnancy among 600 Norwegian women in relation to concurrent use of conventional drugs and pregnancy outcome. Complement Ther Clin Pract. 2011;17(3):147-51. https://doi.org/10.1016/j.ctcp.2010.09.002

[5] Louik C, Gardiner P, Kelley K, Mitchell AA. Use of herbal treatments in pregnancy. Am J Obstet Gynecol. 2010;202(5):439 e1- e10. https://doi.org/10.1016/j.ajog.2010.01.055

[6] Kaygusuz M, Gumustakim RS, Kus C, Ipek S, Tok A. TCM use in pregnant women and nursing mothers: A study from Turkey. Complement Ther Clin Pract. 2021;42:101300. https://doi.org/10.1016/j.ctcp.2020.101300

[7] Mitchell M, Allen K. An exploratory study of women's experiences and key stakeholders views of moxibustion for cephalic version in breech presentation. Complement Ther Clin Pract. 2008;14(4):264-72. https://doi.org/10.1016/j.ctcp.2008.05.002

[8] Maats FH, Crowther CA. Patterns of vitamin, mineral and herbal supplement use prior to and during pregnancy. Aust N Z J Obstet Gynaecol. 2002;42(5):494-6. https://doi.org/10.1111/j.0004-8666.2002.00494.x

[9] Hepner DL, Harnett M, Segal S, Camann W, Bader AM, Tsen LC. Herbal medicine use in parturients. Anesth Analg. 2002;94(3):690-3; table of contents. https://doi.org/10.1097/00000539-200203000-00039

[10] Sim TF, Sherriff J, Hattingh HL, Parsons R, Tee LB. The use of herbal medicines during breastfeeding: a population-based survey in Western Australia. BMC Complement Altern Med. 2013;13:137. https://bmccomplementmedtherapies.biomedcentral.com/articles/10.1186/1472-6882-13-317

[11] Bishop JL, Northstone K, Green JR, Thompson EA. The use of Complementary and Alternative Medicine in pregnancy: data from the Avon Longitudinal Study of Parents and Children (ALSPAC). Complement Ther Med. 2011;19(6):303-10. https://doi.org/10.1016/j.ctim.2011.08.005

[12] Beaglehole R. The World Health Report 2003: Shaping the Future. World Health Organization; Geneva, Switzerland: 2003. https://iris.who.int/handle/10665/42789

[13] Lindzon G., Sadry S., Sharp J. Toronto Notes for Medical Students. 27th ed. Type & Graphics Inc.; Vaughan, ON, Canada: 2011. Obstetric. https://www.studocu.com/my/document/universiti-aimst/obstetrics-gynecology/toronto-notes-2011-obstetrics/77268254

[14] Holst L., Wright D., Nordeng H., Haavik S. Use of herbal preparations during pregnancy: Focus group discussion among expectant mothers attending a hospital antenatal clinic in Norwich, UK. Complement. Ther. Clin. Pract. 2009;15(4):225–229. https://doi.org/10.1016/j.ctcp.2009.04.001

[15] Bhat R. Medicinal plants and traditional practices of Xhosa people in the Transkei region of Eastern Cape, South Africa. Indian J. Tradit. Knowl. 2014;13(2):292–298. http://www.ethnopharmacologia.org/prelude2020/pdf/biblio-hb-61-bhat.pdf

[16] Tsui B., Dennehy C.E., Tsourounis C. A survey of dietary supplement use during pregnancy at an academic medical center. Am. J. Obstet. Gynecol. 2001;185:433–437. http://www.ethnopharmacologia.org/prelude2020/pdf/biblio-hb-61-bhat.pdf

[17] Rajith N., Navas M., Thaha A.M., Manju M., Anish N., Rajasekharan S., George V. A study on traditional mother care plants of rural communities of South Kerala. Indian J. Tradit. Knowl. 2010;9:203–208. https://nopr.niscpr.res.in/handle/123456789/7183

[18] Cuzzolin L., Francini-Pesenti F., Verlato G., Joppi M., Baldelli P., Benoni G. Use of herbal products among 392 Italian pregnant women: Focus on pregnancy outcome. Pharmacoepidemiology. Drug Saf. 2010;19(11):1151–1158. https://doi.org/10.1002/pds.2040

[19] Orief Y.I., Farghaly N.F., Ibrahim M.I.A. Use of herbal medicines among pregnant women attending family health centers in Alexandria. Middle East Fertil. Soc. J. 2014;19:42–50. http://dx.doi.org/10.1016/j.mefs.2012.02.007

[20] Malan D.F., Neuba D.F. Traditional practices and medicinal plants use during pregnancy by Anyi-Ndenye women (Eastern Côte d'Ivoire) Afr. J. Reprod. Health. 2011;15(1):85–93. https://pubmed.ncbi.nlm.nih.gov/21987942/

[21] Ernst E. Herbal medicinal products during pregnancy: Are they safe? BJOG Int. J. Obstet. Gynaecol. 2002;109(3):227–235. https://doi.org/10.1111/j.1471-0528.2002.t01-1-01009.x

[22] Illamola S.M., Amaeze O.U., Krepkova L.V., Birnbaum A.K., Karanam A., Job K.M., Bortnikova V.V., Sherwin C.M., Enioutina E.Y. Use of herbal medicine by pregnant women: What physicians need to know. Front. Pharmacol. 2020;10:1483. https://doi.org/10.3389/fphar.2019.01483

[23] Holst L., Nordeng H., Haavik S. Use of herbal drugs during early pregnancy in relation to maternal characteristics and pregnancy outcome. Pharmacoepidemiology. Drug Saf. 2008;17(2):151–159. https://doi.org/10.1002/pds.1527

[24] Bercaw J., Maheshwari B., Sangi-Haghpeykar H. The use during pregnancy of prescription, over-the-counter, and alternative medications among Hispanic women. Birth. 2010;37(3):211–218. https://doi.org/10.1111/j.1523-536x.2010.00408.x

[25] Sun X., Xue Z., Yasin A., He Y., Chai Y., Li J., Zhang K. Colorectal Cancer and Adjacent Normal Mucosa Differ in Apoptotic and Inflammatory Protein Expression. Eng. Regen. 2022;2:279–287. https://doi.org/10.1016/j.engreg.2022.01.004

[26] Balbontín Y.M., Stewart D., Shetty A., Fitton C.A., McLay J.S. Herbal medicinal product use during pregnancy and the postnatal period: A systematic review. Obstet. Gynecol. 2019;133(5):920-932. https://doi.org/10.1097/aog.0000000000003217

[27] Seddiki A.E., Messaouidi S., Amrani R. Le role du fenugrec dans la survenue d'anomalie de fermeture du tube neural: Un signal d'alerte depuis le Maroc. Phytothérapie. 2017;15:155–158. https://doi.org/10.1007/s10298-017-1128-x

[28] Achour S., Saadi H., Turcant A., Banani A., Mokhtari A., Soulaymani A., Bencheikh R.S. Intoxication au Peganum harmala L. et grossesse: Deux observations marocaines. Médecine et St. Trop. 2012;22:84–86. http://pascal-francis.inist.fr/vibad/index.php?action=getRecordDetail&idt=26414874

[29] Lahsissene H., Kahouadji A., Hseini S. Catalogue des Plantes Médicinales Utilisées dans la Région de Zaër (Maroc Occidental). Lejeunia, Revue de Botanique. 2009. https://popups.uliege.be/0457-4184/index.php?id=701

[30] Singh Y.N., Ikahihifo T., Panuve M., Slatter C. Folk medicine in Tonga. A study on the use of herbal medicine for obstetric and gynecological conditions and disorders J Ethnopharmacol. 1984;12(3):305-329. https://doi.org/10.1016/0378-8741(84)90060-6

[31] Bourdy C., Walter A. Maternity and medicinal plants in Vanuatu I. The cycle of reproduction J Ethnopharmacol. 1992;37(3):179-196. https://doi.org/10.1016/0378-8741(92)90033-n

[32] Wang L.L., Nanakorn W., Fukui K. Food and medicinal plants used for childbirth among Yunnanese Chinese in Northern Thailand J Ethnobiol. 2003;23:209-226. https://biostor.org/reference/175110

[33] Jain A., Katewa S.S., Chaudhary B.L., Galav P. Folk herbal medicines used in birth control and sexual diseases by tribals of southern Rajasthan, India J Ethnopharmacol. 2004;90(1):171-177. https://doi.org/10.1016/j.jep.2003.09.041

[34] Ticktin T., Dalle S.P. Medicinal plant use in the practice of midwifery in rural Honduras J Ethnopharmacol. 2005;96(1-2):233-248. https://doi.org/10.1016/j.jep.2004.09.015

[35] Zumsteg I.S., Weckerle C.S. Bakera, an herbal steam bath for postnatal care in Minahasa (Indonesia): documentation of the plants used and assessment of the method J Ethnopharmacol. 2007;111(3):641-650. https://doi.org/10.1016/j.jep.2007.01.016

[36] de Boer H., Lamxay V. Plants used during pregnancy, childbirth and postpartum healthcare in Lao PDR: a comparative study of the Brou, Saek and Kry ethnic groups J Ethnobiol Ethnomedicine. 2009;5:25. http://www.ethnobiomed.com/content/5/1/25

[37] Deciga-Campos M., Rivero-Cry I., Arriaga-Alba M., Castaneda-Corral G., Angeles- Lopez G.E., Navarrete A., et al. Acute toxicity and mutagenic activity of Mexican plants used in traditional medicine J Ethnopharmacol. 2007;110(2):334-337. https://doi.org/10.1016/j.jep.2006.10.001

[38] Henry A., Crowther C. Patterns of medication use during and prior to pregnancy: the MAP study Aust N. Z J Obstetrics Gynaecol. 2000;40(2):165-172. https://doi.org/10.1111/j.1479-828x.2000.tb01140.x

[39] Hepner D.L., Harnett M., Segal S., Camann W., Bader A.M. Herbal medicine use in parturients Anesth Analgesia. 2002;94(3):690-693. https://doi.org/10.1097/00000539-200203000-00039

[40] Maats F.H., Crowther C.A. Patterns of vitamin, mineral and herbal supplement use prior to and during pregnancy Aust N. Z J Obstetrics Gynaecol. 2002;42(5):494-496. https://doi.org/10.1111/j.0004-8666.2002.00494.x

[41] Nordeng H., Havnen G.C. Use of herbal drugs in pregnancy: a survey among 400 Norwegian women Pharmacoepidemiology Drug Saf. 2004;13(6):371-380. https://doi.org/10.1002/pds.945

[42] Hemminki E., Mäntyranta T., Malin M., Koponen P. A survey on the use of alternative drugs during pregnancy Scand J Public Health. 1991;19(3):199-204. https://doi.org/10.1177/140349489101900310

[43] Gruber C.W., O'Brien M. Uterotonic plants and their bioactive constituents Planta Medica. 2011;77(3):207-220. https://doi.org/10.1055/s-0030-1250317

[44] Shojaii A., Fard M.A. Review of pharmacological properties and chemical constituents of pimpinella anisum ISRN Pharm. 2012; 510795. https://doi.org/10.5402/2012/510795

[45] Boskabady M.H., Ramazani-Assari M.A. Relaxant effect of Pimpinella anisum on isolated guinea pig tracheal chains and its possible mechanism(s) J Ethnopharmacol. 2001;74(1):83-88. https://doi.org/10.1016/s0378-8741(00)00314-7

[46] Mohammed S. Ali-Shtayeh, Rana M. Jamous, Rania M. Jamous, Plants used during pregnancy, childbirth, postpartum and infant healthcare in Palestine, Complementary Therapies in Clinical Practice. 2015;21(2):84-93. https://doi.org/10.1016/j.ctcp.2015.03.004

[47] Tabatabaee M. Use of herbal medicine among pregnant women referring to Valiasr Hospital in Kazeroon, Fars, South of Iran. J. Med. Plants. 2011;10(37):96–108. https://jmp.ir/article-1-227-en.pdf

[48] Pallivalappila AR, Stewart D, Shetty A, Pande B, Singh R, McLay JS. Complementary and alternative medicine use during early pregnancy. Eur J Obstet Gynecol Reprod Biol. 2014;181:251–5. https://doi.org/10.1016/j.ejogrb.2014.08.017

[49] Fakeye TO, Adisa R, Musa IE. Attitude and use of herbal medicines among pregnant women in Nigeria. BMC Complement Altern Med. 2009;9:53. https://doi.org/10.1186/1472-6882-9-53

[50] Hwang JH, Kim YR, Ahmed M, Choi S, Al-Hammadi NQ, Widad NM, et al. Use of complementary and alternative medicine in pregnancy: a cross-sectional survey on Iraqi women. BMC Complement Altern Med. 2016;16:191. https://doi.org/10.1186/s12906-016-1167-0

[51] Koç Z, Sağlam Z, Topatan S. Determination of the usage of complementary and alternative medicine among pregnant women in the northern region of Turkey. Collegian. 2017;24(6):533–9. http://doi.org/10.1016/j.colegn.2016.11.003

[52] Munoz Balbontin Y, Stewart D, Shetty A, Fitton CA, McLay JS. Herbal medicinal product use during pregnancy and the postnatal period: a systematic review. Obstet Gynecol. 2019;133(5):920–932. https://doi.org/10.1097/aog.0000000000003217

[53] Vázquez-Fresno R, Rosana ARR, Sajed T, Onookome-Okome T, Wishart NA, Wishart DS. Herbs and spices-biomarkers of intake based on human intervention studies - a systematic review. Genes Nutr. 2019;14:18. https://doi.org/10.1186/s12263-019-0636-8

[54] Chauhan B, Kumar G, Kalam N, Ansari SH. Current concepts and prospects of herbal nutraceutical: a review. J Adv Pharm Technol Res. 2013;4(1):4–8. https://doi.org/10.4103/2231-4040.107494

[55] Abdel-Wareth AAA, Kehraus S, Südekum KH. Peppermint and its respective active component in diets of broiler chickens: growth performance, viability, economics, meat physicochemical properties, and carcass characteristics. Poult Sci. 2019;98(9):3850–3859. https://doi.org/10.3382/ps/pez099

[56] Muhammad DRA, Dewettinck K. Cinnamon and its derivatives as potential ingredient in functional food-a review. Int J Food Prop. 2017;20(sup2):2237–2263. https://doi.org/10.1080/10942912.2017.1369102

[57] Zamawe C, King C, Jennings HM, Mandiwa C, Fottrell E. Effectiveness and safety of herbal medicines for induction of labour: a systematic review and meta-analysis. BMJ Open. 2018;8(10):e022499. https://doi.org/10.1136/bmjopen-2018-022499

[58] Boltman-Binkowski H. A systematic review: are herbal and homeopathic remedies used during pregnancy safe? Curationis. 2016;39(1):1514. https://doi.org/10.4102/curationis.v39i1.1514

[59] Laelago T. Herbal medicine use during pregnancy: benefits and untoward effects. In: Builders P, editor. Herbal medicine. London: Intech Open; 2019. https://www.intechopen.com/chapters/61138

[60] Hall HR, Jolly K. Women's use of complementary and alternative medicines during pregnancy: a cross-sectional study. Midwifery. 2014;30(5):499-505. https://doi.org/10.1016/j.midw.2013.06.001

[61] Kalder M, Knoblauch K, Hrgovic I, Münstedt K. Use of complementary and alternative medicine during pregnancy and delivery. Arch. Gynecol. Obstet. 2011;283(3):475-482. https://doi.org/10.1007/s00404-010-1388-2

[62] Kochhar K, Saywell RM, Zollinger TW, Mandzuk CA, Haas DM, Howell LK, et al. Herbal remedy use among Hispanic women during pregnancy and while breastfeeding: are physicians informed? Hisp. Health Care Int. 2010;8:93-106. https://doi.org/10.1891/1540-4153.8.2.93

[63] Gibson PS, Powrie R, Star J. Herbal and alternative medicine use during pregnancy: a cross-sectional survey. Obstet. Gynecol. 2001;97(4):44-45. https://doi.org/10.1016/S0029-7844%2801%2901250-9

[64] Ranzini A, Allen A, Lai YL. Use of complementary medicines and therapies among obstetric patients. Obstet. Gynecol. 2001;97(4):46. https://doi.org/10.1016/S0029-7844(01)01255-8

[65] Hwang JH, Kim YR, Ahmed M, Choi S, Al-Hammadi NQ, Widad NM, Han D. Use of complementary and alternative medicine in pregnancy: a cross-sectional survey on Iraqi women. BMC Compl. Alternative Med. 2016;16:191. https://doi.org/10.1186/s12906-016-1167-0

[66] Chuang CH, Chang PJ, Hsieh WS, Tsai YJ, Lin SJ, Chen PC. Chinese herbal medicine uses in Taiwan during pregnancy and the postpartum period: a population-based cohort study. Int. J. Nurs. Stud. 2009;46(6):787-795. https://doi.org/10.1016/j.ijnurstu.2008.12.015

[67] Bettiol A, Lombardi N, Marconi E, Crescioli G, Bonaiuti R, Maggini R, et al. The use of complementary and alternative medicines during breastfeeding: results from the Herbal supplements in Breastfeeding Investigation (HaBIT) study. Br. J. Clin. Pharmacol. 2018;84(9):2040-2047. http://dx.doi.org/10.1111/bcp.13639

[68] Aleandri V, Bertazzoni G, Romanzi D, Vetrano G, Durazzi F, Mazzanti G, Vitalone A. The use of herbal products during breastfeeding: a study from a public Italian hospital. J. Food Process. Technol. 2014;5(8):354. http://dx.doi.org/10.4172/2157-7110.1000354

[69] Eid AM, & Jaradat N. Public Knowledge, Attitude, and Practice on Herbal Remedies Used During Pregnancy and Lactation in West Bank Palestine. Front. Pharmacol. 2020;11:46. https://doi.org/10.3389/fphar.2020.00046

[70] Durmaz A, & Gun Kakasci C. Pregnant women's attitudes towards complementary and alternative medicine and the use of phytotherapy during the COVID-19 pandemic: A cross-sectional study. Plos one. 2024;19(1):e0296435. https://doi.org/10.1371/journal.pone.0296435

[71] Lefever S, Dal M, Matthíasdóttir A. Online data collection in academic research: Advantages and limitations. Br J Educ Technol. 2007;38:574–82. http://dx.doi.org/10.1111/j.1467-8535.2006.00638.x