

# Evidence Based Care Journal

<http://ebcj.mums.ac.ir/>

---

## Sexual Satisfaction and Function in Postmenopausal Women Treated with Herbal Medicines: A Review of Clinical Trials

Azin Niazi, Maryam Moradi

The online version of this article can be found at  
[http://ebcj.mums.ac.ir/article\\_13345.html](http://ebcj.mums.ac.ir/article_13345.html)

---

Evidence Based Care Journal 2019 09:07 originally published  
online 01 July 2019

DOI: 10.22038/ebcj.2019.38679.2016

Online ISSN: 2008-370X

**Address:** Mashhad Nursing and Midwifery School, Ebn-e-Sina St., Mashhad, Iran

**P.O.Box:** 9137913199

**Tel.:** (098 51) 38591511-294

**Fax:** (098 51) 38539775

**Email:** EBCJ@mums.ac.ir





## Sexual Satisfaction and Function in Postmenopausal Women Treated with Herbal Medicines: A Review of Clinical Trials

Azin Niazi<sup>1</sup>, Maryam Moradi<sup>2\*</sup>

Received: 03/03/2019

Accepted: 22/06/2019

Evidence Based Care Journal, 9 (2): 7-16

### Abstract

**Background:** It is widely accepted that lower levels of sexual satisfaction and function are among the common problems in postmenopausal women. Several studies have examined the effect of plants containing phytoestrogens for the prevention and treatment of menopause complications.

**Aim:** The main purpose of this study was to investigate the effect of medicinal plants on the sexual satisfaction and function of postmenopausal women.

**Method:** Related English and Persian articles published between 2000 and December 2018 were searched through the databases of Iran Medex, PubMed, EMBASE, Scopus, and Science Direct. The articles were searched using the keyword of "menopause" through Boolean Operators of AND and OR with keywords of "sexual satisfaction", "sexual function", "herbal supplement", "Review Study in English and Persian".

**Results:** Of the 87 searched articles, 20 articles were ultimately analyzed with a sample size of 1555 people. Plants of Bindii, Fenugreek, Fennel, Liquorice, *Pueraria Mirifica*, Ginseng, Red clover, and Aphrodit had positive effects on dyspareunia, as well as sexual satisfaction and function. Date pollen did not affect sexual satisfaction; moreover, *Ginkgo biloba* capsule had no effect on dyspareunia and sexual satisfaction.

**Implications for Practice:** Medicinal herbs containing phytoestrogens can be considered as a selective treatment for the improvement of dyspareunia and enhancement of the sexual satisfaction and function of postmenopausal women. However, due to the variety of herbs containing phytoestrogens, further studies are needed to determine the effective dose and effects as well as their possible complications.

**Keywords:** Herbal Supplement, Menopause, Review Study, Sexual Function, Sexual Satisfaction

1. MSc. in Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran

2. Assistant Professor in Reproductive Health, Nursing and Midwifery Care Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

\* Corresponding author, Email: moradim@mums.ac.ir

## Introduction

Menopause is a physiological period in women's life, whose most obvious symptom is defined as a permanent cessation of menstruation for one year resulting in a loss of ovarian follicles and estrogen reduction (1). Lower levels of ovarian hormones, especially estrogen, during menopause can lead to multiple physical, psychological, and sexual complications (2).

Vaginal atrophy is a frequently overlooked symptom of menopause, which is one of the factors affecting sexual satisfaction and function (3). Sexual satisfaction involves the feeling of the body, the need to touch, the interest in sexual activity, the communication needs of the individual with the sexual partner, and the ability to obtain satisfaction with sexual activity (4). Sexual dysfunction is defined as a persistent or recurrent decrease in sexual arousal, dyspareunia, and the presence of a problem or inability to achieve orgasm (5).

The results of studies (2018) on women in the United States indicate that sexual problems increase with age and disorders occurring within the age range of 18-44 (27.2%) and 45-64 years (44.6%) (6). In Iran, relative frequency of sexual dysfunction was reported to be in 72.4% of menopausal women, which is accompanied by abnormalities in the arousal phase (75.3%), disturbance in the phase of desire (62.6%), irregular orgasm (56.3%), dyspareunia (34.9%), and vaginismus (15.8%) (7). Different methods are used to prevent problems and improve sexual function during menopause, which are divided into two groups of complementary and alternative medicine and hormonal therapy (8). Estrogen therapy, either systemically or topically, causes increased tissue thickness (9). Complications of alternative hormone therapy include gastrointestinal complications, weight gain, increased risk of breast and endometrial cancer, thromboembolism, and liver adenoma (10).

Medicinal plants have a close relationship with the history of human life; the use of medicinal herbs has always been a therapeutic approach (11). The results of a review study evaluating the effect of phytoestrogens on menopausal symptoms between 2013 and 2017 indicated a positive effect of phytoestrogens on the improvement of symptoms of menopause; however, a review of further articles over a wider time range is suggested to determine the effects of phytoestrogens on menopausal symptoms (12). Considering the numerous studies on the effect of medicinal herbs on sexual satisfaction and function of postmenopausal women, a current review was conducted to investigate the effect of medicinal herbs on sexual satisfaction and function of postmenopausal women.

## Methods

Related English and Persian articles published between 2000 and December 2018 were searched through the databases of Iran Medex, PubMed, EMBASE, Scopus, and Science Direct. The articles were searched using the keyword of "menopause" through Boolean Operators of AND and OR with keywords of "sexual satisfaction", "sexual function", "herbal supplement", "diet supplement" and "Review Study in English and Persian" with all possible combinations and individually.

The inclusion criteria of the articles in this structured review were those which selected participants with no menstrual periods over the past 12 months and no use of medical drugs with estrogenic properties before the intervention. Moreover, the randomized human clinical trials published in Persian and English, which examined the effects of medicinal herbs on the sexual satisfaction and function of postmenopausal women were included in this study.

The articles were included in the study regardless of the method of use (oral, vaginal gel, aromatherapy), and which method of treatment was used for the control group. The initial review of the articles began from the abstracts so that the non-related items and duplicates were excluded from the review. The quality assessment and extraction of articles were performed according to the Jadad scale and by two independent individuals. An independent third person was assisted in case of any disagreement. This scale is directly related to bias control in clinical trials including generalized and randomized methods (score 0: no random allocation, score 2: full description of random allocation), blindness (score 0: no blindness, score 2: double- and triple-blind assessments) and dropout and withdrawal reports (score 1). Articles with a score of 3 or more have a good methodology (Table 1). Figure 1 summarizes the selection process of articles and the reasons for their exclusion from the study (13).

**Table 2. Characteristics of studies included in the review study**

Author / year (reference number)	Location	Variables	Study sample size	Intervention group/ Group 1	Control group/ Group 2	Complications	Results	Tools	Jadad scale			Total score
									Randomization	Blindness	Dropout and reasons	
Yousefzadeh et al., 2017 (43)	Iran	Sexual satisfaction and orgasm in postmenopausal women	60	Daily intake of the date pollen capsules for 35 days / 30 people	Placebo	No	No effect of date pollen on sexual satisfaction and improvement of orgasm	FSFI	2	2	-	4
Mazalazadeh et al., 2017 (15)	Iran	Sexual satisfaction and dyspareunia of postmenopausal women	60	Daily use of Fenugreek vaginal cream 5% for 8 weeks / 30 people	Placebo	No	Reduced dyspareunia and increased sexual satisfaction	Larson (1998)	1	2	-	3
Shamshad Begum et al., 2016 (16)	India	Sexual function of postmenopausal women	88	Edible gelatinized capsule (250 mg) of Fenugreek seed extract	Placebo	No	Improved sexual function	Greene Climacteric Scale (GCS)	2	2	-	4
Najar et al., 2016 (18)	Iran	Sexual satisfaction and dyspareunia of postmenopausal women	60	The use of Fennel vaginal cream 5% for 8 weeks	Placebo	No	Reduced dyspareunia and increased sexual satisfaction	Larson (1998)	1	2	-	3
Abedi et al., 2018 (19)	Iran	Sexual function of postmenopausal women	60	The use of Fennel vaginal cream 5% for 8 weeks	Placebo	No	Improved sexual function	FSFI	1	2	-	3
Shojaei et al., 2016 (39)	Iran	Sexual satisfaction and function of postmenopausal women	120	Group 1: Syrup containing 0.5 mg of Bindii extract Group 2: Syrup containing 0.7 mg of Bindii extract Group 3: Syrup containing 0.9 mg of Bindii extract twice a day for 2 months (each group 30)	Placebo	Not mentioned	Improved sexual satisfaction and function by taking different Bindii doses	FSFI Larson (1998)	1	2	-	3
De Souza et al., 2016 (40)	Brazil	Sexual function of postmenopausal women	45	Daily use of 3 tablets (250 mg) containing Bindii extract for 120 days	Placebo	No	Improved sexual function	FSFI	1	2	-	3
Postigo et al., 2016 (41)	Brazil	Sexual function of postmenopausal women	60	Daily use of 3 tablets (250 mg) containing Bindii extract for 90 days	Placebo	Not mentioned	Improved sexual function	FSFI	1	2	-	3
Taavoni et al., 2014 (23)	Iran	Sexual satisfaction of postmenopausal women	80	Daily use of 2 Aphrodit capsules for a month	Placebo	Not mentioned	Improved orgasm and sexual desire	Sabbatsberg (1995)	2	2	1	5
Taavoni et al., 2016 (24)	Iran	Orgasm and sexual desire of postmenopausal women	80	Daily use of 2 Aphrodit capsules for a month	Placebo	Not mentioned	Improved sexual satisfaction	Sabbatsberg (1995)	2	2	-	4
Sadeghi et al., 2018 (26)	Iran	Dyspareunia in postmenopausal women	70	The use of Liquorice vaginal cream 2% for 8 weeks / (35 people)	Placebo	Not mentioned	Reduced dyspareunia	Self-rating 4-point Likert scale	2	2	-	4
Oh KJ et al., 2010 (27)	Korea	Sexual function	180	Daily use of 3 Ginseng capsules (each capsule containing 1 g of Ginseng) for 8 weeks	Placebo	Vaginal bleeding	Improved sexual arousal	GAQ FSFI	2	2	1	5
Brooks et al., 2008 (28)	Australia	Sexual function of postmenopausal women	16	3.5 g / day of Maca orally for 6 weeks	Placebo	Not mentioned	Reduced sexual dysfunction	Greene Climacteric Scale (GCS)	1	2	-	3
Amiri et al., 2012 (35)	Iran	Sexual satisfaction of postmenopausal women	80	120-240-mg <i>Ginkgo biloba</i> capsule for a month	Placebo	Not mentioned	No effect on sexual satisfaction	Sabbatsberg (1995)	2	2	1	5
Amiri et al., 2014 (34)	Iran	The sexual desire of postmenopausal women	80	120-240-mg <i>Ginkgo biloba</i> capsule for a month	Placebo	Not mentioned	Improved sexual desire	Sabbatsberg (1995)	2	2	1	5
Malakouti et al., 2017 (36)	Iran	Dyspareunia and sexual satisfaction of postmenopausal women	90	First intervention group: Aroma (Lavender, Pelargonium, Roses, Fennel) and 40-mg <i>Ginkgo biloba</i> placebo, Second intervention group: 40-mg <i>Ginkgo biloba</i> pill and Aroma Placebo for 6 weeks	Aroma placebo control and the 40-mg <i>Ginkgo biloba</i> placebo groups	Aromatherapy group: itching <i>Ginkgo biloba</i> group: Headache	No effect of aromatherapy and <i>Ginkgo biloba</i> pills on dyspareunia and sexual satisfaction	FSFI	2	2	1	5
Malakouti et al., 2016 (37)	Iran	Sexual function of postmenopausal women	120	Aroma combination (Lavender, Pelargonium, Roses, Fennel) 3 times a day, and 2-3 drops each time for 6 weeks	Aroma placebo	Not mentioned	Improved sexual function	FSFI	2	2	1	5

Table 2 Continued.

Chedraui et al., 2006 (30)	Santiago	Sexual desire and dyspareunia of postmenopausal women	53	Oral 80-mg Red Clover capsule for 90 days	Placebo	Not mentioned	Reduced dyspareunia and vaginal dryness and improved sexual desire	Researcher made scale	2	2	-	4
Suwanvesh et al., 2017 (32)	Bangkok	Postmenopausal women dyspareunia	82	6% gel of <i>Pueraria Mirifica</i> extract vaginally once a day (0.5 g) for 2 weeks and then three days a week (41 people)	Conjugated estrogens vaginal cream	No	Improved dyspareunia	Researcher made scale	2	1	1	4
Manonai et al., 2007 (33)	Bangkok	Dyspareunia of postmenopausal women	71	Oral <i>Pueraria Mirifica</i> capsule (20, 30, 50 mg) daily for 24 weeks / each group 17	Placebo	Mastalgia, dizziness and nausea in the intervention group (4%) and in the control group (35%)	Improved dyspareunia	Researcher made scale	2	2	1	5

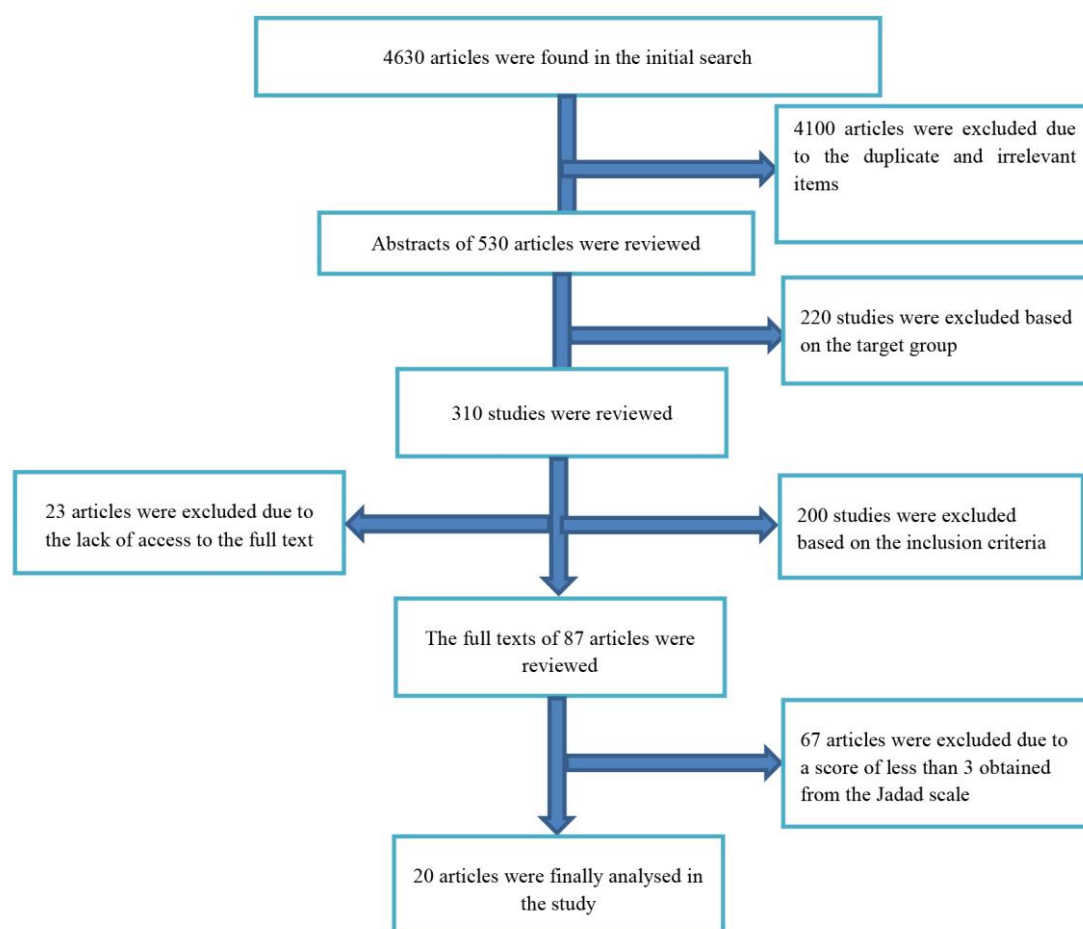


Figure 1. Flowchart for selection of articles

## Results

Of the 87 articles found, 20 articles with a sample size of 1555 people were included in this study. These selected articles consist of 3 articles on *Ginkgo biloba*, 3 articles on *Bindii*, 2 articles on *Pueraria Mirifica*, 2 articles on *Ginseng*, 2 articles on *Fenugreek*, 2 articles on *Fennel*, 2 articles on *Aphrodit*, 1 article on *Liquorice*, 1 article on *date pollen*, 1 article on *red clover*, and 1 article on *aromatherapy*. A summary of the included studies is shown in Table 1.

### *Fenugreek*

The *fenugreek*, *Trigonella foenum*, belongs to family *Fabaceae* with steroidal compounds, such as saponin and diosgenin, which help maintain a balance of hormones (14). In a study conducted by Mazalzadeh et al. (2017), a significant difference was observed between *Fenugreek* and placebo

groups regarding the severity of dyspareunia after the intervention ( $P < 0.001$ ). The mean sexual satisfaction scores in the treatment group were  $44.28 \pm 3.52$  and  $74.18 \pm 1.94$  before and after the intervention, respectively, indicating an increase after the intervention ( $P < 0.001$ ) (15). Shamshad Begum et al. (2016) conducted a study in which the intervention group consumed daily two 250-mg oral capsules of Fenugreek seed extract before breakfast and before dinner for a week. The drug dose was increased to 4 capsules if tolerated, and continued for 12 weeks. According to the obtained results, There was a significant difference between the two groups in terms of each sexual function variable, including the mean scores of sexual desires ( $P = 0.03$ ), orgasm ( $P < 0.001$ ), sexual satisfaction ( $P < 0.001$ ), and dyspareunia ( $P < 0.04$ ) (16).

### **Fennel**

Fennel, *Foeniculum vulgare*, belongs to the family Apiaceae. This plant is rich in phytoestrogens, including lignans and isoflavones (17). In a study performed by Najar et al. (2015), there was an increase in the mean score of sexual satisfaction in the group using Fennel vaginal cream after the intervention ( $73.16 \pm 1.96$ ), compared to the mean score of sexual satisfaction before the intervention ( $43.26 \pm 3.49$ ,  $P < 0.001$ ) (18). In a similar study, Abedi et al. (2018) examined the effect of fennel vaginal cream on sexual function in postmenopausal women. The results revealed a significant difference between the two groups regarding the mean scores of sexual function dimensions, such as desire, arousal, orgasm, sexual satisfaction, and dyspareunia ( $P < 0.001$ ) (19).

### **Aphrodit**

In a study carried out by Taavoni et al. (2014), the participants were randomly assigned to two groups of placebo and intervention who consumed Aphrodit capsules (40 mg of Bindii, 12.27 mg of ginger with active constituent of gingerol) (20) plus 3.3 mg of saffron with active constituents of crocin and safranal (21) and 11 mg of cinnamon with active constituents of cinnamaldehyde and eugenol (22). On the other hand, the placebo group received capsules containing 60 g of starch for one month.

There was a significant difference between the two groups in terms of the mean score of sexual satisfaction ( $P = 0.01$ ) (23). In the same line, according to the results by Taavoni et al. (2016), the mean scores of orgasm before the intervention were  $30.25 \pm 20.6$  and  $29 \pm 21.99$  in the Aphrodit and the placebo groups, respectively. After one month of intervention, the mean scores of orgasm reached  $41.12 \pm 10.08$  and  $29.12 \pm 29.6$  in the Aphrodit and the placebo groups, respectively, indicating a statistically significant difference between the two groups ( $P = 0.02$ ). In addition, a significant difference was observed between the two groups after intervention in terms of the dimension of sexual desire ( $P = 0.08$ ) (24).

### **Liquorice**

Liquorice, *Glycyrrhiza glabra*, belongs to the family Fabaceae, which has phytoestrogen properties. Some of the main compounds in this plant are triterpenoid saponin called glycyrrhizic acid or glycyrrhizin (25). Sadeghi et al. (2018) in a study aimed at determining the effect of Liquorice vaginal cream 2% on vaginal atrophy. According to the results, the categorical mean severity of dyspareunia in the Liquorice group was decreased from  $2.74 \pm 0.61$  on the first visit to  $1.82 \pm 0.70$  on the second visit. In addition, it was reduced from  $0.60 \pm 0.73$  to  $0.23 \pm 0.05$  on the third and fourth visits, respectively (26).

### **Ginseng**

Ginseng contains a steroid glycoside called ginsenoside. The ginsenoside, also called triterpenoid saponin or sometimes panaxoside, can be found in the root of ginseng (27).

In a study performed by Oh KJ et al. (2010), there was an increase in the mean total score of sexual function in the ginseng capsule group from 21.10 to 22.95; however, this difference was not significant, compared to the placebo group ( $P = 0.146$ ). A significant difference was observed between the two groups in terms of the number and level of satisfaction with arousal ( $P < 0.05$ ) (27). The results of a study by Brooks et al. (2008) reported the mean score of sexual dysfunction 6 weeks after taking Maca to be 22.9% and 34.6% lower than the cases reported at the baseline and after placebo intake ( $P < 0.05$ ) (28).

### **Red clover**

Red clover, *Trifolium pratense* is one of the species in the *Trifolium* genus. Genistein and Daidzein are the main isoflavonoids found in red clover (29). In a study by Chedraui et al. (2006), the intervention group received 90 days of treatment with oral red clover capsules. After a week without taking medicine, the position of intervention and control groups changed, so that the control group was treated for 90 days. The evaluation was performed on days 90 and 180 after the intervention. According to the results, dyspareunia decreased from 78.8% before the intervention to 34.6% after the intervention in the treatment group. Moreover, it was 69.2% in the placebo group after taking the Red Clover capsule. The rate of lower levels of sexual desire was 94.3% which was decreased to 52.8% and 73.6% in the intervention and placebo groups, respectively (30).

### **Pueraria Mirifica**

*Pueraria Mirifica* belongs to the family Leguminosae and is a good source of phytoestrogens. Miroestrol and deoxymiroestrol present in this plant have molecular structures similar to those of estradiol (31). According to the results of a study performed by Suwanvesh et al. (2017), the dyspareunia in each group was reduced by 6% using *P. Mirifica* root vaginal gel and conjugated equine estrogen cream ( $P<0.05$ ); however, there was no significant difference between the two groups in this regard ( $P>0.05$ ) (32). In a study conducted by Manonai et al. (2007), the frequency of dyspareunia in the intervention group who consumed oral *P. Mirifica* capsule was decreased from 56.9% to 39.2%, while no change was seen in the placebo group (33).

### **Ginkgo biloba**

*Ginkgo biloba*, commonly known as ginkgo, belongs to the Ginkgoaceae family and contains 24% flavonol glycosides (34). In a study carried out by Amiri et al. (2012), the intervention group was administered by a 220-240-mg capsule of Ginkgo (120 mg for the first week and 240 mg daily as tolerated treatment remaining for 3 weeks). The results showed no significant difference between the two groups of *Ginkgo biloba* and placebo regarding sexual satisfaction one month after the intervention ( $P=0.31$ ) (34). Furthermore, Amiri et al. (2014) prescribed a capsule (60 mg) of *Ginkgo biloba* daily for the intervention group (after a week, if the digestive problems appeared, the same dose was continued, but if tolerated, the dosage was increased to 4 times a day). Based on the results, sexual desire was improved in the intervention group after a month ( $P<0.05$ ) (35). In a study performed by Malakouti et al. (2017), there was a significant difference between the three groups in terms of the total score ( $P<0.001$ ) and all dimensions of sexual function ( $P<0.003$ ), except for dyspareunia and sexual satisfaction (36). In another study, Malakouti et al. (2016) examined the effects of combined inhalation aromatherapy on the sexual function of postmenopausal women. The results showed a significant difference between the aromatherapy and placebo groups regarding the total score ( $P<0.001$ ) and all dimensions of sexual function ( $P<0.003$ ), except for dyspareunia (37).

### **Bindii (Tribulus terrestris)**

Bindii (*Tribulus terrestris*) is an annual herbaceous plant that triggers spermatogenesis and increases LH and testosterone levels due to the presence of estradiol (38). According to the results of a study conducted by Shojaei et al. (2016), the mean total score of sexual function was significantly higher in the intervention groups after the intervention (Bindii extract with concentrations of 0.5, 0.7, 0.9), compared to the mean total scores obtained before the intervention ( $P<0.05$ ).

After two months, there was a significant increase in the mean score of sexual satisfaction in both groups consuming Bindii extract with concentrations of 0.7 and 0.9, compared to the mean scores obtained before the intervention ( $P<0.05$ ) (39). In the same line, de Souza et al. (2016) examined the effects of Bindii extract and placebo on the individuals 120 days after treatment in terms of the sexual function variables, including sexual desire, arousal, orgasm, dyspareunia, and sexual satisfaction. The results revealed a significant difference between the two groups regarding the aforementioned variables ( $P<0.01$ ) (40). Postigo et al. (2016) reported improvements in sexual function up to 20% and 70% in the placebo and the intervention groups treated with Bindii extract, respectively ( $P<0.001$ ). Moreover, a statistically significant difference was observed before and after the treatment in the intervention group in terms of the sexual function variables, including sexual desire, arousal, dyspareunia, and sexual satisfaction ( $P<0.01$ ); however, this difference was not significant in orgasm

domain (P=0.28) (41).

### **Date**

Date (*Phoenix dactylifera*) contains natural antioxidants, such as flavonoids, glycosides, saponins, and estrogens (42). In a study conducted by Yousefzadeh et al. (2017), the mean change in orgasm score in postmenopausal women after oral administration of date pollen was significantly higher than that of the control group (P=0.004); however, the mean change in sexual satisfaction scores after the intervention was not significant in both intervention and control groups (P=0.122) (43).

### **Discussion**

The present study was conducted on 20 articles containing 10 different herbs and 2 combined herbal remedies with the aim of investigating the effect of medicinal herbs on sexual satisfaction and function of postmenopausal women. In the study conducted by Yousefzadeh et al. (2017), the use of date pollen capsules improved orgasm in postmenopausal women; however, it had no effects on sexual satisfaction. The researchers argued some of the reasons for sexual ineffectiveness as individual's attitudes toward life, the type of personal responsibility, the effect of environment on sexual relations, the quality of relationships, and inhibitors, such as anxiety, fear, and discomfort. They recommended that further studies be conducted with wider drug dosage and longer intervention periods (43).

Mazaladeh et al. (2017) found it helpful to use fenugreek vaginal cream to increase the sexual satisfaction of postmenopausal women (15). In the same line, Shamshad Begum et al. (2016) showed that oral capsule containing fenugreek extract improved sexual function in postmenopausal women (16). The saponin and the diosgenin present in the Fenugreek extract are phytoestrogens capable of binding to estrogen receptors, which maintain the endothelial function of the vaginal mucous membranes (15).

Moreover, in a study conducted by Najar et al. (2015), the improvements in vaginal atrophy, dyspareunia, and sexual satisfaction were evident after 8 weeks of treatment with fennel vaginal cream, compared to the placebo group (18). Abedi (2018) reported the effect of Fennel vaginal cream on the improvement of sexual function during menopause. Possible cause of such an effect is the role of phytoestrogens, whose mechanism can be aligned with the effect of the intervention. The results of three clinical trials evaluating the effect of Bindii on the sexual function of postmenopausal women indicated that Bindii had significant effects on sexual function (19).

Sadeghi (2018) showed that the use of Liquorice vaginal cream has a positive effect on the reduction of mental symptoms, such as vaginal dryness, itching, irritation, and dyspareunia in postmenopausal women, compared to placebo (26). Furthermore, Taavoni et al. (2016) stated the remarkable effects of Aphrodit on sexual satisfaction (24). In another study (2014), they revealed that Aphrodit could improve orgasm and sexual desire in postmenopausal women (23). In a study performed by kyung-jin (2010), ginseng was found to have a positive effect on sexual satisfaction; however, it was accompanied by vaginal bleeding (27).

Nevertheless, ginseng (Maca) reduced sexual dysfunction based on the results of a study performed by Brooks (2008) (28). In the study conducted by Amiri (2014), despite the effectiveness of *Ginkgo biloba* herbal supplement on women's sexual desire, the results showed no effect on the frequency of sexual activity. Considering that the effectiveness of many herbal supplements will appear after long use, this plant was recommended to be used for a longer period in subsequent studies (34).

In two other studies aimed at determining the effect of *Ginkgo biloba* capsule on sexual satisfaction in postmenopausal women, the results revealed that *Ginkgo biloba* led to no improvements in sexual satisfaction. Headache was one of the side effects of taking the pill. Given that several factors can affect the sexual relations of postmenopausal women, the ineffectiveness of *Ginkgo biloba* on sexual satisfaction can be based on its inability to affect factors, such as sexual knowledge and psychological factors (35-36).

The results of combined aromatherapy examination on sexual function indicated that this method was effective; however, it had no effect on dyspareunia and sexual satisfaction (37-36). Chedraui et al. (2006) concluded that oral red clover capsules reduced dyspareunia and vaginal dryness leading to the improvement of sexual desire (30). The effect of *P. Mirifica* on atrophy and dyspareunia in postmenopausal women was investigated in two studies. According to the results, *P. Mirifica* had an



estrogenic effect on vaginal tissue and improved dyspareunia, vaginal dryness, and atrophy symptoms. Mastalgia, dizziness, and nausea were reported as complications of oral *P. Mirifica* (31-32).

### Implications for Practice

Plants of Bindii, Fenugreek, Fennel, Liquorice, *P. Mirifica*, Ginseng, Red clover, and Aphrodit had positive effects on dyspareunia, sexual satisfaction, and sexual function. On the other hand, date pollen and *Ginkgo biloba* capsule had no effects on sexual satisfaction; moreover, *Ginkgo biloba* pills were ineffective in the improvements of dyspareunia and sexual satisfaction. A large variety of plants and the type and level of phytoestrogens in the study products prevented meta-analysis. The weak methodology of some studies, the lack of reporting on the exact characteristics of the drug or side effects, the use of different tools to measure variables and lack of access to the text of some articles emphasize the need for more detailed studies on the identification of the therapeutic effects of herbs on sexual satisfaction and function. In addition, it is recommended to conduct comparative studies with similar doses and compare the effects of these plants.

### Acknowledgments

This study was extracted from a research project approved by Mashhad University of Medical Sciences, Mashhad, Iran, with the registration number of 970386. We would like to appreciate the Research Deputy of Mashhad University of Medical Sciences for their financial support.

### Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

### References

1. Salehi K, Ehsanpour S, Zolfaghari B, Salehi Z, Honargoo M. Effect of red clover Isoflavones extract on menopausal symptoms. *J Gorgan Univ Med Sci*. 2013;15(2):21-8( Persian).
2. Berek JS. Berek & Novak's gynecology. 15<sup>th</sup> ed. Philadelphia: Lippincott Williams and Wilkins; 2012.
3. Palacios S, Nappi R, Bruyniks N, Particco M, Panay NJ. The European Vulvovaginal Epidemiological Survey (EVES): prevalence, symptoms and impact of vulvovaginal atrophy of menopause. *Climacteric*. 2018;21(3):286-91.
4. Santoro N, Worsley R, Miller KK, Parish SJ, Davis SR. Role of estrogens and estrogen-like compounds in female sexual function and dysfunction. *J Sex Med*. 2016;13(3):305-16.
5. Avis NE, Colvin A, Karlamangla AS, Crawford S, Hess R, Waetjen LE, et al. Change in sexual functioning over the menopause transition: results from the study of women's health across the nation (SWAN). *Menopause*. 2017;24(4):379.
6. Simon J, Davis S, Althof S, Chedraui P, Clayton A, Kingsberg S, et al. Sexual well-being after menopause: an international menopause society white paper. *Climacteric*. 2018;21(5):415-27.
7. Beigi M, Fahami F, Hassanzahraei R, Arman S. Associative factors to sexual dysfunction in menopause women. *Iran J Nurs Midwifery Res*. 2008;13(1):32-5.
8. Nikjou R, Kazemzadeh R, Asadzadeh F, Fathi R, Mostafazadeh F. The effect of lavender aromatherapy on the symptoms of menopause. *J Natil Med Assoc*. 2018;110(3):265-9.
9. Rioux JE, Devlin MC, Gelfand MM, Steinberg WM, Hepburn DS. 17 $\beta$ -estradiol vaginal tablet versus conjugated equine estrogen vaginal cream to relieve menopausal atrophic vaginitis. *Menopause*. 2018;25(11):1208-13.
10. Anjaneyulu K, Rai KS, Rajesh T, Nagamma T. Therapeutic efficacy of fenugreek extract or/and choline with docosahexaenoic acid in attenuating learning and memory deficits in ovariectomized rats. *J Krishna Instit Med Sci Univ*. 2018;7(2):10-20.
11. Niazi A, Rahimi VB, Soheili-Far S, Askari N, Rahmanian-Devin P, Sanei-Far Z, et al. A systematic review on prevention and treatment of nipple pain and fissure: are they curable? *J Pharmacopuncture*. 2018;21(3):139.
12. Keshavarz Z, Golezar S, Hajifoghaha M, Alizadeh S. The effect of phytoestrogens on menopause symptoms: a systematic review. *J Isfahan Med Sch*. 2018;36(477):446-59( Persian).
13. Jadad AR, Moore RA, Carroll D, Jenkinson C, Reynolds D, Gavaghan DJ, et al. Assessing the quality of reports of randomized clinical trials: is blinding necessary? *Control Clin Trials*.

- 1996;17(1):1-12.
14. Anjaneyulu K, Rai KS, Jetti R, Bhat KM. Effect of fenugreek seed extract on menopause induced neurocognitive deficit. *Adv Sci Let.* 2017;23(3):1864-8.
  15. Mazalzadeh F, Hekmat K, Namjoyan F, SakiMalehi A. Effect of fenugreek vaginal cream on dyspareunia and sexual satisfaction in menopausal women: a randomized clinical trial. *Iran J Obstet Gynecol Infertil.* 2018;21(3):22-30 (Persian).
  16. Shamshad Begum S, Jayalakshmi H, Vidyavathi H, Gopakumar G, Abin I, Balu M, et al. A novel extract of fenugreek husk (FenuSMART™) alleviates postmenopausal symptoms and helps to establish the hormonal balance: a randomized, double-blind, placebo-controlled study. *Phytother Res.* 2016;30(11):1775-84.
  17. Rahimikian F, Rahimi R, Golzareh P, Bekhradi R, Mehran AJ. Effect of *Foeniculum vulgare* Mill (fennel) on menopausal symptoms in postmenopausal women: a randomized, triple-blind, placebo-controlled trial. *Menopause.* 2017;24(9):1017-21.
  18. Yaralizadeh M, Abedi P, Najar S, Namjoyan F, Saki A. Effect of *Foeniculum vulgare* (fennel) vaginal cream on vaginal atrophy in postmenopausal women: a double-blind randomized placebo-controlled trial. *Maturitas.* 2016;84:75-80.
  19. Abedi P, Najafian M, Yaralizadeh M, Namjoyan F. Effect of fennel vaginal cream on sexual function in postmenopausal women: A double blind randomized controlled trial. *J Med Life.* 2018;11(1):24 (Persian).
  20. Haghghi A. Compare the effect of ginger extract and aspirin on COX-2 gene expression in colon cancer cell line HT-29. *J Herbal Drugs.* 2016;7(3):163-8.
  21. Al-Snafi AE. The pharmacology of crocus sativus-a review. *IOSR J Pharm.* 2016;6(6):8-38.
  22. Morozumi SA. Isolation, purification, and antibiotic activity of o-methoxycinnamaldehyde from cinnamon. *Appl Environ Microbiol.* 1978;36(4):577-83.
  23. Taavoni S, Nazem Ekbatani N, Haghani H. The effect of aphrodit on orgasm and sexual desire in menopausal women: a randomized clinical trial. *Hayat J.* 2016;22(1):1-12 (Persian).
  24. Taavoni S, Nazem Ekbatani N, Haghani H. The effect of aphrodit on orgasm and sexual desire in menopausal women: a randomized clinical trial. *Hayat J.* 2016;22(1):1-12 (Persian).
  25. Hajirahimkhan A, Simmler C, Yuan Y, Anderson JR, Chen SN, Nikolić D, et al. Evaluation of estrogenic activity of licorice species in comparison with hops used in botanicals for menopausal symptoms. *PLoS One.* 2013;8(7):e67947.
  26. Sadeghi M, Abbaspoor Z, Namjoyan F, Chergia B. Effect of *Glycyrrhiza glabra* vaginal cream the mental symptoms of vaginal atrophy in postmenopausal women. *Iran J Obstet Gynecol Infertil.* 2018;21(4):53-61 (Persian).
  27. Oh KJ, Chae MJ, Lee HS, Hong HD, Park K. Effects of Korean red ginseng on sexual arousal in menopausal women: placebo-controlled, double-blind crossover clinical study. *J Sex Med.* 2010;7(4):1469-77.
  28. Brooks NA, Wilcox G, Walker KZ, Ashton JF, Cox MB, Stojanovska L. Beneficial effects of *Lepidium meyenii* (Maca) on psychological symptoms and measures of sexual dysfunction in postmenopausal women are not related to estrogen or androgen content. *Menopause.* 2008;15(6):1157-62.
  29. Lall S. Evaluation of the therapeutic potential of red clover extract and red grape seed extract on human adult malignant brain tumours in vitro. London: Middlesex University; 2017.
  30. Chedraui P, Hidalgo L, San Miguel G, Morocho N, Ross S. Red clover extract (MF11RCE) supplementation and postmenopausal vaginal and sexual health. *Int J Gynecol Obstet.* 2006; 95(3):296-7.
  31. Boonchird C, Mahapanichkul T, Cherdshewasart W. Differential binding with ER $\alpha$  and ER $\beta$  of the phytoestrogen-rich plant *Pueraria mirifica*. *Brazil J Med Biol Res.* 2010;43(2):195-200.
  32. Suwanvesh N, Manonai J, Sophonsritsuk A, Cherdshewasart WJ. Comparison of *Pueraria mirifica* gel and conjugated equine estrogen cream effects on vaginal health in postmenopausal women. *Menopause.* 2017;24(2):210-5.
  33. Manonai J, Chittacharoen A, Theppisai U, Theppisai H. Effect of *Pueraria mirifica* on vaginal health. *Menopause.* 2007;14(5):919-24.
  34. Amiri PM, Taavoni S. The effect of *Ginkgo biloba* extract on sexual activity in postmenopausal women aged 60-50 years. *Complement Med J Facul Nurs Midwifery.* 2012;2(2):148-58 (Persian).

35. Amiri Pebdani M, Taavoni S, Haghani H. Effect of extract on sexual satisfaction in 50-60 years menopausal women in Tehran. *Quart J Sabzevar Univ Med Sci.* 2013;20(2):204-12( Persian).
36. Malakouti J, Jabbari F, Jafarabadi MA, Javadzadeh Y, Khalili AF. The impact of ginkgo biloba tablet and aromatherapy inhaler combination on sexual function in females during postmenopausal period: A double-blind randomized controlled trial. *Int J Womens Health Reprod Sci.* 2017;5:129-36.
37. Malakouti J, Farshbaf Khalili A, Asghari Jafarabadi M, Jabbari F. Effect of combined inhaler aromatherapy on sexual function in postmenopausal women: a randomized controlled trial. *Iran J Obstet Gynecol Infertil.* 2016;19(1.2):9-15 (Persian).
38. Roaiah MF, Elkhayat YI, Abd El Salam MA, Din SF. Prospective analysis on the effect of botanical medicine (*Tribulus terrestris*) on Serum testosterone level and semen parameters in males with unexplained infertility. *J Diet Suppl.* 2017;14(1):25-31.
39. Shojaee M. Effect of oral Hydro-Alcoholic Extract of *Tribulus Terrestris* on Sexual Function and Satisfaction in Postmenopausal Women. Masters thesis, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran (Persian).
40. de Souza KZ, Vale FB, Geber S. Efficacy of *Tribulus terrestris* for the treatment of hypoactive sexual desire disorder in postmenopausal women: a randomized, double-blinded, placebo-controlled trial. *Menopause.* 2016;23(11):1252-6.
41. Postigo S, Lima SM, Yamada SS, dos Reis BF, da Silva GM, Aoki T. Assessment of the effects of *Tribulus terrestris* on sexual function of menopausal women. *Rev Brasil Gynecol Obstet.* 2016;38(03):140-6.
42. Amin ES, Awad O, El Samad MA, Iskander MN. Isolation of estrone from Moghat roots and from pollen grains of Egyptian date palm. *Phytochemistry.* 2012;8(1):295-7.
43. Yousefzadeh S, Sadeghi S, Rakhshandeh H, Dadghar S, Mazloum SR. The effect of date palm pollen capsule on orgasm and sexual satisfaction in menopausal women: a double-blind controlled clinical trial. *Iran J Obstet Gynecol Infertil.* 2017;20(10):43-51 (Persian).