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ORIGINAL ARTICLE

Use of herbal medicines among pregnant women attending family health centers in Alexandria

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KEYWORDS

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Abstract Objective: The aim of the study is to elucidate the use of herbal medicines in pregnant women and to explore patterns of herbal medication use including dietary supplements in pregnant women in Alexandria, Egypt.

Methodology: A cross sectional study of pregnant females was conducted in a family health center in Alexandria between March and June 2011 utilizing a sample of 300 pregnant women (100 pregnant women in each trimester). A specially designed self administered questionnaire was used to collect the data.

Results: The mean age of studied pregnant women was 26.9 ± 4.9 years. Only 27.3% of the studied pregnant women reported the use of herbal medicines during pregnancy while 89% reported the use of dietary supplements.

The majority of pregnant women resorted to (family/friends) as primary source of information of herbal medicines (42.7% and 28%, respectively), while the majority of women using dietary supplements resorted to (physicians) as primary source of information (76%).

52.4% of the studied pregnant women reported that they use ginger during the 1st trimester of pregnancy while 51.6% reported that they use fenugreek during the 3rd trimester of pregnancy.

More than half of the studied pregnant women (64.6%) reported the efficacy of herbal medicines in relieving their complaints during pregnancy.

Conclusion: The use of herbal medicines during pregnancy in Alexandria was uncommon while the use of dietary supplements was very common.

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About three quarters of studied sample reported that the physician was the person to recommend dietary supplement usage while the physician was rarely cited as the person recommending herbal usage.

The most common herbs used by pregnant women were aniseed, fenugreek, ginger, while the least used was peppermint.

Ginger was found to be used by a significantly higher percentage of pregnant women in the first trimester; on the other hand, fenugreek was used by a significantly higher percentage of pregnant women in the third trimester.

Recommendations: Results of the following study suggest the following recommendations:

General recommendations: General health education for pregnant women about benefits and harms of herbal use during pregnancy in ante-natal care especially for herbs commonly used in Egypt.

Specific recommendations:

- (A) Care providers: Training of family physicians in the family health centers on the use of herbal medicines in pregnancy and possible effects on the fetus.
- (B) Pregnant women: Health education program directed toward pregnant women to increase their awareness about the effects of herbal medicines.

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1. Introduction

Herbal medicines are defined as plant derived material or preparations with therapeutic benefits, and contain raw or processed ingredients from one or more plants (1). The use of herbal medicines during pregnancy is common, ranging from 7.0% to 55.0% (2).

Characteristics of women more likely to take herbal supplements in pregnancy include being primiparous (3,4); having previous herbal use and being less educated (5).

The use of herbal medicines during pregnancy may be pregnancy related, for example for nausea and vomiting (3,6,7), reflux, candida vaginal infection (6), nutritional (8), or to prepare for labor (3); or may be for unrelated pregnancy health issues such as cold and respiratory illnesses or skin problems (8). Reasons reported for ceasing herbal medicines during pregnancy include concerns for the health of the fetus (9,10), the herbal medicine supplements not helping (3) and advice from a health care provider (7).

Herbal use in pregnancy has been reported to be recommended by health care providers (7), natural or alternative medicine practitioners (7), pharmacists (7); suggested by friends or family (3,7,8); based on information from media sources (7); or based on women's own information and knowledge (7,11).

The use of herbal medicines plays significant roles in the management of both minor and major illnesses (12–14) and has been influenced by patients' dissatisfaction with conventional allopathic medicines in terms of effectiveness, safety and satisfaction with therapeutic outcome (15,16).

1.1. Herbal remedies which are in popular use amongst pregnant women are:

1.1.1. Ginger (Zingiber officinale)

It is a well-known remedy for gestational sickness, its antiemetic effects probably being due to local gastrointestinal anti-cholinergic and antihistaminic actions (17).

Vutyavanich et al. (18) demonstrated significant improvements in the severity of both nausea and vomiting of pregnancy, and Fischer Rasmussen et al. (19) found it particularly effective for hyperemesis gravidarum when compared to placebo.

A review article on the treatments for nausea during pregnancy reported that the existing treatments, including ginger, showed no evidence of teratogenicity (20).

1.1.2. Garlic (Allium sativum)

Garlic's antibacterial and antifungal characteristics make it an ideal nutrient to consume, particularly during pregnancy (21). Garlic will enhance the mothers immune system which in turn will enhance her odds on having a healthy pregnancy and most importantly a healthy baby (22).

New research shows that taking garlic during pregnancy can cut the risk of pre-eclampsia (raised blood pressure and protein retained in the urine) (22). A randomized controlled study was conducted where 100 primigravidae were treated with either garlic tablets (800 mg/day) or placebo during the third trimester of pregnancy to determine the effect of garlic supplementation on pre-eclampsia (23). With the exception of a garlic body odor, few side effects (e.g. feeling of nausea) were reported as a result of garlic supplementation during the third trimester of pregnancy (23). Pregnancy outcomes were comparable in both the group treated with garlic and the placebo group (23). The authors did not report any incidence of major or minor malformations in the newborn infants nor any spontaneous abortions of the fetus (23).

1.1.3. Green tea (Camellia sinensis)

This substance contributes to regulation of blood sugar, cholesterol, and blood pressure levels (24).

This product also helps speed up the body's metabolic rate and provides a natural source of energy. It could possibly help stabilize a pregnant woman's moods, which is the best advantage (24).

However, green tea contains caffeine which is on average about 30–60% less than in coffee so moderation is recommended. This is not the only concern presented to the users but also green tea leads to the reduction of folate, which is necessary for the healthy development of a fetus (25).

Furthermore, excess consumption of green tea during pregnancy could counteract with processes which require iron and calcium.

On the other hand, a moderate amount of green tea can help keep the immune system built up. This will further help prevent any infectious disease or cancer from forming during the term (26).

1.1.4. Peppermint (*Mentha piperita*)

Peppermint has been used since antiquity to treat a variety of conditions, including gastrointestinal (GI) disorders, common cold and respiratory conditions, muscle pain, headache, and neuralgia during pregnancy (27).

Peppermint's reputation is due in large part to its volatile oil compounds that relax the smooth muscles that line the digestive tract. When these muscle cells become overactive, they contribute to indigestion, dyspepsia, gallbladder disease, and irritable bowel syndrome (IBS) (28). Several clinical trials have also shown that peppermint essential oil, a super-concentrated form of the herb, can relieve irritable bowel syndrome (IBS) symptoms (28).

Another series of research studies showed that menthol and closely related compounds from mint oils can actually dissolve gallstones; however, this may take many months to achieve. It is imperative to maintain a low-fat diet, lose weight, and exercise regularly to help the peppermint oil work best (28).

A literature review reported that seven of the 300 nonmedical sources reviewed cited peppermint as unsafe during pregnancy (29). There are no reports in the scientific literature of peppermint being either safe or contraindicated during pregnancy. Peppermint leaves and oil are believed to be safe during pregnancy if consumed in food amounts (30). It has indicated the treatment of pregnancy induced nausea (31).

1.1.5. Fenugreek (*Trigonella foenum-graecum*, *T. foenugraecum*)

During pregnancy, fenugreek needs to be consumed with caution as the seeds have the ability to lower the blood sugar levels. The seeds also contain oxytocin which stimulates uterine contractions. Thus a physician's advice is necessary before consumption.

Fenugreek stimulates uterine causing contractions and fastens labor process. It is also helpful in inducing childbirth. The amount of consumption should be after the doctor's prescription.

The natural herb is also said to increase the production of milk in lactating women (32). Many researchers even claim that there is 500 percent excess milk production in mothers in just a day or two after eating these seeds. Although the studies are still on over the reason as to what makes the increase in the lactation levels, it is determined that the oil in the seeds has a role to play. Lactating women can have about 6–7 seeds or a capsule three times a day (33).

2. Materials and methods

The aim of the study is to elucidate the use of herbal medicines in pregnant women and to explore patterns of herbal medica-

tion use including dietary supplements in pregnant women in Alexandria, Egypt.

To accomplish this aim, a cross sectional study of pregnant females was conducted in a family health center in Alexandria as it was appropriate for gathering data and reflecting what actually prevailed. The estimated sample size was approximated to 300 pregnant women and was estimated randomly. A specially designed questionnaire was used to collect the data. The field work was carried out between March and June 2011.

2.1. Data collection

2.1.1. Orientation and official approval from relevant authorities: (collaborative agreement)

In order to enable the researcher to conduct the study, the necessary permissions to conduct the study were obtained.

2.1.2. Ethical consideration

- The confidentiality of collected data was stressed.
- The questionnaires were anonymous to ensure privacy.
- A written informal consent was taken from pregnant women.

2.1.3. Pilot study

A pilot study was conducted prior to the use of the final questionnaire. The pilot study was conducted on a random subset of pregnant women ($n = 30$, 10 at each trimester).

In the pilot study, individual questions, the questionnaire as a whole and feasibility of data collection procedure were evaluated.

The purposes of pilot study were:

- To test the questionnaires and ensure that all questions were clearly understood.
- To estimate the average time needed to collect data.
- To explore the possible obstacles while conducting the research.

The pilot study was carried out in a family health center and the feedback was the following:

- Each pregnant female took about 30 min to answer the questions.
- Some pregnant females considered some questions difficult to understand, these questions were refined in another simpler way.

2.1.4. Field work and data collection

Visits were paid to the selected family health center where the pregnant women were interviewed in the anti-natal clinic. The relevant data were obtained from subjects of the study through face to face interview. The researcher had to ensure that all questions were properly understood and answered. The researcher had to ask the pregnant female if any of the questions were not understood and if he/she had to clarify its meaning.

2.2. Data analysis

The chi-square (χ^2) test was used to analyze categorical variables which were expressed as percentage values.

On the other hand continuous variables were reported as mean value and standard deviation (SD) and analyzed using the *t*-test.

The continuous variables were also reported as median and analyzed using Mann–Whitney test.

A *P*-value < 0.05 was considered statistically significant. All analyses were performed using SPSS for Windows, version 18.0.

Meanwhile, the continuous variables were also reported as median and analyzed using the Mann–Whitney test.

3. Results

The present study included 300 pregnant female (100 pregnant females in each trimester). Their personal and reproductive characteristics are summarized in Table 1. Table 2 illustrates that high risk pregnancies were 22% as compared to 78% of pregnant women who had no risk pregnancy. Out of the total number of studied pregnant females, 90.9% of the pregnant females had medical causes of risky pregnancy, meanwhile 74.2% had obstetric causes, and 36.4% had biological causes.

27.3% of the studied sample of pregnant females reported that they use herbal medicines, while about 72.7% of them did not use herbs (Table 3).

Regarding the person who recommended use of herbs, 18.3% of women reported that they themselves made the decision to use herbal medicines, whereas 28% of women were recommended by friends, less than half of subjects 42.7% were advised by family while physicians were rarely cited as the person recommending herbal usage as stated by only 11% of subjects (Table 3).

Out of the total number of studied pregnant females, 44.5% of them did not trust effect of herbs, meanwhile 30.3% were afraid of side effects of herbs during pregnancy, and 20.2% did not believe in herbs (Table 3).

The most common herbs used by pregnant women were aniseed (40.2%), fenugreek (31.7%), ginger (29.3%), garlic (22%), green tea (19.5%) and peppermint (11%) (Table 3).

Table 1 Personal and reproductive characteristics of the studied pregnant females.

Personal and reproductive characteristics	Studied females (<i>n</i> = 300)	
	No.	%
<i>Educational level</i>		
Illiterate	12	4.0
Basic education	57	19.0
Secondary education or higher	231	77.0
<i>Age (years)</i>		
Min–max	17–45	
Mean ± SD	26.9 ± 4.9	
<i>Gravidity</i>		
Min–max	1–8	
Mean ± SD	2.3 ± 1.2	
<i>Parity</i>		
min–max	0–7	
Mean ± SD	1.2 ± 1.0	
<i>Body mass index (kg/m²)</i>		
Min–max	24.6–36.2	
Mean ± SD	28.1 ± 2.3	

Table 2 Characteristics of current pregnancy of the studied pregnant females.

Characteristics of current pregnancy	Studied females (<i>n</i> = 300)	
	No.	%
<i>High risk pregnancy</i>		
No	234	78.0
Yes	66	22.0
<i>#Cause of risky pregnancy (n = 66)</i>		
Obstetric causes	49	74.2
Medical causes	60	90.9
Biological causes	24	36.4

Categories are not exclusive.

Concerning the results of using herbs, 64.6% reported that herbal medicines were effective in relieving their complains while 35.4% reported that they were not effective (Table 3).

Regarding the indications for use of herbs, 47.6% used them to relief abdominal colic during pregnancy, while 28% used herbal medicines for nausea and vomiting, 9.7% used them for relieving dysuria, 2.4% used them to relief headache, and 18.2% used them without any indication (Table 3).

Eighty-nine percentage of the studied pregnant females reported that they used dietary supplements, while about 11% did not use them (Table 3).

Regarding the person who recommended the use of dietary supplement, 76% reported that the physician advised them, 2.2% took them by themselves, while 14.3%, 7.5% reported that family and friends recommended dietary supplements, respectively (Table 3).

The BMI categories according to herbal and dietary supplements usage were illustrated in Table 4.

Table 5 illustrates the personal and reproductive characteristics of the studied pregnant females according to herbal usage. A statistical significant difference was found regarding the age, gravidity, parity and BMI among the pregnant group using herbals.

Table 6 illustrates the characteristics of current pregnancy of the studied pregnant females according to herbal usage. A significant relationship between high risk pregnancy and usage of herbal medicines ($X^2 = 28.13$, $P < 0.0001$) was found, while there was no statistically significant difference between duration of current pregnancy and use of herbal medicines.

Out of the studied pregnant women, 77% of them had secondary education or higher while 19% had basic education and only 4% were illiterate. No statistically significant difference between educational level of pregnant female and use of herbal medicines while a significant relationship between educational level of pregnant female and usage of dietary supplement was found (Tables 7 and 9).

The mean age of the studied pregnant females was 26.9 ± 4.9 years with a minimum of 17 years and a maximum of 45 years. A significant relationship between age of pregnant female and usage of both herbal medicines and dietary supplements was present (Tables 7 and 9).

The mean number of gravity of the studied pregnant females was 2.3 ± 1.2 pregnancies with a minimum of 1 pregnancy and a maximum of 8 pregnancies. A significant relationship between the number of pregnancies and the use

Table 3 Pattern of herbal and dietary supplements usage among the studied pregnant females.

	Studied pregnant women (n = 300)			
	No.	Percentage (%)		
<i>Use of herbs</i>				
Non-users	218	72.7		
Users	82	27.3		
<i>Use of dietary supplements</i>				
Non-users	33	11		
Users	267	89		
<i>Use of both dietary supplements and herbal medicines</i>				
Users of herbs alone	12	4		
Users of both herbs and dietary suppl.	70	23.3		
Users of dietary supplement alone	197	65.6		
Non-users of both	21	7		
Persons who recommended use of herbs and dietary supplements	Herbal medicines	Dietary supplements	Herbal medicines	Dietary supplements
Physicians	9	203	11	76
Female herself	15	6	18.3	2.2
Friends	23	20	28	7.5
Family	35	38	42.7	14.3
<i>Causes of not using herbs (n = 218)</i>				
Females do not believe in herbs	44	20.2		
Afraid of side effects of herbs during pregnancy	66	30.3		
Females do not trust effect of herbs	108	44.5		
<i>#Types of herbs used (n = 82)</i>				
Ginger	24	29.3		
Peppermint	9	11		
Fenugreek	26	31.7		
Green tea	16	19.5		
Garlic	18	22		
Aniseed	33	40.2		
<i>Results of using herbs (n = 82)</i>				
Effective	53	64.6		
Not effective	29	35.4		
<i>#Indications for use of herbs</i>				
Nausea and vomiting	23	28		
Abdominal colic	39	47.6		
Dysuria	8	9.7		
Headache	2	2.4		
No indication	15	18.2		

Categories are not exclusive.

of herbal medicines was present while there was no significant relationship between the number of pregnancies and the use of dietary supplements (Tables 7 and 9).

The mean number of parity of the studied pregnant females was 1.2 ± 1.0 child with a minimum of no child (primiparous) and a maximum of 7 children. A significant relationship between the number of children and the use of herbal medicines was present while no significant difference between users and non-users of dietary supplements as regard parity of pregnant women (Tables 7 and 9).

The mean body mass index of the studied pregnant women was 28.1 ± 2.3 with a minimum of 24.6 and a maximum of 36.2. A significant relation between BMI of the studied pregnant women and the use of both herbal medicines and dietary supplements was found (Tables 7 and 9).

There was no statistically significant relationship between use of dietary supplement among the studied pregnant females and use of herbal medicines (Table 7).

Table 8 illustrates the personal and reproductive characteristics of the studied pregnant females according to dietary supplements usage. There was a significant relationship between educational level of pregnant female and usage of dietary supplement ($X^2 = 10.714$, $P = 0.005$). It was found that the better the educational level is the more the percentage of women who use dietary supplements.

Ginger was found to be used by significantly higher percentage of pregnant women in the first trimester than in the second or third trimesters (52.4%, 20% and 22.6%, respectively) (Table 10). On the other hand, fenugreek was used by a significantly higher percentage of pregnant women in the

Table 4 BMI categories according to herbal and dietary supplements usage.

BMI categories		Number		Users of dietary supplements		Users of herbal medicines	
		No.	%	No.	%	No.	%
Under weight	< 18.5	0	0	0	0	0	0
Normal weight	18.5–24.9	1	0.3	1	0.4	0	0
Overweight	25–29.9	237	79	204	76.4	52	63.4
Obesity	≥ 30	62	20.7	62	23.2	30	37.6
Total		300		267		82	

Table 5 Personal and reproductive characteristics of the studied pregnant females according to herbal usage.

Personal and reproductive characteristics	Do not use herbs (<i>n</i> = 218)		Use herbs (<i>n</i> = 82)		Significance
	No.	%	No.	%	
<i>Educational level</i>					
Illiterate	6	2.8	6	7.3	$X^2 = 3.656$ $P = 0.161$
Basic education	40	18.3	17	20.7	
Secondary education or higher	172	78.9	59	72.0	
<i>Age (years)</i>					
Min–max	17–40		17–45		$Z = 4.143$
Mean ± SD	26.1 ± 3.9		29.2 ± 6.2		$P < 0.0001^*$
Median	26		29		
<i>Gravity</i>					
Min–max	1–6		1–8		$Z = 5.182$
Mean ± SD	2.1 ± 0.9		2.9 ± 1.4		$P < 0.0001^*$
Median	2		3		
<i>Parity</i>					
Min–max	0–4		0–7		$Z = 3.637$
Mean ± SD	1.0 ± 0.8		1.6 ± 1.3		$P < 0.0001^*$
Median	1		1		
<i>Body mass index (kg/m²)</i>					
Min–max	24.6–34.5		25.4–36.2		$Z = 2.605$
Mean ± SD	27.8 ± 1.9		28.9 ± 2.9		$P = 0.009^*$
Median	27.3		27.7		

Z: Mann–Whitney test X^2 : Chi-square test *t*: T-test.

* Significant at $P \leq 0.05$.

Table 6 Characteristics of current pregnancy of the studied pregnant females according to herbal usage.

Characteristics of current pregnancy	Do not use herbs (<i>n</i> = 218)		Use herbs (<i>n</i> = 82)		Significance
	No.	%	No.	%	
<i>High risk pregnancy</i>					
No	187	85.8	47	57.3	$X^2 = 28.13$ $P < 0.0001^*$
Yes	31	14.2	35	42.7	
<i>Duration of current pregnancy</i>					
1st Trimester	79	36.7	21	25.6	$X^2 = 3.287$ $P = 0.193$
2nd Trimester	70	30.7	30	36.6	
3rd Trimester	69	32.6	31	37.8	

#Categories are not exclusive X^2 : Chi-square test.

* Significant at $P \leq 0.05$.

third trimester (51.6%) than in the first (19%) or second (20%) trimesters (Table 10).

32.9% of the studied pregnant female believes that herbal medicines are used for reduction of weight while 4.9%

believe that it is used as antibiotic, and 18.2% believe that it facilitates deliveries while 37.8% believe that it improves lactation and 6.1% believe that it controls diabetes (Table 11).

Table 7 Use of dietary supplements among the studied pregnant females according to herbal usage.

Use of dietary supplements	Do not use herbs (<i>n</i> = 218)		Use herbs (<i>n</i> = 82)		Significance
	No.	%	No.	%	
No	21	9.6	12	14.6	$\chi^2 = 1.52$
Yes	197	90.4	70	85.4	$P = 0.217$

χ^2 : Chi-square test.

Table 8 Personal and reproductive characteristics of the studied pregnant females according to dietary supplements usage.

Personal and reproductive characteristics	Do not use dietary supplement (<i>n</i> = 33)		Use dietary supplement (<i>n</i> = 267)		Significance
	No.	%	No.	%	
<i>Educational level</i>					
Illiterate	3	9.1	9	3.4	$\chi^2 = 10.71$
Basic education	12	36.4	45	16.9	$P = 0.005^*$
Secondary education or higher	18	54.4	213	79.8	
<i>Age (years)</i>					
Min-max	17-33		17-45		
Mean \pm SD	25 \pm 4.1		27.2 \pm 4.9		$Z = 2.013$
Median	25		27		$P = 0.044^*$
<i>Gravidity</i>					
Min-max	1-4		1-8		
Mean \pm SD	2.0 \pm 0.9		2.4 \pm 1.2		$Z = 1.757$
Median	2		2		$P = 0.079$
<i>Parity</i>					
Min-max	0-3		0-7		
Mean \pm SD	1.0 \pm 0.91		1.2 \pm 1.01		$Z = 1.03$
Median	1		1		$P = 0.303$
<i>Body mass index (kg/m²)</i>					
Min-max	25.3-29.8		24.6-36.2		
Mean \pm SD	26.8 \pm 1.1		28.3 \pm 2.3		$Z = 3.66$
Median	26.6		27.6		$P < 0.0001^*$

Z: Mann-Whitney test χ^2 : Chi-square test *t*: T-test.

* Significant at $P \leq 0.05$.

Table 9 Characteristics of current pregnancy of the studied pregnant females according to dietary supplements usage.

Characteristics of current pregnancy	Do not use dietary supplements (<i>n</i> = 33)		Use dietary supplements (<i>n</i> = 267)		Significance
	No.	%	No.	%	
<i>High risk pregnancy</i>					
No	30	90.9	204	76.4	$\chi^2 = 3.601$
Yes	3	9.1	63	23.6	$P = 0.058$
<i>#Duration of current pregnancy</i>					
1st Trimester	11	36.4	89	33.2	$\chi^2 = 0.76$
2nd Trimester	15	36.4	85	31.8	$P = 0.684$
3rd Trimester	7	27.2	93	34.8	

Categories are not exclusive χ^2 : Chi-square test.

4. Discussion

The increase in the use of natural health products, particularly herbal products, is noticed all over the world. Herbal medicines are preparations derived from naturally occurring plants with medicinal or preventive properties (34).

In the current study, the herbal medicines were used by about one fourth of the study sample (27.3%) which is rela-

tively closer to the percentage of herbal users (27.8%) in the study conducted by Laura et al. (35).

Among the causes that women gave for not using herbal medicines, the results indicate that (44.5%) of women do not trust the effect of herbs. The same reason was given by a lower percentage of women (18.7%) in the study of Giveon SM (36).

The types of herbs used during pregnancy in this study include aniseed which was the most common herb used (40.2%),

Table 10 Types of herbs used by studied pregnant females during different pregnancy trimesters.

Types of herbs	1st Trimester (<i>n</i> = 21)		2nd Trimester (<i>n</i> = 30)		3rd Trimester (<i>n</i> = 31)		Significance (<i>P</i>)
	No.	%	No.	%	No.	%	
Ginger	11	52.4	6	20.0	7	22.6	$\chi^2 = 7.33 (0.026)^*$
Peppermint	2	9.5	6	20.0	1	3.2	$\chi^2 = 4.45 (0.108)$
Fenugreek	4	19.0	6	20.0	16	51.6	$\chi^2 = 9.13 (0.01)^*$
Green tea	4	19.0	5	16.7	7	22.6	$\chi^2 = 0.34 (0.84)$
Garlic	4	19.0	5	16.7	9	29.0	$\chi^2 = 1.5 (0.472)$
Aniseed	8	38.1	14	46.7	11	35.5	$\chi^2 = 0.85 (0.65)$

χ^2 : Chi-square test.

* Significant at $P \leq 0.05$.

Table 11 Beliefs of women regarding the effects of herbal usage during pregnancy.

Beliefs	No.	%
Reduction of weight	27	32.9
As antibiotic	4	4.9
Facilitates deliveries	15	18.2
Improves lactation	31	37.8
Diabetes control	5	6.1

fenugreek as the second most common herb used (31.7%) and peppermint as the least used (11%). The study of Hashim et al. (37) in Qatar revealed that only (1%) of pregnant women used aniseed, (9%) used fenugreek and (9%) used peppermint.

Ginger was the most commonly used herbal medicine during the first trimester, there was a significant relation between ginger use and different pregnancy trimesters where ginger was used by a significantly higher percentage of pregnant women in the first trimester (52.4%) than in the second or third trimester. Similarly, a study conducted by Broussard (38) which revealed that ginger was also commonly used during the first trimester (53%). In contrast, the study conducted by Willetts et al. (39) which revealed that 14% only used ginger in the first trimester for pregnancy-induced nausea.

Fenugreek, in our study, is more commonly used in the third trimester which is also similar to a study conducted by Fugh-Berman (40) in which fenugreek was used in the third trimester of pregnancy (51%) as pregnant women believe that fenugreek increases milk secretion after delivery and produces oxytocic effect so they used it in the third trimester to facilitate labor and avoid it in the first trimester to prevent abortion.

Perception on the effectiveness of herbal medicines in solving or preventing problems will influence whether mothers might use them again in the next pregnancy. In the current study, about one quarter of women (25.6%) who used herbal medicines during pregnancy believed that these medicines improve lactation, 20.7% believed that they reduce weight, 15.9% of them believed that traditional herbal medicines facilitate deliveries, while only 6.1% of women believed that these drugs can control diabetes.

About 89% of the studied pregnant women used dietary supplements during pregnancy which is relatively closer to the results portrayed in two other studies. A Belgium study carried out by Verbeke et al. (41) that revealed that 62% of the studied pregnant women had used vitamin supplements.

The second Norwegian study conducted by Haugen et al. (42) revealed that the proportion of supplement users was comparable with our study (81%).

5. Recommendations

Results of the following study suggest the following recommendations:

5.1. General recommendations

General health education for pregnant women about the benefits and harms of herbal use during pregnancy in ante-natal care especially for herbs commonly used in Egypt.

Although rates of use are low, there remains a need for investigation of the safety of these products. Given sparse data on efficacy, even small risks might well outweigh benefits.

5.2. Specific recommendations

Care providers:

Health care providers should have guidelines for the usage of herbal medicines during pregnancy.

Training of family physicians in the family health centers on the use of herbal medicines in pregnancy and possible effects on the fetus.

Pregnant women:

Health education program directed toward pregnant women to increase their awareness about the effects of herbal medicines and the importance of consultation of family physicians before taking any types of herbs during pregnancy, since many of these herbal remedies are self-prescribed based on the woman's own information or belief.

6. Conflict of interest

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

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