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The Role of Medicinal Plants in Relieving Menopausal Symptoms: A Traditional Iranian Medicine Perspective

Sima Kamkari[1], **Souzan Soufizadeh Balaneji** [2]✉

[1] Department of Obstetrics and Gynecology, Division of Oncology Gynecology, School of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran
[2] Department of Obstetrics and Gynecology, School of Medicine, Urmia University of Medical Sciences, Urmia, Iran

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✉ ***Correspondence to:***
Susan Soufizadeh Balaneji

Email:
suzan_ph@yahoo.com

A B S T R A C T

Objective: Menopause represents a significant endocrinological transition characterized by declining estrogen levels, leading to vasomotor symptoms (e.g., hot flashes and night sweats), sleep disturbances, and affective changes. Given the growing interest in non-hormonal management strategies, complementary therapies, particularly the use of medicinal plants, have received increasing attention.

Methods: This study systematically reviews and identifies the evidence regarding medicinal plants employed in Traditional Iranian Medicine (TIM) for the management of menopausal symptoms. This review involved a structured examination of authoritative TIM texts, alongside pharmacognosy references and established scientific databases. Inclusion criteria mandated explicit mention of plants in traditional sources as remedies for menopause-related symptoms, excluding those cited in non-authoritative references or lacking direct symptomatic relevance. **Results:** Analysis of the literature identified several key medicinal plants traditionally utilized for this purpose, most notably: *Foeniculum vulgare*, *Trifolium pratense*, *Vitex agnus-castus*, *Glycyrrhiza glabra*, *Salvia officinalis*, and *Matricaria chamomilla*.

Conclusion: Traditional reports primarily attribute therapeutic effects to these plants, including hormonal modulation, alleviation of vasomotor symptoms, improvement in sleep quality, and anxiolytic or sedative properties. The evidence from Traditional Iranian Medicine suggests considerable potential for specific medicinal plants in alleviating menopausal distress. However, rigorous clinical efficacy and safety trials are essential to validate these traditional claims, establish optimal therapeutic dosages, and evaluate potential drug-herb interactions. When supported by scientific evidence, these plants could be integrated as valuable adjunctive interventions to enhance the quality of life for women navigating the menopausal transition.

Keywords: Menopause, Women, Medicinal Plants, Traditional Iranian Medicine, Phytoestrogens, Menopausal Symptoms

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Introduction

Menopause is a natural and inevitable physiological transition, typically occurring between the ages of 45 and 55, characterized by the permanent cessation of menstrual cycles and a progressive decline in ovarian function [1]. This period marks a profound reduction in the production of estrogen and progesterone, giving rise to a constellation of vasomotor, physical, and psychological manifestations, including hot flashes, night sweats, sleep disturbances, vaginal atrophy, mood fluctuations, and decreased libido [2]. Furthermore, menopause is associated with an increased long-term risk of conditions such as osteoporosis, cardiovascular disease, metabolic disorders, and alterations in skin integrity [3,4].

The pathophysiology underlying these changes is primarily linked to the exhaustion of follicular reserves and subsequent dysregulation of the hypothalamic–pituitary–ovarian axis [5].

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This hormonal shift results in elevated levels of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) [6], accompanied by a marked decline in estrogen, which collectively drives the common menopausal symptoms [7,8].

In conventional medicine, hormone replacement therapy (HRT) remains the most effective intervention for controlling severe vasomotor symptoms, alleviating urogenital atrophy, and preventing osteoporosis [9]. However, enduring concerns regarding potential adverse effects such as an increased risk of breast cancer and thromboembolic events have prompted many women to seek non-hormonal alternatives [10]. Pharmacological options, including selective serotonin reuptake inhibitors (SSRIs), serotonin–norepinephrine reuptake inhibitors (SNRIs), gabapentin, and anti-osteoporotic agents (e.g., bisphosphonates and selective estrogen receptor modulators (SERMs), have been explored for symptom management [11]. Despite these options, a significant need for safe, low-risk, and accessible therapeutic approaches persists.

Traditional Iranian Medicine (TIM) approaches menopause as a natural physiological phenomenon, emphasizing management through principles of temperament regulation and the application of natural resources, particularly medicinal plants [12]. Plants utilized in this context contain various bioactive compounds, including flavonoids, saponins, and lignans, which are posited to exert phytoestrogenic, antioxidant, and sedative effects, thereby modulating hormonal and neural pathways [13]. Historically, TIM has employed numerous botanicals such as *Valeriana officinalis*, *Achillea millefolium*, *Matricaria chamomilla*, *Crocus sativus*, *Cimicifuga racemosa*, and *Glycyrrhiza glabra* to reduce hot flashes, improve sleep, regulate mood, and support bone health. These traditional remedies are generally regarded as having a more favorable risk profile compared with conventional hormone-based treatments [14].

This review aims to identify and evaluate medicinal plants employed in Traditional Iranian Medicine for the management of menopausal symptoms, and to compare traditional evidence with contemporary scientific findings, with the goal of providing safe and effective therapeutic options for women undergoing the menopausal transition.

Methods

This study presents a systematic review of medicinal plants employed in TIM for the management of menopausal symptoms. The review process was designed in accordance with PRISMA guidelines and comprised three main stages: identification of sources, screening and selection, and data extraction and analysis.

Information Sources and Search Strategy

To identify plants traditionally used in TIM, classical texts including *Canon of Medicine*, *Al-Hawi*, *Zakhireh Khwarazmshahi*, *Tohfat al-Hakim Mo'men*, and *Makhzan al-Adwiah* as well as authoritative pharmacognosy references were systematically consulted [15-22].

Subsequently, a comprehensive search of electronic databases including PubMed, Scopus, Web of Science, and Google Scholar was conducted to identify recent studies and scientific evidence regarding the effects of medicinal plants on menopausal symptoms. The search strategy employed a combination of keywords, including "Menopause," "Climacteric," "Herbal Medicine," "Phytotherapy," "Iranian Traditional Medicine," "Medicinal Plants," "Hot Flashes," and "Phytoestrogen." Searches were performed without date restrictions, and both Persian and English sources were considered.

Inclusion Criteria
Sources were included if they met the following criteria

Explicit reference to the use of medicinal plants for alleviating menopausal symptoms or promoting the health of menopausal women;

Provision of information on bioactive compounds, therapeutic functions, mechanisms of action, or traditional methods of use;

Publication as authoritative library resources, research articles, reviews, or other scientifically relevant documents;

Availability in Persian or English.

Exclusion Criteria
Sources were excluded if they

Lacked direct relevance to menopause or included only general, unsupported mentions in traditional medicine;

Provided insufficient information on therapeutic properties or bioactive constituents;

Represented duplicates, low-quality studies, or lacked reliable historical or scientific evidence;

Cited plants solely for general or unrelated treatments.

Data Extraction and Analysis

Data from eligible sources were systematically extracted, including

Scientific and common names of the plants;

Plant parts used and methods of administration;

Bioactive compounds and potential mechanisms of action;

Traditional evidence and modern research findings regarding the effects of plants on menopausal symptoms.

Extracted data were organized into tables, and a descriptive analysis was conducted to examine patterns of use, scientific support, and reported mechanisms. This structured approach enabled a comprehensive overview of the role of medicinal plants in managing menopausal symptoms within TIM and facilitated the identification of gaps for future experimental and clinical research.

Results

Comprehensive details on these medicinal plants, including their traditional applications and therapeutic indications for alleviating menopausal symptoms, are presented in Table 1.

Table 1: Medicinal Plants Traditionally Used in Iranian Medicine for Managing Menopausal Symptoms

Plant Family	Common Name	Scientific Name	Plant Part Used	Traditional Use
Apiaceae	Fennel	*Foeniculum vulgare*	Seed, leaf	Infusion, decoction
Asteraceae	Chamomile	*Matricaria chamomilla*	Flower	Infusion, herbal tea
	Greater burdock	*Arctium lappa*	Root, leaf	Root decoction, leaf infusion
	Milk thistle	*Silybum marianum*	Seed, leaf	Seed decoction, extract
	Yarrow	*Achillea millefolium*	Flower, leaf	Infusion, tincture
Boraginaceae	Borage	*Borago officinalis*	Flower, leaf	Infusion, herbal tea
Brassicaceae	Descurainia	*Descurainia sophia*	Seed	Seed decoction, mixed with syrup
	Garden cress	*Lepidium sativum*	Seed, leaf	Seed powder, leaf infusion
Cannabaceae	Hops	*Humulus lupulus*	Cone	Infusion, tincture
Caprifoliaceae	Valerian	*Valeriana officinalis*	Root	Root infusion, tincture
Fabaceae	Alfalfa	*Medicago sativa*	Leaf, flower	Infusion, fresh consumption

	Fenugreek	*Trigonella foenum-graecum*	Seed	Seed decoction, powdered
	Licorice	*Glycyrrhiza glabra*	Root	Root decoction, extract
	Red clover	*Trifolium pratense*	Flower	Flower infusion
	Soy	*Glycine max*	Seed	Decoction, soy milk
Iridaceae	Saffron	*Crocus sativus*	Stigma	Infusion, culinary additive
Lauraceae	Cinnamon	*Cinnamomum verum*	Bark	Bark decoction, culinary spice
Lamiaceae	Holy basil	*Ocimum sanctum*	Leaf	Infusion, herbal tea
	Lavender	*Lavandula angustifolia*	Flower	Infusion, aromatherapy
	Lemon balm	*Melissa officinalis*	Leaf	Infusion, herbal tea
	Mint	*Mentha* spp.	Leaf	Infusion, tea additive
	Peppermint	*Mentha piperita*	Leaf	Infusion, culinary essence
	Sage	*Salvia officinalis*	Leaf	Infusion, tincture
	Chaste tree	*Vitex agnus-castus*	Fruit	Fruit decoction, tincture
	Wild thyme	*Thymus serpyllum*	Leaf, flower	Infusion, herbal tea
Malvaceae	Marshmallow	*Althaea officinalis*	Root, flower	Infusion, root decoction
Moraceae	Fig	*Ficus carica*	Fruit	Fresh consumption, decoction
	Mulberry	*Morus alba*	Leaf, fruit	Leaf infusion, fruit consumption
Ranunculaceae	Black cohosh	*Actaea racemosa*	Root	Root infusion, extract
Rhamnaceae	Jujube	*Ziziphus jujuba*	Fruit	Fresh consumption, decoction
Rutaceae	Zanthoxylum	*Zanthoxylum bungeanum*	Fruit	Fruit decoction, culinary spice

Theaceae	Green tea	*Camellia sinensis*	Leaf	Infusion, daily tea
Violaceae	Violet	*Viola odorata*	Flower, leaf	Infusion, tincture
Zingiberaceae	Ginger	*Zingiber officinale*	Root	Decoction, culinary spice
Onagraceae	Evening primrose	*Oenothera biennis*	Seed, flower	Infusion, extracted oil
Berberidaceae	Barberry	*Berberis vulgaris*	Fruit, root bark	Decoction, syrup

Traditional Effects and Applications of Medicinal Plants in Women's Health

This section summarizes the traditional uses and reported effects of the medicinal plants listed above, with a focus on their applications in women's health. Emphasis is placed on their roles in alleviating menopausal symptoms such as hot flashes, sleep disturbances, mood fluctuations, and hormonal imbalances as well as in supporting overall female well-being, including reproductive and bone health.

Table 2: Indigenous Iranian Medicinal Plants with Traditional Effects on Women's Health

Scientific Name	Traditional Effects and Women's Health Applications	Ref.
Matricaria chamomilla	Sedative, anti-inflammatory; alleviates anxiety and menstrual pain	[23]
Achillea millefolium	Anti-inflammatory, diuretic; regulates menstrual bleeding	[24]
Valeriana officinalis	Sedative, hypnotic; reduces anxiety and insomnia	[25]
Lavandula angustifolia	Sedative, antiseptic; reduces anxiety and hot flashes	[26]
Melissa officinalis	Sedative, anxiolytic; improves mood and sleep	[27]
Berberis vulgaris	Liver and digestive tonic, anti-inflammatory; regulates menstrual cycle	[28]
Borago officinalis	Anti-inflammatory, sedative; reduces menstrual pain and fatigue	[29]
Descurainia sophia	Laxative, anti-inflammatory; reduces swelling and fluid retention	[30]
Trigonella foenum-graecum	Tonic, promotes lactation; alleviates hot flashes	[31]
Lepidium sativum	Tonic, digestive aid; improves menstrual bleeding and anemia	[32]
Crocus sativus	Sedative, mood enhancer; reduces anxiety and depression	[33]

Salvia officinalis	Antiseptic, memory enhancer; reduces night sweats and hot flashes	[34]
Actaea racemosa	Hormone regulator, sedative; alleviates hot flashes and menopausal symptoms	[35]
Vitex agnus-castus	Hormone regulator, anti-inflammatory; reduces PMS and premenstrual pain	[36]
Oenothera biennis	Anti-inflammatory, skin tonic; reduces breast pain and inflammation	[37]

The potential mechanisms of medicinal plants in menopause are presented in Table 3.

Table 3: Medicinal Plants and Their Mechanisms of Action in Alleviating Menopausal Symptoms

Scientific Name	Mechanism in Menopause
Foeniculum vulgare	Exhibits phytoestrogenic activity; alleviates hot flashes and mood swings
Matricaria chamomilla	Mild sedative and anti-inflammatory; improves sleep quality and reduces anxiety
Arctium lappa	Antioxidant; supports liver function and may alleviate fatigue and hormonal imbalance
Silybum marianum	Hepatoprotective; supports estrogen metabolism and reduces menopausal symptoms
Achillea millefolium	Mild estrogenic and anti-inflammatory effects; reduces vasomotor symptoms
Borago officinalis	Source of gamma-linolenic acid; may reduce hot flashes and improve mood
Descurainia sophia	Potential phytoestrogenic effects; alleviates mild vasomotor symptoms
Lepidium sativum	Antioxidant with mild hormonal modulatory effects
Humulus lupulus	Contains 8-prenylnaringenin, a potent phytoestrogen; reduces hot flashes
Valeriana officinalis	Sedative; improves sleep disturbances and reduces anxiety
Medicago sativa	Isoflavone-rich; exhibits phytoestrogenic activity and relieves vasomotor symptoms
Trigonella foenum-graecum	Phytoestrogenic; improves sexual function and reduces hot flashes
Glycyrrhiza glabra	Mild estrogenic effect; supports mood and reduces hot flashes
Trifolium pratense	Isoflavones; alleviates vasomotor symptoms and supports bone health
Glycine max	Isoflavones; reduces hot flashes and improves bone density
Crocus sativus	Mood-enhancing; mild antidepressant; improves sleep and reduces hot flashes

Cinnamomum verum	Antioxidant and metabolic support; alleviates metabolic disturbances
Ocimum sanctum	Adaptogenic; reduces stress and improves mood
Lavandula angustifolia	Anxiolytic and sedative; improves sleep and stress-related symptoms
Melissa officinalis	Mild sedative; enhances sleep quality and mood
Mentha spp.	Mild digestive and calming effects; may reduce headaches and fatigue
Mentha × piperita	Soothing; provides minor relief of hot flashes and digestive discomfort
Salvia officinalis	Estrogenic and antioxidant; reduces hot flashes and excessive sweating
Vitex agnus-castus	Modulates prolactin; supports mood stabilization and regulates menstrual irregularities
Thymus serpyllum	Mild phytoestrogenic and antioxidant effects
Althaea officinalis	Soothing and mildly anti-inflammatory; supports urinary and vaginal comfort
Ficus carica	Phytoestrogenic; may reduce vasomotor symptoms
Morus alba	Isoflavone content; supports bone and cardiovascular health
Actaea racemosa	Modulates serotonergic pathways; reduces hot flashes and mood disturbances
Ziziphus jujuba	Sedative and antioxidant; improves sleep quality and reduces anxiety
Zanthoxylum bungeanum	Mild phytoestrogenic and antioxidant properties
Camellia sinensis	Antioxidant and metabolic support; alleviates weight gain and mood disturbances
Viola odorata	Mild sedative and anti-inflammatory; improves sleep and reduces stress
Zingiber officinale	Anti-inflammatory; alleviates hot flashes and joint pain
Oenothera biennis	Rich in gamma-linolenic acid; reduces breast tenderness and vasomotor symptoms
Berberis vulgaris	Antioxidant; may improve mood and metabolic function

Discussion

The findings of this review collectively indicate that medicinal plants hold considerable therapeutic potential in managing the symptomology associated with menopause. However, the observed efficacy is highly dependent on critical variables, including the specific plant species, dosage, and pharmaceutical formulation employed. Clinical evidence, for instance, strongly suggests that *Foeniculum vulgare* can significantly improve the physical, psychological, and genitourinary dimensions of menopausal syndrome. This efficacy is particularly evident when standardized extracts are administered at clinically adequate or higher dosages [38,39]. These observations emphatically underscore the necessity of extract standardization

and dose optimization to ensure reliable and reproducible clinical outcomes.

Other clinical studies have reported beneficial effects of *Silybum marianum* and *Humulus lupulus* in reducing the frequency and severity of hot flashes and enhancing quality-of-life indicators [40,41]. Certain natural compounds, such as isoflavones, valerian, vitamin E, and ashwagandha, may contribute to improved sleep quality, although heterogeneity among studies and methodological limitations preclude definitive conclusions [42].

Preclinical evidence from animal models demonstrates that phytoestrogenic extracts from alfalfa, sage, fenugreek, and fig can modulate hormonal and histological changes in the ovaries and uterus, mitigating metabolic and inflammatory disturbances associated with menopause [43-46]. These findings suggest that, in addition to managing vasomotor symptoms, medicinal plants may exert beneficial effects on bone health, ovarian function, and metabolism. However, some plants, such as *Trifolium pratense*, do not show significant effects on hot flashes, and there is insufficient data on their long-term impact on breast and uterine tissues. The presence of active compounds such as coumarins in certain species also highlights the need for safety assessments and coagulation studies in future research [46].

Phytoestrogens, including soy isoflavones and *Crocus sativus*, may modulate mood and metabolic complications associated with menopause, though further clinical investigation is warranted [33,46]. Combination herbal formulations including tribulus, ginger, saffron, and cinnamon, or lavender extracts have demonstrated synergistic effects in reducing somatic symptoms and improving sexual function [47-49]. Nevertheless, certain combinations, such as fennel, sage, and black cumin, did not show similar sexual health benefits, emphasizing the importance of careful formulation design and evaluation of component interactions [50].

Systematic reviews and meta-analyses have confirmed the positive effects of sage and *Vitex agnus-castus* in reducing the frequency of hot flashes and other menopausal symptoms, although additional research is needed to assess long-term outcomes and effect magnitude [51,52]. Preclinical studies further indicate that fig and astragalin may enhance bone health and hormonal function by increasing estradiol and progesterone levels and reducing granulosa cell apoptosis [53-55].

Traditional plants such as *Actaea racemosa*, *Glycyrrhiza glabra*, *Ziziphus jujuba*, and *Viola odorata* have demonstrated sedative, antidepressant, and vaginal tissue-enhancing properties, suggesting therapeutic potential in managing psycho-physical symptoms and vaginal atrophy [56-58]. Overall, current evidence suggests that medicinal plants particularly those containing phytoestrogens and possessing anti-inflammatory and hormone-modulating properties may significantly improve the quality of life of menopausal women [59].

Nonetheless, study heterogeneity, variations in dosage and duration, diverse phytochemical compositions, and methodological limitations underscore the need for large-scale, randomized clinical trials with precise dose control and long-term follow-up. Such studies are essential for standardizing the use of medicinal plants and providing evidence-based, safe, and effective clinical recommendations.

Conclusion

A review of historical and contemporary evidence indicates that traditional Iranian medicinal plants, particularly those rich in phytoestrogenic and anti-inflammatory compounds, possess substantial potential to alleviate menopausal symptoms and enhance quality of life. Plants such as fennel, milk thistle, hops, fenugreek, and sage have demonstrated positive effects on hot flashes, sleep disturbances, mood fluctuations, and bone health. While some phytochemicals require further investigation, their long-term safety and efficacy should be evaluated through standardized clinical trials. Preclinical findings also suggest beneficial effects on ovarian and uterine health as well as metabolic function. Future research should focus on safety, efficacy, optimal dosing, and long-term outcomes to develop evidence-based clinical strategies for the management of menopausal symptoms.

Conflict of Interest

The authors have nothing to disclose.

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