Original Article

Effects of Hypnotherapy on Pain Scale, Interleukin-6 Levels, and Quality of Life in Lung Cancer Patients Who Experience Cancer Pain

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Abstract

Background: Pain is a common symptom in lung cancer patients and can affect their quality of life. Interleukin 6 (IL-6) plays a role in malignant cell proliferation and differentiation as well as the initiation and persistence of cancer pain. Hypnosis can reduce pain by reducing anxiety through relaxation and/or directly affecting neurophysiological activity that underlies the subjective experience of pain. This study aimed to evaluate hypnotherapy as a non-pharmacological method for managing cancer pain.

Methods: Clinical trial of 30 subjects with quasi-experimental pre-test and post-test in treatment and control groups of lung cancer patients of NSCLC and SCLC stage III and IV who experienced cancer pain with pain scale ≥3 at RSUD Dr. Moewardi Surakarta in June to August 2023 with a consecutive sampling method. The treatment group received hypnotherapy intervention for 4 weeks. Subjects were assessed for pain scale, interleukin-6 levels, and FACT-L quality of life questionnaire.

Results: A 4-week hypnotherapy intervention can significantly reduce the pain scale (P=0.0001) and improve the quality-of-life FACT-L (P=0.002) in lung cancer patients experiencing cancer pain. Hypnotherapy also significantly reduced IL-6 in the treatment group (P=0.008), but when compared with the control, the results were not significant (P=0.345).

Conclusion: Hypnotherapy may reduce the pain scale and improve the quality of life of lung cancer patients who experience cancer pain, but does not significantly lower IL-6 levels.

Keywords: hypnotherapy, interleukin-6, pain scale, quality of life

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INTRODUCTION

Lung cancer is the most commonly diagnosed malignancy and the leading cause of death in the world among malignancies. According to WHO, lung cancer accounted for 11.6% of 18.1 million cancer cases and 18.4% of 9.6 million cancer-related deaths in 2018.[1] The cancer profile in Indonesia in 2020, based on WHO Cancer Country Profiles, shows that the number of cancer deaths is 207,210 deaths from 348,809 cancer cases.[2]

Pain is one of the most common and distressing symptoms in cancer patients.[3] The prevalence of pain in lung cancer patients is ranked third among all malignancies after head-neck cancer and gastrointestinal cancer. A 2022 study by Zhang et al. in northern China reported that 45.4% of lung cancer patients experienced cancer pain.[4] The pathophysiology of cancer pain is complex due to interactions between cancer cells, the central and peripheral nervous system, and the immune system.[5]

Cytokines are involved in the initiation and persistence of pathological pain through direct or indirect action on nociceptive sensory neurons. Interleukin-1β (IL-1β), tumor necrosis factor α (TNF-α), and interleukin-6 (IL-6) are pro-inflammatory cytokines associated with pathological pain.[6]

Interleukin-6 is produced and secreted by various cell types, including tumor cells, is involved in malignant cell proliferation and differentiation, and its levels are highly elevated in serum and tumor tissue in most cancers, including lung cancer. Elevated levels of IL-6 are associated with aggressive tumor growth and response to cancer therapy, with high levels associated with poor prognosis and shorter survival.[7]

The goal of pain management is to relieve pain to a level that allows for a better quality of life.[8] Pain management in cancer patients includes pharmacologic and nonpharmacologic interventions. Nonpharmacologic interventions are an important part of comprehensive pain management, and one of them is hypnosis.[3,9] Hypnosis is a state of deep relaxation in which the conscious part of the mind is detached from everyday events and the subconscious is activated to respond to imagery and suggestions. Hypnotherapy or medical hypnosis is a term to explains everything related to the power of suggestion that produces a therapeutic or healing effect.[10]

Several clinical studies have shown hypnotherapy to be effective in reducing pain, anxiety, depression, nausea, and length of hospital stay. The study of Sharma et al. in India in 2017 showed that hypnotherapy intervention can significantly reduce cancer pain in cervical cancer or other cancers that have pain scores of four to seven and obtained a decrease in pain scores from 6.53 to 3.23.[9]

The study by Prasetya et al in 2021 in Surakarta reported that hypnotherapy had a major influence in reducing the pain of cervical cancer patients, with a decrease in the average pain score from 3.91 to 0.8.[11] Schoen et al in 2013 in the United States conducted a self-hypnosis study through CD hypnosis to reduce stress on 11 healthy individuals for 12 weeks and found a significant reduction in IL-6 levels.[12]

No prior study has evaluated the effect of hypnotherapy on pain and interleukin-6 levels in lung cancer patients. Based on this, this study was prepared to explain the role of hypnotherapy as an effective non-pharmacological therapy for cancer pain management.

METHODS

This study used a quasi-experimental pretest and posttest design. The population in this study were lung cancer patients with non-small cell lung carcinoma (NSCLC) and small cell lung carcinoma (SCLC) stage III and IV who experienced cancer pain with a pain scale ≥3 as measured by the numerical rating scale (NRS), with performance status (PS) ≤2 using the WHO scale, with or without comorbidities, in outpatient and inpatient care at dr. Moewardi Hospital, Surakarta, in June–August 2023.

Determination of research samples by consecutive sampling. The sample size was calculated based on the hypothesis test formula for means of two independent groups, based on standard deviation and the difference in mean pain scores from Prasetya et al's research in 2021 in Surakarta and added the calculation of anticipated drop-out. The minimum sample size required is 16 patients in each group, divided into control and treatment groups.

The inclusion criteria of the study included NSCLC and SCLC stage III and IV, having cancer pain with a pain scale ≥3 as measured by the NRS, PS ≤2 based on WHO, age >18 years, able to read and write, able to communicate in Indonesian, willing to participate in the study with full commitment and sign informed consent, have a family member who can supervise the implementation of self-hypnosis audio at home.

Exclusion criteria included patients with severe pneumonia with or without sepsis, other severe inflammatory or autoimmune diseases (e.g., systemic lupus erythematosus, rheumatoid arthritis), severe hearing loss or deafness, organic brain disorders, personality disorders, schizophrenia, psychosis, and patients who refused to participate in the study. Discontinuation criteria included being lost to follow-up, withdrawal during the study, pneumonia or sepsis during the study, poor compliance and motivation (defined as fewer than five days per week or fewer than ten sessions weekly).[12]

The treatment group received pharmacological pain relief therapy according to WHO (opioid or non-opioid) and hypnotherapy intervention for one face-to-face session at the first meeting, followed by a 15-minute self-hypnosis audio that was listened to twice a day, over a period of four weeks. They were also asked to mark the daily checklist after listening to the self-hypnosis audio.

The control group only received pharmacological pain relief therapy (opioid or non-opioid). Both groups were assessed for pain scale, interleukin-6 level, and quality of life assessment using the Functional Assessment of Cancer Therapy-Lung (FACT-L) questionnaire before treatment (pre-test) and 4 weeks after treatment (post-test).

This study was approved by the Health Research Ethics Committee (HREC) of dr. Moewardi Hospital, Surakarta, with number 1.020/VI/HREC/2023. Data analysis was carried out using the Statistical Package for the Social Sciences (SPSS) version 25 for windows. Analysis of pain scale, interleukin-6 levels, and quality of life before and after treatment using the Wilcoxon test because the data distribution was not normal. Data analysis to compare treatment and control groups used the Mann-Whitney test because the data distribution was not normal.

RESULTS

This study was conducted on 30 lung cancer patients undergoing systemic chemotherapy and targeted therapy at dr. Moewardi Hospital, Surakarta, in June–August 2023. Three subjects in the treatment group dropped out and were replaced to maintain group size. At the end of the study, one subject from each group developed sepsis and decreased consciousness, so that the final result was 30 subjects divided into 15 subjects of the treatment group and 15 subjects of the control group.

Subject characteristics included age, gender, education, occupation, cancer type, cancer therapy, and pain therapy. The characteristics of the subjects of each group were measured and compared to determine the homogeneity of the samples in the two research groups. The mean age of the subjects was 56.33±7.35 years in the treatment group and 56.67±10.22 years in the control group. The gender of most of the study subjects was male. The education level of the subjects was mostly elementary school. The majority of the subjects' occupations were farmers.

The most common type of malignancy was adenocarcinoma. The most systemic therapy that the subjects underwent was systemic chemotherapy. The most common pain relief therapy that the subjects received were non-opioid. The statistical test results obtained *P*>0.05 in all subject characteristics, so it was concluded that the basic characteristics of the research subjects between the treatment group and the control group were homogeneous. The basic characteristics of the research subjects can be seen in Table 1.

Table 1. Sample characteristics

Characteristic	Group		*P*
	Control (n=15)	Treatment (n=15)	
Age (mean±SD)	56.67±10.22	56.33±7.35	0.919[a]
Gender			
Male	7 (23.3%)	9 (30.0%)	0.464[b]
Female	8 (26.7%)	6 (20.0%)	
Education			
Not going to school	1 (3.3%)	0 (0.0%)	
Primary school	4 (13.3%)	5 (16.7%)	
Junior high school	3 (10.0%)	5 (16.7%)	0.317[b]
Senior high school	4 (13.3%)	5 (16.7%)	
Bachelor	3 (10.0%)	0 (0.0%)	
Occupation			
Labor	2 (6.7%)	2 (6.7%)	
Housewife	2 (6.7%)	4 (13.3%)	
Retiree	3 (10.0%)	0 (0.0%)	
Merchant	1 (3.3%)	3 (10.0%)	0.573[b]
Employee	1 (3.3%)	1 (3.3%)	
Farmer	5 (16.7%)	4 (13.3%)	
Driver	1 (3.3%)	1 (3.3%)	
Types of malignancy			
Adenocarcinoma	12 (40.0%)	11 (36.7%)	
Adenosquamous	0 (0.0%)	1 (3.3%)	0.593[b]
Squamous	3 (10.0%)	3 (10.0%)	
Types of cancer therapy			
Systemic chemotherapy	10 (33.3%)	12 (40.0%)	0.682[b]
targeted therapy	5 (16.7%)	3 (10.0%)	
Pain relief therapy			
Non-opioid	9 (30.0%)	11 (36.7%)	0.700[b]
Opioid	6 (20.0%)	4 (13.3%)	

Note: [a]Fisher-exact test; [b]Chi-square

In the treatment group, the pre-test mean pain score was 4.33±1.50 and the post-test mean was 1.87±1.41. The difference in posttest-pretest pain scores decreased by a mean of 2.47±0.64. Pretest pain score in the control group was 4.33±1.50 and posttest mean of 3.40±1.60. The difference in posttest-pretest pain scores decreased by a mean of

0.93±1.22. Description and comparison of pain scores before (pre-test) and after (post-test) intervention in the treatment and control groups, as well as comparison of pain scores between the two groups, can be seen in Table 2.

Table 2. Description and comparison of pain scores between before and after therapy in the treatment and control groups.

Group	Pain score		*P*	Difference post-test – pre-test
	Pre-test	Post-test		
Control	4.33±1.50	3.40±1.60	0.017[b]	-0.93±1.22
Treatment	4.33±1.50	1.87±1.41	0.0001[b]	-2.47±0.64
P	0.948[a]	0.013[a]		0.0001[a]

Note: Observations are described as mean±SD;
[a]unpaired group difference test does not pass the normality requirement (Mann-Whitney);
[b]paired group difference test does not pass the normality requirement (Wilcoxon rank test);
Normality using the Shapiro-Wilk test;
Differences are declared significant if the test produces *P*<0.050

Paired test in the treatment group (*P*=0.0001), which means that the treatment group had a significant decrease in pain scores. The control group (*P*=0.017), which means that the control group also had a significant decrease in pain scores. Giving hypnotherapy treatment significantly reduces pain scores, unpaired test on the posttest-pretest difference value (*P*=0.0001), which means there is a significant difference in pain score changes between the treatment group and the control group.

Interleukin-6 levels in the treatment group obtained a pretest mean of 44.18±16.63 and a posttest mean of 29.53±12.95. The difference in posttest-pretest IL-6 levels decreased by an average of 14.65±19.44. In the control group, IL-6 levels decreased from 57.36±49.80 to 33.88±13.08. The difference in changes in posttest-pretest IL-6 levels was obtained with a mean of 23.48±48.69. Description and comparison of IL-6 levels before (pre-test) and after (post-test) therapy in the treatment and control groups and comparison of IL-6 levels between the two groups can be seen in Table 3.

Paired test in the treatment group (*P*=0.008), which means that the treatment group experienced a significant decrease in IL-6 levels. The control group (*P*=0.191), which means that the control group did not experience a significant decrease in IL-6 levels. Although IL-6 levels decreased in the treatment group, the between-group difference was not significant (*P*=0.345), which means there is no significant difference in IL-6 levels changes between the treatment group and the control group.

Table 3. Description and comparison of interleukin 6 levels between before and after therapy in the treatment and control groups.

Group	Interleukin 6		*P*	Difference post-test – pre-test
	Pre-test	Post-test		
Control	57.36±49.80	33.88±13.08	0.191[b]	-23.48±48.69
Treatment	44.18±16.63	29.53±12.95	0.008[b]	-14.65±19.44
P	0.683[a]	0.325[a]		0.345[a]

Note: Observations are described as mean±SD;
[a]unpaired group difference test does not pass the normality requirement (Mann-Whitney);
[b]paired group difference test does not pass the normality requirement (Wilcoxon rank test);
Normality using the Shapiro-Wilk test;
Differences are declared significant if the test produces *P*<0.050

The Functional Assessment of Cancer Therapy-Lung (FACT-L) score of the treatment group obtained a pretest mean of 84.13±18.86 and a post-test mean of 105.13±11.64. The difference in changes in posttest-pretest FACT-L scores increased by an average of 21.00±15.81. The control group's FACT-L score had a pretest mean of 100.13±13.02 and a posttest mean of 102.60±10.43. The difference in the change in posttest-pretest FACT-L score was 2.47±5.60. Description and comparison of FACT-L scores before (pre-test) and after (post-test) therapy in the treatment and control groups, as well as comparison of FACT-L scores between the two groups, can be seen in Table 4.

Table 4. Description and comparison of FACT-L scores between before and after therapy in the treatment and control groups

Group	FACT-L Score		*P*	Difference post-test – pre-test
	Pre-test	Post-test		
Control	100.13±13.02	102.60±10.43	0.078[b]	2.47±5.60
Treatment	84.13±18.86	105.13±11.64	0.002[b]	21.00±15.81
P	0.013[a]	0.389[a]		0.002[a]

Note: Observations are described as mean±SD;
[a]unpaired group difference test does not pass the normality requirement (Mann-Whitney);
[b]paired group difference test does not pass the normality requirement (Wilcoxon rank test);
Normality using the Shapiro-Wilk test;
Differences are declared significant if the test produces *P*<0.050

The paired test in the treatment group (*P*=0.002), which means that the treatment group experienced a significant increase in FACT-L scores.

The control group (*P*=0.078), which means that the control group did not experience a significant increase in FACT-L score. Hypnotherapy intervention significantly increased the FACT-L score, unpaired test on the post-test and pre-test difference value (*P*=0.002), which means there is a significant difference in changes in FACT-L score between the treatment group and the control group.

DISCUSSION

Primary lung cancer originates from the bronchial epithelium. Most lung cancer cases are in males, over 40 years old, and smokers. Lung cancer can be divided into two main types, namely NSCLC and SCLC. NSCLC is the most common type of lung cancer, accounting for about 85% of all lung cancers, consisting of several subtypes, including squamous carcinoma as much as 20%, adenocarcinoma as much as 38.5% and large cell carcinoma as much as 2.9%.[13] Lung cancer is the leading cause of death in the world among malignancies, accounting for 18.4% of the 9.6 million deaths caused by cancer.[1]

The average age of subjects in both groups was 56 years. The average age of lung cancer diagnosis in the US is 70 years, and about 53% of cases occur between 55 and 74 years old. Lung cancer can also occur under 50 years old in 10% of American cases. Biological aging contributes to the incidence of lung cancer due to telomere shortening, decreased levels of the metabolite nicotinamide adenine dinucleotide (NAD+), and cells lose the ability to survive and repair DNA damage with age.[14]

The majority gender in both groups was male. The 2020 Global Cancer Observatory (GLOBOCAN) reported a higher incidence of lung cancer in men.[15] Hospital-based cancer registration data at Dharmais Cancer Hospital Jakarta from 2003 to 2007 reported that lung cancer was the most common malignancy in men (5.92/100,000) and in women, it was the fourth (5.52/100,000).[16]

The education level of most subjects is low, not going to school as many as 1 subject (3.3%), elementary school as many as 9 subjects (30%), junior high school as many as 8 subjects (26.7%). Low education is linked to limited awareness of smoking risks and harmful exposures.[14,17] The majority of research subjects in both groups were farmers, about 9 subjects (30%). Farmers have a risk of exposure to hazardous chemicals such as pesticides. Pesticides such as herbicides, insecticides, fungicides, fumigants, and rodenticides are important chemicals that are widely used in the agricultural sector.[18]

Pain is common in cancer patients and often has a negative impact on their functional status and quality of life.[19] The pathophysiology of cancer pain is complex due to interactions between cancer cells, the central and peripheral nervous system, and the immune system.[5]

Lung cancer causes chronic stress conditions. In cancer patients, microglia are activated in several brain areas and are involved in the interpretation and response to psychological distress. Cancer also reduces astrocyte reactivity in two areas of the brain cortex.[20]

The spinothalamic tract is the main pathway for transmitting nociceptive signals. The thalamus transmits pain information from the periphery and spinal cord to several sites in the cortex involved in processing nociceptive information. The prefrontal cortex encodes the cognitive aspects of acute and chronic pain, the anterior cingulate cortex is related to the affective or emotional components of pain and the motivational-motor aspects of pain. The S1 and S2 somatosensory cortices process sensory information about nociceptive, including location, severity and identification. The insula is responsible for encoding physical conditions in various domains related to motivation.[21]

Stress serves as both a predisposing and modulating factor for chronic pain.[22] The corticolimbic system plays an important and essential role in the regulation of stress responses through HPA axis feedback.[23] The adrenal cortex produces more cortisol under acute stress conditions, which will inhibit the secretion of corticotrophin-releasing hormone (CRH) from the hypothalamus and adrenocorticotropic hormone (ACTH) from the pituitary to normalize cortisol release and maintain

body homeostasis.[24]

The HPA axis is hyperactive in the early stages of chronic pain and after experiencing long-term hyperactivity, the stress system reaches a state of fatigue and the HPA axis turns into hypoactivity.[22,24] A hypoactivated HPA axis causes ACTH hyperreactivity and leads to hypocortisolemia.[24] Low cortisol levels will increase pain sensitivity. A number of factors may influence the relationship between cortisol expression and chronic pain, e.g., comorbid depression, anxiety or chronic stress may alter HPA axis function.[22]

Hypnosis reduces pain by reducing anxiety through relaxation and/or directly affecting the neurophysiological activity underlying the subjective experience of pain.[25] Hypnosis affects activity in the spinal cord, thalamus, sensory cortex, insula, anterior cingulate cortex, and prefrontal cortex. Hypnotic suggestions decrease activity in the anterior cingulate cortex, thereby reducing pain discomfort, and decrease activity in S1 and S2 cortices, thereby reducing pain intensity.[21] The experience of pain is also related to brain waves, where there is an increase in beta activity of 13–30 Hz and a decrease in alpha activity of 8–13 Hz during pain. Hypnosis decreases beta activity and increases alpha activity.[9] Hypnosis has the potential to modulate the HPA axis.[26] Hypnosis accesses corticolimbic circuits that may decrease subjective pain perception in the central nervous system.[27]

Minimal clinically important difference (MCID) is the minimum change in pain score that is meaningful in a patient's pain status. This minimal change in pain scores needs to be assessed to determine patient comfort with pain relief treatment and assess treatment success. The study by Bahreini et al in 2019 in Iran reported the minimum pain score change required by patients of 1.65 using the NRS scale to be able to feel changes in pain severity.[28] A systematic review study by Olsen et al in 2017 in Denmark reported a range of MCID values of 14–23 mm based on the VAS scale, which when correlated with the NRS score, is equivalent to 1.4–2.3.[29]

In this study, there was a significant difference in pain score changes between the hypnotherapy and control groups, with a value of *P*=0.0001. This is in accordance with the research of Sharma et al. in India in 2017 that hypnotherapy intervention can significantly reduce cancer pain and the study of Prasetya et al in 2021 in Surakarta that hypnotherapy has a major influence in reducing the pain of cervical cancer patients.[9,11] Studies related to the effect of hypnotherapy on the pain of lung cancer patients have not yet obtained scientific data. The decrease in pain scale of 2.47 in the hypnotherapy group is also clinically meaningful because it is above the MCID value of several studies that can provide comfort to patients. The final average pain result of 1.87 in the treatment group after hypnotherapy also shows that the patient is in a mild pain level, which provides a sense of comfort to the patient.

In lung cancer, there is a chronic inflammatory process through intrinsic and extrinsic pathways, which results in the activation of transcription factors nuclear factor-kappa beta (NF-kB), signal transducer and activator of transcription 3 (STAT 3), and hypoxia-inducible factor 1α (HIF1α) of tumor cells. These transcription factors will produce inflammatory mediators such as cytokines and chemokines, which further stimulate inflammatory cell recruitment, activate transcription factors of inflammatory cells, stromal cells, and tumor cells, and subsequently produce more proinflammatory cytokines.[30] Cancer induces stimulation of proinflammatory cytokines such as IL-1, IFN-α, IL-6, and TNF-α in the hypothalamus, which alters HPA axis activity and results in glucocorticoid resistance. HPA axis stimulation also leads to increased expression of proinflammatory cytokines.[31]

Interleukin-6 is produced by various immune cells during inflammation and by non-immune cells such as fibroblasts, endothelial cells, endocrine cells, and tumor cells. Interleukin-6 is a potent activator of the HPA axis.[32] Many factors affect circulating IL-6 levels in the blood. Sample processing and handling factors, such as delays in processing, shocks to the sample when brought to the laboratory, the length of time the sample is at room temperature, and the

length of the centrifugation process at high speed, can also affect the measurement.[33]

The study of Cohen et al showed that whole blood stored at room temperature will cause a decrease in cytokine levels, but is relatively stable at storage at 4°C. Various conditions, including autoimmune disease, cardiovascular disease, cancer, and aging affect IL-6 levels.[34] Interleukin-6 levels in healthy individuals and lung cancer patients vary. Research by Siagian et al in 2021 in Medan, comparing 42 healthy individuals and 42 lung cancer patients found that the average IL-6 value was 6.24 pg/mL in healthy individuals and 45.99 pg/mL in lung cancer patients.[35] Research by Chen et al in 2020 in China reported IL-6 levels in healthy individuals of 5.10±2.79 pg/mL and in lung cancer of 31.98±16.29 pg/mL.[36]

This study did not find a statistically significant decrease in IL-6 levels between the two groups (*P*=0.345) and a decrease in IL-6 values that are close to the range of IL-6 values of healthy individuals, so that hypnotherapy has not provided clinical benefits in reducing IL-6 levels. This is in accordance with Lesmana's research in 2012 in Bali, which provided an intervention of one spiritual hypnotherapy session for 120 minutes in 1 month that could not significantly reduce IL-6 levels.[37] Another study by Schoen et al in 2013 in the United States reported a decrease in IL-6 levels in healthy individuals with the administration of stress reduction self-hypnosis CD for 12 weeks.[12] There is no scientific data related to the effect of hypnotherapy on IL-6 levels in lung cancer patients.

In this study, hypnotherapy intervention was conducted for four weeks, so it may not have been able to reduce significant IL-6 levels in the research subjects. In this study, blood sampling of research subjects for IL-6 examination was not all done on the first treatment day; some samples were taken on the second or third treatment day. The time for IL-6 blood sampling also varied from the morning at 08:00 to the evening at 21:00, depending on the patient's arrival time and the order in which the patient was examined by the researcher. Shocks to sample delivery from the ward or polyclinic to the laboratory may also occur. The time from sample collection to storage in a storage cabinet at minus 80°C also varies. These things can be confounding factors that cannot be controlled and can affect IL-6 results.

Cancer pain is a critical symptom that has the potential to affect all dimensions of quality of life. Cancer pain interferes with various aspects of patients' quality of life, including activities of daily living, social functioning, and sleep quality.[38]

There are significant differences between the control (100.13) and treatment group (84.13) at the beginning of the study, especially in emotional well-being. After hypnotherapy intervention, there was a significant difference in the FACT-L score between the treatment group and the control group (*P*=0.002). All aspects of FACT-L improved in the treatment group, especially in the emotional well-being aspect, followed by the physical well-being aspect.

This is in accordance with the research of Tellez et al in 2017 that hypnotherapy can improve the overall quality of life of breast cancer patients.[39] The 2017 study by Forester-Miller also reported an improvement in the quality of life of patients with breast cancer after a self-hypnosis intervention.[40] However, there is no scientific data regarding the effect of hypnotherapy on the quality of life of lung cancer patients.

LIMITATION

This study has limitations. First, the intervention time was limited to 4 weeks. Second, researchers cannot control the state of the patient and the environment around the patient when listening to self-hypnosis audio recordings, such as patients falling asleep during sessions or distractions in the environment. Third, researchers are not always able to directly evaluate each patient who listens to self-hypnosis audio recordings at home, such as poor signal reception at the patient's home.

CONCLUSION

Hypnotherapy may serve as an adjunct therapy for lung cancer patients with cancer pain to improve overall management, especially in terms of

pain scale and quality of life. Further studies should assess its effect on interleukin-6 over a longer duration, such as 12 weeks.

CONFLICT OF INTEREST

The authors declare no conflicts of interest in the research, its funding, or the publication of this scientific article.

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