

EFFECT OF THE INFORMATION SUPPORT METHOD COMBINED WITH YOGA EXERCISE ON THE DEPRESSION, ANXIETY, AND SLEEP QUALITY OF MENOPAUSAL WOMEN

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SUMMARY

Background: Menopause is a special stage in a woman's life, but no safe clinical treatment exists against menopausal symptoms. To analyze the effect of the information support method combined with yoga exercise on the depression, anxiety, and sleep quality of menopausal women.

Subjects and methods: From June 2019 to December 2019, menopausal women who were newly recruited in three yoga clubs in three cities in East China were selected as the participants by convenience sampling. A total of 52 women were in the experiment group and 54 were in the control group. In 24 weeks, the experiment group engaged in yoga exercise for 60 minutes each time, three times a week. They group was given professional positive psychological information support at the same time. The Kupperman Menopausal Symptom Distress Scale, Self-rating Depression Scale (SDS), Self-rating Anxiety Scale (SAS), and Pittsburgh Sleep Quality Index (PSQI) were used before the experiment, three months into the experiment, and six months into the experiment to monitor the intervention effect on the participants.

Results: After the intervention, the symptoms of distress among menopausal women in the experiment group and the Kupperman score of the experiment group reduced significantly. Repeated measures of analysis of variance were conducted in the two groups ($P < 0.001$). After the intervention, the depression score of the experiment group decreased significantly. A significant difference was found between the two groups in repeated measures analysis of variance in the SDS score ($P < 0.001$). After the intervention, the anxiety score of the experiment group reduced significantly, and repeated measures of analysis of variance in the SAS score were conducted in the two groups ($P < 0.001$). After the intervention, the sleep quality of the experiment group improved, and repeated measures of analysis of variance in sleep quality were conducted in the two groups ($P < 0.001$).

Conclusions: The information support method combined with yoga exercise can alleviate the depression and anxiety of menopausal women, improve their sleep quality, and reduce their symptoms of menopausal distress.

Key words: information support method - menopausal women - depression - anxiety - sleep quality

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INTRODUCTION

Menopause is a special stage in a woman's life. Menopause refers to a gradual physiological transition period from normal menstruation to menstrual disorders and final menolipsis (Azarbal et al. 2016). The entire period lasts approximately 20 years and is a natural part of a woman's life. Menopause mostly occurs between the ages of 45 and 55, and its first manifestation is a change in menstrual disorders, a stage in which women transition from the reproductive to infertile ages. The major cause of menopause is the gradual decline in hormone levels from the gradual recession in ovarian physiological functions. The symptoms often comprise interactive syndromes such as autonomic neurological disorders and metabolic disorders (Lee et al. 2016). The main manifestations of female menopause include insomnia, dreaminess, dizziness, fever, palpitation, sweating, fatigue, depression, anxiety, fear, nervousness, sensitivity, suspiciousness, and irritability, collectively known as menopausal syndrome (Haas et al. 2016). A woman may not have all the symptoms above. Instead,

the degree and duration of the symptoms are determined by the individual's physical condition and environment. Menopause often represents the passing of reproductive age and women's gradual transition from middle age to old age. A series of physical and psychological problems occur during the transition (Zhao et al. 2018). Al-Mehaisen and Al-kuran (2018) found in a cross-sectional survey on more than 30,000 menopausal women that menopause results in common effects on women's quality of life and that more than 90% of menopausal women generally report a decline in their quality of life. In addition to certain basic physical menopausal symptoms such as hot flashes, sweating, and headache (Hildreth et al. 2018), certain emotional symptoms, triggered by physical and mental factors together, appear in sequence due to dramatic changes in hormone levels. One of the problems faced by menopausal women is emotional disorders. A meta-analysis on the prevalence of depression among Chinese menopausal women indicated that the prevalence of depression among Chinese menopausal women is as high as 36.3%, and the prevalence of moderate and severe depression is

as high as 15.3% and 3.7% (Zeng et al. 2019). The prevalence of anxiety that often occurs with depression is also not optimistic (Mulhall et al. 2018). Emotional disorders affect the mental health of menopausal women and their sleep quality. Sleep problems have become one of the common physical health problems among menopausal women (Lampio et al. 2017, Rodriguez et al. 2019). Depression, anxiety, and sleep quality problems gradually affect each other, forming either a vicious or a benign cycle. Thus, active external intervention plays an important role in regulating this cycle.

At present, no safe clinical treatment exists against menopausal symptoms. Medically, menopausal symptoms are treated by sedation, hypnosis, hormone alternative therapy, and drugs that relieve depression (Guo & Liu 2015, Pizzi et al. 2020). Although these common methods have a fast onset and strong effect, certain side effects remain. For instance, these methods are likely to result in drug tolerance and dependency, and long-term use may even damage liver and kidney functions, increasing the risk of cancers (Lin & Pan 2018). Exercise as a positive intervention has elicited the attention of medical researchers because it is simple, convenient, safe, and effective. The results of several related studies have shown that exercise can effectively relieve people's negative emotions and improve sleep quality. Studies have found that aerobic exercise can relieve psychological stress and improve sleep quality (Ströhle 2018). Research shows that exercise can enhance physical fitness while improving mental status, and exercise is therefore an important factor to improve sleep quality (Ren & Li 2020). The probability of depression among women who do not regularly participate in exercise is twice that of ordinary people (Mastura et al. 2012). Aerobic exercise of no less than 20 minutes can produce anti-depression effects, especially in patients with mild and severe depression (Zhang et al. 2018). Compared with clinical hormonal and other drug therapies, exercise intervention is cheaper, more convenient, and free of side effects. Cramer et al. (2018) conducted a systematic meta-analysis of studies on yoga and menopause syndrome. The results show that yoga has advantages in reducing menopausal syndrome (including depression, anxiety, and sleep disorders). Although exercise has a mitigating effect on menopausal symptoms, studies have pointed out that the lack of scientific exercise knowledge, such as proper exercise length, exercise intensity, and type of exercise, can also lead to poor intervention effects and even more serious adverse effects such as exercise injuries (Ye et al. 2017). Therefore, providing correct disease information support to and develop targeted exercise plans for menopausal patients are extremely important. Psychological hint is a psychological intervention method that offers positive guidance and allows patients to acquire a positive attitude, thereby reducing or even eliminating their disease symptoms. Information support helps improve patients' awareness of the disease, thereby

improving their treatment compliance (Li et al. 2018). The positive information support method and the intervention method of yoga exercise have been proven effective in reducing depression and anxiety in menopausal women and improving their sleep quality (Liu & Xu 2019). However, no comprehensive study has been conducted on the unique advantages of combining the information support method with yoga exercise. Information support based on positive psychological hints was combined with yoga exercise in this study to intervene in menopausal patients and explore an intervention program that can effectively alleviate the symptoms of menopause, ease depression emotions, and improve sleep quality.

SUBJECTS AND METHODS

Participants

From June to December 2019, menopausal women (sometimes referred to here as "patients") who were newly recruited in three yoga clubs in Wenzhou, Hangzhou, and Shanghai in China were selected as the participants by convenience sampling. A total of 52 effective samples are in the experiment group, aged between 45 and 55 years old. The patients have suffered irregular menstruation or natural amenorrhea for more than 12 months. They participated in a 60-minute yoga exercise three times a week for 24 weeks while receiving positive psychological information support. At the same time, menopausal women aged 45–55 years old with irregular menstruation or with natural amenorrhea for more than 12 months (54 effective samples) were randomly selected from communities in Wenzhou. Except for basic housework and normal work, they did not participate in other exercise activities. Inclusion criteria are as follows: 1) those who met the diagnostic criteria for menopause, 2) those who had normal communication skills, and 3) those who participated in the study voluntarily. Exclusion criteria are as follows 1) those with severe liver and kidney diseases or malignant tumors, 2) those with hearing impairments that affect communication, 3) those with mental abnormalities, and 4) out-of-town patients for whom follow-up is difficult. The samples were randomly divided into 52 patients in the experiment group and 54 in the control group. No statistically significant difference was observed in the general situation data between the two groups, suggesting that the two groups are comparable (Table 1).

Methodology

Before the intervention, the significance, main methods, intervention time, and precautions of this study were explained to the participants to obtain their cooperation. The participants joined this study voluntarily, and consent was obtained from the guardians of the participants and the community administrators.

Table 1. Comparison of the basic conditions of the two groups before the intervention ($X \pm S$)

Factor	Experiment group (n=52)	Control group (n=54)	t/ χ^2	P
Age	50.56±3.27	50.74±2.95	-0.303	0.763
Education level			3.582	0.167
Junior high school and below	6 (11.54%)	14 (25.93%)		
High school/ polytechnic school	38 (73.08%)	33 (61.11%)		
College and above	8 (15.38%)	7 (12.96%)		
Marital status			-	0.980
Unmarried	2 (3.85%)	2 (3.7%)		
Married	37 (71.15%)	37 (68.52%)		
Divorced	8 (15.38%)	10 (18.52%)		
Widowed	5 (9.62%)	5 (9.26%)		
Income			0.757	0.860
Below 1000	9 (17.31%)	7 (12.96%)		
1000-2000	15 (28.85%)	14 (25.93%)		
2000-3000	22 (42.31%)	27 (50%)		
3000 and above	6 (11.54%)	6 (11.11%)		
Menstrual condition			0.116	0.734
Menstrual disorders	35 (67.31%)	38 (70.37%)		
Natural amenorrhea <12 months	17 (32.69%)	16 (29.63%)		
Work pattern			3.957	0.266
Sitting for a long time	13 (25%)	21 (38.89%)		
Standing for a long time	12 (23.08%)	12 (22.22%)		
Fieldwork	5 (9.62%)	7 (12.96%)		
Housework	22 (42.31%)	14 (25.93%)		
Personal medical history			0.129	0.719
Yes	11 (21.15%)	13 (24.07%)		
No	41 (78.85%)	41 (75.93%)		

All the scales in this study were filled in anonymously. Afterward, each participant was given a small gift, such as a scarf. Conventional medical interventions such as health education, psychological care, diet guidance, medication guidance, and discharge guidance were given to the two groups at the same time. Based on conventional treatment, yoga exercise and positive information support counseling were provided to the experiment group. The specific measures include (1) positive psychological hints, as follows. A) Language hints: different dialogues were designed according to the patients' different personalities and characteristics. Hints were consciously given to the patients by dialogue during yoga exercise to indicate that the symptoms of menopause can be effectively relieved. B) Behavior hints: in addition to correcting the patients' negative cognition of menopausal treatment promptly, necessary and correct health behavior hints were also provided. C) Model hints: the yoga exercise teams were arranged reasonably. When conditions permitted, those patients with depression and other symptoms were included in the same exercise team as those with cheerful personalities, so that they could be positively affected subtly. (2) Information support is as follows. A) Evaluation: the investigator spoke with the patient to obtain a preliminary understanding of the patient's personalities, characteristics, educational level, living environment, hobbies, lifestyle habits, family lifestyle, and other basic

information to evaluate the patient's knowledge of menopause. B) Multi-channel and multi-form health education: gynecologists from community hospitals were invited to incorporate their knowledge of menopausal syndrome, including the causes, clinical manifestations, treatment options, drug effects, and influence of emotions and sleep on the disease, into health prescriptions and health education manuals with rich pictures and texts. The gynecologists also provided regular health knowledge lectures and led the patients to understand that pre-menopausal symptoms are normal physiological changes and that they can easily experience menopause as long as they develop positive healthy life behaviors. The situation of each patient was evaluated to determine what should be understood, and one-to-one key explanation was provided to assist the patient to analyze and correct bad health habits and to improve positive psychotherapy for the patient. C) Peer support: during group lectures, yoga practice, and other crowd-gathering times, peers were encouraged to learn from each other and share exercises and relaxation methods suitable for recovery from the disease, including yoga meditation exercises, relaxation training methods, and acupressure before bed. Participants were encouraged to share happy things with others to ease the mood, relax the mind, and promote sleep. D) Continuous information support: WeChat groups were established to regularly release relevant disease knowledge;

follow up on the patients' diet, activities, emotions, sleep, and other conditions; and answer their questions promptly. Those with privacy protection needs were contacted via WeChat individually, and telephone follow-up was conducted once every two weeks for those who could not access the Internet. During WeChat, telephone follow-up, or follow-up visits, positive psychological information support was continued to provide the patients with positive hints and supervision. E) Yoga exercise: yoga exercise was carried out for up to 24 weeks, three times a week, 60 minutes every time. An appropriate combination of yoga exercise was compiled according to the physiological condition of the patient. A professionally trained yoga instructor from the yoga club demonstrated the movements during the intervention, and the instructor used gentle language and movements to guide the patient's training and meditation. Precautions for warming up and exercise were given to the patient before each treatment. After the training was completed, the instructor exchanged experiences, especially the positive and peaceful life attitudes advocated by yoga, with the patient. At the same time, before the intervention, the investigator explained the significance of the study to the participants in the control group and emphasized that they could not participate in any other exercises such as jogging and tai chi for six months.

Measuring Tools

General Situation Questionnaire

The questionnaire includes factors such as age, marital status, education level, work pattern, menstruation status, and personal medical history.

Kupperman Menopausal Symptom Distress Scale

This special scale for scoring menopausal symptoms is the most widely used internationally and domestically. This scale comprises a total of 13 physical and psychological symptoms, and each symptom is assigned a specific index that multiplies the severity of the symptom to calculate the score. The total score is the sum of the scores in the 13 items, and it evaluates the severity of menopausal symptoms. A high score indicates that menopausal symptoms are highly obvious (Liang et al. 2010).

Self-rating Depression Scale (SDS)

SDS was compiled by Zung and used to evaluate the state and severity of depression in the participants. This scale is filled in according to the participant's personal feelings within one week to intuitively reflect the subjective feelings of the object. SDS includes 20 items in four dimensions of psychological disorders, namely, psychotic emotional symptoms, somatic disorders, psychomotor disorders, and depression. The scale is easy to operate and master, suitable for normal people and mental patients in all types of occupations, cultures, and age groups. A lower total score means a

better situation in terms of depression and vice versa (Zung 1965).

Self-rating Anxiety Scale (SAS)

SAS was compiled by Zung and contains 20 test items that are scored at four levels. SAS mainly evaluates the anxiety of the tested participant at the time or in the last week. The scale can effectively reflect the subjective feelings of the participants for one week. SAS is suitable for people in all occupations, cultures, and ages. SAS is also suitable for adults with anxiety symptoms. Thus, SAS has a wide range of applications (Zung 1971).

Pittsburgh Sleep Quality Index (PSQI)

This self-rating sleep quality scale compiled by Buysse et al. is one of the most widely used sleep quality assessment scales. It was translated into Chinese by Liu, tested for reliability and validity, and proven suitable for application in China. PSQI is used to evaluate the sleep quality of the tested participants in the last month. PSQI is suitable for people with sleep disorders and for evaluating the sleep quality of ordinary people (Buysse et al. 1989).

Statistical Analysis

The participants in the two groups were observed before the experiment, three months into the experiment, and six months into the experiment. Dynamic changes in Kupperman Menopausal Symptom Distress Scale, SDS, SAS, and PSQI were used to monitor the effect on the participants. SPSS 18.0 was used for statistical processing and analysis of the data. Descriptive analysis, χ^2 test, t-test, and repeated measures analysis of variance were combined for analysis.

RESULTS

Comparison of the basic conditions between the two groups before the intervention

The results show no significant difference in the indicators between the two groups, indicating that the two groups are comparable before the intervention.

Repeated measures analysis of variance in SDS scores of the two groups before and after the intervention

The SDS scores of the participants in the experiment group changed with time, indicating that the difference in the data at each time point is statistically significant. The time and method of SDS score re-intervention show an interactive effect, indicating that the information support method combined with yoga exercise in this study can alleviate the depression of menopausal women. A statistically significant difference was found between the experiment and control groups. Details are shown in Table 2.

Table 2. Repeated measures analysis of variance in SDS scores of the two groups before and after the intervention

Group	Before intervention	After intervention		Time effect	Cross-group effect	Interactive effect
		At the end of 3 months	At the end of 6 months			
Experiment group	36.62±2.37	33.12±2.38	30.22±2.11	F=25.42	F=37.21	F=27.38
Control group	37.04±2.44	36.69±2.33	36.33±2.54	P<0.001	P<0.001	P<0.001

Table 3. Repeated measures analysis of variance in SAS scores of the two groups before and after the intervention

Group	Before intervention	After intervention		Time effect	Cross-group effect	Interactive effect
		At the end of 3 months	At the end of 6 months			
Experiment group	38.75±3.3	33.05±2.76	28.33±2.71	F=287.32	F=237.13	F=51.23
Control group	39.00±2.8	38.19±2.79	38.01±2.14	P<0.001	P<0.001	P<0.001

Repeated measures analysis of variance in SAS scores of the two groups before and after the intervention

The SAS scores of the participants in the experiment group changed with time, indicating that the difference in the data at each time point is statistically significant. The time and method of SAS score re-intervention show an interactive effect, indicating that yoga exercise can alleviate the anxiety of menopausal women. A statistically significant difference was found between the experiment and the control groups. Details are shown in Table 3.

Repeated measures analysis of variance in Kupperman symptom scores of the two groups before and after the intervention

No difference was found between the two groups in Kupperman symptom score before the intervention. However, a significant difference between the two groups was found after the intervention. No difference in the control group was found before and after the intervention, and a significant difference was found in the experiment group before and after the intervention, indicating a significant intervention effect. Details are shown in Table 4.

Effect of the information support method combined with yoga exercise on sleep quality

The PSQI scores of the experiment group in time to fall asleep, use of hypnotic drugs, and daytime functions changed with time, as did the total score. Apart from sleep disorders and hypnotic drugs, the scores in other PSQI components and the total score show an interacting effect between time and grouping, indicating that the information support method combined with yoga exercise can improve the sleep quality of menopausal women. The comparison between the two groups in the total PSQI score shows a statistically significant difference between the experiment and the control groups. Details are shown in Table 5.

DISCUSSION

No significant difference is found between the experiment group and the control group in menopausal symptoms before the intervention. However, three and six months into the intervention, menopausal symptoms of women in the experiment group who underwent the information support method combined with yoga exercise reduced significantly, at a level lower than the control group. This finding is consistent with that obtained by Koch et al. (2017), in which menopausal women with breast cancer were the participants. Using randomized experiment group intervention, Koch et al. (2017) also found that yoga exercise can significantly reduce the symptoms of menopausal distress. The following reasons may explain why the information support method combined with yoga exercise can effectively reduce the symptoms of menopausal distress. Many symptoms of menopausal distress, such as sensory abnormality, bone and joint muscle pain, headache, and palpitations, have certain physiological causes. Yoga is a type of physical exercise that can improve physiological functions. For example, yoga exercise can relieve cardiovascular diseases (Loganathan et al. 2019), autonomic nervous system problems (Wang et al. 2019), bone joint and muscle pain (Field 2016), and urinary system diseases (Sha et al. 2019). Yoga can improve the overall physiological health of menopausal women, effectively alleviating their symptoms of distress.

No significant difference was found between the two groups in the depression level before the intervention, both at a relatively high level. However, after three and six months of the intervention, the information support method combined with yoga exercise effectively reduced the depression level of the experiment group. This finding is consistent with that obtained by Levine et al. (2016), who conducted a 12-week yoga intervention in women with depression. They found that yoga exercise can significantly reduce the symptoms of women with depression. The possible reasons for the information support method combined with yoga exercise reducing the depression level of menopausal women are as follows. First, with the information support method,

Table 4. Repeated measures analysis of variance in Kupperman symptom scores of the two groups before and after the intervention (X±S)

K1 Item	Group	Before intervention	After intervention		Time effect	Cross-group effect	Interactive effect
			At the end of 3 months	At the end of 6 months			
Hot flashes	Experiment group	3.85±0.78	3.62±1.19	1.85±2.01	F=23.409	F=30.236	F=29.986
	Control group	3.78±0.92	3.85±0.76	3.93±0.54	P<0.001	P<0.001	P<0.001
Sensory abnormality	Experiment group	1.42±1.07	1.27±0.97	0.77±0.98	F=4.035	F=5.834	F=2.435
	Control group	1.52±1.02	1.41±1	1.41±1.07	P=0.019	P=0.017	P=0.090
Insomnia	Experiment group	2.15±0.54	1.35±0.95	0.88±1	F=18.950	F=43.765	F=18.570
	Control group	2±0.67	2.15±0.76	1.96±0.61	P<0.001	P<0.001	P<0.001
Agitation	Experiment group	1.65±0.95	1.50±0.87	1.31±0.96	F=1.742	F=0.708	F=0.309
	Control group	1.67±0.93	1.56±1.08	1.52±1.02	P=0.178	P=0.402	P=0.734
Depression doubt	Experiment group	0.31±0.47	0.04±0.19	0.04±0.19	F=7.308	F=18.529	F=2.128
	Control group	0.39±0.49	0.33±0.48	0.28±0.45	P=0.001	P<0.001	P=0.122
Dizziness	Experiment group	0.83±0.47	0.58±0.5	0.44±0.5	F=6.190	F=9.305	F=2.795
	Control group	0.83±0.47	0.78±0.46	0.76±0.55	P=0.002	P=0.003	P=0.063
Fatigue	Experiment group	1.04±0.48	0.81±0.4	0.52±0.5	F=8.234	F=20.578	F=13.056
	Control group	0.98±0.41	0.93±0.38	1.04±0.19	P<0.001	P<0.001	P<0.001
Bone and joint muscle pain	Experiment group	1.19±0.56	0.62±0.49	0.5±0.5	F=12.895	F=44.497	F=13.714
	Control group	1.19±0.55	1.15±0.63	1.22±0.46	P<0.001	P<0.001	P<0.001
Headache	Experiment group	0.83±0.38	0.58±0.5	0.38±0.49	F=5.152	F=14.746	F=8.574
	Control group	0.76±0.47	0.8±0.41	0.81±0.39	P=0.007	P<0.001	P<0.001
Palpitation	Experiment group	0.58±0.57	0.42±0.5	0.33±0.47	F=3.251	F=0.334	F=5.629
	Control group	0.65±0.59	0.57±0.54	0.52±0.54	P=0.041	P=0.717	P=0.020
Skin formication	Experiment group	0.73±0.45	0.69±0.47	0.6±0.5	F=1.368	F=2.307	F=0.211
	Control group	0.78±0.42	0.78±0.5	0.72±0.45	P=0.257	P=0.132	P=0.810
Sexual life	Experiment group	1.12±1	0.69±0.96	0.42±0.82	F=3.997	F=10.730	F=2.709
	Control group	1.11±1	1.11±1	1.04±1.01	P=0.020	P=0.001	P=0.069
Urinary system infection	Experiment group	1±1.01	1.08±1.01	1.04±1.01	F=0.887	F=0.751	F=0.961
	Control group	0.96±1.01	1±1.01	1.04±1.01	P=0.120	P=0.102	P=0.040
Total K1 score	Experiment group	16.69±2.74	13.23±2.61	9.08±3.26	F=63.480	F=104.972	F=52.309
	Control group	16.61±2.23	16.41±2.83	16.24±2.57	P<0.001	P<0.001	P<0.001

Table 5. Repeated measures analysis of variance in sleep therapy of the two groups before and after the intervention (X±S)

Item	Group	Before intervention	After intervention		Time effect	Cross-group effect	Interactive effect
			At the end of 3 months	At the end of 6 months			
Sleep therapy	Experiment group	1.33±0.76	1.23±0.67	1.01±0.71	F=2.815	F=3.56	F=0.891
	Control group	1.37±0.78	1.34±0.72	1.35±0.78	P=0.061	P=0.037	P=0.378
Time to fall asleep	Experiment group	1.58±0.64	1.42±0.61	1.30±0.59	F=5.091	F=4.39	F=0.312
	Control group	1.48±0.64	1.45±0.72	1.49±0.70	P=0.009	P=0.012	P=0.723
Length of sleep time	Experiment group	0.98±0.67	0.88±0.61	0.59±0.64	F=2.342	F=5.81	F=0.895
	Control group	0.91±0.59	0.96±0.55	0.99±0.57	P=0.103	P=0.003	P=0.372
Sleep efficiency	Experiment group	0.58±0.5	0.54±0.48	0.53±0.51	F=0.313	F=0.001	F=0.151
	Control group	0.63±0.49	0.63±0.44	0.63±0.45	P=0.781	P=0.999	P=0.798
Sleep disorders	Experiment group	1.23±0.67	1.09±0.61	1.00±0.63	F=1.222	F=3.49	F=0.781
	Control group	1.19±0.65	1.20±0.63	1.18±0.63	P=0.389	P=0.049	P=0.371
Hypnotic drugs	Experiment group	0.27±0.45	0.19±0.44	0.10±0.48	F=5.821	F=1.02	F=1.114
	Control group	0.33±0.48	0.28±0.43	0.23±0.49	P=0.002	P=0.920	P=0.347
Daytime functions	Experiment group	1.67±0.58	1.31±0.51	1.30±0.57	F=7.881	F=4.81	F=1.892
	Control group	1.61±0.6	1.55±0.61	1.60±0.62	P<0.001	P=0.015	P=0.210
Total PSQI score	Experiment group	7.63±1.52	6.57±1.23	6.01±1.44	F=18.340	F=16.11	F=7.911
	Control group	7.52±1.41	7.50±1.42	7.47±1.37	P=0.000	P=0.000	P=0.005

menopausal women have a more correct and comprehensive understanding of menopause, realizing that menopause is a normal and necessary stage in the life, that various changes in physiology and psychology are also normal reactions, and that evasion accelerates aging instead of assisting them to successfully undergo this period (Levine et al. 2016). Correct cognition improves menopausal women's sense of control over menopause, whereas the lack of control is a key factor leading to individual depression (Georgakis et al. 2016). Hence, improving self-control also reduces the depression level. Second, yoga exercise has the characteristic of mindfulness, emphasizing that individuals should focus on important things in the moment (Yang et al. 2018). Therefore, yoga decreases the attention to negative emotions and negative events, improving the level of depression on a cognitive, emotional, and even physical basis (Broughton 2016).

No significant difference was found between the two groups in anxiety level before the intervention. Both were at a relatively high level. However, after three and six months of the intervention, the information support method combined with yoga exercise effectively reduced the anxiety level of the menopausal women in the experiment group. This finding is consistent with those of the meta-analyses by Cramer et al. (2018) and Hofmann et al. (2016). Depression and anxiety are often symbiotic emotional disorders, and their causes share many similarities (Kroenke et al. 2019). Apart from the aforementioned reasons why the information support method combined with yoga exercise can effectively reduce depression, certain psychosocial reasons can also be used to explain the decline in the anxiety level. First, the information support method helps menopausal women improve their self-efficacy, thereby reducing their anxiety. Ebrahimi & Rahimi (2019) used a randomized experiment group and a control group to examine the effect of improved self-efficacy on menopausal symptoms (including anxiety). They found that the improvement in menopausal women's self-efficacy brought by the information support method can effectively relieve their anxiety symptoms. Second, in addition to the nature of mindfulness, yoga exercise also plays the other very important role of providing social support. Social support is an important psychological resource for individuals to effectively reduce depression and anxiety, especially when individuals particularly need this type of social support (Vodermaier & Linden 2019). Menopausal women are faced with not only a decline in physical functions but also a decline in confidence of self-ability. Considering this strong sense of difference, menopausal women urgently need social support to supplement their psychological resources and relieve their anxiety (Erbil & Gümüşay 2018).

Before the intervention, no significant difference was found between the experiment group and the control group in sleep quality score. However, as the inter-

vention progressed, the sleep quality of the experiment group improved significantly compared with the level before the intervention and the level of the control group. The information support method combined with yoga exercise can effectively improve the sleep quality of menopausal women for two reasons. First, the information support method combined with yoga exercise effectively improves the physiological functions of menopausal women. For example, yoga exercise can balance the excitement suppression process of the sympathetic nervous system, reducing nervous tension and enhancing the system's ability to regulate, relieve fatigue, speed up sleep, and promote deep sleep (Rao et al. 2017). Yoga exercise can also promote the secretion of endorphins and has the function of hypnosis (Halpern et al. 2014), thereby effectively improving the sleep quality of menopausal women. Second, the improvement in the depression and anxiety of menopausal women brought by the information support method combined with yoga exercise in turn positively affects their sleep quality. Within the same functional organization, the body and the mind are interconnected and influence each other. The improvement in psychological functions contributes to the improvement in physiological functions. Similarly, when the psychological pressure faced by menopausal women is reduced and the level of depression and anxiety is reduced, their sleep quality would improve accordingly (Li & Lu 2017).

CONCLUSION

The positive information support method combined with yoga exercise was used in this study to intervene in the experiment group, while no intervention was conducted in the control group. Symptoms of distress, depression, anxiety, and sleep quality of the two groups were examined before the intervention, after three months of the intervention, and after six months of the intervention. The following results were obtained by analysis. First, the six-month information support method combined with yoga exercise was proven to effectively improve the overall symptoms of menopausal distress in the experiment group. Second, the six-month information support method combined with yoga exercise can effectively improve the depression and anxiety of menopausal women and promote their sleep quality. However, despite the acquisition of certain meaningful results, no in-depth investigation was conducted to examine the relationship between the symptoms of distress, depression, anxiety, and sleep quality during menopause. Whether the symptoms of distress, depression, anxiety, and sleep quality of menopausal women at three months of intervention have a predictive effect on the symptoms at six months of intervention will be further investigated by our team.

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Conceptualization, investigation: Xi Lu & Lu Liu;

Methodology, writing - review and editing: Xi Lu & Rui Yuan;

Formal analysis, data, writing - original draft preparation: Xi Lu;

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