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Original Article

Effects of mindfulness-based stress reduction on negative emotions and sleep quality levels of clinical medical staff members

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Abstract: Objective: The aim of the current study was to explore the effects of mindfulness-based stress reduction (MBSR) on negative emotions and sleep quality levels of clinical medical staff members. Methods: A total of 100 clinical medical staff members were randomly divided into the study group and control group. Both groups were given psychological care in the hospital. Only the study group received MBSR, performed once a week on Wednesday for 2 hours, for a total of 8 weeks. Self-Rating Depression Scale (SDS), Self-Rating Anxiety Scale (SAS), Five Facet Mindfulness Questionnaire (FFMQ), and Self-Rating Scale of Sleep (SRSS) scores were evaluated before the study and at week 4 and week 8, respectively. Results: After 4 and 8 weeks of intervention, SDS, SAS, and SRSS scores of the study group were significantly lower than those of the control group ($P<0.05$). FFMQ scores were significantly higher than those of the control group ($P<0.05$). Moreover, intervention effects were more significant over time ($P<0.05$). Conclusion: Mindfulness-based stress reduction can significantly reduce negative emotions, improve sleep quality levels of clinical medical staff members, and contribute to overall psychological and sleep health. Therefore, MBSR is worthy of further clinical application.

Keywords: Mindfulness-based stress reduction, negative emotions, sleep quality

Introduction

As an occupational group with high-stress and high risk, clinical medical staff members are prone to negative conditions, including anxiety, depression, and sleep disorders. These are particularly prominent in China. A domestic meta-analysis showed that the detection rate of depression and sleep disorders of medical staff members in China was more than 40%, significantly higher than that of healthy people [1-3]. Due to the special work environment and service objects, medical staff members in the Intensive Care Unit (ICU) and Traditional Chinese Medicine (TCM) departments are faced with more serious clinical stress, compared with those in other departments. Thus, they are more prone to negative emotions and sleep disorders [4-6]. Mindfulness-Based Stress Reduction (MBSR), first proposed by Mark Williams, John Teasdale, and Zindel Segal, is a self-healing method combining Eastern meditation with Western cognitive insight. Many studies have found that MBSR provides significant therapeutic efficacy against obsession, anxiety, and sleep disorders [7-9]. Based on the above understanding, the present study performed an intervention for 100 medical staff members, recruited from ICU and TCM departments of Sichuan Provincial People's Hospital. The aim of the current study was to explore the clinical value of MBSR.

Materials and methods

General materials

A total of 100 medical staff members working in the ICU and TCM departments of Sichuan Provincial People's Hospital, from May 2017 to October 2017, were selected. Inclusion criteria: Patients that complained about obsession, anxiety, and sleep disorders, with a time of duration >1 month; Patients that understood the study comprehensively and could participate in the study for 8 weeks. Exclusion criteria:

Table 1. Comparison of general conditions of medical staff members in the two groups

	The study group (n=50)	The control group (n=50)	P
Gender (Male/Female)	16/34	18/32	0.685
Age (Years)	42 ± 10.36	45 ± 11.26	0.325
BMI	21 ± 9.65	22 ± 8.52	0.178
Working hours (h)	46 ± 10.02	44 ± 11.11	0.842
Number of night shifts	6 ± 1.25	6 ± 2.01	0.245
Comorbidity (Yes/No)	38/12	36/14	0.528

Note: BMI, body mass index.

Patients with a family history of psychiatric disorders; Patients that had taken psychotropic drugs recently; Patients that had suffered recent emotional instability. All medical staff members participated in the study voluntarily and provided informed consent. They were randomly divided into the study group and control group. The present study was approved by the Institutional Review Board of Sichuan Provincial People's Hospital. Written informed consent was obtained from each subject before treatment.

Methods

Medical staff members in both groups received general psychological health guidance, including work and amusement treatment, health education, and necessary psychological counseling. The study group was given MBSR additionally, performed once a week for 2 hours, for a total of 8 weeks. Specific methods are as follows [10]: (1) In a sitting position, the subjects relaxed their shoulders with two arms hanging on both sides naturally, holding their necks up; (2) Raisin Training: Subjects experienced thought and emotion changes brought by the body and sense organs by seeing and smelling raisins in front of them; (3) Breathing Meditation: Subjects closed their eyes, focused on breathing, kept the breathing even and smooth, and felt the breathing process uncritically. Also, they performed meditation; (4) Walking Meditation: Subjects concentrated, listened to their inner thoughts and feelings, and gained freedom and joy from it; (5) Sitting Meditation: Subjects observed negative emotions deep in their hearts, whether suffering or not. They released negative emotions without trying to change them, achieving self-liberation.

Effect evaluation

Self-Rating Depression Scale (SDS), Self-Rating Anxiety Scale (SAS), Five Facet Mindfulness Questionnaire (FFMQ), and Self-Rating Scale of Sleep (SRSS) scores were evaluated before the study and at week 4 and week 8, respectively.

Statistical methods

Data was analyzed with SPSS 21.0 statistical software. Count data are expressed as percentages and were compared using Chi-square tests. Measurement data are expressed as mean ± standard deviation ($\bar{x}$ ± sd). Comparisons between the two groups were based on independent t-tests. The two groups were compared at different time periods by factorial comparisons. $P<0.05$ indicates statistical significance.

Results

General conditions of the medical staff

No significant differences were found in gender, age, BMI, working hours, number of night shifts, and comorbidities between the two groups. See **Table 1**.

SDS scores of the medical staff

Results showed that SDS scores of medical staff members in the two groups had statistical differences between groups, between groups at different time points, and between interaction effects at different time points (F=1.261, P=0.026). See **Figure 1**.

SAS scores of the medical staff

At week 4, SAS scores of medical staff members in the two groups had no statistical differences between groups, between groups at different time points, and between interaction effects at different time points (P>0.05). However, at week 8, scores of medical staff members in the study group were significantly lower than those in the control group. Scores showed statistical differences between groups, between groups at different time points, and between interaction effects at different time points (F=1.081, P=0.016). See **Figure 2**.

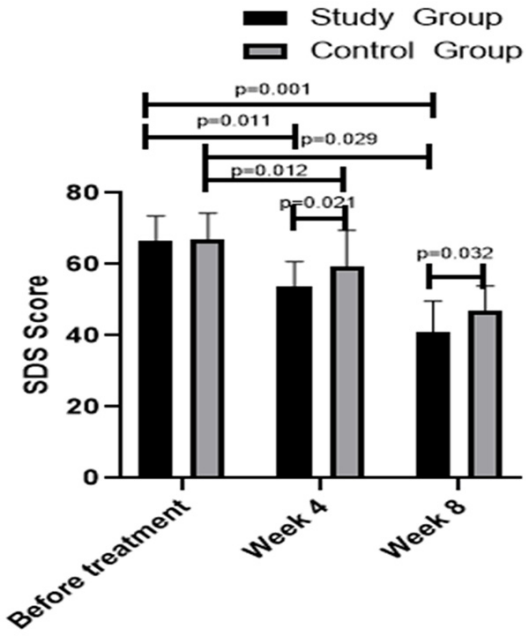

Figure 1. Comparison of SDS scores of medical staff members in the two groups ($\bar{x}$ ± sd). There were no significant differences between the two groups before treatment. At week 4, SDS scores in the study group were significantly lower than those in the control group. This trend was more obvious at week 8; SDS, The Self-Rating Depression Scale.

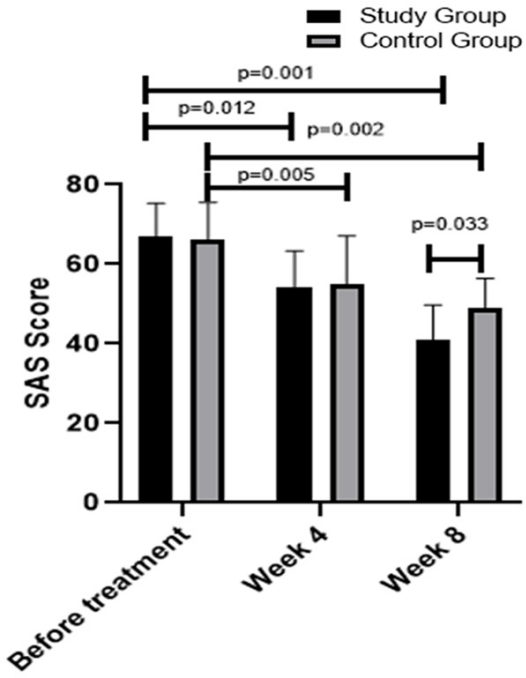

Figure 2. Comparison of SAS scores of medical staff members in the two groups ($\bar{x}$ ± sd). There were no significant differences between the two groups before treatment and at week 4. At week 8, SAS scores in the study group were significantly lower than those in the control group; SAS, Self-Rating Anxiety Scale.

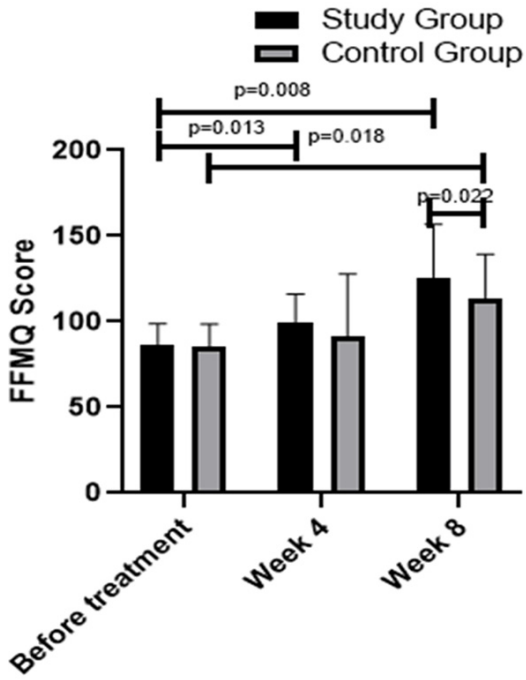

Figure 3. Comparison of FFMQ scores of medical staff members in the two groups ($\bar{x}$ ± sd). There were no significant differences between the two groups before treatment and at week 4. At week 8, FFMQ scores in the study group were significantly higher than those in the control group; FFMQ, Five Facet Mindfulness Questionnaire.

FFMQ scores of the medical staff

Statistical analysis showed that FFMQ scores of medical staff members in the two groups had statistical differences between groups, between groups at different time points, and between interaction effects at different time points (F=3.847, P=0.033), as shown in **Figure 3**.

SRSS scores of the medical staff

Statistical analysis showed that sleep quality levels of medical staff members in the two groups were generally poor before treatment. After 8 weeks of treatment, sleep quality levels of the study group were obviously improved. Scores showed statistical differences between groups, between groups at different time points, and between interaction effects at different time points (F=4.166, P=0.041), as shown in **Figure 4**.

Discussion

Medical staff members in ICU and TCM departments are responsible for emergency work and nursing care for the elderly. Due to rapid and

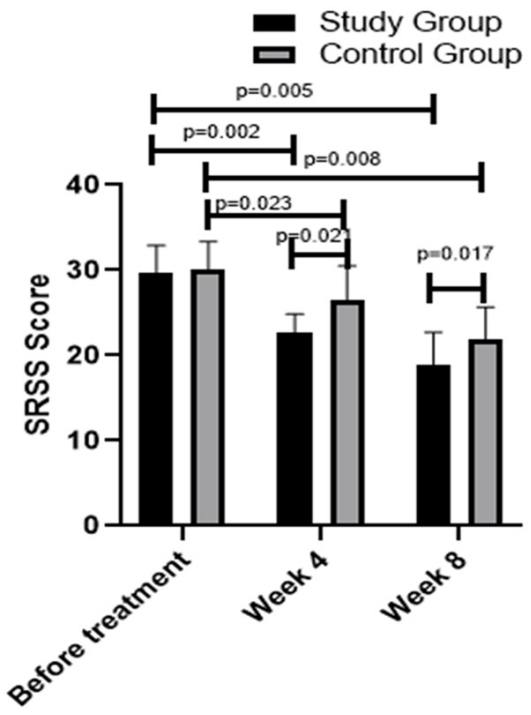

Figure 4. Comparison of SRSS scores of medical staff members in the two groups ($\bar{x} \pm sd$). There were no significant difference between the two groups before treatment. At week 4, SRSS scores in the treatment group were significantly lower than those in the control group. This trend was more obvious at week 8; SRSS, Self-Rating Scale of Sleep.

acute progression, as well as the complexity of diseases in elderly and critical patients, the risk of the medical work is high with low fault tolerance rates. Thus, quality requirements of medical care are high. In addition, a general lack of workers, high labor intensity, day and night shifts, and biological clock disorders often result in more serious negative emotions and poorer sleep quality among medical staff members. Some medical staff members even show psychological problems, including depression, insomnia, and loss of delight of life [11, 12].

In the current medical environment, although psychological health problems of medical staff members have not received enough attention, many scholars have conducted preliminary investigations. In a study on negative emotions and coping strategies, Xu found that most medical staff members suffered negative emotions, such as anxiety and depression. Stress was also shown as an independent risk factor. Helping the medical staff adopt positive coping strategies can reduce the generation of negative emotions. Ma et al. found that cognitive-behavioral therapy can effectively relieve negative emotions of nurses for cancer patients and improve sleep quality [6]. Wu et al. also found that human-based targeted management can effectively improve negative emotions of nurses, especially newly recruited nurses, in the Emergency Department [13].

In Hindi, mindfulness means awareness [14]. Kabat-Zinn, the creator of mindfulness, defined it as a kind of mental training. MBSR, as its name implies, is to return your own life to yourself. By releasing the stress, pain, and discomfort in work and life, the individual's psychology returns to its original state. Even in foreign countries, specialized clinics have applied this method [15, 16]. In an intervention study on negative emotions of nurses working in wards for elderly senior cadres, Yu found that mindfulness-based cognitive therapy can effectively improve negative emotions [17]. The current study showed that, after 4 weeks of MBSR, negative emotions, including anxiety and depression, of medical staff members in the study group were well-relieved. Mindfulness-based cognitive beliefs were strengthened and sleep quality showed obvious improvement. Differences between groups, between groups at different time points, and between interaction effects at different time points were statistically significant. Present results suggest that MBSR can improve negative emotions and sleep quality levels of medical staff members. Through mindfulness training, abilities to feel pain and to adjust thoughts and emotions are enhanced. The self-ability of resisting disturbance is improved [13]. The self-ability of resisting disturbance is derived from changes in thought patterns, that is, to cognize the negative experience that is originally self-associated as existing objects, without bringing in too much subjective evaluation and emotions. This is consistent with studies in China and other countries [18-21].

The current study initially confirmed that MBSR can significantly improve negative emotions and sleep quality levels of clinical medical staff members. However, due to the relatively short period of intervention (only 8 weeks) and lack of biochemical detection, intrinsic mechanisms of MBSR in improving sleep quality were not explained. Therefore, further studies with larger sample sizes and longer follow-up periods are necessary.

Disclosure of conflict of interest

None.

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