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The positive effects of psychosocial support on psychological resilience and long-term quality of life in cancer patients

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CITATION

Li Y, Xiao S. The positive effects of psychosocial support on psychological resilience and long-term quality of life in cancer patients. *Psycho-Oncologie*. 2026; 20(8): 5960.
<https://doi.org/10.18282/po5960>

ARTICLE INFO

Received: 2 June 2026

Revised: 6 July 2026

Accepted: 14 July 2026

Available online: 6 August 2026

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Abstract: Objective: The aim of this study was to explore the positive effects of psychosocial support on psychological resilience and long-term quality of life of cancer patients through a subgroup study. **Methods:** One hundred and thirty-one cancer patients who attended our oncology department from January 2024 to February 2026 were selected and randomly divided into an intervention group (66 patients) and a control group (65 patients). All patients received conventional treatment, the control group received conventional care, and the intervention group received a 3-month psychosocial support intervention, including psychological counseling, social support activities, family support interventions, and oriented coping strategy training, on top of conventional treatment and care. All participants received a 3-month intervention followed by a 12-month follow-up. Psychological status, coping patterns, self-image and long-term quality of life of both groups were evaluated pre- and post-intervention. **Results:** After the intervention, the Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) scores of the intervention group decreased significantly ($P < 0.001$), and the Connor-Davidson Resilience Scale (CD-RISC) scores increased significantly; the scores of the “face” strategy increased significantly, while the scores of “avoidance” and “resignation” significantly decreased; there was a significant improvement in self-image identity, and the total Self-Image Questionnaire for Cancer Patients (SIQ-CP) score was significantly higher than that of the control group. In terms of long-term quality of life, the intervention group improved significantly more than the control group in both functional and symptomatic dimensions. **Conclusion:** Psychosocial support exerts prominent positive effects on psychological resilience and long-term quality of life among cancer patients. Such intervention effectively relieves anxiety and depression, strengthens psychological resilience, reshapes adaptive coping strategies, improves self-image identity, and promotes patients’ long-term quality of life.

Keywords: psychosocial support; cancer patients; psychological resilience; long-term quality of life; psychological intervention

1. Introduction

Cancer has become a major global public health problem, and its incidence rate and mortality continue to rise. Epidemiological data show that in 2025, there will be 20.6 million new cancer cases worldwide, and more than 9.8 million cancer related deaths [1]. Cancer will be among the leading causes of fatal diseases. Common malignant tumors such as lung cancer, breast cancer, colorectal cancer, etc. can cause significant physical discomfort and psychological distress for survivors. Cancer is not simply a physical illness. After diagnosis, patients often experience negative emotions

such as anxiety, depression, and fear, which can damage immune function, increase the risk of cancer recurrence, and disrupt sleep, appetite, and daily activities. Factors such as insufficient social support, economic pressure, and family conflicts can further exacerbate psychological distress and hinder the recovery process [2].

Psychosocial support encompasses emotional, informational, and substantive assistance provided by healthcare professionals, family members, and peers. It is a core intervention in the cancer care system that can effectively alleviate negative emotions, enhance psychological resilience, and optimize disease adaptation levels. Further research from 2024 to 2026 has revealed the intrinsic relationship between psychosocial support and psychological resilience. In 2025, a randomized controlled trial involving 33 participants confirmed that multidimensional psychosocial support can enhance patients' psychological resilience by regulating stress cognitive assessment and coping responses [3]. In the same year, a cross-sectional study showed that sufficient social support was a positive predictor of Connor Davidson Resilience Scale (CD-RISC) scores, while insufficient support was more likely to trigger avoidance and passive coping patterns [4]. A study published in 2026 showed that structured psychosocial interventions can significantly improve emotional disorders, but existing research is mostly limited to short-term follow-up of 3-6 months and lacks longitudinal evidence of 12 months or more [5]. In addition, the comprehensive intervention model that integrates individual counseling, family training, and peer support has not been fully validated in the long term, and the complete chain mechanism of psychosocial support → adaptive coping → self-image improvement → psychological resilience enhancement → continuous improvement of quality of life has not been systematically explained, which is currently a research gap [6].

Scientific basis and research hypothesis: This study uses the biological psychological social model and stress cognitive assessment coping theory as theoretical frameworks to systematically analyze the role of psychosocial support in reshaping patients' threat cognition, adjusting coping behaviors, reducing physical image damage, and enhancing psychological resilience, ultimately achieving long-term improvement in the quality of life of cancer patients. Based on this, the following four research hypotheses are proposed: (1) H1 hypothesis. Compared with the conventional nursing group, a 3-month multidimensional psychosocial support intervention treatment can reduce patients' Self Rating Anxiety Scale (SAS) and Self Rating Depression Scale (SDS) scores, and improve CD-RISC psychological resilience scores. (2) H2 hypothesis suggests that intervention therapy can improve the score of the Medical Coping Questionnaire (MCMQ) in the face dimension and reduce the score of avoidance and surrender dimensions. (3) Assuming H3, intervention therapy can significantly improve the scores of various dimensions of the Self Image Questionnaire (SIQ-CP) for cancer patients. (4) Assuming H4, during the 12-month follow-up period, the intervention group had higher scores in the functional dimension of the Quality of Life Questionnaire (QLQ-C30) for cancer patients than the control group, and lower scores in the symptom burden dimension than the control group.

This study adopted a randomized controlled design, dividing 131 patients into an intervention group and a control group. Multidimensional indicator evaluations were conducted before intervention, after intervention, and at 12-month follow-up nodes to systematically explore the impact of standardized multidimensional psychosocial support on the psychological resilience and long-term quality of life of cancer patients. The research results can provide high-quality clinical evidence for

the construction of a psychological intervention framework and the development of sustainable support strategies for cancer survivors.

2. Materials and methods

2.1. General information

We recruited 131 cancer patients admitted to our oncology department from January 2024 to February 2026. Inclusion criteria: diagnosed with cancer by pathology; aged 18-70 years old; conscious and with normal communication ability; willingly took part in the study and provided their informed consent by signing the relevant document. Exclusion criteria: combined with severe cardiac, hepatic, renal, and other important organ dysfunction; suffering from psychiatric diseases or cognitive disorders; expected quality of life less than 3 months [7].

The 131 patients were randomly allocated into the intervention and control groups utilizing a randomized numerical table approach. The random allocation sequence of the research subjects was constructed using a random number table method, and the sequence was sealed by dedicated independent researchers. All envelopes were coded and sorted according to the expected enrollment order of the subjects. After the subjects to be enrolled have completed all baseline data collection, the researchers will open the corresponding numbered envelopes on site to determine the subject grouping scheme. The principle of separation of grouping operations was implemented throughout the entire study, which means that personnel involved in random sequence generation and envelope sealing do not participate in subject screening and intervention implementation, and intervention execution personnel do not participate in the process of random sequence generation and sealing, effectively controlling selection bias and ensuring the scientific and rigorous nature of random grouping. Specifically, the intervention group comprised 66 participants, whereas the control group consisted of 65 individuals. Comparison between the two groups in terms of general information such as age, gender, cancer type, disease severity (judged according to Tumor-Node-Metastasis (TNM) staging), education level, marital status, etc., no statistically significant difference was observed, indicating that the groups were comparable, and the specific data are shown in **Table 1**.

All enrolled patients completed the 3-month intervention. During the subsequent 12-month follow-up, 7 patients were lost to follow-up, with an overall attrition rate of 5.34%. In the intervention group, 3 patients withdrew (1 declined follow-up visits, 2 transferred to other hospitals); in the control group, 4 patients dropped out (2 lost contact, 2 refused continued assessment). The final complete analysis sample included 124 patients, with 63 cases in the intervention group and 61 cases in the control group.

The sample size of this study was determined through sample efficacy analysis, and the main outcome measure was set as the score of the CD-RISC Psychological Resilience Scale after intervention. Using previous similar tumor psychological intervention research data as a reference, the test level was set to $\alpha = 0.05$, the test efficacy was set to $1 - \beta = 0.8$, the expected mean difference between groups was 12 points, and the standard deviation was about 9 points. Independent sample t-test was used for efficacy estimation, and it was calculated that a minimum of 58 subjects were required to be included in each group; Considering a 10% follow-up dropout rate, it was ultimately determined that at least 64 cases would be included in each group, with a total sample size of no less than 128 cases. This study initially included 131 patients (66 in the intervention group and 65 in the control group), meeting the

minimum sample size requirement for efficacy analysis and ensuring that the inter group effect indicators have statistical testing power.

This study did not include patients with advanced TNM stage IV tumors, mainly because patients in this stage often have severe complications such as extensive multi organ metastasis, severe cancer pain, and cachexia. Their expected survival period is usually less than 3 months, which cannot meet the inclusion criteria of ≥ 3 months set in this study. In addition, stage IV patients have poor physical tolerance and find it difficult to complete a comprehensive 3-month offline psychosocial support intervention, which can lead to decreased intervention compliance and reduced completeness of research data.

2.2. Research methods

All patients received conventional treatment, and according to the cancer type, stage, and physical condition of the patients, corresponding conventional treatment measures such as surgery, chemotherapy, radiotherapy and targeted therapy were administered in strict adherence to established clinical treatment protocols. In the course of treatment, the patients' conditions changed, and treatment responses were closely observed, and the treatment program was adjusted in time.

The outcome measure evaluator of this study implemented a single blind design throughout the entire process. The scale evaluators only knew the patient number and were not clear about the subject grouping (intervention group/control group). All grouping information was kept separately by a dedicated person, and the grouping data was unlocked after the evaluation was completed to avoid evaluation bias.

2.2.1. Control group—conventional care

Patients in the control group received routine nursing care as detailed below.

Routine nursing: provide basic nursing services for patients in the control group, including vital signs monitoring, condition observation, dietary care, excretion care, skin care, and so on. Nursing staff, in accordance with the nursing operation procedures, regularly measure the temperature, pulse, respiration, blood pressure, and other vital signs of the patient and observe the patient's condition changes, such as the presence of fever, cough, pain, and other symptoms. According to the patient's condition and nutritional status, formulate a reasonable diet plan, instruct the patient to eat reasonably, and ensure nutritional intake. Assist patients in daily life activities, such as washing, dressing, eating, excretion, etc.; keep patients' skin clean and dry; and prevent the incidence of complications, including conditions like pressure ulcers. At the same time, give patients the necessary health guidance, informing them of the precautions to be taken during the treatment process, the use of drugs, and adverse reactions.

2.2.2. Intervention group—psychosocial support intervention

The intervention group received a 3-month multidimensional psychosocial support intervention on the basis of routine nursing and treatment. The intervention plan includes four standardized modules:

(1) One on one psychological counseling. The frequency is once a week, 50 minutes each time, implemented by certified counselors using cognitive-behavioral therapy (CBT), covering mindfulness training and body image reconstruction training, aimed at alleviating body image difficulties related to cancer treatment.

(2) Peer social support activities. The frequency is once every two weeks, 2-3 hours each time, conducted in small groups, including survivor experience sharing, themed discussions, and outdoor relaxation activities, to provide patients with disease

coping experience exchange.

(3) Family support training. Conduct 3 training sessions per month for patients' families, each lasting 60 minutes, covering emotional care methods, disease supportive care skills, and strategies for coping with negative emotions.

(4) Guidance on coping strategies training. Integrate and embed the above intervention activities, including identification of social support resources, improvement of communication skills, and training in positive coping strategies, to enhance patients' ability to cope with stress.

After the intervention, a 12-month stratified follow-up will be implemented: once a month for the first three months, once every two months for the third six months, and once quarterly after six months.

All the psychological counselors involved in the intervention in this study hold a national second level psychological counselor practice certificate and have 2 years or more of clinical experience in psychological intervention for cancer patients. All personnel must pass the training and assessment before conducting one-on-one clinical interventions, and strictly follow the unified standardized operation manual throughout the process to ensure the homogeneity of intervention measures and the controllability of research quality to the maximum extent possible.

2.2.3. Intervention compliance monitoring and fidelity assessment

This study strictly carried out intervention fidelity control and patient participation compliance monitoring throughout the entire process: 1) Offline activity sign in ledger management. Paper attendance sheets are set up for family training and patient mutual assistance sharing meetings, recording the duration of participation and reasons for absence; 2) Online follow-up check-in supervision. Patients who were not present completed a brief online emotional follow-up on the same day, and the type of absence was recorded synchronously; 3) Quantitative assessment criteria for intervention completion. If the participation rate of psychological counseling within a 3-month period is $\geq 80\%$, the completion of all 3 courses of family training, and the participation of patients in mutual assistance activities ≥ 4 times, it will be judged as compliant; 4) Standardized quality control for interveners. All psychological counselors and family training instructors shall receive standardized pre service training on CBT and body image reconstruction, and retain complete lesson plans, communication records, and brief on-site audio and video archives for each intervention to ensure the fidelity of intervention implementation.

This study collected compliance data throughout the entire process: the intervention group of 66 patients had an average participation rate of 91.32% in overall psychological counseling, a complete participation rate of 94.70% in family training, and an average participation rate of 8.1 times in social support activities for patients. Only 5 patients had single or multiple absences, all due to severe chemotherapy fatigue and remote follow-up visits. Subsequently, one-on-one online intervention content was supplemented.

2.3. Observation indicators

2.3.1. Assessment of psychological state

To evaluate the psychological resilience of the two patient cohorts both pre- and post-intervention, the Connor-Davidson Resilience Scale (CD-RISC) was utilized as the assessment tool [8]. Comprising 25 items, the scale encompasses three distinct dimensions: resilience, self-sufficiency, and a positive outlook, namely optimism. The assessment scale utilized a 5-point Likert scale, with responses ranging from

“never” (assigned a value of 1) to “almost always” (assigned a value of 5). Among them, the resilience dimension is mainly related to an individual’s ability to persevere and recover in the face of difficulties and setbacks; the self-improvement dimension reflects an individual’s knowledge of his/her own abilities and confidence in coping with challenges; and the optimism dimension within the scale gauges an individual’s forward-looking, positive mindset and their optimistic interpretation of circumstances. The overall scale score is derived from the mean value of all 25 questions, whereas the subscale scores are calculated as the average of the respective questions within each subscale. Elevated scores on this scale are indicative of enhanced psychological resilience.

The psychological conditions of the two distinct patient cohorts were assessed using the Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) before and after intervention [9]. Both scales contain 4-point Likert items and adopt standardized scoring based on total raw scores; higher standard scores indicate more severe anxiety or depressive symptoms. Participants answered items according to their emotional experiences in the past week to self-evaluate mood and sleep disturbances caused by cancer.

2.3.2. Assessment of coping styles

The Medical Coping Modes Questionnaire (MCMQ) [10] was used to evaluate patients’ disease coping strategies. This questionnaire contains 20 items scored on a 4-point Likert scale (1–4), with eight reverse-scored items. The MCMQ comprises three dimensions: Face (items 1, 2, 5, 10, 12, 15, 16, 19), Avoidance (items 3, 7, 8, 9, 11, 14, 17), and Resignation (items 4, 6, 13, 18, 20). Higher Face scores represent active problem-solving attitudes toward illness, while higher Avoidance and Resignation scores stand for maladaptive coping patterns of evasion and passive acceptance.

2.3.3. Assessment of patients’ self-image

The Self-Image Questionnaire for Cancer Patients (SIQ-CP) was used to assess the self-image identity of cancer patients [11]. The scale contains 30 items covering the following dimensions: (1) physical appearance perception: acceptance of treatment-induced changes in body image (e.g., scars, alopecia); (2) functional integrity: adaptability to somatic functional limitations (e.g., loss of physical strength); (3) social role identity: the impact of the disease on the identity of the family or occupational roles; (4) emotional acceptance: the regulation of negative emotions, such as shame and inferiority complex; and (5) future self-expectation: the level of confidence in life after rehabilitation. A 5-point Likert scale was implemented, ranging from “1” denoting “total disagreement” to “5” representing “complete agreement”. An elevated cumulative score on this scale signifies a more favorable self-perception.

2.3.4. Assessment of long-term quality of life

Assessment of patients’ enduring quality of life was conducted through the application of the Treatment of Cancer’s Quality of Life Questionnaire—Core 30 (QLQ-C30) [12]. The scale consists of 30 entries covering multiple dimensions that can be assessed in two main sections: functional and symptomatic. The functional evaluation domains encompass aspects such as role performance, physical capabilities, cognitive abilities, emotional well-being, and social engagement. Role functioning mainly assesses the patients’ ability to fulfill their roles in family, work, and society; somatic functioning focuses on the patients’ physical mobility, self-

care ability, and the implications of somatic manifestations, including exhaustion and discomfort on daily life; cognitive functioning involves the patients' memory, attention, thinking ability, etc.; emotional functioning assesses the patients' emotional states such as anxiety, depression, fear, etc.; and social functioning examines the patients' relationship with their social functioning examines the patient's interpersonal relationships and social support with family members, friends, and coworkers. Symptomatic assessment dimensions mainly included retching with nausea, physical distress, and profound fatigue, which were assessed by asking patients about the severity of these symptoms and the degree of disturbance to their lives [13].

Evaluation timeframes were designated as prior to the initiation of the intervention, as well as at the 6-month and 12-month post-intervention completion junctures. The long-term effects of the intervention were ultimately compared, i.e., at 12 months.

2.4. Statistical processing

Statistical Package for the Social Sciences (SPSS) version 26.0 statistical software was employed. For the measurement data, such as age, scale scores, etc., if the data obeyed normal distribution, it was presented in the format of mean $\pm$ standard deviation [14]. For comparing two distinct groups, an independent samples t-test was employed, whereas a one-way analysis of variance (ANOVA) was utilized for comparisons involving multiple groups, and when the results of the ANOVA showed statistical differences, further two-by-two comparisons were performed by the LSD - t-test or Dunnett's T3 test, which was made based on the outcomes derived from the ANOVA and chi-square tests. For count data, such as cancer type, TNM stage, literacy level, marital status, etc., the number of cases (denoted as 'n') and the corresponding rates (expressed as percentages) were reported. Statistical comparisons between the two groups were conducted using the chi-square (χ^2) test. However, in instances where the theoretical frequency fell below 5, Fisher's exact probability method was applied instead. Statistical significance was defined as a P-value less than 0.05, and all statistical tests were performed as two-tailed analyses [15]. This study used a single blind outcome evaluator method, where evaluators blinded group allocation to reduce measurement bias caused by subjective evaluation.

Before conducting the study, G*Power 3.1 software was used to complete sample size efficacy analysis. Based on the main observation indicator CD-RISC score, two independent sample means were compared for efficacy estimation. Parameter settings were: $\alpha = 0.05$, Power = 0.8, and effect size $d = 1.33$. The minimum sample size required for each group was calculated to be 58 cases, and then 10% follow-up dropout was estimated. The sample size for each group was expanded to 64 cases or more. The sample size for this study was in line with the efficacy analysis results.

This study employed a dual data analysis strategy for statistical analysis, with the main analysis based on the Protocol Compliance (PP) dataset. A total of 124 participants who completed a 12-month full scale follow-up were included. To verify the stability and reliability of the research results, this study further conducted an intention to treat (ITT) sensitivity analysis, which covered all 131 randomized subjects. Multiple imputation method was used to fill in the missing intervention scale data for 7 lost to follow-up subjects. The ITT analysis results show that the trend of effects and statistical conclusions between each group are consistent with the PP analysis. Therefore, the main text of this article only presents the analysis results of the PP dataset. This study calculated the standardized effect size Cohen's d for

comparing all primary and secondary outcome measures between groups to determine the clinical actual effect intensity corresponding to statistical differences between groups: $d < 0.2$ indicates no significant clinical effect; $0.2 \leq d < 0.5$ indicates mild clinical effects; $0.5 \leq d < 0.8$ indicates moderate clinical effect; $d \geq 0.8$ is considered a significant clinical effect.

Given that this study includes multiple primary and secondary outcome measures, there is a risk of multiple statistical comparisons leading to a class of inflated errors. Therefore, the Benjamini Hochberg false discovery rate (FDR) method was used for multiple test correction in this study. Compared to the Bonferroni method, the FDR correction strategy is more reasonable because the Bonferroni method's correction mechanism is too conservative, which can increase the risk of type II errors in this multidimensional psychological intervention study; FDR can effectively balance a class of error control and statistical testing efficiency in multiple comparisons of multiple indicators. The study ultimately used the corrected P-value as the statistical basis for determining the differences between groups. All P values presented in the results tables are FDR adjusted for multiple comparisons.

3. Results

3.1. Comparison of general information

Table 1 provides a comprehensive presentation and comparative analysis of the demographic and clinical attributes of the 131 patients distributed across both groups. All baseline comparisons were performed based on the initial 131 enrolled participants; all outcome analyses at the 12-month endpoint adopted the complete-case dataset of 124 patients without missing follow-up data.

Table 1. Comparison of general information of patients in the two groups

Survey item	Intervention group (n = 66)	Control group (n = 65)	t/ χ^2 value	P value
Age (years, $\bar{x} \pm s$)	52.31 $\pm$ 8.50	53.08 $\pm$ 9.02	0.514	0.609
Sex (male/female, cases)	36/30	34/31	0.074	0.786
Type of cancer [n (%)]			0.832	0.934
Lung cancer	20 (30.30)	19 (29.23)		
Colorectal cancer	18 (27.27)	17 (26.15)		
Breast cancer	15 (22.73)	16 (24.61)		
Stomach cancer	8 (12.12)	9 (13.85)		
Others	5 (7.58)	4 (6.15)		
TNM stage (I/II/III/IV)	22/28/16/0	20/29/16/0	0.153	0.926
Literacy level [n (%)]			1.248	0.742
Elementary school and below	13 (19.70)	11 (16.92)		
Junior high school	24 (36.36)	26 (40.00)		
High school / Junior college	18 (27.27)	17 (26.15)		
College and above	11 (16.67)	11 (16.92)		
Marital status [n (%)]			0.687	0.876

Continuation Table:

Survey item	Intervention group (n = 66)	Control group (n = 65)	t/ χ^2 value	P value
Unmarried	6 (9.09)	5 (7.69)		
Married	53 (80.30)	54 (83.08)		
Divorced/Widowed	7 (10.61)	6 (9.23)		

A Consolidated Standards of Reporting Trials (CONSORT) flow diagram (**Figure 1**) is attached to visually display the whole process of patient screening, randomization, intervention implementation, follow-up and participant attrition.

The random allocation sequence of the research subjects was constructed using a random number table method, and the sequence was sealed by dedicated independent researchers: (1) The generated random grouping numbers were sealed in opaque envelopes, and all envelopes were coded and sorted according to the expected enrollment order of the subjects. (2) After the subjects to be enrolled have completed all baseline data collection, the researchers will open the corresponding numbered envelopes on site to determine the subject grouping scheme. This study followed the principle of separation of grouping operations throughout the entire process, completely avoiding human intervention in grouping through the standardized operations mentioned above, effectively controlling selection bias, and ensuring the scientific and rigorous nature of random grouping.

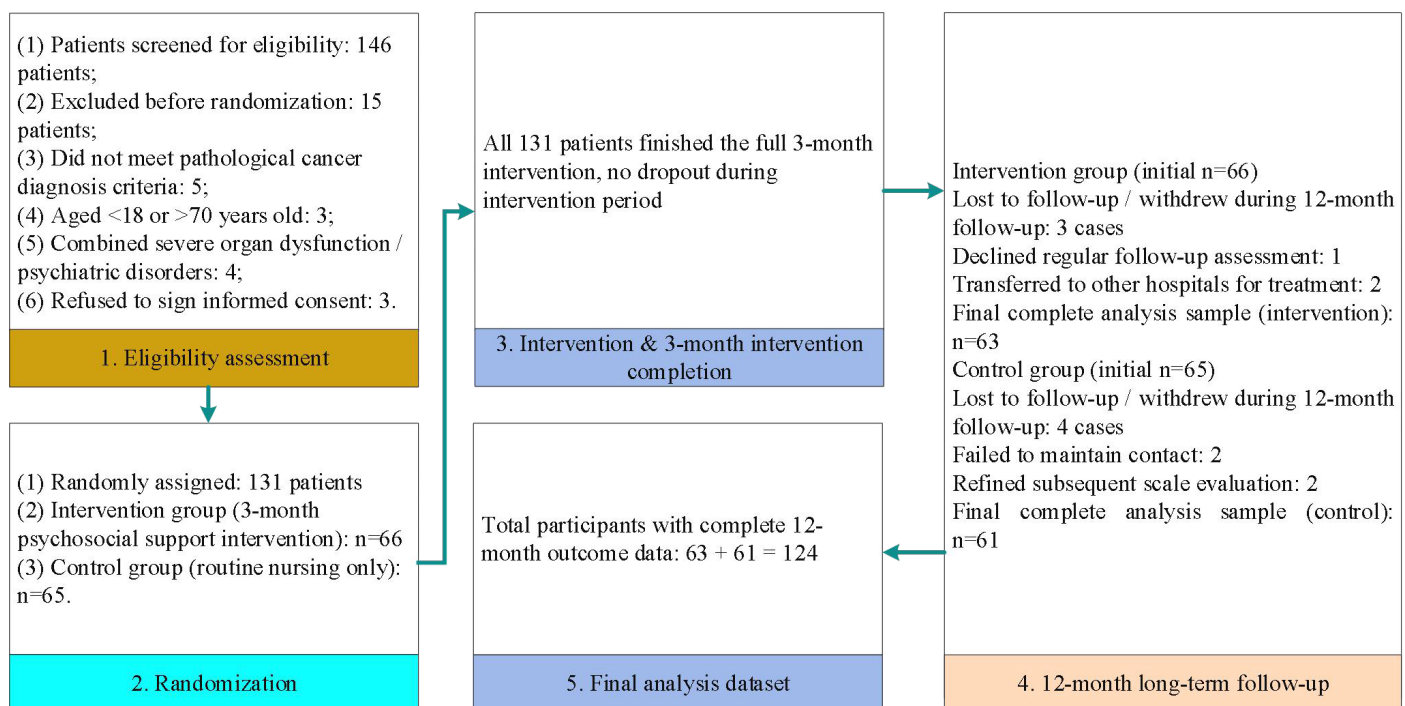


Figure 1. CONSORT flow diagram

3.2. A comparative analysis of psychological condition scores between the two patient groups before and after the intervention

Table 2 delineates the comparative outcomes of psychological condition scores for both patient groups, assessed pre- and post-intervention. There was no statistically significant difference in SAS, SDS, and CD-RISC scores between the two groups of patients before intervention. After intervention, the SAS score of the intervention

group decreased from 56.33 ± 6.27 to 38.15 ± 5.89 , and the SDS score decreased from 58.12 ± 7.13 to 40.28 ± 6.44 . The improvement in the scores of the two negative emotion scales was significantly better than that of the control group, and the differences between the groups were highly significant ($P < 0.001$). In addition, the CD-RISC psychological resilience score of the intervention group increased from 65.08 ± 8.27 to 82.47 ± 9.13 , which was significantly higher than that of the control group (67.32 ± 8.46), and the differences between the groups were statistically significant ($P = 0.014$), indicating that this intervention plan can significantly improve the psychological resilience level of cancer patients.

Table 2. Comparison of psychological resilience scores of patients in the two groups before and after intervention (points, $\bar{x} \pm s$)

Group	SAS		SDS		CD-RISC	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Intervention group (n = 66)	56.33±6.27	38.15±5.89	58.12±7.13	40.28±6.44	65.08±8.27	82.47±9.13
Control group (n = 65)	55.98±6.14	53.72±6.35	57.89±7.05	55.63±6.92	64.89±7.95	67.32±8.46
t-value	0.169	-14.276	1.020	-13.942	0.089	9.253
P-value	0.078	0.0006	0.085	0.0008	0.073	0.014
Cohen's d	0.83	1.77	0.89	1.73	0.95	1.14

Note: P values were adjusted using the Benjamini Hochberg FDR method.

3.3. Contrast in coping strategies between the two patient groups pre- and post-intervention

The comparative findings between the two patient groups are presented in **Table 3**. Before intervention, the baseline scores of the three-dimensional coping styles of facing, avoiding, and yielding were balanced between the two groups of patients, and there was no statistically significant difference between the groups. After intervention, the coping dimension score of the intervention group significantly increased from 18.32 ± 3.47 to 23.67 ± 4.12 ($P = 0.009$), and the avoidance and yielding negative coping dimension scores decreased from 14.78 ± 2.97 and 12.45 ± 2.43 , respectively, to 10.23 ± 2.15 and 8.77 ± 1.98 , with inter group differences of $P = 0.003$ and $P = 0.001$, respectively. Before and after intervention, there was only a slight fluctuation in the MCMQ dimension scores, and no significant positive improvement was observed in the control group.

Table 3. Comparison of medical coping questionnaire scores between the two groups of patients before and after the intervention (points, $\bar{x} \pm s$)

Group	Face		Avoid		Succumb	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Intervention group (n = 66)	18.32±3.47	23.67±4.12	14.78±2.97	10.23±2.15	12.45±2.43	8.77±1.98
Control group (n = 65)	18.29±3.38	19.01±3.57	14.82±2.89	14.05±2.74	12.51±2.41	12.03±2.28
t-value	0.109	6.883	0.126	-8.942	0.117	-9.217

Continuation Table:

Group	Face		Avoid		Succumb	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
P-value	0.069	0.009	0.071	0.003	0.064	0.001
Cohen's d	0.92	0.87	0.93	1.10	1.06	1.14

Note: P values were adjusted using the Benjamini Hochberg FDR method.

3.4. Comparison of self-image between the two groups of patients before and after intervention

Table 4 presents the comparative outcomes of the SIQ-CP scores for both patient groups, evaluated before and after the intervention. Before intervention, the baseline levels of physical appearance perception, physical functional integrity, social role identity, emotional acceptance, future self expectations, and total score of the scale were comparable between the two groups of patients, and there was no statistically significant difference between the groups ($P > 0.05$). After intervention, the SIQ-CP scores of the intervention group were significantly improved in all dimensions, and the total score of the scale increased from 47.45 ± 5.84 to 65.02 ± 6.76 , which was significantly higher than the post intervention score of the control group (49.99 ± 6.05). The difference between the groups was extremely significant ($P < 0.001$).

Table 4. Comparison of SIQ-CP scores before and after the intervention in the two groups (points, $\bar{x} \pm s$)

Group	Physical appearance perception		Functional Integrity		Social role identity	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Intervention group (n = 66)	52.34±6.78	68.21±7.05	48.15±5.92	65.33±6.84	50.22±6.15	70.18±7.32
Control group (n = 65)	53.02±6.85	54.89±6.92	47.89±5.87	50.12±6.11	51.05±6.20	53.47±6.85
t-value	0.208	10.385	0.164	9.673	0.200	8.954
P-value	0.067	< 0.001	0.078	0.010	0.060	0.013
Intervention group (n = 66)	45.67±5.43	62.75±6.57	40.89±4.95	58.64±6.02	47.45±5.84	65.02±6.76
Control group (n = 65)	46.12±5.38	48.33±5.72	41.23±4.88	43.15±5.14	47.86±5.79	49.99±6.05
t-value	0.311	10.241	0.258	9.417	1.104	14.372
P-value	0.076	0.001	0.063	0.002	0.072	0.0006
Cohen's d	0.85	1.24	0.86	1.18	1.12	1.72

Note: P values were adjusted using the Benjamini Hochberg FDR method.

3.5. Comparison of quality of life before and after treatment between the two groups of patients

Table 5 delineates the findings from the long-term quality of life evaluations conducted before and after treatment in both patient groups. Before intervention, the baseline scores of functional and symptom dimensions were balanced and comparable between the two groups of patients, and there was no significant difference between the groups. After intervention, the 12-month long-term follow-up results showed that

the comprehensive functional score significantly increased from 60.19 ± 6.90 to 76.44 ± 7.94 ($P = 0.010$), and the scores of tumor related symptom dimensions such as pain, nausea, and fatigue significantly decreased from 5.37 ± 1.49 to 2.76 ± 1.02 ($P < 0.001$).

Table 5. Comparison of QLQ-C30 scores before and after intervention in the two groups (points, $\bar{x} \pm s$)

Group	Functional scores		Symptomatic score	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Intervention group (n = 66)	60.19 ± 6.90	76.44 ± 7.94	5.37 ± 1.49	2.76 ± 1.02
Control group (n = 65)	59.95 ± 6.83	62.63 ± 7.03	5.36 ± 1.47	5.02 ± 1.38
t-value	0.186	10.927	0.204	-12.601
P-value	0.073	0.010	0.067	0.0008
Cohen's d	0.93	1.38	0.93	1.59

Note: P values were adjusted using the Benjamini Hochberg FDR method.

4. Discussion

This study included 131 cancer patients as the research subjects (66 in the intervention group and 65 in the control group). The intervention group received multidimensional social and psychological support intervention for 3 months on the basis of routine diagnosis and nursing, and completed a 12-month follow-up. Quantitative evaluation of patients' psychological status, disease coping strategies, self-image, and long-term quality of life using multiple standardized scales. The statistical results in Chapter 3 indicate that: (1) Before intervention, there was no statistically significant difference in baseline data and scores of each scale between the two groups ($P > 0.05$), and the baseline was balanced and comparable between the groups; (2) After intervention, the levels of anxiety and depression in the intervention group significantly decreased, while psychological resilience, positive coping styles, self-image identification, and long-term quality of life significantly improved. Negative coping behaviors were significantly reduced, and the differences in various indicators between the groups were statistically significant ($P < 0.05$). After intervention, the Cohen d values of SAS and SDS both exceeded 0.8, indicating significant clinical efficacy in alleviating anxiety and depression; The Cohen's d of CD RISC (1.14) also represents a significant improvement in psychological resilience.

4.1. Analysis of the improvement effect of social psychological support on negative emotions and psychological resilience of cancer patients

The CBT and mindfulness-based counseling in this intervention alleviates rumination and emotional overarousal to relieve anxiety and depression. The above results are consistent with the systematic review conclusion of Tian X et al. [16], that comprehensive psychological intervention based on social psychological support can effectively reduce the risk of emotional disorders in cancer patients. In addition, this study constructed a multi-level social support system through monthly family support training and biweekly patient mutual aid sharing meetings, which can help patients accumulate psychological resources in adversity, strengthen individual psychological resilience from multiple dimensions such as optimism, self-improvement, and

resilience. Quantitative data further confirms that the group identity brought by group mutual aid intervention can further amplify the effectiveness of psychological intervention, promote the alleviation of negative emotions and the improvement of psychological resilience to form a two-way positive gain cycle.

4.2. The optimization effect of social psychological support on patients' disease coping strategies

Integrated family training and coping skill drills reshape patients' illness management behaviors. The research results showed that specialized training in family support can enhance the emotional companionship and collaborative care abilities of family members, and suppress the tendency of yielding negative coping from the causal level. The randomized controlled trial conducted by Howell D et al. [17] also confirmed that interventions in communication skills and self-management skills can effectively enhance the positive coping level of cancer patients. The data from this study further confirms that compared to conventional nursing, the three-dimensional social psychological intervention model that integrates professional psychological counseling, family collaborative support, and group mutual assistance can reshape the disease coping strategies of cancer patients in the long run and stably. It can effectively improve patients' treatment cooperation and rehabilitation initiative, reduce emotional internal friction, and provide good internal conditions for patients' physical and mental function recovery.

4.3. The value of social and psychological support intervention in reshaping self-image identity of cancer patients

The above statistical results indicate that conventional treatment methods such as tumor surgery and radiotherapy and chemotherapy are prone to causing changes in body shape and function such as hair loss, surface scars, and physical fatigue, which are important factors that increase patients' psychological burden and damage their self-identity. Body image reconstruction training embedded in one-on-one counseling helps patients accept treatment-related physical changes. The meta-analysis results of Sebri V et al. [18] showed that body image targeted intervention based on social psychological support system can significantly improve the physical and psychological adaptation ability of cancer patients. In this study, the dimensions of perceived physical appearance and emotional acceptance showed the most significant improvement, indicating that the one-on-one personalized psychological counseling combined with group mutual aid intervention model can effectively improve patients' negative self-evaluation caused by changes in physical appearance.

4.4. The comprehensive improvement effect of social and psychological support on the long-term quality of life of cancer patients

Improved psychological status and family support jointly modulate neuroendocrine-immune pathways to reduce symptom burden and restore daily function. According to the psychological neuroimmunology theory proposed by Gezici S [19], psychological intervention can improve the long-term quality of life of cancer patients by mediating the neural immune regulatory pathway. The 12-month longitudinal follow-up data in this study can provide real clinical empirical support for this theory.

4.5. Research limitations and future research prospects

This study verified the clinical benefits of multi-dimensional psychosocial support intervention on tumor patients through a controlled trial. The limitations are as follows: (1) The research objects only come from the oncology department of a

single hospital, and the included diseases are mainly common tumors such as lung cancer, colorectal cancer, breast cancer, etc. The sample source is relatively single, and no detailed subgroup analysis was carried out for different tumor stages and age stratification, which to some extent limited the extrapolation and universality of the research conclusions. In addition, the sample size calculation did not stratify based on tumor type, age, and disease stage, resulting in uneven distribution of sub group samples and high sample heterogeneity, which weakened the reliability of sub group inference. (2) The long-term follow-up period of this study is only 12 months, and it is currently not possible to verify the long-term efficacy stability and sustained effects of this intervention plan. (3) The outcome indicators of this study were evaluated based on subjective questionnaires, and did not include objective biomarkers such as peripheral blood inflammatory factors and cortisol, making it difficult to deeply reveal the potential molecular mechanisms of psychological intervention in regulating patients' physical and mental states. (4) A small number of patients dropped out during long-term follow-up, which may slightly bias the long-term efficacy results; future trials shall record dropout causes in detail and adopt intention-to-treat analysis to reduce bias. (5) This study only set up a routine nursing control group and did not establish an active control group with attention matching, which cannot exclude non-specific intervention effects caused by additional attention from medical staff, patient psychological expectations, and doctor-patient treatment alliances. The current design of this study cannot separate the specific intervention effects of standardized psychosocial support from the aforementioned confounding factors, which may lead to an overestimation of the true efficacy of the intervention program.

Subsequent multicenter, large sample randomized controlled trials can be conducted, extending the follow-up period to 2-3 years, and conducting stratified subgroup analysis based on tumor type, age range, and tumor staging. At the same time, a digital social psychological support intervention system can be constructed by combining artificial intelligence online psychological counseling tools, breaking through the temporal and spatial limitations of traditional offline interventions, and integrating inflammation and stress-related peripheral blood biomarker detection and subjective evaluation data of scales. The subjective and objective system can clarify the internal pathways of social psychological support intervention in regulating the psychological resilience, disease coping strategies, and long-term quality of life of cancer patients, providing a more solid and comprehensive evidence-based basis for clinical construction.

5. Conclusion

In summary, this study confirmed the positive effects of multidimensional psychosocial support intervention in enhancing psychological resilience, optimizing coping strategies, improving self-image, and enhancing the enduring quality of life for individuals afflicted with cancer. Despite the insights gained, this study nonetheless exhibits certain constraints, such as a relatively single sample source and a short follow-up period, and the generalizability and durability of the intervention effects need to be further verified through multicenter studies and long-term follow-up in the future. Follow-up studies could explore the potential of digital psychological intervention tools (e.g., AI-assisted counseling) and combine them with biomarker analysis (e.g., levels of inflammatory factors) to further reveal the mechanism of psychosocial support and provide more accurate guidance for clinical practice.

Author contributions: Conceptualization, SX and YL; methodology, YL; software,

YL; validation, SX and YL; writing—review and editing, SX and YL; project administration, YL; funding acquisition, YL. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Innovation Research Team Project of Taizhou Polytechnic College (2024ATD05).

Ethical approval: This study was reviewed and approved by The Affiliated Taizhou People's Hospital of Nanjing Medical University (approval number: 2026029).

Informed consent statement: All eligible cancer patients were fully informed of the study's research purpose, specific intervention scheme, follow-up schedule, scale assessment content, potential benefits and harmless risks before enrollment. Each participant voluntarily signed written informed consent documents before being included in this trial. All subjects had the right to withdraw from the research at any stage without any penalty or negative impact on their routine anti-tumor treatment and clinical nursing. The whole informed consent process was supervised and recorded by specialized researchers.

Data availability statement: The raw scale assessment data, demographic clinical baseline data, original statistical analysis outputs, and supporting figures/tables generated in this study are securely stored in the electronic research archive of The Affiliated Taizhou People's Hospital. De-identified research datasets without sensitive patient personal information can be reasonably obtained from the corresponding author upon formal written request. All requesters need to submit an official data access application form stating the research purpose, data usage scope and academic background. The original signed informed consent documents and on-site intervention recording archives are retained in the hospital clinical research management office and cannot be provided externally to protect patient privacy. Data sharing is restricted to non-commercial academic research only, and all data users must comply with medical privacy and ethical research regulations.

Conflict of interest: The authors declare that there is no conflict of interest.

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