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# Aromatherapy Combined with Emotional Freedom Techniques on Fear of Recurrence and Sleep Quality in Lung Cancer Survivors

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***A*bstract:** *Objective*: This study aimed to explore the effect of aromatherapy combined with emotional release technology on recurrence fear and sleep quality of lung cancer survivors. *Methods*: 114 cases of lung cancer survivors were divided into routine nursing group, emotional release technology group and aromatherapy combined with emotional release technology group. Routine nursing group received routine nursing; Emotional release technology group implemented emotional release technology for one month on the basis of routine nursing group; Aromatherapy combined with emotional release technology group used lavender aromatherapy on the basis of emotional release technology group. *Results*: After one month of intervention, there were statistically significant differences in the scores of fear of disease progression and sleep quality among the three groups. *Conclusion*: Aromatherapy combined with emotional release technology can improve the sleep quality of lung cancer survivors and reduce the economic toxicity of cancer to some extent.

**Keywords:** Emotional freedom technology; Lavender; Lung cancer; Fear of relapse; Sleep

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## 1. Introduction

With the development of medical conditions, the update of targeted drugs and treatment methods, the survival period of lung cancer survivors has been prolonged [1]. However, the negative emotions brought by cancer to survivors have not disappeared, and they still suffer from severe psychological burden during treatment, including fear of cancer recurrence [2,3]. Studies have shown that the higher the level of fear of recurrence among cancer survivors, the worse their sleep quality [4]. If not intervened in a timely manner, it may lead to a prolonged recovery period for survivors.

Lavender is known as the "king of herbs" with a fresh and elegant aroma. It is mild in nature and has the effects of sedation, hypnosis and anti-anxiety. Moreover, its fragrance can enter the spleen to invigorate spleen Qi.

Emotional Freedom Techniques (EFT), developed by American scholar Gary Craig, is a psychological intervention method based on traditional Chinese medicine meridian theory and Western psychology. It mainly relieves negative emotions by tapping specific acupoints to dredge meridians while reciting cues [5]. Foreign scholars have used EFT to alleviate anxiety and depression in medical staff and women [6]. Domestic and foreign studies have confirmed that aromatherapy combined with EFT has a significant effect on different groups of people with insomnia.

This study applied aromatherapy combined with EFT to lung cancer survivors to explore its impact on their fear of recurrence and sleep quality, in order to provide a reference for traditional Chinese medicine nursing. The report is as follows:

## 2. Objects and methods

### 2.1. Objects

Based on Wang' s intervention study, this paper adopted the formula $n = (Z\alpha+Z\beta)2*2\sigma2/\delta2$ [11]. Here, σ represents the standard deviation, and δ represents the difference between the means of the two groups. In this study, σ = 4.24, δ =3.45, with α = 0.05 and β = 0.10. A two-tailed test was used. By looking up the table, u 0.05/2 = 1.96 and u 0.10 = 1.282. Substituting these values into the formula, the sample size of the intervention group in this study was calculated to be 32.

The sample size of each of the three groups was 38, totaling 114 cases. Using convenient sampling, 114 lung cancer survivors from the Oncology Department of a Grade A tertiary hospital in Yichang City were selected. A non-concurrent controlled experimental design was adopted: those admitted from September to December 2023 were set as the routine nursing group, those admitted from January to March 2024 as the EFT group, and those admitted from April to June 2024 as the aromatherapy combined with EFT group.

### 2.2. Intervention methods

#### 2.2.1. Routine nursing group

The control group received routine nursing. Responsible nurses provided face-to-face guidance on diet, medication, and health education to survivors during morning nursing and treatment.

#### 2.2.2. EFT group

On the basis of routine nursing, this group received operational procedure intervention from postgraduate nurses with professional EFT knowledge. The intervention cycle was 1 month, once a day, 8–10 minutes each time.

**(a) Preparation stage**

An EFT intervention team composed of 1 postgraduate nurse with professional EFT knowledge, 1 oncology head nurse, and 1 oncology specialist nurse was established, where all three of them had systematically studied EFT theory and received training. A comfortable and quiet room was arranged, and the Chinese version of the Fear of Progression Questionnaire-Short Form, Pittsburgh Sleep Quality Index and a general information questionnaire was filled out by the cancer survivors to establish personal files.

**(b) Operation stage**

Before the operation, survivors were instructed to trim their nails, practice hand hygiene, take a comfortable position, relax, and take relevant protective measures. Survivors were asked to feel and

identify their fear emotion, and the intensity of fear was evaluated with reference to the negative psychological index. They were then informed of the specific locations of the following acupoints and the corresponding cues: Houxi (SI3), Neiguan (PC6, preferably the left side), Cuanzhu (BL2), Tongziliao (GB1), Chengqi (ST1), Shuigou (GV26), Chengjiang (CV24), Shencang (KI25), Dabao (SP21), and Baihui (GV20). Survivors were guided to put their index, middle, and ring fingers together, and tap the above acupoints in sequence with their fingertips, with the intensity being slightly sore and distended. They have recited the cues while tapping the acupoints. After tapping the 10 acupoints in sequence, 3 deep breaths were taken and turbid Qi was exhaled to complete a round of psychological regulation. After evaluating the effect of the first round of emotional regulation, the cues were adjusted and the second round of emotional regulation was adjusted. After adjusting the cues according to the effect, the third and fourth rounds of emotional regulation were conducted. The intervention was terminated when the emotional intensity score was ≤ 2 points and the survivor's fear emotion was relieved.

## 2.3. Evaluation methods

### 2.3.1. Evaluation indicators

**(a) Negative psychological index**

A 0–10 scale was used, where 0 points indicate no discomfort at all, and 10 points indicate extreme inner pain that is unbearable. It was used for survivors to subjectively and quickly assess emotional intensity before and after performing EFT, and the score indicates whether the emotional release operation can be terminated.

**(b) Chinese version of the fear of progression questionnaire-short form (FoP-Q-SF)**

Localized by Wu in 2015, it includes 12 items divided into two dimensions: physical health dimension and family-social dimension, which is used to evaluate the level of fear of recurrence in cancer survivors. The scale adopts a 5-point Likert scoring system and is a self-assessment scale for survivors, with "1" representing "never" and "5" representing "always". The total score ranges from 12 to 60, and a higher score indicates a higher level of fear in cancer survivors.

**(c) Pittsburgh sleep quality index (PSQI)**

Developed by Buysse in 1989, it is used to evaluate the sleep quality of the subjects. The total score ranges from 0 to 21 points: a total score ≤ 7 points indicates normal sleep quality, while a total score ≥ 8 points indicates poor sleep quality.

### 2.3.2. Data collection methods

When the subjects were enrolled, a postgraduate student conducted a general information assessment and FoP-Q-SF scale evaluation, and a second evaluation was performed one month later. If a cancer survivor was discharged from the hospital during the study period, the intervention group was supervised by another researcher to check in via WeChat group after completing the daily operation, and the second data collection was completed by scheduling a time through WeChat or phone call at the end of the study.

## 2.4. Statistical methods

SPSS 23.0 software was used for t-test, Wilcoxon rank-sum test, $\chi^2$ test and Fisher's exact probability test. The test level was set at $\alpha = 0.05$.

## 3. Results

### 3.1 Comparison of scores of the Chinese version of FoP-Q-SF before and after intervention between the EFT group and the routine nursing group

The EFT group demonstrated a significantly greater reduction in fear of progression (as measured by the Chinese version of the FoP-Q-SF) compared to the routine nursing group following the intervention. The detailed scores are presented in **Table 1**.

**Table 1** Comparison of scores of the Chinese version of FoP-Q-SF before and after intervention between the EFT group and the routine nursing group

| Groups | n | Physical health dimension | Family-social dimension | Total scale score |
|---|---|---|---|---|
| EFT group | | | | |
| Before intervention | 38 | 19.34 ± 2.643 | 22.58 ± 2.596 | 41.92 ± 3.744 |
| After intervention | 38 | 11.13 ± 1.989 | 13.03 ± 2.795 | 24.16 ± 4.156 |
| Routine nursing group | | | | |
| Before intervention | 38 | 19.79 ± 2.256 | 21.66 ± 2.374 | 41.45 ± 2.938 |
| After intervention | 38 | 20.95 ± 1.874 | 22.42 ± 2.262 | 43.37 ± 3.174 |
| Inter-group comparison | - | | | |
| Before intervention (t/*P*) | - | -0.794/0.430 | 1.614/0.111 | 0.614/0.541 |
| After intervention (t/*P*) | - | -22.145/< 0.001 | -16.109/< 0.001 | -22.645/< 0.001 |
| Intra-group comparison of EFT group (before vs after intervention) (t/*P*) | - | 15.300/< 0.001 | 15.439/0.012 | 19.575/0.002 |
| Intra-group comparison of routine nursing group (before vs after intervention) (t/*P*) | - | -2.434/0.17 | -1.435/0.156 | -2.738/0.08 |

### 3.2. Comparison of scores of the Chinese version of FoP-Q-SF before and after intervention between the aromatherapy combined with EFT group and the routine nursing group

A significant difference was observed in the reduction of FoP-Q-SF scores when comparing the aromatherapy combined with EFT group to the routine nursing group, as detailed in **Table 2**.

### 2.3 Comparison of scores of the Chinese version of FoP-Q-SF before and after intervention between the aromatherapy combined with EFT group and the EFT group

A comparison of the Chinese Version of the FoP-Q-SF scores before and after the intervention was conducted between the two groups. As presented in **Table 3**, the aromatherapy combined with EFT group demonstrated a significantly greater reduction in scores compared to the EFT-only group.

**Table 2** Comparison of scores of the Chinese version of FoP-Q-SF before and after intervention between the two groups

| Groups | n | Physical health dimension | Family-social dimension | Total scale score |
|---|---|---|---|---|
| Aromatherapy combined with EFT group | | | | |
| Before intervention | 38 | 20.37 ± 2.211 | 21.87 ± 2.133 | 42.24 ± 3.300 |
| After intervention | 38 | 9.84 ± 1.717 | 10.71 ± 2.588 | 20.55 ± 3.818 |
| Routine nursing group | | | | |
| Before intervention | 38 | 19.79 ± 2.256 | 21.66 ± 2.374 | 41.45 ± 2.938 |
| After intervention | 38 | 20.95 ± 1.874 | 22.42 ± 2.262 | 43.37 ± 3.174 |
| Inter-group comparison | - | | | |
| Before intervention (t/*P*) | - | -1.130/0.262 | -0.407/0.685 | -1.101/0.274 |
| After intervention (t/*P*) | - | 26.938/< 0.001 | 21.003/< 0.001 | 28.325/< 0.001 |
| Intra-group comparison of aromatherapy combined with EFT group (before vs after intervention) (t/*P*) | - | 23.183/< 0.001 | 20.509/< 0.001 | 26.488/< 0.001 |
| Intra-group comparison of routine nursing group (before vs after intervention) (t/*P*) | - | -2.434/0.17 | -1.435/0.156 | -2.738/0.08 |

**Table 3** Comparison of scores of the Chinese version of EoP-Q-SF before and after intervention between the two groups

| Groups | n | Total score of physical health dimension | Total score of family-social dimension | Total scale score |
|---|---|---|---|---|
| **Aromatherapy combined with EFT group** | | | | |
| Before intervention | 38 | 20.37 ± 2.211 | 21.87 ± 2.133 | 42.24 ± 3.300 |
| After intervention | 38 | 9.84 ± 1.717 | 10.71 ± 2.588 | 20.55 ± 3.818 |
| **EFT group** | | | | |
| Before intervention | 38 | 19.34 ± 2.643 | 22.58 ± 2.596 | 41.92 ± 3.744 |
| After intervention | 38 | 11.13 ± 1.989 | 13.03 ± 2.795 | 24.16 ± 4.156 |
| **Inter-group comparison** | - | | | |
| Before intervention (t/*P*) | - | -1.836/0.07 | 1.304/0.196 | -0.390/0.698 |
| After intervention (t/*P*) | - | 0.334/0.003 | 0.149/< 0.001 | 0.329/< 0.001 |
| Intra-group comparison of aromatherapy combined with EFT group (before vs after intervention) (t/*P*) | - | 23.183/< 0.001 | 20.509/< 0.001 | 26.488/< 0.001 |
| Intra-group comparison of EFT group (before vs after intervention) (t/*P*) | - | 15.300/0.001 | 15.439/0.012 | 19.575/0.002 |

## 4. Discussion

### 4.1 Both EFT and aromatherapy combined with EFT can effectively reduce survivors‘ fear of recurrence and improve their sleep quality

After one month of intervention with EFT and aromatherapy combined with EFT, the scores of FoP-Q-SF and PSQI in the aromatherapy combined with EFT group were significantly lower than those in the routine nursing group, with statistically significant intra-group differences ($P < 0.05$, $P < 0.01$). This indicates that EFT and aromatherapy combined with EFT can effectively reduce the fear of recurrence and improve the sleep quality of lung cancer survivors, thereby enhancing their quality of life, which is consistent with the research by Chen et al. [7]. Meanwhile, the above data showed that aromatherapy combined with EFT has a more positive effect on relieving survivors' fear than EFT alone, making survivors more mentally calm and improving their sleep quality ($P < 0.05$, $P < 0.01$).

### 4.2. Mechanisms of action of EFT and aromatherapy

EFT is based on the theories of traditional Chinese medicine meridian theory and Western psychology. It relieves the negative emotions caused by the fear of cancer recurrence in cancer survivors at different disease stages by tapping acupoints to dredge meridians and reciting cues [8]. Lonnberg used computational models to test the mechanistic relationship between amygdala function and circuit adaptation during fear regulation, which affects fear behavior through changes in neural circuits, providing a framework model of the amygdala in the process of neural adaptation [9]. The amygdala is the fear center of the brain and is responsible for fear memory. The body's endocrine activities regulate emotions through the "amygdala-hypothalamus-pituitary" signal axis [10–12].

At the same time, a study by Stapleton et al. have shown that tapping acupoints can reduce the size of the amygdala and the secretion of cortisol [13]. By tapping specific acupoints, lung cancer survivors can reduce cortisol secretion, dredge meridians, and alleviate negative emotions. Tapping specific acupoints has different effects; for example, tapping Cuanzhu (BL2) can regulate Qi and calm the mind, and tapping Baihui (GV20) can eliminate fear [14].

"Compendium of Materia Medica" records that lavender is sweet, mild, and non-toxic, with the effects of nourishing meridians, calming the mind, and inducing sleep. Thirteen components of lavender, including linalool, may be related to increasing the content of 5-HT and decreasing the content of dopamine in brain tissue, thereby exerting sedative and soothing effects [15].

## 5. Conclusion

Aromatherapy combined with EFT can effectively alleviate the fear of recurrence and improve the sleep quality of lung cancer survivors, better enhance their compliance with anti-cancer treatment, reduce the economic toxicity of cancer, avoid the vicious cycle between poor sleep and negative emotions, and thus improve their quality of life. As a method integrating traditional Chinese medicine meridian theory and Western psychology, EFT is helpful for relieving the fear of recurrence in lung cancer survivors. Lavender, as an easily accessible Chinese herbal medicine, has the advantages of being cost-free, painless, free of side effects, non-invasive, easy to learn and operate. The combination of the two can further exert the effect of traditional Chinese medicine.

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## Disclosure statement

The authors declare no conflict of interest.

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