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Effects of mindfulness-based psychological care on mood and sleep of leukemia patients in chemotherapy

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ABSTRACT

Purpose: The aim of this research was to explore the benefits of mindfulness-based psychological care (MBPC) and assess whether the intervention would be beneficial in reducing insomnia and emotional symptoms of leukemia patients receiving chemotherapy.

Methods: A randomized control design study was applied in two hematology departments in a hospital in Zhengzhou. Patients in the experimental group received mindfulness-based psychological care (MBPC), and those in the control group received conventional care. Anxiety, depression, and sleeping problems were measured using the Self-Rating Anxiety Scale, Self-Rating Depression Scale, and the Pittsburgh Sleep Quality Index.

Results: Statistically significant differences were observed among anxiety, depression, and sleeping problems between the two groups in the post-test ($P < 0.05$). A significant decrease in anxiety and depression and an improvement in sleep were observed between pre- and post-interventions ($P < 0.05$) in the experimental group.

Conclusions: MBPC significantly improved sleep quality and mood of the experimental group. It is an effective complementary therapy for leukemia treatment that is inexpensive, noninvasive, and associated with relaxation and pain reduction.

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1. Introduction

Significant anxious and depressive symptoms are common in the course of leukemia and are related to physical symptom burden. Chemotherapy is a standard treatment for leukemia and benefits most patients. However, patients may experience many different chemotherapy-related side effects, such as discomfort, anxiety, and fatigue, which can significantly affect comfort and well-being during and after cancer treatment [1–4]. Patients receiving chemotherapy described the loss of the ability to touch or be touched by others due to the isolated environment to be the most significant psychological deprivation [5]. Moreover, disturbed sleep is common among cancer patients, and many frequently report daily sleep disturbance following primary treatment [6]. Disturbed

sleep may affect mental health and physical functioning [7,8]. These symptoms can lead to negative influence on the effects of chemotherapy and significantly impact the quality of life of leukemia patients.

Increasing the comfort and well-being of cancer patients during chemotherapy is a goal for all oncology nurses, and emphasis has been placed on the use of complementary interventions to achieve this goal [9]. The use of alternative medicine has grown exponentially since 2000, and an abundance of literature has shown an increase in comfort and well-being when complementary and alternative medicinal therapies are used for cancer patients [10]. Psychological care can increase patients' compliance to chemotherapy [11], and psychological interventions can improve the quality of life of cancer patients [12]. Various psychological interventions deal with the emotional problems of cancer patients. During treatment, patients are required to adhere to strict infection precautions because of their weakened immune systems [13]. This condition must be adequately considered when choosing a psychological intervention method to ensure that it is mild and relaxing. An increasingly popular type of psychological

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intervention to support people who are living with cancer is mindfulness-based therapy (MBT) [14].

MBT is a mild form of therapy that can reconcile the body and spirit through the mindfulness-based method. Mindfulness is the practice of bringing one's attention to the internal and external experiences occurring in the present moment [15]. It has its roots in Eastern techniques, in particular, Buddhist meditation. Numerous studies have shown that MBT enormously empowers patients with chronic pain [16,17], hypertension [18,19], heart disease, and psychological problems, such as depression [20] and anxiety [21,22], and improves the well-being of cancer patients [23,24]. Mindfulness-based psychological intervention has been used for many types of problems and had positive results. To the best of our knowledge, the effect of MBT on leukemia patients has seldom been studied. The aim of this study was to assess whether mindfulness-based psychological care (MBPC) improved the health outcomes of Chinese leukemia patients. The research questions were as follows: (1) How can MBPC be applied to leukemia patients? (2) Will the intervention improve mood and sleep? (3) How would patients value this kind of therapy? The original research hypothesis was that variable differences would be observed between pre- and post-intervention results for patients who received MBPC. Moreover, we hypothesized that the experimental and control groups would have differences in the post-test.

2. Methods

2.1. Research design and participants

This is an experimental, randomly assigned study using two groups. Participants were recruited from two hematology departments in the First Affiliated Hospital of Zhengzhou University. All patients who met the inclusion criteria and gave their consent to take part in the study were assigned to the experimental or control group via digital randomization. Inclusion criteria: (1) diagnosed with leukemia, including acute lymphocytic leukemia (ALL), acute myeloid leukemia (AML), chronic lymphocytic leukemia (CLL), chronic myeloid leukemia (CML), and other kinds of leukemia and were receiving chemotherapy; (2) age > 16 years; (3) conscious and has the ability to speak and read the scales or understand the measurement by listening and giving an answer. Exclusion criteria: do not know the diagnosis of their illness, unconscious, and had prior experience with MBT-type practices, such as yoga. The sample size was calculated to be ≥ 34 according to the two-sample mean comparison and the statistical calculation, and the coefficients in the calculation are the following: α is 0.05 and $1-\beta$ is 0.80; the estimated effect is 0.70. The sample size was decided as 38 in each group thinking over 10% lost.

Thirty-eight patients (20 males and 18 females, mean age \pm SD: 38.35 ± 8.93 years, range: 17–70 years) were placed in the experimental group, and the same number (19 males and 19 females, mean age \pm SD: 39.71 ± 9.42 years, range: 18–71 years) was placed in the control group at pre-intervention. At post-intervention, the experimental group consisted of 33 participants and the control group consisted of 32, all of whom received MBPC and successfully completed the measurements.

2.2. Interventions

2.2.1. Conventional care

Conventional care involved physical assessment; protective isolation; medication; normal living care including safety, diet, and oral care; other necessary care; and health education on oral hygiene, emotional adjustment, leukemia, and self-protection/self-management. No other planned activities took place during the

IV infusion, although some patients chose to read, listen to music, or watch television.

2.2.2. MBPC

Besides conventional care, patients received 30–40 min of MBPC during IV infusion that usually lasted at least 1.5 h. To coincide with the chemotherapy condition, MBPC was slightly modified based on the original mindfulness-based stress reduction (MBSR), which was established by Williams [25] and edited into Chinese by Liu [26]. It consists of seven meditation episodes, which would be played by an audio player or cell phone. MBSR is a structured group program that employs mindfulness meditation to alleviate suffering associated with physical, psychosomatic, and psychiatric disorders [14]. The manualized MBPC program in this study features five weeks of therapeutic sessions. The content and operation schedule are presented in Table 2. On the first week, caregivers guided the participants individually. After which, the participants engaged in mindfulness-based practice independently, and caregivers provided needed counseling and help. Caregivers initially provided the participants with explanations and directions on the therapy. After which, they slowly moved on to a purely encouraging role but still communicated with patients about their feelings after the practice. The participants were invited to focus with an interested, accepting, and non-judgmental attitude on their difficult sensations, emotions, cognitions, and behavior. They were guided by verbal cues with background music to focus their attention on movement, breathing, and feelings throughout the exercises (Table 1). Although walking and sitting forms of meditations are common tools for the mindfulness-based approach, lying dominated in this setting due to the chemotherapy. Eventually, the patients were encouraged to practice mindfulness in their daily lives. This continued the therapeutic process outside of the confines of the therapeutic sessions and allowed the patients to observe, explore, and experience mindfulness at other times. The caregivers and patients evaluated the effects and obstacles they encountered during daily life and used these as a catalysts for thought modification.

2.3. Measurements

A short demographic survey was used to determine the patients' age, gender, occupation, ethnicity, and satisfaction with the intervention. Patients were told that provision of this data was optional. Information about the disease, such as leukemia subtype and chemotherapy session, was filled out by the caregivers.

The second measurement was the Chinese version of the Pittsburgh Sleep Quality Index (PSQI). The PSQI is a self-administered questionnaire that measures the aspects of sleep quality. It is a standard instrument for measuring subjective insomnia with seven dimensions: subjective sleep quality, time of falling asleep, sleep time, sleep efficiency, sleep disorders, use of hypnotic drugs, and daytime dysfunction. A score of ≥ 6 is considered to be pathological [27]. A high score meant serious insomnia. The alpha reliability coefficient was 0.803 in this study.

The third measurement is the Self-Rating Anxiety Scale (SAS). It was designed by Zung [28] to quantify patients' levels of anxiety. The SAS is a 20-item self-report assessment device based on scoring in four groups of manifestations: cognitive, autonomic, motor, and central nervous system symptoms. Some questions are negatively worded to avoid the problem of set response. Overall assessment was based on the total score. The total raw scores range from 20 to 80. The raw score was then converted to a percentage standard score. The alpha reliability coefficient of SAS was 0.915 in this study.

The Self-Rating Depression Scale (SDS), also designed by Zung [29], assesses patients' level of depression. The alpha reliability

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