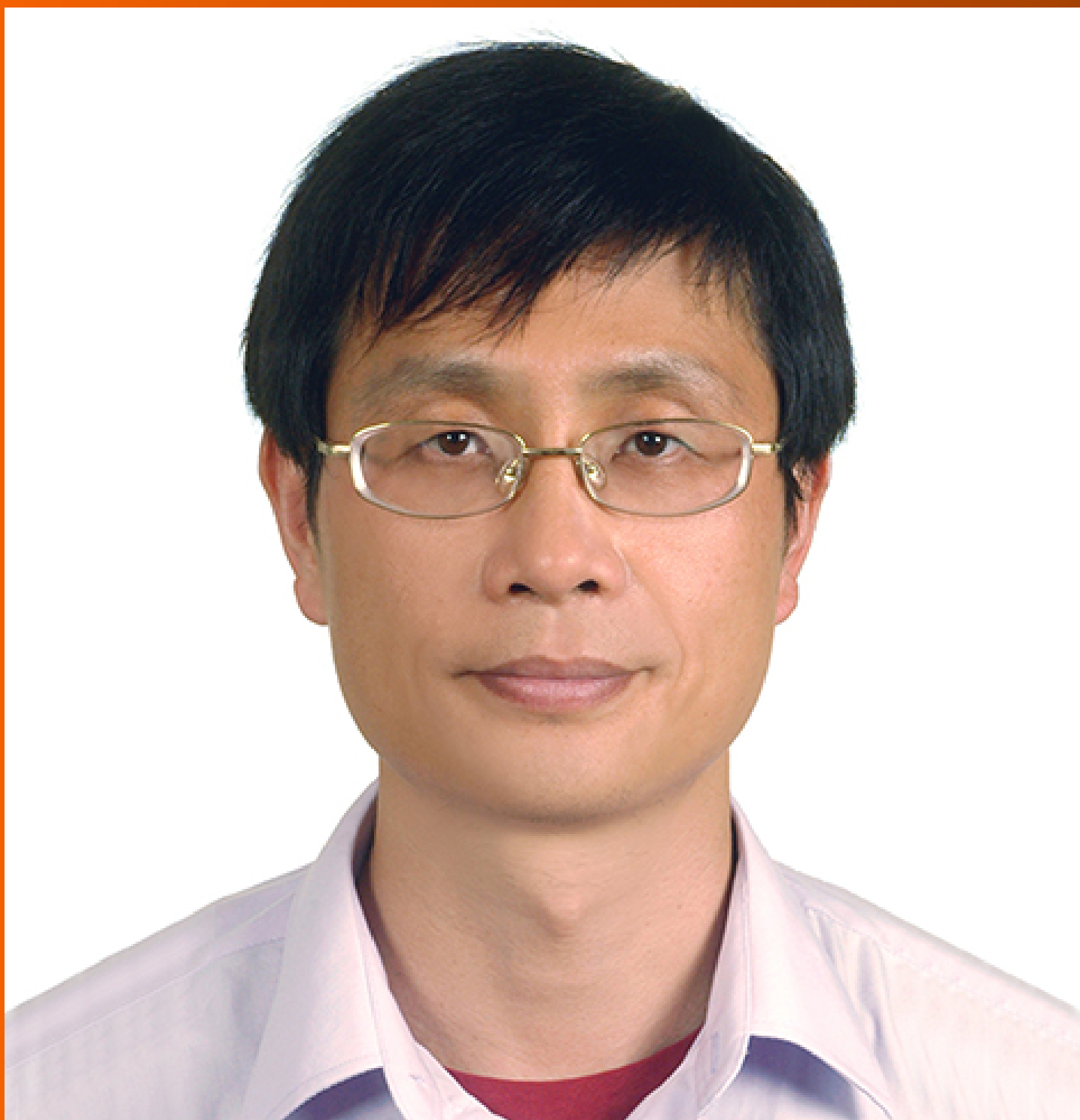


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Retrospective Study

# Influence of initial check, information exchange, final accuracy check, reaction information nursing on the psychology of elderly with lung cancer

Cui Jiang, Jing Ma, Wen He, Hai-Ying Zhang

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## Abstract

### BACKGROUND

As one of the fatal diseases with high incidence, lung cancer has seriously endangered public health and safety. Elderly patients usually have poor self-care and are more likely to show a series of psychological problems.

### AIM

To investigate the effectiveness of the initial check, information exchange, final accuracy check, reaction (IIFAR) information care model on the mental health status of elderly patients with lung cancer.

### METHODS

This study is a single-centre study. We randomly recruited 60 elderly patients with lung cancer who attended our hospital from January 2021 to January 2022. These elderly patients with lung cancer were randomly divided into two groups, with the control group taking the conventional propaganda and education and the observation group taking the IIFAR information care model based on the conventional care protocol. The differences in psychological distress, anxiety and depression, life quality, fatigue, and the locus of control in psychology were

compared between these two groups, and the causes of psychological distress were analyzed.

## RESULTS

After the intervention, Distress Thermometer, Hospital Anxiety and Depression Scale (HADS) for anxiety and the HADS for depression, Revised Piper's Fatigue Scale, and Chance Health Locus of Control scores were lower in the observation group compared to the pre-intervention period in the same group and were significantly lower in the observation group compared to those of the control group ( $P < 0.05$ ). After the intervention, Quality of Life Questionnaire Core 30 (QLQ-C30), Internal Health Locus of Control, and Powerful Others Health Locus of Control scores were significantly higher in the observation and the control groups compared to the pre-intervention period in their same group, and QLQ-C30 scores were significantly higher in the observation group compared to those of the control group ( $P < 0.05$ ).

## CONCLUSION

The IIFAR information care model can help elderly patients with lung cancer by reducing their anxiety and depression, psychological distress, and fatigue, improving their tendencies on the locus of control in psychology, and enhancing their life qualities.

**Key Words:** Initial check, information exchange, final accuracy check, reaction information care model; Lung cancer; Mental health

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**Core Tip:** Elderly patients with lung cancer have poor self-care ability, which easily leads to a series of psychological problems. The purpose of this study is to explore the influence of initial check, information exchange, final accuracy check, reaction (IIFAR) nursing on mental health of elderly patients with lung cancer. Through the randomized controlled trial based on IIFAR nursing, it is found that IIFAR information nursing mode can help the elderly patients with lung cancer to reduce anxiety, depression, psychological distress and fatigue, improve their tendency of locus of control and effectively improve their quality of life.

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## INTRODUCTION

Lung cancer is the tumor disease with the highest incidence and mortality rate in China. According to the statistics from the International Agency for Research on Cancer (IARC) of the World Health Organization, there were about 1.8 million new cases of lung cancer and 1.59 million deaths in the world in 2012, and the number of lung cancer deaths in the world is expected to reach 3 million by 2035[1]. The incidence of lung cancer is concentrated in the middle and older age groups. Research studies have shown that elderly patients with lung cancer could suffer from severe psychological distress (unpleasant emotional experiences caused by multiple causes), anxiety, and depression. Psychological distress is an emotional experience that is manifested by a range of psychological problems, such as mental and emotional crises, and is caused by various reasons that lead to changes in the patient's knowledge, beliefs, and behavior[2]. Studies have shown that the favorable detection rates for psychological distress, anxiety, and depression in patients with lung cancer are 30%, 26.7%, and 27.7%, respectively[3]. These negative experiences and emotions will reduce life quality[4] and treatment adherence[5] and are even associated with increased mortality[5,6].

Elderly patients usually have poor self-care and also a higher risk of falls and blood clots, have weaker general and cognitive functions, acquire limited access to disease knowledge and treatment options, and have increased needs for their environment and care. If needs are not met, this can lead to negative emotions such as anxiety, fear, and reduced expectations of life[7]. Lack of scientific understanding of cancer is a major cause of psychological distress and anxiety in patients with lung cancer, and information support can alleviate their psychological distress, anxiety, and depression mood[8]. The information needs of patients with lung cancer are currently extraordinarily high and unmet[9]. Therefore, providing high-quality information support that enables patients to receive better information about health education is an important part of lung cancer care. Currently, clinical health education is mainly delivered by nurses to patients unilaterally, verbally, on television, or in a simple paper format, which has the disadvantages of being brief and rushed, informative, and not taking into account individual differences and patient understanding[10]. The British scholar Nichols[11] believes that information care is an essential psychological care component and has proposed the initial check, information exchange, final accuracy check, reaction (IIFAR) information care model.



This method bridges the gap of traditional health education by providing information to patients, keeping the information at a certain level, prompting patients to develop realistic expectations, reducing patients' fear, stress, and doubt due to their illness, and guiding them to participate effectively in treatment and self-care. In this study, a randomized controlled trial was conducted to investigate the effectiveness of the IIFAR information care model of the interventions on psychological distress, anxiety and depression, life quality, fatigue, and the locus of control on psychology in patients hospitalized with lung cancer.

## MATERIALS AND METHODS

### Study subjects

In this single-center randomized controlled trial, we randomly recruited 60 elderly patients with lung cancer who presented to our hospital from January 2021 to January 2022. Inclusion criteria: (1) Meeting the diagnostic criteria for lung cancer[12,13]; (2) Age  $\geq 60$  years; (3) Patients were conscious and able to fill in questionnaires or answer them independently or with the assistance of the investigator; and (4) Education level at primary school and above. Exclusion criteria: (1) Patients who were unaware of the disease; (2) Patients with slurred speech or communication difficulties; (3) Patients with comorbidities of other types of cancer or life-threatening severe diseases; (4) Patients with Karnofsky Performance Scale scores  $< 60$ ; and (5) Patients with symptoms of mental illness or a history of mental illness. All patients signed an informed consent form. All processes of this study were by the Declaration of Helsinki.

### Care methods

In the control group, conventional teaching methods were used: Nurses gave verbal health education to patients according to the daily teaching process, including admission instructions, treatment plans, side effects, discharge instructions, *etc.*

The observation group used the IIFAR information care model based on the control group, which consisted of a postgraduate nursing student who had been trained and completed the pre-lab and carried out four information care sessions of 45 min each in strict accordance with the Investigator's Intervention Manual. The first session was completed within 1 d of admission and focused on relevant ancillary tests and pain management; The second session was completed within 3-4 d of admission and focused on treatment protocols and side effects; The third session was completed within 7-8 d of admission and focused on coping with side effects and emotional management; The fourth session was completed within 24 h before discharge and focused on post-discharge rehabilitation. The operational steps of the specific IIFAR information care model include an initial check, information exchange, final accuracy check, and response in 4 steps: (1) Initial check: Checking the patient's emotional and cognitive state to determine if the patient is at the best time to receive information; Confirming that the patient has an information need or not; Asking the patient to describe in their own words about the information they have received, identifying the information they have, and the information they still need; Making a judgment on the patient's basic needs; (2) Information exchange: Organizing the information that the patient lacks into small packets of information, no more than 4-5 packets in total, based on the presentation of the packets of information, with a pause in each packet to allow for questions, repetition, and discussion, avoiding adulteration with redundant information to ensure effectiveness; (3) Final accuracy check: Asking patients to state the critical points of this information exchange in their own words, listening carefully, and re-teaching the patient for misinformation and gaps; and (4) Reaction: Changing the researcher-led atmosphere of the information communication to ensure that the patient is relaxed; Briefly discussing with the patient his or her reaction to the information and the thoughts and feelings that this triggers.

### Evaluation indicators

**Psychological distress:** A psychological Distress Thermometer (DT)[14] was used to assess changes in psychological distress in patients before and after the intervention. The National Comprehensive Cancer Network recommends it as a screening tool for psychological distress. The Chinese version of the DT used in this study was revised by Tang *et al* at Peking University Cancer Hospital according to the actual situation in China. The first part is a single-item and self-assessment question on psychological distress with a scale of 0-10 (0 being no distress and 10 being extreme distress), which assesses the average level of psychological distress experienced by the patient in the last week. The second part is a problem list, which includes 40 problems in 5 categories that patients may experience after their illness: Practical, relationship, emotional, physical, and religious problems. Significant psychological distress is defined as when the DT  $\geq 4$  points.

**Anxiety and depression:** The comprehensive Hospital Anxiety and Depression Scale (HADS)[15] was used to assess anxiety and depression before and after intervention. The HADS, developed by Zigmond *et al*, is one of the most commonly used instruments to screen for depression and anxiety associated with physical illness and is used to screen patients for their depression and anxiety rapidly. The HADS consists of two subscales, the HADS for anxiety (A) and the HADS for depression (D), with 14 items, seven for anxiety and seven for depression. The items are scored on a standard scale of 0 to 3, so the total score range for anxiety and depression is 0 to 21 each, with higher scores indicating more severe levels of anxiety or depression.

**Life quality:** The EORTC Core Quality of Life Questionnaire (EORTC QLQ-C30)[16] assessed the patient's quality of life before and after the patient intervention. The scale contains 30 items, which are evaluated on 15 dimensions, including



five functional domains (somatic, emotional, cognitive, role, and social), three symptom domains (fatigue, pain, nausea, and vomiting), one life quality domain (general health) and six single domains (insomnia, shortness of breath, loss of speech, diarrhea, constipation, and financial difficulties), where items 1 to 28 were rated on a 4-point scale (1 to 4). In contrast, items 29 and 30 were rated on a 7-point scale (1 to 7). The scores were linearly transformed using the polarisation method to convert the total row score into a standardized score, with the standardized score ranging from 0-100, with higher scores indicating better life quality.

**Fatigue:** The Revised Piper's Fatigue Scale (RPFS)[17] assessed patients' fatigue before and after the intervention. The scale consisted of 22 items on four dimensions: Behavioural, emotional, perceptual, and cognitive, as well as four open-ended questions and one question on fatigue duration. Each score ranges from 0 to 10 points, and the final score is based on the average score of 22 items to determine the patient's fatigue level. The higher the score, the more severe the fatigue level.

**Locus of control on psychology:** The patient's tendency on the locus of control on their psychology before and after the intervention was assessed using the Multidimensional Health Locus of Control (MHLC)[18]. The scale consists of three dimensions with a total of 18 entries: The Internal Health Locus of Control (IHLC) (entries 1, 6, 8, 12, 13, 17), the Powerful Others Health Locus of Control (PHLC) (entries 3, 5, 7, 10, 14, 18) and the Chance Health Locus of Control (CHLC) (entries 2, 4, 9, 11, 15, 16), from which patients' perceptions of health are assessed. A 6-point Likert scale of 1 (strongly disagree)-6 (strongly agree) was used, with scores ranging from 6 to 36 on each scale, with higher scores on each dimension indicating an individual's preference for that source of psychological control type. The Cronbach's alpha coefficients for the three subscales were: 0.49, 0.58, and 0.70, respectively.

### Statistical analysis

SPSS 22.0 statistical software was applied to analyze the data. After testing for normality, the measurement data confirmed to be normally distributed were expressed as mean  $\pm$  SD and a *t*-test was adopted. Count data were expressed as percentages by taking the line chi-square test, the Mann-Whitney test, or the Wilcoxon test, with  $P < 0.05$  indicating a difference that owns statistical significance.

## RESULTS

### Characteristics of baseline information

There was no statistical difference between the observation and control groups when comparing general information such as age, gender, education level, self-assessed economic status, and type of pathology ( $P > 0.05$ ; Table 1).

### Comparison of psychological distress

Before the intervention, there was no statistically significant difference in the DT scores between the observation and control groups ( $P > 0.05$ ). After the intervention, the DT scores of the observation group decreased compared to the same group before the intervention. They were significantly lower in the observation group compared to the control group ( $P < 0.05$ ; Table 2).

### Comparison of anxiety and depression

Before the intervention, there was no statistically significant difference in the HADS (A) and HADS (D) scores between the observation group and the control group ( $P > 0.05$ ). After the intervention, the HADS (A) and HADS (D) scores of the observation group and the control group were significantly lower compared to the same group before the intervention, and those of the observation group were significantly lower compared to those of the control group ( $P < 0.05$ ; Table 3).

### Comparison between life quality and fatigue

Before the intervention, there was no statistically significant difference in the QLQ-C30 and RPFS scores between the observation and control groups ( $P > 0.05$ ). After the intervention, the QLQ-C30 scores of the observation and control groups were significantly higher. The RPFS scores were significantly lower than the group before the intervention. The QLQ-C30 scores of the observation group were significantly higher, and the RPFS scores of the observation group were significantly lower than the control group ( $P < 0.05$ ; Table 4).

### Comparison in locus of control on psychology

Before the intervention, there was no statistically significant difference between the observation and control groups in the IHLC, PHLC, and CHLC scores ( $P > 0.05$ ). After the intervention, the IHLC and PHLC scores of the observation and the control group were significantly higher. Their CHLC scores were significantly lower compared to the same group before the intervention. The IHLC and PHLC scores of the observation group were significantly higher and its CHLC scores were significantly lower than that of the control group ( $P < 0.05$ ; Table 5).

### Analysis of issues related to psychological distress

After analysis, it was found that the top 5 factors related to psychological distress among elderly patients with lung cancer were sleep disturbance, worry, breathing difficulties, memory loss, and pain, accounting for 51.67% (31/60),

**Table 1** Characterization of baseline information, *n* (%)

Projects	Observation group ( <i>n</i> = 30)	Control group ( <i>n</i> = 30)	<i>t</i> / $\chi^2$ value	<i>P</i> value
Age (yr), mean $\pm$ SD	70.38 $\pm$ 5.07	69.08 $\pm$ 4.87	1.016	0.313
Gender			0.300	0.583
Male	19 (63.33)	21 (70.00)		
Female	11 (36.67)	9 (30.00)		
Education level			0.449	0.798
Primary schools	19 (63.33)	18 (60.00)		
Secondary schools	8 (26.67)	10 (33.33)		
University and above	3 (10.00)	2 (6.67)		
Self-assessment of economic status			0.315	0.854
Affluent	3 (10.00)	4 (13.33)		
General	17 (56.67)	15 (50.00)		
Poverty	10 (33.33)	11 (36.67)		
Type of pathology			0.416	0.518
Small cell lung cancer	7 (23.33)	5 (83.33)		
Non-small cell lung cancer	23 (76.67)	25 (16.67)		

**Table 2** Comparison of psychological distress in these two groups, mean  $\pm$  SD

Group	<i>n</i>	Pre-intervention	Post-intervention	<i>t</i> value	<i>P</i> value
Observation group	30	2.88 $\pm$ 1.52	1.82 $\pm$ 0.87	3.120	0.004
Control group	30	3.09 $\pm$ 1.96	2.45 $\pm$ 1.11	2.215	0.034
<i>t</i> value		0.446	2.444		
<i>P</i> value		0.657	0.017		

**Table 3** Comparison of anxiety and depression in these two groups, mean  $\pm$  SD

Group	<i>n</i>	Anxiety		Depression	
		Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Observation group	30	4.64 $\pm$ 1.74	2.33 $\pm$ 1.14 <sup>a</sup>	5.96 $\pm$ 2.08	3.59 $\pm$ 1.45 <sup>a</sup>
Control group	30	4.88 $\pm$ 1.92	3.44 $\pm$ 1.46 <sup>a</sup>	6.34 $\pm$ 2.26	5.07 $\pm$ 1.91 <sup>a</sup>
<i>t</i> value		0.496	3.242	0.673	3.381
<i>P</i> value		0.621	0.002	0.503	0.001

<sup>a</sup>*P* < 0.05 compared to the situation of pre-intervention.

46.67% (28/60), 41.67% (25/60), 40.00% (24/60) and 33.33% (20/60), respectively.

## DISCUSSION

The majority of patients with lung cancer patients are middle-aged and elderly groups, with reduced cognitive ability[19] and poor self-care. Therefore, high-quality health education is essential for elderly patients with lung cancer. Some studies have found[20] that patients' satisfaction with traditional health education could be higher, mainly due to the lack of understanding of patients' needs and the lack of confirmation of patients' understanding of relevant knowledge. The IIFAR information nursing model effectively compensates for the shortcomings of traditional health education. IIFAR model of information nursing adds a post-evaluation information check and its response compared to traditional teaching

**Table 4 Comparison of life quality and fatigue between these two groups, mean  $\pm$  SD**

Group	n	QLQ-C30		RPFS	
		Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Observation group	30	47.23 $\pm$ 9.36	70.59 $\pm$ 11.83 <sup>a</sup>	7.40 $\pm$ 0.38	6.61 $\pm$ 0.29 <sup>a</sup>
Control group	30	47.55 $\pm$ 10.32	55.98 $\pm$ 13.03 <sup>a</sup>	7.57 $\pm$ 0.52	7.02 $\pm$ 0.31 <sup>a</sup>
t value		0.123	4.546	1.474	5.190
P value		0.902	< 0.001	0.145	< 0.001

<sup>a</sup>P < 0.05 compared to the situation of pre-intervention.

QLQ-C30: Quality of Life Questionnaire Core 30; RPFS: Revised Piper's Fatigue Scale.

**Table 5 Comparison in locus of control on psychology between these two groups, mean  $\pm$  SD**

Projects	Observation group (n = 30)		Control group (n = 30)		t value	P value
IHLC						
Pre-intervention	24.69 $\pm$ 4.15		24.23 $\pm$ 4.01		0.437	0.663
Post-intervention	27.43 $\pm$ 2.23 <sup>a</sup>		25.88 $\pm$ 1.60 <sup>a</sup>		3.096	0.003
PHLC						
Pre-intervention	25.29 $\pm$ 3.68		25.86 $\pm$ 3.72		0.596	0.553
Post-intervention	29.56 $\pm$ 3.15 <sup>a</sup>		27.44 $\pm$ 2.45 <sup>a</sup>		2.902	0.005
CHLC						
Pre-intervention	21.45 $\pm$ 2.93		21.94 $\pm$ 3.28		0.604	0.548
Post-intervention	17.22 $\pm$ 2.58 <sup>a</sup>		19.51 $\pm$ 3.05 <sup>a</sup>		3.121	0.002

<sup>a</sup>P < 0.05 compared to the situation of pre-intervention.

CHLC: Chance Health Locus of Control; IHLC: Internal Health Locus of Control; PHLC: Powerful Others Health Locus of Control.

[21]. Due to aging, patients' recent memory declines, and false memories occur[22,23].

After the intervention, DT scores in the observation group were lower compared to those in the pre-intervention period in the same group, and those were significantly lower in the observation group compared to those of the control group ( $P < 0.05$ ). This suggests that the IIFAR information care model is effective in alleviating the level of psychological distress in elderly patients with lung cancer.

After the intervention, the HADS (A) and HADS (D) scores in the observation group and the control group were significantly lower compared to those in the pre-intervention period in the same group, and those in the observation group were significantly lower compared to the those in the control group ( $P < 0.05$ ). This demonstrates that the IIFAR information care model can effectively alleviate the anxiety and depression of patients with lung cancer. This may be related to the direct provision of information and indirect emotional support in the IIFAR information care model[24]. The provision of cancer information is more important to patients with lung cancer than their emotional support[25], and the provision of relevant information to patients with lung cancer is an essential measure in lung cancer care[26].

In this study, after the intervention, the IHLC and PHLC scores of the observation and control groups were significantly higher. The CHLC scores were significantly lower than those of the same group before the intervention. The IHLC and PHLC scores of the observation group were significantly higher, and the CHLC scores were significantly lower than those of the control group ( $P < 0.05$ ). This indicates that the IIFAR information care model helps elderly patients with lung cancer improve their tendency to locus of control on their psychology.

There are limitations to this study. Firstly, the small sample size in this study and the fact that it was all patients from our hospital may lead to some bias in the findings. Secondly, the selection of elderly patients as the study subjects may result in the findings not being applied to other age groups of patients with lung cancer. There is a need to expand the sample size, refine the study design, and explore the findings further.

## CONCLUSION

In summary, the IIFAR information care model can help elderly patients with lung cancer by alleviating their anxiety, depression, psychological distress, and fatigue, improving their tendencies in the locus of control on their psychologies,

and enhancing their life quality.

## ARTICLE HIGHLIGHTS

### Research background

Lung cancer, being a highly prevalent and life-threatening ailment, poses a significant threat to public health and safety. The elderly population, due to their diminished ability for self-care, often exhibit a range of psychological issues.

### Research motivation

To investigate nursing effect of elderly lung cancer patients.

### Research objectives

This study aims to examine the efficacy of the initial check, information exchange, final accuracy check, reaction (IIFAR) information care model in improving the mental health outcomes of elderly patients diagnosed with lung cancer.

### Research methods

The control group used the usual care model, the observation group, which received the IIFAR information care model in addition to the conventional care protocol.

### Research results

Following the intervention, the observation group exhibited lower scores in Distress Thermometer, Hospital Anxiety and Depression Scale (HADS) for anxiety and the HADS for depression, Revised Piper's Fatigue Scale, and Chance Health Locus of Control compared to their pre-intervention scores, and these scores were significantly lower than those of the control group ( $P < 0.05$ ). Additionally, both the observation and control groups showed significantly higher scores in Quality of Life Questionnaire Core 30 (QLQ-C30), Internal Health Locus of Control, and Powerful Others Health Locus of Control after the intervention compared to their pre-intervention scores within their respective groups. Furthermore, the observation group had significantly higher QLQ-C30 scores compared to the control group ( $P < 0.05$ ).

### Research conclusions

The implementation of the IIFAR information care model has the potential to ameliorate various psychological challenges faced by elderly patients diagnosed with lung cancer, including anxiety, depression, psychological distress, and fatigue. Moreover, this model exhibits the capability to enhance their psychological well-being by positively influencing their locus of control in psychology and ultimately improving their overall quality of life.

### Research perspectives

The small sample size in this study and the fact that it was all patients from our hospital may lead to some bias in the findings. There is a need to expand the sample size, refine the study design, and explore the findings further.

## FOOTNOTES

**Co-first authors:** Cui Jiang and Jing Ma.

**Author contributions:** Jiang C and Ma J designed the research and wrote the paper; Jiang C, Ma J, He W, and Zhang HY contributed to new reagents/analytic tools; He W and Zhang HY analyzed the data; Cui Jiang and Jing Ma contributed equally to this work as co-first authors; All authors were involved in the critical review of the results and have read and approved the final manuscript. The reasons for designating Jiang C and Ma J as co-first authors are threefold. First, the research was performed as a collaborative effort, and the designation of co-first authorship accurately reflects the distribution of responsibilities and burdens associated with the time and effort required to complete the study and the resultant paper. This also ensures effective communication and management of post-submission matters, ultimately enhancing the paper's quality and reliability. Second, the overall research team encompassed authors with a variety of expertise and skills from different fields, and the designation of co-first authors best reflect this diversity. This also promotes the most comprehensive and in-depth examination of the research topic, ultimately enriching readers' understanding by offering various expert perspectives. Third, Jiang C and Ma J contributed efforts of equal substance throughout the research process. The choice of these researchers as co-first authors acknowledge and respects this equal contribution, while recognizing the spirit of teamwork and collaboration of this study. In summary, we believe that designating Jiang C and Ma J as co-first authors of is fitting for our manuscript as it accurately reflects our team's collaborative spirit, equal contributions, and diversity.

**Institutional review board statement:** This study was approved by the Ethics Committee of Huangpi District People's Hospital of Wuhan.

**Informed consent statement:** All the families have voluntarily participated in the study and have signed informed consent forms.

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**Data sharing statement:** Data generated from this investigation are available upon reasonable request from the corresponding author.

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