

CLINICAL STUDY

Baduanjin exercise improved premenstrual syndrome symptoms in Macau women

Huilin Zhang, Mingxia Zhu, Yang Song, Meirong Kong

Huilin Zhang, Nursing Department, the Second Xiangya Hospital of Central South University, Changsha 410011, China; Kiang Wu Nursing College of Macau, Macau 999078, China

Mingxia Zhu, Research Service Office, Kiang Wu Nursing College of Macau, Macau 999078, China

Meirong Kong, Gynecology and Obstetrics Teaching and Research Office, Kiang Wu Nursing College of Macau, Macau 999078, China

Yang Song, Gynaecology and Obstetrics, Guangzhou University of Chinese Medicine, Guangzhou 510405, China

Correspondence to: Prof. Huilin Zhang, Nursing Department, the Second Xiangya Hospital of Central South University, Changsha 410011, China. huilin-aileen0000@163.com

Telephone: +86-731-85294072

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Abstract

OBJECTIVE: To investigate the effect of Baduanjin, a traditional Chinese medical exercise, on improving premenstrual syndrome (PMS) symptoms in women.

METHODS: Forty reproductive age women with PMS in Macau practiced standardized Baduanjin exercise for three menstrual cycles. A questionnaire, the daily record of severity of problems (DRSP), was used to measure symptom severity. DRSP was filled out every day starting from the last cycle before exercise (i.e., the first menstrual cycle) to the third cycle after exercise initiation (i.e., the fourth menstrual cycle). The total scores and the scores of each item during the 5 premenstrual days and follicular phase (5-9 postmenstrual days) were calculated.

RESULTS: After exercise, the total DRSP scores dur-

ing the 5 premenstrual days and differences in the total DRSP scores between the 5 premenstrual days and the follicular phase were both significantly reduced. Of note, the physical symptom total scores in the 5 premenstrual days and the differences between its total score in the 5 premenstrual days and in the follicular phase were both significantly reduced. The differences between the total scores of depressed mood, anxious mood, loss of interest, and reduction in social activity during the 5 premenstrual days and the follicular phase were also reduced.

CONCLUSION: Baduanjin exercise was able to improve the mental and especially the physical symptoms of PMS.

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Key words: Premenstrual syndrome; Baduanjin exercise; Questionnaires; Daily record of severity of problems

INTRODUCTION

Premenstrual syndrome (PMS) is a recurrent dysphoric disorder characterized by periodic physical and mental symptoms that occur during the luteal phase.¹ It is unrelated to mental disorders or internal medical diseases, and subsides during the follicular phase and disappears after menorrhoea.² Kwan *et al*³ reported that 95% of fertile women have PMS and the incidence rate of severe PMS appears to be 5%. Epidemiological study of PMS found that 41.9% of adult women suffer PMS.⁴ Because of its high prevalence in adult women, there is much concern about PMS in the medical field.^{5,6} However, there is still no specific treatment for it. Current

therapies include medical therapies from Traditional Chinese Medicine (TCM) and modern Western Medicine, mental and psychosocial support therapy, or physical therapy.⁷⁻⁹ However, there are many disadvantages to these therapies, including long therapeutic course, high cost, poor long-term effects, and significant side effects. Therefore, a cost-effective approach is required for the management of PMS.

Baduanjin exercise is one of the most common forms of traditional Chinese exercises. Baduanjin is broken down into eight sections.¹⁰ As a low-intensity medical exercise, Baduanjin is not only easy to practice, but also has little physical and cognitive demand.¹¹ Therefore, it is considered a safe exercise for health promotion in China.¹² Over the past decade, Baduanjin has been practiced by patients with chronic diseases. However, there are not any reports on the effect of Baduanjin practice on PMS. Therefore, this study attempted to investigate the effect of Baduanjin on PMS symptoms.

MATERIAL AND METHODS

Diagnostic criteria

Established by Gao *et al.*¹³ in 2008, the diagnostic criteria of PMS for Chinese patients are as follows: (a) The patient presented one of the following symptoms 5 days before menstruation, which were present for three previous menstrual cycles: depressed mood; marked anger and inability to control or manage emotions; irritability; anxiety; confusion or irrational thoughts; breast swelling or tenderness; a sensation of "bloating"; headache; and hand or foot swelling. (b) Identifiable decrease in social and economic coping capacity. (c) Symptoms that decrease or disappear in the first 4 days of the menstrual cycle, and do not recur within the first 13 days of the menstrual cycle. (d) Expected recurrence of the above symptoms in the subsequent two menstrual cycles. (e) Presence of the symptoms without use of medication, alcohol, or hormones. Patients who presented with all of the above criteria were diagnosed with PMS.

Inclusion criteria

Included in the study were patients who met the diagnostic criteria of PMS, aged from 18 to 49 with regular menstrual cycles of 25 to 34 days, and did not participate in any clinical trials within the last 3 months.

Exclusion criteria

Exclusion criteria were: irregular menstrual cycle or menstrual abnormalities; patients preparing for pregnancy, pregnant, or lactating; dysmenorrhea as the main symptom; severe internal, surgical diseases or mental disorders; inflammation, menopausal syndrome, tumors, breast disease, or other organic diseases; history of taking medication for PMS, psychotropic drugs, or contraceptive pills 3 months before the study;

history of chronic pain.

Subjects

Forty-nine women from Macau diagnosed with PMS were enrolled in our study. In the course of study, 2 of them became pregnant, 2 subjects had irregular menstrual cycle, 1 woman broke her leg because of an accident, and 4 participants withdrew for personal reasons. From February 2011 to May 2012, 40 PMS women aged from 18 to 38 years (24 ± 7) years completed the study. All participants were given an explanation of the purpose of the study, the rights of the participants, the protections given to their privacy, and the benefits and risks of the study. Voluntary participation was assured and written consent was obtained from each participant. The study was approved by the Nursing Research and Ethics Committee of Kiang Wu Nursing College of Macau.

Baduanjin exercise

A standardized Baduanjin exercise program launched by State Sport General Administration of China in 2003 was used as the intervention. The participants practiced the program twice each time, twice daily, and five times a week for three consecutive menstrual cycles.

Daily record of severity of problems (DRSP)

DRSP served as the evaluation tool for PMS symptoms. DRSP is a self-administered scale developed by Endicott and Harrison of New York State Psychiatric Institute in 1990 to measure the severity of symptoms before and after menstruation.¹⁴ It was first introduced to China by Professor Mingqi Qiao of Shandong University of Traditional Chinese Medicine. Study on the reliability and validity on the Chinese DRSP indicated that it has good test-retest reliability, internal consistency, and construct validity. There was good criterion-related validity associated with the English version of DRSP.¹⁵

DRSP includes 14 individual items grouped into 24 distinct symptoms (Table 1).

Each item is rated on a scale of 1 to 6. Increased score indicates more severe symptoms. The form was compiled into a manual for participants. Researchers informed the participants of the meaning of each item and how to fill in the form. Each participant filled in the manual daily according to their symptoms. Participants were asked to fill in the DRSP form daily for four consecutive menstrual cycles, including one menstrual cycle before and three menstrual cycles after Baduanjin exercise practice. Based on the application characteristics of the self-rating scale, the total DRSP scores and item scores during the 5 premenstrual days and the differences in the total DRSP scores and item scores between the 5 premenstrual days and the follicular phase (5-9 postmenstrual days) were selected as research indexes.

Data collection and analysis

(a) Participants were interviewed before the study.

Table 1 Daily Record of Severity of Problems

No.	Item
1	Felt depressed, sad, "down", or "blue"; hopeless; worthless, or guilty
2	Felt anxious, tense, "keyed up" or "on edge"
3	Had mood swings (e.g., suddenly felt sad or tearful); was more sensitive to rejection or my feelings were easily hurt
4	Felt angry, irritable; had conflicts or problems with people
5	Had less interest in usual activities (e.g., work, school, friends, hobbies)
6	Had difficulty concentrating
7	Felt lethargic, tired, fatigued, or had a lack of energy
8	Had increased appetite or overate; had cravings for specific foods
9	Slept more, took naps, found it hard to get up when intended; had trouble getting to sleep or staying asleep
10	Felt overwhelmed or that I could not cope; felt out of control
11	Had breast tenderness; had breast swelling, felt "bloated", or had weight gain; had headache; had joint or muscle pain
12	At work, at school, at home, or in daily routine, at least one of the problems noted above caused reduction of productivity or inefficiency
13	At least one of the problems noted above interfered with hobbies or social activities (e.g., avoid or do less)
14	At least one of the problems noted above interfered with relationships with others

DRSP items were explained, and the participants were instructed on how to complete the DRSP form. Each participant was given four copies of the scale for four menstrual cycles. (b) Instructions on Baduanjin exercises were given by a professional coach combined with a standardized demonstrative video of Baduanjin exercise before intervention. After participants mastered the Baduanjin exercise, the research and related data collection were carried out. (c) The finished surveys were collected at the end of each menstrual cycle. (d) DRSP scores are expressed as mean \pm SD. ANOVA and student's *t*-test were performed. A *P*-value less than 0.05 was considered significant. All data were analyzed by SPSS 16.0 (IBM SPSS, Armonk, NY, USA) software.

RESULTS

Changes in the total DRSP scores before and after Baduanjin exercise

The total DRSP scores of the 5 premenstrual days and the differences in total DRSP scores between the 5 premenstrual days and the follicular phase significantly decreased after Baduanjin exercise (Tables 2, 3).

Changes in the DRSP item scores before and after Baduanjin exercise

The total scores of the physical symptoms item ("breast tenderness") during the 5 premenstrual days and the differences in the total scores between the 5 premenstrual days and the follicular phase both decreased significantly after Baduanjin exercise. Symptom scores for depression, anxiety, decreased interest, and less participation in social activities also decreased significantly (Tables 4, 5).

Table 2 Comparison of total DRSP scores in the 5 premenstrual days of the four menstrual cycles ($\bar{x} \pm s$)

Menstrual cycle	DRSP score	<i>F</i> value	<i>P</i> value
First	145 \pm 51	-	-
Second	132 \pm 55	-	0.23
Third	118 \pm 45	-	0.01
Forth	118 \pm 43	-	0.01

Notes: *P*-values were calculated by student's *t*-test. $F=2.901$, $P<0.05$, was calculated by ANOVA. DRSP: daily record of severity of problems.

Table 3 Differences in total DRSP scores between the 5 premenstrual days and the follicular phase ($\bar{x} \pm s$)

Menstrual cycle	DRSP score	<i>F</i> value	<i>P</i> value
First	31 \pm 40	-	-
Second	14 \pm 42	-	0.05
Third	6 \pm 28	-	0.00
Forth	15 \pm 33	-	0.06

Notes: *P*-values were calculated by student's *t*-test. $F=2.599$, $P<0.05$, was calculated by ANOVA. DRSP: daily record of severity of problems.

DISCUSSION

In this study, as a means of intervention, we found that Baduanjin exercise has certain effects on the improvement of PMS symptoms. During four consecutive menstrual cycles, total premenstrual DRSP scores decreased significantly after Baduanjin exercise compared with DRSP scores before Baduanjin exercise. This indicates that Baduanjin exercise could improve PMS symptoms. When practicing Baduanjin exercise during the three menstrual cycles, total premenstrual DRSP scores of the second and third menstrual cycles

Table 4 Comparison of the total DRSP item scores in the 5 premenstrual days of the four menstrual cycles ($\bar{x} \pm s$)

No.	The first menstrual cycle	The second menstrual cycle	The third menstrual cycle	The fourth menstrual cycle	F value	P value
1	11.0±4.8	9.1±4.5	8.5±4.1	9.0±4.2	2.28	0.08
2	11.0±5.0	9.2±4.6	8.8±4.2	8.7±3.8	2.10	0.10
3	10.6±4.2	9.8±4.6	8.5±4.0	9.0±4.1	1.74	0.16
4	11.0±4.5	9.6±5.0	8.9±3.9	9.2±3.7	1.65	0.17
5	10.8±4.1	9.2±4.9	8.4±3.6	8.7±4.3	2.27	0.08
6	11.6±5.3	9.8±5.0	9.3±4.3	8.8±3.8	2.51	0.06
7	13.1±5.2	12.4±5.6	11.0±4.4	10.7±4.5	1.90	0.13
8	10.4±4.9	10.2±5.2	8.9±4.1	8.6±3.9	1.54	0.20
9	11.6±4.5	11.0±5.5	10.0±4.4	9.8±4.8	1.11	0.34
10	8.6±4.0	7.9±3.9	7.4±3.3	7.6±3.8	0.73	0.53
11	11.4±5.5	11.5±6.7	8.2±4.3	8.7±3.6	4.39	0.00 ^a
12	8.3±4.0	7.6±4.6	6.6±3.2	6.6±2.8	1.78	0.15
13	8.0±3.8	7.2±4.0	6.2±2.6	6.4±2.9	2.08	0.10
14	7.8±4.2	6.9±3.7	6.3±2.4	6.4±2.9	1.53	0.30

Notes: the *P*-values were calculated by ANOVA. Comparing the total DRSP item scores in the 5 premenstrual days of the four menstrual cycles together, ^a*P*<0.01. DRSP: daily record of severity of problems.

Table 5 Differences in total DRSP item scores between the 5 premenstrual days and the follicular phase ($\bar{x} \pm s$)

No.	The first menstrual cycle	The second menstrual cycle	The third menstrual cycle	The fourth menstrual cycle	F value	P value
1	2.8±4.5	0.6±3.2	0.6±2.9	1.4±3.7	2.89	0.03 ^a
2	2.7±4.4	0.4±3.9	0.8±3.1	0.8±3.0	2.90	0.03 ^a
3	2.8±4.2	1.6±3.4	0.7±3.1	1.7±3.3	2.18	0.09
4	2.7±4.3	1.0±4.0	1.0±2.9	1.5±3.5	1.73	0.16
5	3.0±4.6	0.4±4.1	0.6±2.7	1.2±3.7	3.47	0.01 ^b
6	2.1±5.0	0.3±4.3	0.3±3.1	0.6±3.3	1.76	0.15
7	1.9±5.4	1.7±5.9	0.8±3.5	1.3±3.7	0.38	0.76
8	2.1±4.2	1.8±5.2	0.6±3.5	0.4±3.2	1.69	0.17
9	1.3±4.5	0.6±5.6	0.6±3.2	1.2±3.8	0.26	0.85
10	1.8±3.9	0.3±3.0	0.3±2.5	0.8±3.2	1.83	0.14
11	5.0±5.4	4.1±6.3	1.2±3.3	2.0±3.0	5.17	0.00 ^b
12	1.9±3.7	0.4±3.9	0.3±2.0	0.8±2.0	2.01	0.11
13	1.8±3.1	0.5±2.9	0.1±1.5	0.7±2.0	2.95	0.03 ^a
14	1.4±3.3	0.4±2.8	0.3±1.8	0.7±2.2	1.44	0.23

Notes: the *P*-values were calculated by ANOVA. Comparing differences in total DRSP item scores between the 5 premenstrual days and the follicular phase of the four menstrual cycles together, ^a*P*<0.05, ^b*P*<0.01. DRSP: daily record of severity of problems.

were significantly lower than that of the first cycle. This suggests that PMS symptoms began to improve one month after practicing Baduanjin exercise, and the symptoms gradually improved during the exercise course.

Compared with that before Baduanjin exercise, the differences between premenstrual and follicular phase DRSP scores after Baduanjin exercise were reduced, but not significantly. During the second menstrual cycle when practicing Baduanjin exercise, the premen-

strual and follicular phase DRSP scores decreased significantly compared with those before Baduanjin exercise. Combined with the changes in total premenstrual DRSP scores, Baduanjin exercise can relieve both premenstrual and postmenstrual symptoms, and the difference between premenstrual and postmenstrual symptoms were lower. However, during the third menstrual cycle while practicing Baduanjin exercise, the difference between premenstrual and follicular phase DRSP scores was not significant. We inferred that because

Baduanjin exercise was a good intervention for psychosomatic regulation, it not only improved patients' premenstrual mental and physical state, but coordinated the overall psychosomatic state of the practitioners during the whole menstrual cycle. Before exercise, the PMS state was poor, and Baduanjin exercise could improve the premenstrual state. Therefore, after two menstrual cycles, the premenstrual state was better coordinated. Finally, after the third menstrual cycle, although the premenstrual state did not change significantly, the patients' psychosomatic state during the entire menstrual cycle, including follicular phase, was improved greatly. Therefore, the difference between the premenstrual and follicular phase DRSP scores increased because the follicular phase DRSP scores were significantly reduced.

This study found that Baduanjin exercise significantly improved mental symptoms including when patients: "felt depressed, sad, down, or blue; hopeless; worthless, or guilty" and "felt anxious, tense, 'keyed up' or 'on edge'". Baduanjin exercise also showed significant improvement in symptoms such as "had less interest in usual activities" and "at least one of the problems noted above interfered with hobbies or social activities." Therefore, these improvements suggest that Baduanjin exercise was able to produce positive mental health effects, help reduce the risk of diverse premenstrual negative mental health outcomes, and markedly improve family and social barriers caused by these negative outcomes. Meanwhile, the study also found that Baduanjin exercise was able to significantly relieve physical discomfort. The premenstrual DRSP scores and the differences between the premenstrual and follicular phase DRSP scores for physical symptoms, "had breast tenderness; had breast swelling, felt 'bloated', or had weight gain; had headache; had joint or muscle pain," were significantly reduced after Baduanjin exercise compared with those before Baduanjin exercise. Therefore, regular Baduanjin exercise can improve both mental and especially physical PMS symptoms to some extent.

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