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# Phytotherapy in sexual disorder: overview of the most important medicinal plants effective on sexual disorders

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## Abstract

Sexual health is the result of the interaction of vascular, nervous and hormonal factors and is influenced by individual factors, interpersonal relationships, traditions governing family and society, culture and religion; these sexual disorders are one of the factors influencing marital life and it faces a challenge. The present study is a review of the most important medicinal plants effective on sexual disorders. In this study, a review of the key words "sexual function, sexual dysfunction, plant medicine, herbal medicine, treatment, fertility" was searched from Embase, Magiran, SID, Web of Science, Scopus, PubMed and Google Scholar databases. For each herb, selected published clinical trial and review articles were used. Based on the obtained results, medicinal plants such as *Tribulus terrestris*, *Pomegranate*, *Red clover Lavandula angustifolia*, *Elaeagnus angustifolia*, *Pelargonium*, *Melissa officinalis*, *Quercus brantii*, *Ginkgo biloba*, *Trigonella foenum-graecum*, *Crocus Sativus*, *Zingiber officinalis*, *Ros Damascena*, *Celery seed*, *Date*, *Fennel* and *Carrot seed* in clinical trials and Animal models are used to treat sexual disorders, Medicinal plants can effectively treat sexual disorders. Since hormone therapy has many side effects, increasing awareness of how herbs work on androgen, estrogen, and progesterone hormones and the sexual function of people will give us the knowledge that in couples' sexual dysfunctions, there are more choices for correction without using to have hormones with the aim of increasing the quality of life.

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## Introduction

Marriage can be considered one of the most important and stable interpersonal relationships. However, depending on the quality of this relationship, marriage can have problematic consequences [1]. Marital satisfaction is one of the common concepts used to evaluate happiness and stability in marriage. In fact, what is more important than the marriage itself is the success of the marriage and the satisfaction of the couple [2]. Hawkins defined marital satisfaction as the feeling of satisfaction and happiness that a husband or wife experiences considering all aspects of their marriage; it is also one of the most important indicators of life satisfaction and family functioning [2]. One of the destructive factors of this satisfaction is sexual disorders, which cause emotional and psychological damage, decrease the quality and satisfaction of marriage, and increase marital exhaustion.

Therefore, any disorder that causes dissatisfaction with sex can lead to sexual dysfunction. Sexual dysfunction is defined as a person's inability to perform one or all phases of sexual activity, including desire, arousal, orgasm, erection/ejaculation for men, and lack of vaginal moisture for women [3]. They can cause sexual dysfunction as long as they affect any part of the sexual response cycle. There is limited information about the incidence and prevalence of female sexual dysfunction (FSD) in women. The incidence of FSD is estimated from 25.8% to 91.0% [4]. Decreased libido has the highest prevalence among lifetime sexual disorders for both men and women [3]. In a 5-year study of Finnish women aged 18-74 years, decreased libido was found in 45% of women: 20% among those younger than 25 years and 70-80% among those aged 55-74 years [4]. A 2006 survey by Hayes and his colleagues reported the prevalence of 16 problems in 64% of women, arousal problems in 31%, orgasm problems in 35%, and sexual pain in 26% [5]. Various researches also indicate the high prevalence of sexual disorders in Iranian women. The prevalence of sexual dysfunction in the general population of Iran is estimated at 35%, which is the highest prevalence among all sexual dysfunctions [3].

Endocrine disorders including breast and ovarian cancer, inflammatory diseases such as fibromyalgia and rheumatoid arthritis and neurological conditions such as multiple sclerosis, secondary (acquired) problems such as childbirth, hormonal changes, menopause, breastfeeding, trauma, psychological factors such as depression and anxiety, medications such as antidepressants, antipsychotics, and hormonal methods of birth control, lifestyle factors, such as unhealthy diet and weight, lack of exercise, smoking, and alcohol consumption, and psychosocial factors

such as age, education, income, and ethnicity can play a role in this [4, 6].

A recent large survey study in the United Kingdom, using proxy criteria for DSM-5 sexual disorders, found that while 22.8% of women reported one or more sexual problems including problematic orgasm, low sexual interest, and arousal or painful intercourse. There are now three criteria for diagnosing sexual disorders: symptoms must persist for at least 6 months, be experienced in all or nearly all (75% to 100%) sexual encounters or be persistent/recurrent, and clinically established [7]. In addition to women, men may also have sexual dysfunction. According to statistics, 52% of men aged 40 to 70 suffer from various degrees of sexual dysfunction caused by various biological and psychological factors. In addition, epidemiological evidence suggests that impotence affects 10 million American men [8]. Due to the sensitivity of the male reproductive system, it is easily affected by several risk factors such as chronic diseases, environmental pollutants, drug toxicity and unhealthy lifestyle, etc.

Maintaining normal sexual function depends on the coordination of several human systems, including the coordination of the nervous system, cardiovascular system, endocrine system, and reproductive system (9). A variety of factors such as psychological factors, surgery and trauma, vascular diseases, neurological factors, lifestyle changes, stressful living conditions, various chronic diseases, various environmental pollutants and drug side effects, etc.[9, 10]. The cause of FSD is multifactorial and has biological and psychological elements. In addition, many patients report concerns about different symptom clusters. Many women experience lack of sex or sexual problems in having an orgasm. When a woman is uncomfortable or unhappy with her feminine health, a woman has sexual dysfunction, which is called FSD. Diabetes, heart disease, cancer, arthritis, multiple sclerosis or alcohol abuse, high blood pressure medications, depression, oral contraceptives, endometriosis, cystitis, pelvic muscle problems, or chronic pelvic pain are causes the FSD [10]. Due to the multifactorial etiology of FSD, both pharmacological and non-pharmacological strategies have been used [11]. Although the sexual functions of men and women are affected by many aspects, currently there are almost no effective treatments in sexual medicine specifically for such disorders.

In the 1990s, sildenafil (brand name Viagra) was the first approved treatment for impotence to gain public attention. Chemical drugs, in addition to psychotherapy and cognitive therapy, are among the options for affected people. Despite the increase in access to effective modern medical treatments, the prevalence of side effects associated with these drugs

has led to the introduction of complementary medicine-based treatments as a desirable and acceptable option in the treatment of various diseases as well as improving sex life [12]. Currently, although there are many traditional medicines or herbal medicines that have been used by patients with sexual dysfunctions with varying degrees of success, herbal products are still used irregularly in many regions and countries, and a large proportion of medicinal plants are. They are traditionally used to solve sexual problems [9]. Iran is one of the first countries in using plants to treat diseases. The therapeutic effects of some plants have been investigated and proven by conducting scientific studies [13]. One of the methods of complementary medicine that can replace diets and medication is the use of medicinal plants. The use of medicinal plants, in addition to being economical, easy to access and low cost, have fewer side effects than chemical drugs.

The uses of medicinal plants provides a good reason to conduct new research in order to obtain information about the effect of medicinal plants in the treatment of problems and diseases [14]. Therefore, the present study is a review of the most important medicinal plants effective on sexual disorders.

## Methods

### Literature Search and Selection Criteria

In this review study, Embase, Magiran, SID, Web of Science, Scopus, PubMed and Google Scholar databases were searched using the keywords "sexual function, sexual dysfunction, plant medicine, herbal medicine, treatment, fertility". For each herb, selected published clinical trial and review articles were used. Low relevance or irrelevant articles, articles with irrelevant information, abstracts were the exclusion criteria

## Discussion

In the present study, 21 species of plants were found that are used in the treatment of sexual disorders. The plants that are used to treat these disorders and their effectiveness are given in table 1.

### *Ros Damascena*

It is especially useful for people who suffer from depression and have sexual disorders [30]. This plant has been especially effective in reducing dyspareunia and increasing orgasm and libido in depressed women [30]. In addition, the use of rose oil extract increases testosterone levels in men [31]. These functions are through the effect on sex hormones [30, 31].

### *Zingiber officinalis*

It has improved the sexual performance of depressed people, especially in the area of arousal and desire in

these patients [30]. In traditional medicine, it is used to improve sexual performance [30] in the study of Stein et al. (2018) which was conducted on 14 healthy men, 100 mg of the alcoholic extract of this plant improved erectile dysfunction and increased satisfaction in men, even middle-aged and elderly people [29]. Ginger has anti-inflammatory and antioxidant properties and reduces oxidative stress, thus helping to treat erectile dysfunction.

### *Crocus sativus*

As an important factor related to the effect on nitric oxide and opioid secretion system, saffron has an efficient role on erection [27, 28, 34, 35].

### *Trigonella foenum-graecum*

It is able to improve the overall score of sexual function in women [26, 36]. It has beneficial effects especially on the areas of arousal and sexual desire as well as dyspareunia [26, 37]. The results of a study showed that on 60 postmenopausal women, a group of 30 people received *Trigonella foenum-graecum* in the form of 5% vaginal cream for 8 weeks, there was a decrease in dyspareunia and an increase in libido in the *Trigonella foenum-graecum* group compared to placebo [26]. *Trigonella foenum-graecum* increases free testosterone, which is a justification for increasing sexual desire (in both sexes). The increase in testosterone is normal and is related to the decrease in SHBG levels [36-40].

### *Cinnamomum verum* (Cinnamon)

It is used to improve sexual performance, especially in the area of sexual desire and arousal [30, 41]. *Cinnamon* increases the humidity of the genital tract and as a result reduces dyspareunia and increases orgasm [30, 42].

### *Tribulus terrestris*

It has been used for sexual disorders since ancient times. Studies have shown that consumption of *Tribulus terrestris* can increase sperm production and testosterone levels [43, 44]. This plant improves sexual performance in women especially by promoting sexual desire (especially during menopause) [13, 36].

The study by D'Souza et al. (2016) on 36 postmenopausal women who were treated with this plant for 120 days with 750 mg per day and in the placebo group, in all sexual areas except for moisturizing the vaginal environment, this plant improved the sexual performance of women. It also increased testosterone levels [13]. has been used for sexual disorders since ancient times. Studies have shown that consumption of *Tribulus terrestris* can increase sperm production and testosterone levels [43-46].

| Plant   | Name                                    | Type of study  | The number of participants | Target group         | Drug dosage and drug form   | Duration of intervention     | Result  | Main compound                            |
|---|---|----------------|----------------------------|----------------------|---|------------------------------|---|--|
| Red Clover / Khayatan et al. (2019) [15]                  | Red clover                              | Clinical trial | 78                         | menopausal women     | A 5 gram applicator   | 8 weeks                      | Improvement in all areas  | Trifolin                                 |
| Pelargonium / Malkoti et al. (2016) [19]                  | Pelargonium                             | Clinical trial | 120                        | menopausal women     | Inhalation 3 times a day, placing 2-3 drops of solution on the skin of the forearm                                  | 6 weeks                      | Improving sexual performance in all areas except dyspareunia  | Pelargonium sidoides                     |
| Tribulus terrestris / D'Souza et al. (2016) [13]          | Tribulus terrestris                     | Clinical trial | 36                         | menopausal women     | 750 mg (250 mg tablet 3 times a day)  | 120 days                     | Improving all areas except for moisturizing the vaginal environment and increasing testosterone   | beta-D-Fructofuranosyl                   |
| Granatum Punica L / Mohammadzadeh et al. (2019) [14]      | Granatum Punica L                       | Clinical trial | 110                        | Non-menopausal women | Vaginal gel based on Carbopol with a concentration of 3%  | 8 weeks                      | Effective orgasm with increased frequency and increased sexual satisfaction   | Citric acid                              |
| Quercus / Larzadeh et al. (2016) [24]                     | Quercus                                 | Clinical trial | 120                        | women                | after the end of the period for 3 days and 5 minutes before sexual contact in the form of vaginal gel 2.5% oak bark | Not mentioned in the article | Increased satisfaction and orgasm, increased satisfaction from vaginal contraction during intercourse, increased vaginal slipperiness and relaxation after intercourse. | Suberin                                  |
| Fennel / Nikjo et al. (2018) [16]                         | Fennel                                  | Clinical trial | 60                         | menopausal women     | Vaginal cream 5 grams   | 8 weeks                      | Improving the overall score of sexual performance   | (E)-anethole                             |
| Date pollen / Yousefzadeh et al. (2017) [17]              | Date pollen                             | Clinical trial | 60                         | menopausal women     | 300 mg capsule daily  | 35 days                      | Improvement of orgasm   | dimethoxytoluene isomers                 |
| Elaeagnus angustifolia / Akbarzadeh et al. (2014) [18]    | Elaeagnus angustifolia                  | Clinical trial | 125                        | Non-menopausal women | 4.5 grams in 2 daily doses (capsules every 12 hours)  | 35 days                      | Improvement of orgasm   | 2-Furancarboxaldehyde, 5-(hydroxymethyl) |
| Melissa officinalis / Darvish et al. (2018) [20]          | Melissa officinalis                     | Clinical trial | 89                         | Women                | 500 mg capsule of aqueous extract twice a day   | 4 weeks                      | Improving all areas of sexual performance   | Caffeic acid                             |
| Ginseng/ Ghorbani et al. (2019) [22]                      | Ginseng                                 | Clinical trial | 62                         | menopausal women     | 500 mg twice a day  | 4weeks                       | Improving the quality and quantity of sexual performance  | Saponin                                  |
| Carrot seed/ Sadeghi et al. (2020) [23]                   | Carrot seed                             | Clinical trial | 68                         | women                | 500 mg capsule 3 times a day  | 12 weeks                     | Enhance sexual performance  | carotol                                  |
| <i>Drimia maritima</i> / Abbasi et al. (2019) [24]        | <i>Drimia maritima</i>                  | Clinical trial | 60                         | Non-menopausal women | 1-3 times a week and each time 5 minutes before intercourse 2-5 drops of oil locally                                | 4 weeks                      | Improving sexual performance in the areas of desire, moisture, orgasm and sexual arousal  | Campesterol                              |
| Ginkgo biloba/ Amiri et al. (2015) [25]                   | Ginkgo biloba                           | Clinical trial | 77                         | women                | 60 mg capsule, 120-240 mg daily   | 1 month                      | Enhance sexuality   | 6-hydroxykynurenic acid                  |
| Trigonella foenum graecum / Mazelzadeh et al. (2018) [26] | Trigonella foenum graecum               | Clinical trial | 60                         | menopausal women     | vaginal cream 5%  | 8 weeks                      | Reducing dyspareunia and increasing libido  | galactomannan                            |
| Crocus Sativus / Mohammadzadeh et al. (2015) [28]         | Crocus Sativus                          | Clinical trial | 34                         | Women                | 50 mg capsules daily  | 4 weeks                      | Enhance sexual performance  | Crocin                                   |
| Ginger/ Stein et al. (2018) [29]                          | Giner                                   | Pilot study    | 14                         | Men                  | 100 mg daily  | 30 days                      | Improvement of erectile dysfunction   | Zingiberene                              |
| Crocus Sativus / Kashani et al. (2015) [27]               | Crocus Sativus                          | Clinical trial | 50                         | Men                  | 1% gel before intercourse   | 4 weeks                      | Positive effect on erectile dysfunction   | Crocin                                   |
| Rosa damascene / Shabanian et al. (2018) [30]             | Rosa damascene and ginger, and cinnamon | Clinical trial | 140                        | Women                | -   | 2 month                      | Enhance sexual performance and level  | Carboxylic acid                          |
| Rosa damascene / Fernia et al                             | Rosa damascene                          | Clinical trial | 50                         | Men                  | drop (oil)  | 4-8                          | Enhance sexual performance and level  | Myrcene                                  |
| Celery seed / Hasami et al. (2021) [32]                   | Celery seed                             | Clinical trial | 80                         | men                  | 500 mg capsule 3 times a day  | 6 weeks                      | Enhance sexual performance  | Apigenin                                 |

Table 1: Medicinal plants used in sexual disorders

***Granatum Punica L.***

The results of a study that was conducted on 110 women of reproductive age, after 8 months of intervention with this pomegranate skin gel, it improved the sexual performance of women of reproductive age by enhancing the area of orgasm. The effects of tannin present in pomegranate skin with the effect of appropriate contraction in pelvic floor muscles have caused effective orgasm by increasing the frequency of orgasm and increased sexual satisfaction [14].

***Ginkgo biloba***

*Ginkgo biloba* extract actually has a significant effect on the two main activities of this plant in the body, including anti-aromatase and vasodilatation, on two important areas of sexual function, i.e. slippery (wetting) and orgasm, and leads to the improvement of sexual function [25, 47].

***Quercus brantii***

It is rich in tannin, which has astringent effects on smooth muscles [48]. In the study of Lorzadeh et al. (2016) which was conducted on *Quercus brantii* in Lorestan province, the astringent property of it was used and the samples were divided into four groups of 30 people and *Quercus brantii* extract with percentages of 1.5, 2 and 5. 2 was given to them, and the greatest effect was observed in the concentration of 2.5%. In women consuming *Quercus brantii* skin gel, satisfaction and orgasm, feeling of vaginal contraction during intercourse, feeling of wetness (slippery) of the vagina and other parameters including urinary incontinence, feeling of mass coming out of the vagina, feeling of not reaching sexual orgasm, the feeling of air release during intercourse and the feeling of relaxation after intercourse improved in the studied subjects after the intervention [24]. With this mechanism, pelvic floor muscle relaxation causes sagging or prolapse of pelvic organs, dysfunction of pelvic organs, painful intercourse or dyspareunia, back pain, sexual dysfunction and sexual dissatisfaction of couples [49].

***Lepidium meyenii* (Maca)**

The effect of *maca* root is to regulate sexual disorders. It is effective on fertility and sexual function in both men and women, as it is mentioned to improve libido and ejaculation, increase the quality, mobility and total number of sperms [50, 51].

***Foeniculum vulgare* (Fennel)**

It has phytoestrogenic effects and removes menstrual disorders such as premenstrual syndrome and is effective in treating many diseases [52-54]. *Fennel*, a

plant rich in phytoestrogens, is used in men [58]. In Iranian traditional medicine, fennel is used to treat erectile dysfunction [59]. In traditional Indian medicine, fennel is used for male sexual disorders [60]. This plant exerts its effect on increasing sperm count, testicle weight, and the balance of sex hormones [61].

***Cydonia oblonga***

*Cydonia oblonga* as a strong stimulant, the fruit strengthens the libido. Oral consumption of the hydroalcoholic extract of the plant leads to the improvement of the sexual behavior of the male animal. The results of Najjar et al.'s study (2015) showed that postmenopausal women were divided into two groups of 30 people and the effect of vaginal cream of 5 grams of this plant was compared with placebo. The results indicated the positive effect of this plant compared to placebo, which improved the overall score of sexual function in postmenopausal women based on the FSFI questionnaire [23].

***Panax quinquefolius* (Ginseng)**

The results of a study conducted on 62 postmenopausal women by receiving 500 mg of this *ginseng* plant twice a day for 28 days, showed the therapeutic effects of this plant on improving the quality of life and the quality and quantity of sexual performance [55]. Researchers have attributed the effect of this plant to the increase in the release of nitric oxide from the vessel wall following the consumption of ginseng, as well as its phytoestrogenic effects, which, by increasing estrogen receptors, has reduced FSH and thus reduced the symptoms of estrogen deficiency [55, 56]. The therapeutic effects of using this plant on the sexual function of men have also been reported [57].

***Anacyclus pyrethrum***

It is a sexual stimulant and can be used to improve sexual function and prevent sexual function disorders and increase sexual desire [62].

***Ansal* (*Drimia maritima*)**

In traditional medicine, *Ansal* has been used for men's sexual disorders, and in the book of Qarabadin Kabir Aghili Khorasani, *Ansal oil* has been very effective in treating erectile dysfunction and increasing libido [63,64].

The results of the study in Iran on 60 women using *Ansal oil* (the oil was prepared from the combination of 900 grams of *Ansal* onion in 3 kilograms of olive oil after heating) for 4 weeks, 1-3 times a week and 5 minutes each time Before intercourse, 2-3 drops of oil topically showed improvement in sexual performance in the areas of desire, moisture, orgasm and sexual excitement [21].

***Arctium lappa***

The results of the animal study show the therapeutic effect of the *Arctium lappa* plant in improving sexual performance and behaviors in a way that increases sexual ability, sexual desire and arousal [65]. Plant extracts and essential oils have important effects on body organs and disease treatment due to the presence of effective medicinal substances, plant bioactive and antioxidants [67-72].

#### ***Melissa officinalis***

The results of a study that was conducted on 89 women aged 18-50 with reduced libido, the treatment group received 500 mg of *Melissa officinalis* plant extract twice a day for 28 days, the results showed that the use of the plant compared to placebo, *Melissa officinalis* (blue extract) improved all areas of women's sexual performance [20].

#### ***Elaeagnus angustifolia***

In traditional medicine, it is known as a plant that can have a positive effect on sexual stimulation, especially in women [18]. The results of a clinical trial study that was conducted on 125 women with orgasmic disorders for 35 days showed significant positive effects of this herb compared to placebo on women's orgasmic disorders. Researchers reported that the consumption of this herb improves performance and sexual satisfaction [18].

#### ***Date Palm Pollen***

The results of animal studies have shown that date pollen increases testosterone, progesterone, and estradiol in adult male and female mice and as a result improves sexual performance [73, 74].

On the other hand, the presence of compounds such as saponin in date pollen causes the release of nitric oxide and, as a result, improves blood supply to the reproductive system [75]. According to the mentioned mechanisms, using the capsule of this plant in postmenopausal women has improved orgasm compared to the placebo group. The results of a recent study were obtained from the consumption of 300 mg of date pollen for 35 days on 60 postmenopausal women [17].

#### ***Trifolium pretense* (Red clover)**

The results of a study that was conducted on menopausal women, 76 women were studied in the study group, and in the treatment group, a 5-gram applicator was used daily for 8 weeks, and the results showed the therapeutic effects of red clover plant on sexual performance in women. However, in the systematic review study by Najafi et al. (2018), red clover had no effect on the sexual performance of postmenopausal women compared to placebo [15, 76].

#### ***Lavandula angustifolia***

The results of a study showed that the effect of aromatherapy with *Lavandula angustifolia* plant in postmenopausal women reduced anxiety and depression and also improved sexual performance compared to the placebo group [16, 77,78].

#### ***Pelargonium peltatum* (Pelargonium)**

The effects of *Pelargonium* aromatherapy on the sexual performance of postmenopausal women have been investigated. In the study of Malkuti et al., which was conducted on 120 postmenopausal women aged 45-55 years, the subjects were randomly assigned to two groups of 60 people consuming Aroma solution and Aroma placebo, which were 2-3 drops 3 times a day. The solution was used by inhalation on the skin of the forearm for 6 weeks. The results of the study showed that combined aromatherapy with *Lavandula*, *Red clover* and *pelargonium* in postmenopausal women led to the improvement of sexual function in all areas except dyspareunia [19].

#### ***Daucus carota* (Carrot seed)**

The results of a study showed that 500mg capsules of *carrot seeds* were used 3 times a day for 12 weeks, *carrot seeds* improved the overall sexual performance questionnaire in women [33]. The effects of carrot seeds are attributed to its testosterone-increasing and anti-depressant effects [79- 82].

#### ***Apium graveolens* (Celery seed)**

In traditional medicine, *celery seeds* have been used to treat sexual disorders and affect infertility [83]. In animal studies, the effect of this plant on increasing testosterone levels and its phytoestrogenic effects, which can lead to the improvement of sexual performance, have been reported [84-86]. In the study of Hasami et al., on women, the consumption of 500 mg capsules of this plant led to the improvement of their sexual performance [32]. The results showed that different species of medicinal plants reduce sexual function disorders with different underlying mechanisms.

In fact, a wide range of medicinal plant species with numerous phytochemical compounds such as *Fennel*, *Celery seed*, *Trigonella foenum-graecum*, *Tribulus terrestris*, *Ros Damascena*, *Carrot seed*, *Date pollen*, *Crocus Sativus*, *Ginseng*, *Lavender* and *Red clover* can be mentioned, which are used in the treatment Sexual disorders have been used. Considering the public acceptance and the fact that most people believe that herbal products do not have the side effects of chemical drugs and are in line with their values and lifestyle, it is very important to investigate the mechanisms proposed in the articles in the field of the effects of plants on sexual performance [13]. According to

research, medicinal substances in some plants are effective in increasing sexual power by affecting gonads, endocrine system and brain. Herbal medicines with antioxidant effects and anti-inflammatory properties may lead to the improvement of sexual performance of people, such as *Red clover*, *Crocus Sativus*, *ginseng* and *Zingiber officinalis* [12].

There are a number of plants that mimic the function of one or more hormones, hormone mimics have exactly the same physiological effect as the hormone they mimic. These substances do not necessarily need to bind to the receptor for their effect [15]. These substances are used clinically to target the function of testosterone, progesterone and estrogen without binding to their receptors [15].

Some plant species have compounds known as phytoestrogens that mimic the effects of estrogen hormones in the body [14]. Also, some studies have shown that phytoestrogens increase sexual desire and sexual arousal, and by increasing lubrication, it leads to a pleasurable orgasm [16] such as fennel and celery seeds. Herbal treatments that are effective in improving testosterone function not only help to improve sexual performance, but are also able to improve other important functions of testosterone, including increasing adaptation to stressful conditions in both sexes [15] such as *Tribulus terrestris*, *Trigonella foenum-graecum*, *Red clover* and *Carrot seeds*. Estrogen and testosterone act as key hormones in sexual function, and their decrease causes a decrease in sexual function [13]. An excessive increase in androgens puts these women at risk of insulin resistance, diabetes, dyslipidemia, cancers and cardiovascular diseases.

Herbal anti-androgens (plants inhibiting the activity of excess testosterone) are a class of plant compounds that often reduce tissue sensitivity to androgens or reduce androgenic activity by inhibiting the 5-alpha reductase enzyme, which reduces the conversion of testosterone to androgenic dihydrotestosterones [15]. In addition, at the same time, the reduction of androgens, which play a key role in arousal and sexual desire, affect sexual performance.

Therefore, in people who have a decrease in androgen levels, a plant like *Tribulus terrestris*, increases responses in the area of sexual desire and arousal and improves sexual performance [13]. The mechanism of some plants in improving sexual performance is to reduce anxiety and depression, among these plants we can mention lavender, Red clover and *Zingiber officinalis*. Studies have shown that these plants play a significant role in increasing libido by increasing norepinephrine [17]. The positive effect on the release of nitric oxide is another mechanism of some plants such as *Crocus Sativus* and ginseng in improving sexual

performance. Among the effects of nitric oxide on the cardiovascular system, which is a vasorelaxant factor, it increases blood supply and improves lubrication problems and erectile and ejaculation disorders [13]. Traditional medicine studies provide a unique perspective on the use of medicinal plants in different regions of the world to treat diseases. However, more extensive studies on the mechanism of action of these herbs, their safety and therapeutic effects are needed [84-87].

## Conclusion

Since hormone therapy has many side effects, increasing awareness of how herbs work on androgen, estrogen, and progesterone hormones and the sexual function of people will give us the knowledge that in couples' sexual dysfunctions, there are more choices for correction without using to have hormones with the aim of increasing the quality of life.

## Author Contributions

OAA, KDV, YQA, HAK, AH, BMH, HAH hey came up with an idea. HAH, NN, MP literature review. All authors contributed to the article and approved the submission version.

## Conflicts of interest

The authors declare no conflict of interest.

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