FEMALE SEXUAL FUNCTION

Clinical Study on the Use of Acupuncture for the Treatment of Female Sexual Dysfunction: A Pilot Study

Jun tan Zhang, MM,[1] Lin Ma, MD,[1] Xiang Gong, BN,[2] Sufang Luo, BN,[1] and Shuqin Zhao, MM[1]

ABSTRACT

Introduction: Female sexual dysfunction (FSD) seriously affects the quality of life of women. However, most women do not have access to effective treatment.

Aim: This study aimed to determine the feasibility and effectiveness of the use of acupuncture in FSD treatment based on existing clear acupuncture protocol and experience-supported face-to-face therapy.

Methods: A retrospective analysis was performed on 24 patients with FSD who received acupuncture from October 2018 to February 2022. The Chinese version of the female sexual function index , subjective sensation, sexual desire, sexual arousal, vaginal lubrication, orgasm, sexual satisfaction, and dyspareunia scores were compared before and after the treatment in all 24 patients.

Main Outcome Measure: A specific female sexual function index questionnaire was used to assess changes in female sexual function before and after the acupuncture treatment.

Results: In this study, the overall treatment improvement rate of FSD was 100%. The Chinese version of the female sexual function index total score, sexual desire score, sexual arousal score, vaginal lubrication score, orgasm score, sexual satisfaction score, and dyspareunia score during intercourse were significantly different before and after the treatment ($P < .05$). Consequently, participants reported high levels of satisfaction with acupuncture. This study indicates that acupuncture could be a new and effective technique for treating FSD. The main advantages of this study are its design and efficacy in treating FSD. To the best of our knowledge, this is the first study to evaluate the efficacy of acupuncture in the treatment of FSD using the female sexual function index scale from 6 dimensions. The second advantage is that the method used (ie, the nonpharmacological method) is simple, readily available, highly safe with few side effects, and relatively inexpensive with high patient satisfaction. However, limitations include small sample size and lack of further detailed grouping, pre and post control study of patients, blank control group, and pre and post control study of sex hormones.

Conclusion: Acupuncture can effectively treat FSD from all dimensions with high safety, good satisfaction, and definite curative effect, and thus, it is worthy of promotion and application. **Zhang JT, Ma L, Gong X, et al. Clinical Study on the Use of Acupuncture for the Treatment of Female Sexual Dysfunction: A Pilot Study. Sex Med 2022;10:100541.**

Key Words: Female Sexual Dysfunction; Female Sexual Function Index Scale; Acupuncture; Education; Age

INTRODUCTION

Female sexual dysfunction (FSD) refers to the disorder of one or more links of the female sexual response cycle or pain related to sexual intercourse, mainly including desire, arousal, lubrication, orgasm, satisfaction, and dyspareunia disorders, which seriously affects the quality of life of couples.[1,2] The incidence of FSD is 15.8%,[3] which is gradually increasing in recent years.

The treatment for FSD is currently under exploration. Drug therapy, whether it is a Western medicine, traditional Chinese

Received March 1, 2022. Accepted May 23, 2022.

[1]Maternal and Child Health Care Hospital of Zaozhuang, Zaozhuang, Shandong, China;

[2]Zaozhuang Municipal Hospital, Zaozhuang, Shandong, China

https://doi.org/10.1016/j.esxm.2022.100541

medicine (TCM), or psychological professional treatment method, has not been completely applied in clinical practice. Few studies on FSD treatment currently exist. TCM has the advantage of a wide adaptation range with low side effects. Therefore, exploring the effectiveness and feasibility of TCM in FSD treatment is of great clinical significance.

The internationally accepted female sexual function index (FSFI) was developed by Rosen in 2000, and it has good validity and reliability.[4] The Chinese version of the female sexual function index (CVFSFI) has been translated by Qingqing and Sun[5] according to FSFI and has also been verified to have satisfactory reliability and validity for the Chinese population.[6]

When we were using acupuncture to treat other diseases, we accidentally discovered that Professor Fang's method of acupuncture can effectively treat FSD. Therefore, we conducted a prospective noncontrolled observational study on 24 patients with FSD and compared their FSFI scores before and after treatment to determine the feasibility and effectiveness of acupuncture in the treatment of FSD.

This study aimed to evaluate the effectiveness of acupuncture in the treatment of FSD. Moreover, we aimed to test the following hypothesis: "Can acupuncture effectively treat most FSD at all dimensions with high safety and good satisfaction?"

MATERIALS AND METHODS

This observational prospective study was approved by the ethical board of Zaozhuang Maternal and Child Health Hospital (approval: zzfy2019-006 of September 10, 2019). From October 2018 to February 2022, 31 eligible patients with FSD who received acupuncture were gathered in the hospital, in which the current study was conducted. These patients were Chinese and Han and without special religious beliefs. Diagnosis was made in accordance with the *Diagnostic and Statistical Manual of FSD*-fifth edition (DSM-5). The symptoms of all patients lasted for at least 6 months and caused significant personal distress. All patients had a FSFI score of <26.55. All patients provided signed informed consents. Age, education level, BMI, disease course, onset time, and FSFI were all included in this study. The size of the study depends on the time required for data collection from eligible patients in our hospital. To address potential sources of bias, we have strict inclusion criteria for the enrolled FSD cases. We

Patients should have regular sexual partners, recent sexual activity, and certain cognitive abilities; they should be able to understand the content of the questionnaire and cooperate to complete the survey. Exclusion factors included patients with gynecological inflammation, organic lesions, and sexual dysfunction caused by the aforementioned diseases; patients taking drugs that affect or can affect sexual function (eg, antihypertensive drugs and sedatives); cases caused by male factors; those with a history of trauma and surgery that may affect sexual life; those with severe urinary incontinence, fecal incontinence, or pelvic organ prolapse; those not cooperating with investigators; and those with lactation. Consequently, 7 cases were excluded, including 4 cases complicated with severe male sexual dysfunction, 2 cases unable to mate, and 1 case during lactation.

Twenty-four patients answered the following question in a face-to-face interview: "What bothers you sexually?" All 24 patients had "dyspareunia" and "desire" as the main cause of distress. The main motivation for participants' treatment is their subjectively perceived "dyspareunia" and "desire." These subjective sensations had a serious effect on their marriage and may lead to infertility. FSD was confirmed by the DSM-5 criteria. After confirming the FSD diagnosis, a CVFSFI score was assigned. The duration of patient treatment was determined by whether the patient had improved subjective sensation, increased FSFI scores, and self-requirements. This study measured outcomes by asking patients face-to-face if their sexual pain had been resolved and by having them complete the FSFI score questionnaire. Increased FSFI scores and subjective sensation improvements were our strict definition of treatment effect.

CVFSFI includes 6 dimensions as follows: desire, arousal, lubrication, orgasm, satisfaction, and dyspareunia. Each dimension is composed of 2−4 questions, with 19 options for the questions, a full score of 6 points for each item, and a total score of 36 points. The higher the total FSFI score, the better the sexual function. A FSFI score of <26.55 indicated a risk of sexual dysfunction. The score of each dimension was as follows: dimension 1 (questions 1−2) with a score of <4.28 indicated desire; dimension 2 (questions 3−6) with a score of <5.08 indicated arousal; dimension 3 (questions 7−10) with a score of <5.45 indicated lubrication; dimension 4 (questions 11−13) with a score of <5.05 indicated orgasm; dimension 5 (questions 14−16) with a score of <5.04 indicated satisfaction; dimension 6 (questions 17−19) with a score of <5.51 indicated dyspareunia.[5−9]

Needles

The disposable sterile acupuncture needles (specifications: 0.20 × 25 mm, 0.20 × 50 mm, and 0.30 × 75 mm; the production numbers are 20092621, 180628, and 212180810) were from Beijing Zhongyan Taihe Medical Instrument Co., LTD (Beijing, China). Moreover, the electroacupuncture instrument (Da Jia pulse acupuncture electrotherapy instrument) was from Shantou Medical Equipment Factory Co., LTD. (Shantou, China). The groups were classified into the front and back groups following the front and back acupuncture. The front and back groups were alternately used once every other day for 2−3 times a week. The needle was left for 30 minutes. The back group was connected with electroacupuncture and adjusted to the density wave tolerated by the patient.

The specific program of acupuncture is as follows: in the positive group, Shenting, Benshen (double), and Baihui (the backward flat acupuncture was 0.5−1 inches); Zhongwan, Tianshu, Daimai, Ovary, Huangshu, Guan Yuan, Dahe, and Zusanli, except for Zhongwan and Guan Yuan (acupuncture was

performed at bilateral acupoints, with the direct puncture of 1−1.5 inches); and Sanyinjiao, Taixi, and Taichong (0.5−1 inches of direct acupuncture and acupuncture on both sides of the acupoints), and in the back group: Shenshu (acupuncture 1−1.5 inches on both acupoints) and secondary liao (oblique to the median line of the second sacral foramen of 2−2.5 inches and acupuncture on both sides of the acupoints).

Statistical Analyses

Mean and standard deviation of FSFI total and individual domain scores before and after the treatment were calculated using a *t*-test. The *t*-test was used to compare the CVFSFI, sexual desire, sexual arousal, vaginal lubrication, orgasm, sexual satisfaction, and pain during intercourse scores before and after treatment. *P* values of $< .05$ were considered statistically significant. All statistical analyses were conducted using SPSS Statistics 26.0 for Windows, which is a tool introduced by International Business Machines Corporation for its statistical data analysis.

RESULTS

Of the 24 participants, all women in the study scored below the cutoff limit for desire, arousal, and dyspareunia. In 23 participants, the lubrication domain FSFI score was below the cutoff score; in 22, the orgasm domain FSFI score was below the cutoff score; and in 22, the satisfaction domain FSFI score was below the cutoff score. Of the 24 patients, 14 (58.33%), 6 (25.0%), 2 (8.33%), and 2 (8.33%) were found to have decreased ovarian reserve, premature ovarian failure, polycystic ovary syndrome, and normal ovarian function, respectively. None of the participants were on any other medications or treatments for the study duration. All participants had relevant cultural education experience and completed university education (13 participants), high school education (7 participants), junior high school education (3 participants), or primary school education (1 participant). The patients were 28−45 years old with a body mass index (BMI) ranging from 18.06 to 34.62 kg/m^2. The disease course ranged from 6 months to 5 years, and the onset treatment time was from 1 week to 3 months.

The comparison of sexual function before and after treatment showed that all patients with FSD had improvements in subjective sensation and FSFI score. After the treatment, increased desire and reduced dyspareunia were the most obvious subjective sensation improvements. The CVFSFI, desire, arousal, lubrication, orgasm, satisfaction, and dissatisfaction scores had significant differences ($P = .00$ [*P*-value is close to zero as well as retains 2 decimal places]). They showed increased FSFI scores at the mid-treatment stage (Table 1).

Women aged 30−40 years were more satisfied with their improved FSFI scores than women in other age groups. The patients' age was positively associated with the onset time. The onset time had a positive correlation with education background and a negative correlation with mean improvement FSFI score. Furthermore, there was no obvious correlation between BMI and onset time (Table 2, Table 3).

In general, all the FSD patients who received acupuncture treatment improved in subjective sensation and FSFI score during the treatment. Table 1 shows the total FSFI score and the mean of different dimensions before and after treatment. Moreover, Table 1 shows the total FSFI improved score and improvement rate of scores in different dimensions (pre- and post-treatment). Specifically, the total effective rate of FSD acupuncture treatment was 100%, and the improvement rate of different dimensions was in the following order: lubrication = arousal > desire = dyspareunia > satisfaction = orgasm; however, no significant difference was noted among these. A significant increase in sexual function scores was found between 1 week and 3 months after acupuncture treatment. Table 2 and Table 3 show that age is positively correlated with the effective time of improving FSFI score, educational background is negatively correlated with the onset time of improving FSFI score, and BMI is not substantially correlated with the onset time of improving FSFI score. However, these findings should be interpreted with caution owing to the small sample size. Tables 2 and 3's data were not statistically analyzed due to the small sample size, and their results may

Table 1. Sexual function before and after treatment

FSFI domain	Mean before treatment (SD) n = 24	Mean after treatment (SD) n = 24	Mean improve (SD) n = 24	Improved % (n)	Improved to normal % (n)
Desire	2.38 (0.56)	3.68 (0.66)*	1.30	95.83 (23/24)	8.33 (2/24)
Arousal	2.71 (0.72)	3.95 (0.67)*	1.24	100 (24/24)	12.5 (3/24)
Lubrication	3.50 (0.82)	4.93 (0.50)*	1.43	100 (23/23)	4.34 (1/23)
Orgasm	3.23 (0.95)	4.41 (0.77)*	1.18	81.81 (18/22)	18.18 (4/22)
Satisfaction	3.5 (1.06)	4.75 (0.81)*	1.25	81.81 (18/22)	27.27 (6/22)
Dyspareunia	3.20 (1.10)	4.58 (0.86)*	1.38	95.83 (23/24)	16.66 (4/24)
Total score	18.52 (3.79)	26.32 (2.7)*	7.8	100.00 (24/24)	45.83 (11/24)

FSFI = Female Sexual Function Index; SD, standard deviation.
Data are presented as mean (SD) or % (n/n).
Mean FSFI scores pre- and post-treatment were compared using *t*-test.
*$P = .00$

Table 2. Education and Sexual function before and after treatment

Education	FSFI mean before	FSFI mean after	Mean improved	Onset time (wk)	Disease course (y)	BMI (kg/m^2)	Age (y)
Junior high and primary school (n = 4)	16.27	26.65	10.37	2.75	2.05	27.03	35.5
High school (n = 7)	18.8	27.31	8.51	4.14	1.74	24.49	36.42
University (n = 13)	19.07	25.68	6.60	5.76	1.05	22.46	34.76

BMI = body mass index; FSFI = female sexual function index.

Table 3. Age and Sexual function before and after treatment

Age (y)	FSFI mean before	FSFI mean after	Mean improved	Onset time (wk)	Disease course (y)	BMI (kg/m^2)
20–30 (n = 6)	19.41	26.6	7.18	3.16	0.85	23.24
31–35 (n = 6)	16.85	25.5	8.65	4.50	1.06	22.38
36–40 (n = 8)	19.41	27.17	7.76	4.12	2.20	25.96
≥41 (n = 4)	17.95	25.42	7.47	8.00	1.25	22.55

BMI = body mass index; FSFI = female sexual function index.

reflect correlated trends, which could be the aim of the future hypothesis study.

DISCUSSION

The physiological and pathological mechanisms underlying FSD are complex (eg, endocrine dysfunction, social–psychological factors, drug factors, and gynecological diseases) and will affect female sexual function. In general, FSD-influencing factors can be roughly divided into 3 categories: biological factors (eg, age, hormone level, and history of pelvic surgery), psychological factors (eg, emotions and marital relationship), and social factors (eg, education level, economic income level, religious belief, traditional culture, and ideas).[10–14] Current treatments include drug and nondrug therapies. Drug therapy includes androgen, estrogen, phosphodiesterase inhibitors, psychotropic drugs, Chinese herbal medicine, and so on. Nondrug treatments include counseling for couples, pelvic physical therapy, urinary incontinence treatment, psychotherapy, lifestyle changes, improved body image, lubricants, humectants, and negative clitoral pressure attraction.[15–18] For example, mindfulness is shown to be effective in individual treatment. However, the majority of available treatments are ineffective and unsatisfactory.

The normal secretion of hormones in the female body is important to maintain female sexual function; therefore, current treatment mostly relies on dopamine receptor agonists, sex hormones, or antidepressants. Androgen is the primary hormone affecting female sexual desire and motivation and plays an important role in female health.[19] Female desire is related to the fluctuation in total testosterone levels; the greater the fluctuation range, the lower the sexual desire.[20] Moreover, estrogen can directly affect FSD in multiple dimensions.[21–23] Abnormal estrogen levels can lead to dyspareunia and orgasmic dysfunction. Reduced estrogen can negatively affect FSD in central consciousness and indirectly lead to low desire, arousal, lubrication, orgasm.[24,25] Sex hormones can enhance the sexual stimulation response by increasing dopamine release, which can enhance desire, arousal, and the desire to continue the sexual activity after the onset of sexual stimulation in rats.[26,27]

Through unique dialectical thinking, TCM can analyze the characteristics and etiology of diseases by focusing on women's feelings. It can thereby relieve psychological and mental pressure and achieve therapeutic effects through body conditioning. Acupuncture can activate the human dopamine system, regulate the endocrine function of the brain–pituitary–ovary, promote the normal release of hormone levels, inhibit the hyperactive hypothalamic–pituitary–adrenal axis,[28–30] treat depression, and regulate psychological factors.[31] Relevant studies have shown that acupuncture can enhance ovarian function and delay its decline; increase E2 levels; and improve the function of the hypothalamic–pituitary–gonad axis.[32,33] The mechanism may be related to hormone secretion regulation by the neuroendocrine system[34,35] and signal transduction pathway regulation by cytokines and their receptors.[36]

In this study, the method of acupuncture was created by Professor Fang Yi gong of The Chinese Academy of Chinese Medical Sciences. As a treatment principle, tonifying kidney essence, regulating chong ren, and relieving mental stress can adjust the hypothalamic–pituitary–adrenal and hypothalamus–pituitary–gonad axes, promote normal hormone release, and relieve anxiety.[37,38] Existing studies show that the treatment of the Guanyuan acupoint can have a protective effect on the uterus.[39] Sanyinjiao acupoint has a better function in promoting blood circulation and has a better curative effect in the application of gynecological diseases.[40] Shenting, Benshen, and Baihui are the main acupoints (located in the head) that have a direct regulating effect on mental stress due to the local therapeutic effect of the acupoint. Acupuncture at the Taichong acupoint can treat depression by inhibiting the hyperactive hypothalamic–pituitary

−adrenal axis.[30] The secondary liao acupoint is located in the second posterior sacral foramina, and sacral nerves were noted deep inside, whereas the female reproductive organs and their surrounding tissues are mainly innervated by L1−3 and S2−4. Therefore, the acupuncture of the secondary liao acupoint has a certain therapeutic effect on pelvic disease. Ovary acupoint is a strange point outside the meridian channels, which has a unique therapeutic effect on the ovary. Dyspareunia is a type of FSD and its etiology mainly comprises mental factors and vaginal dryness. The method of this acupuncture can effectively increase vaginal discharge. This method can also treat anxiety and depression as well as ease vaginal convulsion as a result of intensity, thereby forming effective treatment. Considering these factors, from the perspective of TCM, the method of this acupuncture is believed to be enough for tonifying kidney essence, regulating chong ren, and stabilizing mood. From the perspective of modern medicine, it can improve the function of the hypothalamic−pituitary−adrenal and hypothalamus−pituitary−gonad axes, effectively regulate endocrine and depression, and increase vaginal secretions to achieve the purpose of treating FSD diseases.

This treatment of acupuncture for FSD is extremely effective. A positive and modest improvement was observed in all measures as follows: different measures improved to normal in 1−6 of the participants; desire in 2 of 24, lubrication in 3 of 24, orgasm in 4 of 22, dyspareunia in 4 of 24, lubrication in 1 of 23, and satisfaction in 6 of 22. However, relatively few participants showed improvement to "normal" FSFI domain scores, indicating that the treatment is likely to help but not completely resolve these issues. Additionally, all participants with FSD showed a significant improvement, which could be due to the small sample size. With the increase in the sample size, the effective improvement rate may decrease. This study found that patients with higher education, older age, and longer disease course required prolonged treatment. Furthermore, BMI was not strongly correlated with duration of treatment and extent of improvement. This may be related to the mental work that most highly educated patients are engaged in and the greater psychological pressure. The improvement rate of different dimensions was in the following order: lubrication = arousal > desire = dyspareunia > satisfaction = orgasm. However, no significant difference was noted among these dimensions. The onset treatment time is also different. Some patients can significantly improve after 2-time treatments (1 week), whereas some patients with older age and longer disease course even need 3 months of treatment. All the curative effects of acupuncture should be related to the improvement in the hypothalamic−pituitary−gonad and hypothalamic−pituitary−adrenal axes as well as anxiety of patients. Thus, acupuncture treatment has been proven to have little side effects and has good clinical effects.

However, there are some limitations to our study, including the absence of a control group, which is difficult to establish in complex interventions, such as TCM or mindfulness therapy. Difficulties in observational studies of complex interventions have not been adequately addressed. According to a study, the placebo effect accounted for 67.7% of treatment success rates on average.[41] Hence, we could observe the effects far beyond the placebo. Studies in the control group as well as insufficient hormonal controlled trials before and after treatment can help to clarify this issue, which can be assessed in future controlled studies. Due to strict inclusion and exclusion criteria for selecting patients, a relatively small sample size was observed in a single-center setting, and cases of 24 patients were prospectively included in our study. We hypothesize that the partially excluded findings can be applied to this study as well. This should be demonstrated in future studies using broader inclusion criteria. Another limitation of the study is that it assessed gender-related distress and improvement only via face-to-face interviews but did not include a relevant assessment scale for changes in pain.

CONCLUSIONS

This preliminary study results showed that the use of acupuncture can effectively improve FSD and can be used as the preferred or even the first choice for patients for FSD treatment. The use of acupuncture can be effective in FSD treatment with clear clinical significance, definite curative effect, and good safety, which is worth promoting. However, this study needs to be further studied with large sample size and detailed grouping.

Corresponding Author: Juntan Zhang, MM, Zaozhuang Maternal and Child Health Care Hospital, 88 meters east of the intersection of Fuyuan 3rd Road and Xiamen Road, Xuecheng District, Zaozhuang, Shandong, China. Tel: 086-1786-190-6299; Fax: 0632-369-9005; E-mail: haohaoxuexi318@163.com

Conflict of Interest: The authors report no conflicts of interest.

Funding: This study was supported by Shandong Provincial Health Commission and Zaozhuang Municipal Health Commission [Shandong Province 2019-2020 Traditional Chinese Medicine Science and Technology Development Plan Project 2019-0656][2020 Zaozhuang Traditional Chinese Medicine Science and Technology Development Plan Project 2020ZYY006].

STATEMENT OF AUTHORSHIP

Original: Jun tan Zhang and Lin Ma conceived and performed experiments, wrote the manuscript, and secured funding. Jun tan Zhang, Lin Ma, Xiang Gong, Sufang Luo performed experiments. Lin Ma and Shuqin Zhao provided expertise and feedback. Revised: Conceptualization, Jun tan Zhang and Lin Ma; Methodology, Jun tan Zhang and Lin Ma; Investigation, Jun tan Zhang, Lin Ma, Xiang Gong, Sufang Luo; Writing-Original Draft, Jun tan Zhang and Lin Ma; Writing- Review & Editing, Jun tan Zhang and Lin Ma; Funding Acquisition, Jun tan Zhang and Lin Ma; Resources, Jun tan Zhang and Lin Ma; Supervision, Shuqin Zhao, Jun tan Zhang and Lin Ma.

REFERENCES

1. Hoyer J, Velten J. Sexual dysfunction: Changing conceptions and criteria of classification. **Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz 2017;60:979–986.**
2. Khosla R, Say L, Temmerman M. Sexual health, human rights, and law. **Lancet 2015;386:725–726.**
3. Burri A, Spector T. Recent and lifelong sexual dysfunction in a famale UK population sample: Prevalence and risk factors. **J Sex Med 2011;8:2420–2430.**
4. Rosen R, Brown C, Heiman J, et al. The female sexual function index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. **J Sex Marital Ther 2000;26:191–208.**
5. Sun X, Li C, Jin L, et al. Development and validation of Chinese version of female sexual function index in a Chinese population a pilot study. **J Sex Med 2011;8:1101–1111.**
6. Liu H, Yu J, Chen Y, et al. Sexual function in cervical cancerpatients: Psychometric properties and performance of a Chinese version of the female sexual function index. **Eur J Oncol Nurs 2016;20:24–30.**
7. Hevesi K, Meszaros V, Kovi Z, et al. Different characteristics of the female sexual function index in a sample of sexually active and inactive women[J]. **J Sex Med 2017;14:1133–1141.**
8. Chedraui P, Perez-Lopez FR. Assessing sexual problems in women at midlife using the short version of the female sexual function index. **Maturitas 2015;82:299–303.**
9. Cruz EF, Nina VJDS, Figuerêdo ED. Climacteric symptoms and sexual dysfunction: Association between the Blatt-Kupperman Index and the Female Sexual Function Index. **Rev Bras Ginecol Obstet 2017;39:66–71.**
10. Li HJ. Female sexual dysfunction: An epidemiological study. **Chinese J Family Planning 2014;22:352–355.**
11. Sreelakshmy K, Velayudhan R, Kuriakose D, et al. Sexual dysfunction in females with depression: A cross-sectional study. **Trends in Psychiatry and Psychother 2017;39:106–109.**
12. Jamali S, Javadpour S. The impact of intimate male partner violence on women's sexual function: A study in Iran. **J Clin Diagn Res 2016;10:QC29–QC33.**
13. Yang YQ, Xu Q, Tong WJ, et al. Sexual dysfunction among Chinese nurses: Prevalence and predictors. **Biomed Environ Sci 2017;30:229–234.**
14. Lianjun P, Aixia Z, Zhong W, et al. Risk factors for low sexual function among urban Chinese women, a hospital- based investigation. **J Sex Med 2011;8:2299–2304.**
15. Kegel AH. Progressive resistance exercise in the functional restoration of the perineal muscles. **Am J Obstet Gynecol 1948;56:238–248.**
16. Johannessen HH, Wibe A, Stordahl A, et al. Do pelvic floor muscle exercises reduce postpartum anal incontinence: A randomised controlled trial. **BJOG 2017;124:686–694.**
17. Brotto LA, Basson R, Luria M. A mindfulness-based group psychoeducational intervention targeting sexual arousal disorder in women. **J Sex Med 2008;5:1646–1659.**
18. Brotto LA, Seal BN, Rellini A. Pilot study of a brief cognitive behavioral versus mindfulness-based intervention for women with sexual distress and a history of childhood sexual abuse. **J Sex Marital Ther 2012;38:1–27.**
19. Brzozowska M, Lewiński A. Changes of androgens levels in menopausal women. **Przeglad Menopauzalny 2020;19:151–154.**
20. Gracia CR, Sammel MD, Freeman EW, et al. Predictors of decreased libido in women during the late reproductive years. **Menopause 2018;25:1238–1243.**
21. Baber RJ, Panay N, Fenton A, et al. 2016 IMS Recommendations on women's midlife health and menopause hormone therapy. **Climacteric 2016;19:109–150.**
22. Waetjen LE, Crawford SL, Chang PY, et al. Factors associated with developing vaginal dryness symptoms in women transitioning through menopause: A longitudinal study. **Menopause (New York, NY) 2018;25:1094–1104.**
23. Thomas HN, Neal-Perry GS, Hess RR. Female sexual function at midlife and beyond. **Obstet Gynecol Clin N Am 2018;45:709–722.**
24. Ju R, Ruan X, Xu X, et al. Sexual dysfunction in Chinese women at different reproductive stages and the positive effect of hormone replacement therapy in the early postmenopause. **Eur J Contracept Reprod Health Care 2021;26:246–254.**
25. Dennerstein L, Randolph J, Taffe J, et al. Hormones, mood, sexuality, and the menopausal transition. **Fertil Steril 2002;77(suppl. 4):S42–S48.**
26. Sato S, Braham CS, Putnam SK, et al. Neuronal nitric oxide synthase and gonadal steroid interaction in the MPOA of male rats: Co-localization and testosterone-induced restoration of copulation and NOS-immunoreactivity. **Brain Res 2005;1043:205–213.**
27. Hull EM, Lorrain DS, Du J, et al. Hormone-neurotransmitter interactions in the control of sexual behavior. **Behav Brain Res 1999;105:105–116.**
28. Wang WM, Wang Y, Zhao J. Current situation and thoughts on clinical research of acupuncture and moxibustion for prevention and treatment of primary ovarian dysfunction. **Global Traditional Chinese Med 2017;10:1408–1411.**
29. Wang SJ. Preliminary discussion of the relationship between acupuncture effect and cellular information conduction. **Chinese J Basic Med Traditional Chinese Med 2004;10:31–33.**
30. Huang XY. Application of acupuncture in assisted reproduction. **Chinese J Family Planning 2012;20:714–716.**
31. Wang SJ, Zhang JJ, Yang HY, et al. Effects of acupuncture at Baihui and Taichong points on hypothalamic-pituitary-adrenal axis in chronic stress and depression model rats. **Acta Chinese Med Pharmacol 2006;34:52.**
32. Sun YX, Qi C. Research progress of acupuncture in improving ovarian function. **Electronic J Clin Med Literature 2015;2:2906.**
33. Zhang XH, Deng LL. Clinical observation of acupuncture combined with medicine in the treatment of ovarian reserve function decline. **New Chinese Med 2016;48:173–175.**

34. Manni L, Cajander S, Lundeberg T, et al. Effect of exercise on ovarian morphology and expression of nerve growth factor and alpha (1). **J Neuroendocrinol 2005;17:846–858.**
35. Manni L, Holmäng A, Cajander S, et al. Effect of anti-NGF on ovarian expression of alpha1-and Eta2-adrenoceptors, TrkA, p75NTR, and tyrosine hydroxylase in rats with steroid-induced polycystic ovaries. **Am J Physiol 2006;290:826–835.**
36. Mo J, Li XH, He YW. Effect of going against acupuncture and moxibustion at guan-yuan (CV-4) point on body weight growth rate, leptin level in hypothalamic and ovarian of 12 months old natural climacteric rats. **Tianjin J Traditional Chinese Med 2010;27:383–385.**
37. Li XT, Xu HF, Liu BY, et al. 'Tiaojing Cuyun' acupuncture therapy in diminished ovarian reserve: A randomized controlled trial. **China J Traditional Chinese Med Pharmacy 2018; 33:1736–1739.**
38. Zhang JT, Liu SL, Gao XN, et al. Clinical study on improving ovarian reserve function with thirteen injections of regulating menstruation and promoting Pregnancy in assisted reproductive Technology. **Chinese J Human Sex 2021; 30:96–99.**
39. Li X, Song X, Zhang L, et al. Changes of HSP70, HSP70 mRNA, SOD, NOS in uterus of natural climacteric rats and the intervention of preventive moxibustion on Guanyuan point. **China J Traditional Chinese Med Pharmacy 2010;25:46–49.**
40. Lu CD, Zhang YC, Jia HL. Analysis of ancient literature on indications and compatibility of Sanyinjiao points. **J Shandong Univ Traditional Chinese Med 2013;37:410–412.**
41. Weinberger JM, Houman J, Caron AT, et al. Female sexual dysfunction and the placebo effect: A meta-analysis. **Obstet Gynecol 2018;132:453–458.**