

# Application Study on Aroma Therapy Combined with Acupressure in Insomnia Patients with Breast Cancer

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## Abstract

**Objective:** To investigate the effect of lavender aromatherapy combined with acupressure on insomnia in breast cancer. **Methods:** 96 cases of insomnia patients with breast cancer were randomly divided into observation group and control group with 48 cases in each group. The control group received traditional methods to assist sleep, while the observation group underwent lavender aromatherapy combined with acupressure on this basis. Within 24 hours of patient enrollment and after 2 weeks of intervention, PSQI was utilized to assess sleep quality, SCL-90 was employed to evaluate psychological status, TCM syndrome scale was applied to assess symptom improvement. Besides, cancer-related fatigue score was also used to assess patient fatigue status. **Results:** After the intervention, the observation group was conspicuously better than the control group in PSQI score, SCL-90 score, TCM syndrome scale score. The differences were statistically significant ( $P < 0.05$ ). **Conclusion:** Lavender aromatherapy combined with acupressure can significantly improve the sleep quality of breast cancer patients, and also show a certain effect in relieving adverse emotions and symptoms.

## Keywords

Aroma Therapy, Acupressure, Breast Cancer, Insomnia

## 1. Introduction

Breast cancer is one of the most common cancers in women, and its incidence is increasing globally year by year, posing a huge challenge to the physical and mental health of patients [1]. Breast cancer patients face a complex treatment process

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and life stresses, among which insomnia is particularly prominent in breast cancer patients, which also negatively affects the immune system, quality of life, and recovery of the patient [2] [3]. Therefore, finding a method to alleviate insomnia and also to reduce the patient's psychological stress is crucial. Aromatherapy has attracted much attention for its potential benefits in improving mood and promoting body balance [4]. It is a non-pharmacological method of providing insomnia relief to breast cancer patients through the direct influence of volatile aromatic molecules in essential oils on the areas of the brain responsible for mood regulation and sleep [5] [6]. On the other hand, acupressure, as one of the traditional Chinese medical therapies, can regulate the body's qi and blood and balance yin and yang, which can help to improve the symptoms of insomnia. By stimulating specific acupoints, acupressure prompts the body to release endogenous substances such as endorphins, which regulate the function of the nervous system and affect sleep quality [7]. Therefore, this study will investigate the effects of aromatherapy combined with acupressure on insomnia patients with breast cancer to provide a scientific basis for finding a gentle, natural, and effective insomnia-relieving solution to improve the patients' quality of life and mental health.

## 2. Subjects and Methods

### 2.1. Study Subjects

Ninety-six insomnia patients with heart-spleen deficiency type of breast cancer who were hospitalised in our hospital between June 2022 and June 2023 were selected by convenience sampling method as study subjects. Inclusion criteria: 1) age 18 - 70 years old; 2) confirmed diagnosis of breast cancer; 3) meeting the diagnostic criteria of insomnia and PSQI score more than 7. Exclusion criteria: 1) patients with impaired consciousness or mental illness, serious tumour complications; 2) patients who are allergic to lavender and are receiving other insomnia treatments.

### 2.2. Study Methods

#### 2.2.1. Control Group Interventions

1) General nursing care: Provide a comfortable hospital environment and ensure that beds are clean and comfortable. Conduct regular rounds. Emphasise their sleep status and general comfort. 2) Disease observation: Carefully monitor the patient's insomnia symptoms, sleep quality and sleep onset time. Observe the patient's mental state during the day and pay attention to early awakening or multiple awakenings during the night. 3) Medication care: Give therapeutic drugs in strict accordance with the doctor's prescription and make sure the medication is accurate. 4) Dietary care: Avoid consuming a lot of caffeine and spicy and other stimulating foods before going to bed. Avoid excessive hunger or overeating. Emotional care: Provide psychological support and encourage patients to express their emotions and concerns. Encourage patients to actively participate in rehabilitation activities to improve their emotional state. Health guidance: Educate

patients to maintain good sleep hygiene, e.g., keep a regular work schedule. Emphasise the establishment of a good sleep environment, e.g. keeping the room quiet and dim. Provide educational brochures covering proper completion of sleep diary and advice on insomnia management.

### **2.2.2. Interventions in the observation group**

#### **1) Formation of teams and division of labor**

Members of the team included a nurse leader, an attending physician, a Chinese medicine physician, a charge nurse, and a Chinese medicine specialist nurse. The nurse leader was responsible for supervising and coordinating the work of the entire research team to ensure that the study complied with ethical norms and regulations. The attending physician was responsible for confirming the diagnosis of the patient's breast cancer and formulating the treatment plan. Provide medical supervision. Coordinate medical interventions and assess the patient's condition. The Chinese medicine practitioner is responsible for assessing the patient's Chinese medicine constitution, designing and directing the Chinese medicine intervention programme including acupressure, and monitoring the patient's change in Chinese medicine constitution. The nurse-in-charge is responsible for the specific nursing care of the patient, including aromatherapy and acupressure, monitoring the patient's physiological and psychological responses, and recording the patient's care and feedback. The TCM specialist nurse assists the TCM physician in TCM constitution assessment and implements TCM interventions such as acupressure.

#### **2) Development of interventions**

Each team member is able to use their professional strengths to ensure that patients receive comprehensive and coordinated care. This co-operation helps to improve the scientific validity of the study and the effectiveness of the interventions, while ensuring the safety and health of the patients in the study. After literature review, expert consultation and discussion among the team, the use of acupoints such as Yongquan, Taixi, Shansanli and Sanyinjiao was finally determined. According to domestic and international studies and the recommendations of international aromatherapists, lavender essential oil and lemon essential oil were mixed, and safflower seed oil was used as the base oil and diluted to a concentration of 2% to formulate a compound essential oil. Prior to the clinical trial, TCM experts trained the postgraduate students on acupressure methods and related precautions, and the interventions were implemented only after passing the assessment.

#### **3) Implementation of interventions**

##### **1) Acupressure**

Firstly the patient should lie flat on the operating table in a comfortable position. The acupoints to be massaged include Guanyuan, Yintang, Baihe, Si Shen-chong, Neiguan, Sanyinjiao, Ashansanli, Taichong, Shenmen, and Hegu. The gastrocnemius muscle was massaged with thumb-driven pressure at each point for 25 seconds at 3-second intervals for 15 minutes. Subsequently, acupoint kneading therapy was adopted until the patient felt soreness. After the massage, the patient

should lie flat on their back for 30 minutes and care should be taken to maintain body temperature to ensure comfort and healing throughout the process. Any confusion the patient may have is answered and necessary emotional support is provided. The intervention will take place from 2 days before to 5 days after radiotherapy. 2 sessions per day. Comprehensive non-pharmacological intervention for breast cancer patients with insomnia. Lavender Aromatherapy for 30 minutes per day after herbal acupressure, ensuring that it is carried out when the patient is ready to fall asleep.

## II) Lavender aromatherapy

Dosage and replacement frequency: Use 8 - 10 grams of Lavender each time and put it in a pouch to maintain the consistency of the dose. Replace the lavender every 5 days to maintain the aroma. Time of use: Lavender intervention for 10 hours per day from 21:00 of the previous day to 07:00 of the next day. Placement: Place the lavender sachet near the patient's pillow to ensure that the scent is maintained before the patient goes to sleep and throughout the night. Post-conditioning: At the end of the intervention, the lavender pouch were collected to prevent overexposure and to ensure that the patient responded normally to the aroma without discomfort. The intervention cycle was two weeks to ensure that the effects of the intervention were adequately observed. During this period, the patient's sleep quality and corresponding changes were continuously monitored. The aim of this care programme is to provide comprehensive, safe and effective aromatherapy combined with acupressure to alleviate insomnia in breast cancer patients through teamwork.

## 2.3. Outcome Measures

1) The Pittsburgh Sleep Quality Index (PSQI) score [8], which includes sleep onset, efficiency, timing, disorders, substance use, and daytime functioning. Each item has a maximum of 10 points, and the higher the score, the poorer the quality of sleep.

2) Mental status was measured using the SCL-90 [9] and included obsessive-compulsive disorder, depression, somatisation, interpersonal sensitivity, hostility, anxiety, phobic anxiety, psychosis and delusions. A total of 90 items (1 to 5 points per item) are included. The higher the score, the worse the psychological condition.

3) Chinese Medicine Syndrome Scale [10], according to the Diagnostic and Therapeutic Criteria for Chinese Medicine Syndrome, the main symptoms are difficulty in falling asleep, waking up easily with dreams, and unclear tongue. Secondary symptoms such as dizziness, palpitations and mental fatigue. According to the severity of the symptoms, they are classified as severe, moderate, mild, or none. The sum is the final TCM syndrome score.

## 2.4. Statistical Methods

SPSS 25.0 was applied for data analysis. Measurement data consistent with normal distribution were presented as  $(\bar{x} \pm s)$ . Independent sample t test was employed

for comparison between the two groups. Enumeration data were manifested as the number of cases (percentage).  $\chi^2$  test was utilized for comparison between the two groups.  $P < 0.05$  indicated that the differences were statistically significant.

### 3. Results

#### 3.1. Comparison of Pittsburgh Sleep Quality Index Scores

Before the intervention, there was no statistical significance in comparing the PSQI scores of the two groups of patients ( $P > 0.05$ ). After the intervention, the PSQI scores of the intervention group were better than those of the control group, and the difference was statistically significant ( $P < 0.05$ ). see **Table 1**.

**Table 1.** Comparison of PSQI scores before and after intervention between both groups ( $\bar{x} \pm s$ ).

Group	Case	Sleep onset time		Sleep quality		Sleep duration	
		Pre-intervention	Post Intervention	Pre-intervention	Post Intervention	Pre-intervention	Post Intervention
Intervention group	N = 48	2.17 ± 0.59	1.40 ± 0.49	2.23 ± 0.42	1.44 ± 0.50	2.29 ± 0.62	1.40 ± 0.50
Control group	N = 48	2.19 ± 0.64	1.69 ± 0.51	2.17 ± 0.38	1.73 ± 0.64	2.35 ± 0.60	1.69 ± 0.59
t		-0.165	-2.840	0.763	-2.477	-0.503	-2.628
P		0.869	0.006	0.448	0.015	0.616	0.01
		Sleep disorders		Sleep efficiency		Daytime function	
		Pre-intervention	Post Intervention	Pre-intervention	Post Intervention	Pre-intervention	Post Intervention
Intervention group	N = 48	2.19 ± 0.61	1.42 ± 0.50	2.23 ± 0.75	1.33 ± 0.78	2.02 ± 0.81	1.35 ± 0.49
Control group	N = 48	1.96 ± 0.65	1.47 ± 0.67	2.29 ± 0.71	1.58 ± 0.71	2.13 ± 0.79	1.77 ± 0.69
t		1.784	-2.513	-0.418	-2.027	-0.638	-3.421
P		0.078	0.014	0.677	0.046	0.525	0.001

#### 3.2. Comparison of Mental State Scores

Before the intervention, there was no statistical significance in the SCL-90 scores of the two groups of patients ( $P > 0.05$ ). After the intervention, the SCL-90 scores of the intervention group were better than those of the control group, and the difference was statistically significant ( $P < 0.05$ ), see **Table 2**.

#### 3.3. Comparison of TCM Syndrome Scores

Before the intervention, there was no statistical significance in the comparison of TCM syndrome scores between the two groups of patients ( $P > 0.05$ ). After the intervention, the TCM syndrome scores of the intervention group were better than those of the control group, and the difference was statistically significant ( $P < 0.05$ ), see **Table 3**.

**Table 2.** Comparison of SCL-90 scores before and after intervention between the two groups ( $\bar{x} \pm s$ ).

Group	Case	Obsessive-compulsive		Depression		Somatization	
		Pre-intervention	Post Intervention	Pre-intervention	Post Intervention	Pre-intervention	Post Intervention
Intervention group	N = 48	1.90 ± 0.69	1.42 ± 0.61	1.88 ± 0.57	1.23 ± 0.43	2.08 ± 0.74	1.38 ± 0.49
Control group	N = 48	1.98 ± 0.70	1.75 ± 0.67	1.96 ± 0.58	1.52 ± 0.52	2.02 ± 0.72	1.69 ± 0.69
t		-0.587	-2.546	-0.709	-2.432	0.444	-2.562
P		0.559	0.013	0.48	0.017	0.658	0.012
Group	Case	Interpersonal relationship		Hostility		Anxiety	
		Pre-intervention	Post Intervention	Pre-intervention	Post Intervention	Pre-intervention	Post Intervention
Intervention group	N = 48	2.31 ± 0.72	1.48 ± 0.58	2.25 ± 0.53	1.52 ± 0.51	2.26 ± 0.53	1.55 ± 0.53
Control group	N = 48	2.21 ± 0.74	1.83 ± 0.38	2.13 ± 0.67	1.79 ± 0.54	2.14 ± 0.57	1.69 ± 0.64
t		0.963	-3.535	1.014	-2.528	1.013	-2.533
P		0.487	0.001	0.313	0.013	0.315	0.013
Group	Case	Phobia		Psychotic		Paranoia	
		Pre-intervention	Post Intervention	Pre-intervention	Post Intervention	Pre-intervention	Post Intervention
Intervention group	N = 48	1.96 ± 0.41	1.40 ± 0.49	2.23 ± 0.62	1.27 ± 0.45	1.89 ± 0.89	1.38 ± 0.53
Control group	N = 48	1.90 ± 0.59	1.67 ± 0.66	2.06 ± 0.67	1.60 ± 0.61	1.69 ± 0.41	1.79 ± 0.58
t		0.601	-2.269	1.263	-3.049	1.414	-3.665
P		0.549	0.026	0.210	0.003	0.161	0.000

**Table 3.** Comparison of TCM syndrome scores before and after intervention between the two groups ( $\bar{x} \pm s$ ).

Group	Case	TCM syndrome score	
		Pre-intervention	Post Intervention
Intervention group	N = 48	14.25 ± 1.26	12.04 ± 1.05
Control group	N = 48	14.50 ± 0.92	14.02 ± 1.24
t		-1.107	-8.014
P		0.271	0.000

#### 4. Discussion

Lavender Aromatherapy combined with acupressure treatment significantly improved the patients' sleep disorders, which may stem from a combination of

multiple effects. This is mainly because aromatherapy stimulates the olfactory nerves, which helps to relieve anxiety, reduce tension, and create a more relaxed psychological state for falling asleep [11]. In addition, the lavender molecules in aromatherapy are transmitted to the brain through the sense of smell, which regulates circadian rhythms and thus adjusts the sleep cycle [12]. Acupressure also promotes blood circulation, relieves physical fatigue, and improves the overall comfort of patients, which is conducive to the initiation of sleep and deep maintenance of sleep [13]. In this study, aromatherapy was combined with acupressure for an integrated intervention. These two approaches complement each other and mutually promote the therapeutic effects. Lavender Aromatherapy provides patients with a pleasurable sensory experience and helps them to establish a more comfortable sleep environment, while acupressure starts at the physiological level by stimulating meridians to adjust qi and blood and change the overall physiological state [14]. It works synergistically at the neurological, physiological, and psychological levels, resulting in a relatively better sleep outcome.

Lavender Aromatherapy combined with acupressure lowered the TCM evidence scores of the patients in the observation group and alleviated the insomnia symptoms caused by the deficiency of the heart and spleen [5]. The main reason for this is that the aromatic components of Lavender aromatherapy can regulate the spleen and stomach functions emphasised in TCM, thus alleviating the symptoms of the deficiency of the heart and spleen [15]. The stimulation of the aroma is transmitted to the brain through the olfactory nerve and activates the brain area, which helps to increase the overall energy level of the body. During treatment, stimulation of specific acupoints helps to promote the operation of qi and blood, harmonise the functions of the spleen and stomach, and improve the condition of deficiency of the heart and spleen. This combined effect was responsible for the significant reduction in the TCM symptom scores of the patients in the observation group, providing a comprehensive and effective intervention programme to alleviate the symptoms of insomnia in the heart-spleen deficiency type.

“The combined application of aromatherapy and acupressure significantly reduced the Traditional Chinese Medicine (TCM) evidence scores of the patients in the observation group, effectively alleviating insomnia symptoms caused by deficiency of the heart and spleen. This therapeutic effect is primarily attributed to two mechanisms: firstly, the aromatic components in aromatherapy can regulate the spleen and stomach functions emphasized in TCM, indirectly alleviating the symptoms of deficiency of the heart and spleen, and thereby improving the patients’ sleep quality; secondly, the stimulation of the aroma is transmitted to the brain through the olfactory nerve, exerting a positive influence on brain function and emotional state, further promoting sleep for the patients. In summary, aromatherapy combined with acupressure is an effective treatment method, demonstrating significant efficacy in alleviating insomnia symptoms caused by deficiency of the heart and spleen.”

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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