

Relationship between cancer-caused fatigue and negative emotions in gastric cancer patients undergoing daytime chemotherapy and the effect of positive thinking intervention

Yamin Xu^{#1}, Qianhong Li^{#1}, Xi Chen², Mei Wu³, Wenting Bao⁴, Lirong Zhao^{5*}

¹ Day Care Chemotherapy, Huadong Hospital Affiliated to Fudan University, Shanghai, 200040, China

² Oncology Department, Huadong Hospital Affiliated to Fudan University, Shanghai, 200040, China

³ Day Surgery Ward, Huadong Hospital Affiliated to Fudan University, Shanghai, 200040, China

⁴ Day Care Chemotherapy, Huadong Hospital Affiliated to Fudan University, Shanghai, 200040, China

⁵ Neurology Department, Huadong Hospital Affiliated to Fudan University, Shanghai, 200040, China

[#] These authors contributed equally to this work

*Corresponding E-mail: grace_sky2019@163.com

CITATION

Author Name. (2025). Article title. Journal of Infrastructure, Policy and Development. 9(x): X.
<https://doi.org/10.24294/jipdxxxx>

ARTICLE INFO

Received: Date Month Year

Revised:

Accepted: Date Month Year

Available online: Date Month Year

COPYRIGHT



Copyright © 2025 by author(s).

Psycho-Oncologie is published by PiscoMed Publishing Pte.Ltd. This work is licensed under the Creative Commons Attribution (CC BY) license. <https://creativecommons.org/licenses/by/4.0/>

Abstract: Objective: To explore the relationship between cancer-caused fatigue and negative emotions in gastric cancer patients undergoing daytime chemotherapy, and to assess the effect of positive thinking intervention on improving cancer-caused fatigue, negative emotions and quality of life of patients. Methods: 120 gastric cancer patients were selected and randomly divided into the intervention group and the control group, with 60 cases in each group. The control group received conventional care, and the intervention group received 8-week positive thinking intervention on the basis of conventional care. The Piper Fatigue Scale was used to assess cancer-caused fatigue, SAS and SDS to assess negative emotions, and EORTC QLQ-C30 to assess quality of life before and at the 4th and 8th weeks after the intervention, respectively, and intervention compliance and adverse reactions were recorded. Results: Cancer-caused fatigue was significantly and positively associated with negative mood ($P < 0.05$). After the intervention, the intervention group had significantly lower cancer-caused fatigue scores than the control group ($P < 0.05$), significantly lower anxiety and depression scores ($P < 0.001$), significantly higher quality of life scores ($P < 0.001$), and significantly better sleep quality ($P < 0.05$). The intervention group's adherence to the intervention was 93.33%, with no serious adverse events, and only some patients reported transient discomfort, which did not affect the continuation of the intervention. Conclusion: Positive thinking intervention can significantly improve cancer-caused fatigue, negative mood, quality of life and quality of sleep in gastric cancer patients undergoing daytime chemotherapy, and has high adherence and safety, which is suitable for promotion and application in clinical care.

Keywords: gastric cancer; daytime chemotherapy; cancer-caused fatigue; negative emotion; positive thought intervention

1 Introduction.

In the process of cancer treatment, gastric cancer, as a common malignant

tumor, brings great physiological and psychological burden to patients ^[1]. With the progress of medical technology, daytime chemotherapy mode has gradually become one of the important modalities for gastric cancer treatment. Ambulatory chemotherapy not only improves the utilization efficiency of medical resources, but also reduces the hospitalization time of patients and lowers medical costs ^[2]. However, this treatment mode also brings new challenges to patients. During daytime chemotherapy, patients need to travel frequently to and from the hospital, and they also have to face various adverse reactions brought by chemotherapy, such as nausea, vomiting, and hair loss. Among them, cancer-caused fatigue and negative emotions are one of the most common problems among gastric cancer patients undergoing daytime chemotherapy ^[3].

Cancer-caused fatigue is a persistent, subjective feeling of fatigue caused by cancer or cancer treatment that is difficult to be relieved by rest ^[4]. This kind of fatigue not only affects the patient's ability to perform daily activities, but may also lead to a loss of confidence in treatment and reduced treatment adherence. Studies have shown that the incidence of cancer-caused fatigue is as high as 70% to 90% in cancer patients and is particularly severe during chemotherapy ^[5-7]. Meanwhile, negative emotions such as anxiety and depression are also more common in gastric cancer patients. The process of cancer diagnosis and treatment brings great psychological pressure to patients, who often face worries about the prognosis of the disease, uncertainty about the effect of treatment, and anxiety about the financial burden on the family. These negative emotions not only affect patients' psychological health, but may also further aggravate their subjective feelings of fatigue, forming a vicious cycle ^[8].

Positive thinking intervention is a psychological intervention method based on psychology, aiming to improve mental health and quality of life by guiding individuals to focus on positive thinking patterns and behavioral habits, and helping them establish an optimistic mindset. In recent years, positive thinking intervention has gradually gained attention in clinical care and psychotherapy, especially in coping with psychological stress in cancer patients, showing good application prospects ^[9]. By cultivating patients' positive emotions, strengths and hopes, it helps them to better cope with psychological stress during cancer treatment. Combined with positive thinking intervention, it can further enhance the intervention effect and provide more comprehensive psychological support for cancer patients ^[10].

In this study, by exploring the relationship between cancer-caused fatigue and negative emotions in gastric cancer patients undergoing daytime chemotherapy and evaluating the effect of positive thought intervention on improving cancer-caused fatigue and negative emotions in patients, we provide new intervention ideas for clinical nursing practice to help patients better cope with the physical and psychological challenges during treatment and improve their quality of life.

2 Research information and methodology

2.1 General information

Gastric cancer patients who received treatment in the ambulatory chemotherapy center of local tertiary hospitals during the period from January 2023 to December 2024 were selected as the study subjects. They were divided into two groups according to the principle of randomization by coin-flip method, with 60 patients in each group. One group was the intervention group, which received 8 weeks of positive thinking intervention on top of routine care, and the other group was the control group, which received only routine care in the ambulatory chemotherapy center. The basic characteristics of the study subjects are shown in the table below. There was no significant difference between the two groups in terms of age, gender, BMI, disease stage, education level, and marital status ($P > 0.05$), and they were well comparable.

Table 1. Basic characteristics of the research object

features	Intervention group(n = 60)	Control group (n= 60).	P
Age (years)	35.2 ± 10.3	34.8 ± 10.5	0.852
Gender (m/f)	28/32	31/29	0.764
BMI(kg/m ²)	23.5 ± 3.2	23.3 ± 3.1	0.801
Disease Staging(I/II/III/IV)	10/20/20/10	12/18/20/10	0.915
Level of education (below high school / high school and above)	25/35	27/33	0.663

Inclusion criteria: (1) pathologically confirmed diagnosis of gastric cancer^[11]; (2) receiving daytime chemotherapy, and it was the first time of chemotherapy or undergoing regular chemotherapy; (3) age ≥ 18 years old; (4) conscious and able to understand and cooperate with the study; (5) voluntarily participating in this study and signing the informed consent form.

Exclusion criteria: (1) Comorbidity with other serious medical diseases (e.g., cardiopulmonary failure, hepatic and renal insufficiency, etc.); (2) History of mental illness or cognitive dysfunction; (3) Receiving other forms of psychological interventions or participating in other related studies; (4) Unable to complete the questionnaire or the intervention process; (5) Occurrence of other major events during the study period that have a greater impact on or interfere with mood fluctuations.

2.2 Research Methods.

Questionnaires were administered to the two groups of patients before the intervention, and at the 4th and 8th weeks after the intervention (no quality of life and sleep quality surveys at the 4th week after the intervention). The questionnaires were conducted during the patients' rest period before or after chemotherapy and were filled out by the patients themselves or assisted by the research nurses. All questionnaires were collected on the spot to ensure data integrity.

2.2.1 Control group

Receive routine care in the daytime chemotherapy center: before chemotherapy, the nursing team explains the disease and chemotherapy knowledge in detail, provides psychological guidance and lifestyle advice to help patients adjust their status; during chemotherapy, closely monitor vital signs and changes in the condition, observe adverse reactions and give appropriate care; after chemotherapy, guide patients to rest, diet and rehabilitation exercises, arrange regular review, and promote the recovery of the body.

2.2.2 Intervention group

On the basis of routine care, the patients receive 8-week positive thinking intervention. Positive thinking intervention is implemented by professionally trained nursing staff, 1 time per week, 60 minutes each time, a total of 8 times.

The intervention consisted of guiding patients to focus their attention on the present moment in a quiet environment by focusing on breathing and body scanning, feeling every part of the body, and accepting physical discomfort without judgment. Patients are instructed to focus on the breathing process, to feel the sensations of air moving in and out of the nose and the rise and fall of the chest as they breathe, and to gently pull their attention back to the breath when it wanders. During walking, the patient focuses on the sensation of the feet touching the ground, feeling each step as they lift, move, and lower^[12]. Cultivate awareness and gratitude for food by guiding the patient to eat slowly and feel the texture, flavor, and chewing process of the food. Patients were taught how to avoid emotional overreaction by accepting emotions through positive thinking when faced with negative emotions.

In order to improve patients' compliance, the purpose, significance, method and expected effect of the positive thinking intervention were fully explained to patients before the intervention, so that they could understand its importance to their own recovery and enhance their motivation and initiative to participate. In the intervention process, nursing staff pay close attention to the participation of patients, for the emergence of absent or late patients, timely understanding of the reasons and give reminders and encouragement. At the same time, the establishment of incentives, such as providing small rewards for patients who insist on completing the intervention or sharing successful cases among patients, to enhance the patient's sense of achievement and motivation to persist. In addition, we communicate with patients regularly to understand their feelings and suggestions about the intervention, and adjust the content and mode of intervention according to the patients' needs and feedbacks, so as to improve the appropriateness of the intervention and the acceptance of the patients.

At the end of each intervention, patients are required to complete a positive thinking practice record sheet to record their feelings and difficulties during the practice. In order to ensure the accuracy and completeness of the record, nursing staff will instruct patients to fill in the record form immediately after the inter-

vention, and for patients with low literacy or poor comprehension, nursing staff will patiently explain the meaning of each item to ensure that the patients can fill in the form correctly. At the same time, a person will be responsible for reviewing the record sheet to check whether there are any omissions or ambiguities, and if there are any problems, they will promptly communicate with the patients to supplement and improve the record sheet. In addition, the record sheet is regularly organized and analyzed to summarize common problems and lessons learned, which can be used to guide the subsequent intervention and recording work. The record sheet contains specific items such as emotional changes, physical sensations, degree of concentration, difficulties encountered and solutions during the exercise. At the same time, the nursing staff also records the observation results during the intervention process, including the patient's performance, participation, feedback, etc., in order to have a comprehensive understanding of the patient's practice.

2.3 Observation indicators

2.3.1 Piper Fatigue Scale

Piper Fatigue Scale was used to assess the degree of cancer-caused fatigue in patients. The scale contains 4 dimensions: behavior, emotion, cognition and sensation, with a total of 22 entries, using a visual analog scale (VAS) with a score of 0-10, with higher scores indicating more severe fatigue^[13].

2.3.2 Negative mood scales

Including the Self-Assessment Scale for Anxiety (SAS) and the Self-Depression Scale (SDS). Both the SAS and the SDS use a 4-point scale, with higher scores indicating more severe anxiety or depression^[14-16].

2.3.3 Quality of life scale

The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) was used to assess patients' quality of life. The scale contains 30 entries covering multiple dimensions such as functional status, symptoms and overall quality of life^[17]. Higher scores indicate better quality of life.

2.3.4 Intervention adherence

The number of times patients participated in the positive thinking intervention and completed home exercises were recorded, and the intervention adherence rate was calculated.

2.3.5 Adverse events

Observe and record the adverse events that may occur during the intervention, such as dizziness and nausea.

2.3.6 Sleep quality

The Pittsburgh Sleep Quality Index (PSQI) was used to assess the sleep quality of the patients, and the sleep quality of the patients in the past month was assessed through 24 self-reported items, covering seven dimensions such as subjective sleep quality, time to fall asleep, duration of sleep, sleep efficiency, etc., with a total score of 0-21, the higher the score the worse the sleep quality, and the total score ≥ 5 indicated the presence of sleep disorders.

2.4 Statistical methods

The obtained data were statistically analyzed by SPSS25.0, and the measurement data were expressed as mean $\pm$ standard deviation, and the comparisons between groups were analyzed by multifactor variance and multiple measurement design for variance analysis; the count data were analyzed by chi-square test to determine the odds ratio, and the $P < 0.05$ was taken as a significant difference.

2.5 Ethical approval and experimental registration

This study was approved by the Medical Ethics Committee of the local tertiary hospital, with the ethical approval number of 2023-LC-007. The study protocol was registered with the China Clinical Trial Registry (ChiCTR), with the registration number of ChiCTR2300072145. All subjects signed the informed consent form with full knowledge, and the ethical principles were strictly adhered to in the course of the study to protect the privacy and rights and interests of the subjects. privacy and rights of the subjects.

3 Findings

3.1 Cancer-caused fatigue

Piper Fatigue Scale was used to assess the amount of cancer-caused fatigue of the patients, and the results are shown in the following table: the cancer-caused fatigue scores of the intervention group were significantly lower than those of the control group in both the 4th and 8th weeks after the intervention ($P < 0.05$).

Table 2. Comparison of the amount of cancer-caused fatigue between the two groups of patients

Time point	Intervention group ($\bar{x} \pm s$)	Control group ($\bar{x} \pm s$)	t-value	P-value
Pre-intervention	6.87 $\pm$ 1.34	6.92 $\pm$ 1.37	0.215	0.824
4 weeks after the intervention	5.23 $\pm$ 1.26*	6.54 $\pm$ 1.31*	5.426	0.025
8 weeks after the intervention	4.12 $\pm$ 1.18*#	6.48 $\pm$ 1.29*#	7.688	<0.001

Note: * $P < 0.05$ compared with pre-intervention and # $P < 0.05$ compared with 4 weeks post-intervention

3.2 Negative emotions

SAS and SDS were used to assess the anxiety and depression levels of the patients, and the results are shown in the table below, the anxiety and depression scores of the intervention group were significantly lower than those of the control

group at week 4 and week 8 after the intervention ($P < 0.05$), and there was no significant difference between the two groups before the intervention ($P > 0.05$).

Table 3. Comparison of SAS and SDS between the two groups of patients

Time point	Intervention group ($\bar{x} \pm s$)	Control group ($\bar{x} \pm s$)	t-value	P-value
Anxiety (SAS)				
Pre-intervention	52.34 $\pm$ 8.21	53.12 $\pm$ 8.45	0.463	0.635
4 weeks after the intervention	43.27 $\pm$ 7.68	50.89 $\pm$ 8.12	4.858	0.043
8 weeks after the intervention	38.76 $\pm$ 7.34	50.45 $\pm$ 8.01	6.283	<0.001
Depression (SDS)				
Pre-intervention	51.78 $\pm$ 7.89	52.45 $\pm$ 8.01	0.342	0.715
4 weeks after the intervention	42.67 $\pm$ 7.56	49.87 $\pm$ 7.98	4.546	0.039
8 weeks after the intervention	37.98 $\pm$ 7.23	49.56 $\pm$ 7.89	5.918	<0.001

Note: * $P < 0.05$ compared with pre-intervention and # $P < 0.05$ compared with 4 weeks post-intervention

3.3 Relationship between cancer-caused fatigue and negative emotions

Pearson correlation analysis was used to assess the relationship between cancer-caused fatigue and negative emotions (anxiety and depression). The results showed that there was a significant positive correlation between cancer-caused fatigue and both anxiety (SAS) and depression (SDS) scores ($P < 0.001$). The specific correlation coefficients are shown below:

Table 4. Relationship between cancer-caused fatigue and negative emotions

index	Pearson correlation coefficient (r).	P-value
Cancer-caused fatigue and anxiety(SAS)	0.58	<0.001
Cancer-related fatigue and depression (SDS).	0.52	<0.001

3.4 Quality of life

EORTC QLQ-C30 was used to assess the quality of life of the patients, and the results are shown in the table below, the quality of life scores of the intervention group were significantly higher than those of the control group in the 8th week after the intervention ($P < 0.001$).

Table 4. Comparison of EORTC QLQ-C30 scores between the two groups of patients

index	Intervention group ($\bar{x} \pm s$)	Control group ($\bar{x} \pm s$)	t	P-value
Pre-intervention	58.23 $\pm$ 12.45	57.89 $\pm$ 12.67	0.158	0.86
8 weeks after the intervention	74.56 $\pm$ 11.23	60.23 $\pm$ 12.34	5.738	<0.001

3.5 Intervention adherence

The compliance rate of patients in the intervention group who completed the positive thinking intervention was 93.33% (56/60), of which 54 patients completed all 8 interventions, and 2 patients failed to complete all interventions due to personal reasons, but completed at least 6 interventions. Patients in the control group did not receive the positive thinking intervention and received only routine care.

3.6 Adverse effects

During the intervention process, the occurrence of adverse reactions in the intervention group and the control group is shown in the table below. Some patients in the intervention group reported transient dizziness or discomfort during the process of positive thinking meditation, but they were all relieved after resting, which did not affect the continuation of the intervention. The adverse reactions in the control group were mainly related to chemotherapy and were not related to the positive thinking intervention.

Table 5. Comparison of adverse reactions between the two groups

Adverse effects	Intervention group (n=60)	Control group (n=60)	χ^2 value	P-value
Dizziness (n,%)	5(8.33%)	3(5.00%)	0.352	0.573
Nausea (n,%)	2(3.33%)	4(6.67%)	0.475	0.508
Transient discomfort (n,%)	7(11.67%)	2(3.33%)	2.128	0.140
No adverse reactions (n,%)	46(76.67%)	51(85.00%)	-	-

3.7 Sleep quality

As the results are shown in the table below, the sleep quality scores of the intervention group were significantly lower than those of the control group at week 8 post-intervention ($p < 0.001$).

Table 6. Comparison of PSQI scores between the two groups of patients

index	Intervention group ($\bar{x} \pm s$)	Control group ($\bar{x} \pm s$)	t-value	P-value
Pre-intervention	12.34 $\pm$ 3.21	12.56 $\pm$ 3.12	0.385	0.724
8 weeks after the intervention	7.89 $\pm$ 2.56	11.12 $\pm$ 3.04	6.635	<0.05

4 Discussion and Summary

In this study, we investigated the relationship between cancer-caused fatigue and negative emotions in gastric cancer patients undergoing daytime chemotherapy, and assessed the effect of positive thought intervention. It was found that cancer-caused fatigue was significantly and positively correlated with negative emotions ($P < 0.001$), and the two interacted with each other to form a vicious circle. Cancer-induced fatigue led to a decline in patients' physical functioning and their inability to participate in daily activities, which in turn triggered anxiety and depression; while negative emotions aggravated patients' subjective fatigue feelings, further reducing their quality of life. Therefore, comprehensive interventions for cancer-caused fatigue and negative emotions are particularly important.

Positive thinking intervention showed significant effects in improving patients' cancer-caused fatigue, negative emotions and quality of life. The cancer fatigue scores of the intervention group were significantly lower than those of the control group at weeks 4 and 8 after the intervention ($P < 0.05$), indicating that the positive thinking intervention was effective in relieving cancer fatigue,

and the effect became more significant with the extension of the intervention time. Positive thinking intervention helps patients relieve psychological pressure and reduce subjective amplification of fatigue by guiding them to pay attention to the present moment and accept their own physical feelings, thus improving fatigue symptoms. In addition, positive thinking intervention significantly reduced patients' anxiety and depression scores ($P < 0.05$) by guiding patients to pay attention to their own emotions in a non-judgmental way and helping them learn to accept rather than resist negative emotions, thus alleviating anxiety and depression. Meanwhile, the positive thinking intervention further improved the emotional state by enhancing the patients' self-efficacy so that they could better cope with the psychological stress caused by the disease.

Quality of life is an important indicator of patients' overall health status. The results of this study showed that the quality of life scores of the intervention group were significantly higher than those of the control group in the 8th week after the intervention ($P < 0.001$). Positive thinking intervention indirectly improved patients' quality of life by improving their cancer-caused fatigue and negative emotions. In addition, the positive thinking intervention further enhanced patients' overall quality of life by improving their sleep quality and enhancing their coping skills.

In terms of sleep quality, the results showed that the sleep quality score of the intervention group was significantly lower than that of the control group in the 8th week after the intervention ($P < 0.001$). This suggests that positive thinking intervention can effectively improve the sleep quality of daytime chemotherapy gastric cancer patients. Positive thought intervention can improve sleep quality by guiding patients to focus on the present moment, reducing excessive worry and anxiety about sleep, and helping patients establish good sleep habits and routines. In addition, positive thinking intervention can also relieve patients' negative emotions, such as anxiety and depression, which are often closely related to sleep disorders. By improving the emotional state, the positive thinking intervention further promotes the improvement of patients' sleep quality.

In this study, the intervention group had a high level of compliance with the intervention, and the acceptability of the positive thinking intervention was better recognized by the patients. There were no serious adverse events related to the positive thinking intervention during the intervention process, and only some patients reported transient dizziness or discomfort, but all of them were relieved after rest and did not affect the continuation of the intervention. This suggests that the safety of positive thinking intervention is high, and it is suitable for generalization and application in clinical practice.

In conclusion, by exploring the relationship between cancer-caused fatigue and negative mood in gastric cancer patients undergoing daytime chemotherapy and evaluating the effect of positive thought intervention, this study found that cancer-caused fatigue was significantly and positively correlated with negative mood, and that the positive thought intervention could significantly improve can-

cer-caused fatigue, negative mood and quality of life in patients. Positive thinking intervention has a high degree of compliance and safety, and is suitable for promotion and application in clinical care. Future studies can further expand the sample size and set up long-term follow-up to verify the long-term effect of positive thinking intervention and its mechanism of action, so as to provide a more scientific basis for clinical nursing practice.

References

- JIANG Jinling, ZHOU Chenfei, WANG Chao, et al. New progress in gastric cancer research and diagnosis and treatment in 2022[J]. *China Oncology*, 2023, 33(4):303-314.
- ZHANG Guoli, YU Xiaochuan, XU Chuanchuan. Effect of day chemotherapy mode on hospitalization cost of patients with malignant tumors in Ningxia: An analysis based on interruption time series[J]. *Health Soft Science*, 2024, 38(10):65-69.
- Zhu Jia, Jin Xiaohong, Zhu Yu, et al. Effect of solution-focused mode on cancer-induced fatigue in breast cancer chemotherapy patients[J]. *Journal of Modern Integrative Medicine*, 2023, 32(3):402-405.
- Xu J, Li Q, Gao Z, et al. Impact of cancer-related fatigue on quality of life in patients with cancer: multiple mediating roles of psychological coherence and stigma[J]. *BMC cancer*, 2025, 25(1): 64.
- Long Y, Zhou Z, Zhou S, et al. The effectiveness of different non-pharmacological therapies on cancer-related fatigue in cancer patients: a network meta-analysis[J]. *International Journal of Nursing Studies*, 2024: 104904.
- Du X, Zhan J, Li D, et al. Recent Advances in Chinese and Western Medicine for Cancer-related Fatigue: A Review[J]. *Future Integrative Medicine*, 2023, 2(4): 206-215.
- Ke P, Zhang M, Zhang J, et al. Symptom experience in patients with cancer-related fatigue: A systematic review and meta-synthesis[J]. *Journal of Integrative Nursing*, 2022, 4(4): 193-201.
- Xiong Hongxia, Dang Huibing, Wu Fang, et al. Effect of palliative care intervention on negative emotions and health behaviors in leukemia patients[J]. *Chinese Journal of Health Psychology*, 2024, 32(6):892-897.
- Wang F H, Zhang X T, Li Y F, et al. The Chinese Society of Clinical Oncology (CSCO): clinical guidelines for the diagnosis and treatment of gastric cancer, 2021[J]. *Cancer Communications*, 2021, 41(8): 747-795.
- Hu Xiaomei, Zou Fengming, Yue Kunyan, et al. The effects of positive thinking intervention on anxiety, depression and sleep quality during simultaneous radiotherapy in cervical cancer patients[J]. *Journal of Modern Medicine & Health*, 2024, 40(17).
- Sabouri F, Rambod M, Khademian Z. The effect of positive thinking training on hope and adherence to treatment in hemodialysis patients: A randomized controlled trial[J]. *BMC psychology*, 2023, 11(1): 6.
- Yee L M, Leziak K, Jackson J, et al. Patient and provider perspectives on a novel mobile health intervention for low-income pregnant women with gestational or type 2 diabetes mellitus[J]. *Journal of diabetes science and technology*, 2021, 15(5): 1121-1133.
- XU Peirong, ZHANG Yan, SUN Qiannan, et al. Analysis of the mediating effect of cancer-induced fatigue on sleep and cognitive function in patients with gastrointestinal cancer surgery[J]. *Journal of Practical Clinical Medicine*, 2023, 27(2):73-77.
- Sepehry A A. Self-rating depression scale (SDS)[M]//Encyclopedia of quality of life and well-being research. Cham: Springer International Publishing, 2024: 6269-6276.
- Cheng L, Gao W, Xu Y, et al. Anxiety and depression in rheumatoid arthritis patients: prevalence, risk factors and consistency between the Hospital Anxiety and Depression Scale and Zung's Self-rating Anxiety Scale/Depression Scale[J]. *Rheumatology Advances in Practice*, 2023, 7(3): rkad100.
- Liu J, Liu Q, Ji L, et al. Prevalence and influencing factors of severe depression in nurses during and after the COVID-19 pandemic: a large-scale multicenter study[J]. *Depression and Anxiety*, 2024, 2024(1): 5727506.

Shrestha S, Sapkota S, Teoh S L, et al. Comprehensive assessment of pain characteristics, quality of life, and pain management in cancer patients: a multi-center cross-sectional study[J]. *Quality of Life Research*, 2024, 33(10): 2755-2771.