*Original Article*
# High-quality nursing service system is superior to routine care in the care management of malignancies

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**Abstract:** Purpose: To analyze the application value of the high-quality nursing service system in the care management of malignancies. Methods: 116 patients with malignancies treated in the Harbin Medical University Cancer Hospital between December 2019 and June 2022 were retrospectively enrolled. This included 56 patients who received routine care (regular group) and 60 patients treated by high-quality care (high-quality group). Complications, mental state (Self-Rating Depression/Anxiety Scale, SDS/SAS), pain severity (Visual Analogue Scale, VAS), cancer-related fatigue (Piper Fatigue Scale, PFS), and quality of life (Generic Quality of Life Inventory-74, GQOL-74) were collected from both groups for comparative analysis. Factors influencing quality of life in patients with malignancies were identified using the multivariate linear regression model. Results: Patients treated by the high-quality nursing service system experienced fewer complications than those cared by routine care. The high-quality group showed a significantly reduced SDS, SAS, VAS, and PFS score and elevated GQOL-74 scores after nursing compared with the baseline (before nursing) and the regular group. The multivariate linear regression model showed that the type of care had a significant impact on patients' quality of life. Conclusions: The high-quality nursing service system has a higher application value in the care management of malignancies than routine nursing. This can reduce complications, relieve patients' anxiety, depression, pain degree and cancer-related fatigue, and boost their quality of life, with high clinical popularization prospects.

**Keywords:** High-quality nursing service system, routine nursing, malignancies, complications, mental state

## Introduction

Due to diversified pathogenic factors of malignancies and occultation at the early stage, patients usually have a delayed diagnosis that increases the difficulty of medical management [1, 2]. Malignant tumor patients are accompanied with mental health problems, reduced quality of life (QoL) and physical manifestations such as cancer pain and cancer-related fatigue (CRF) [3, 4]. Timely and effective interventions for these patients can help to curb disease exasperation, relieve the mental health of patients and their families, help patients regain their confidence in overcoming the disease, and better fight against the disease [5]. Radical surgery, radiotherapy, and chemotherapy are the known primary treatment options for malignant tumor patients. They come with unavoidable risks of complications with certain thera-peutic effects [6, 7]. Effective treatment programs for patients with malignancies and a high-quality nursing service system are of great value to prevent complications and optimize clinical application in other aspects.

The current routine nursing service system provides patients ordinary daily management. It has certain limitations and cannot meet the relatively complicated health needs of patients [8]. The high-quality nursing service system is a management system different from the conventional one. It is comprehensive, effective, and detailed, with the main goal of improving patients' medical experience, treatment effect, and QoL [9, 10]. Being a patient-oriented humanistic care model, the high-quality nursing service system develops customized high-quality care services for patients integrating their health needs and conditions [11]. To meet

**Table 1.** Baseline data

| Classification | Regular group (n=56) | High quality group (n=60) | $X^2$ value | $P$ value |
|---|---|---|---|---|
| Gender | | | 0.246 | 0.620 |
| Male | 24 (42.86) | 23 (38.33) | | |
| Female | 32 (57.14) | 37 (61.67) | | |
| Age (years old) | 53.25±6.71 | 53.80±7.22 | 0.424 | 0.672 |
| Course of disease (years) | 6.93±3.48 | 7.70±3.40 | 1.205 | 0.231 |
| Tumor type | | | 0.665 | 0.881 |
| Colorectal cancer | 8 (14.29) | 7 (11.67) | | |
| Cervical cancer | 12 (21.43) | 11 (18.33) | | |
| Gastric cancer | 13 (23.21) | 13 (21.67) | | |
| Lung cancer | 23 (41.07) | 29 (48.33) | | |
| Educational level | | | 0.409 | 0.523 |
| Below high school | 21 (37.50) | 26 (43.33) | | |
| High school and above | 35 (62.50) | 34 (56.67) | | |

patients' complex health needs and improve nursing quality, high-quality nursing teams often put forward higher professional requirements for nursing staff. This helps to improve the professional skills and professionalism of nursing teams and optimizes the overall quality of nursing services [12]. The high-quality nursing service system has been shown to help alleviate the psychological distress of patients with malignancies such as colorectal, cervical, gastric, and lung cancers, while maintaining high efficacy and safety [13-15]. It has been indicated to be effective in improving postoperative QoL in patients with malignant glioma, with high nursing satisfaction [16].

Considering the limited research on the clinical application of the high-quality nursing service system in the clinical setting of multiple malignancies, we analyzed the complications, mental state, pain intensity, CRF, and QoL of patients receiving high-quality nursing service, in the hope of providing effective clinical basis for malignancy care management and contributing to improving the medical experience of malignant tumor patients.

**Materials and methods**

*General data*

This retrospective study has been approved by the Ethics Committee of the Harbin Medical University Cancer Hospital. The study selected 116 patients with malignancies treated in the Harbin Medical University Cancer Hospital between December 2019 and June 2022. This

included 56 patients who received routine care (regular group) and 60 patients who received high-quality care (high-quality group). As shown in **Table 1**, the two patient cohorts differed insignificantly in baseline data (P>0.05).

*Eligibility criteria*

Inclusion criteria: in line with the diagnostic criteria for malignancies such as colorectal, cervical, stomach, or lung carcinoma [17]; no preoperative history of surgery, radiotherapy, chemotherapy, or interventional therapy; no organ dysfunction; life expectancy ≥6 months; clear consciousness and no mental illness nor cognitive dysfunction; intact case data.

Exclusion criteria: more than one malignancies; heart, lung, and kidney dysfunction; coagulation dysfunction and autoimmune system defects; infectious diseases; dropouts during the trail; pregnant or lactating women.

*Nursing measures*

The regular group received routine nursing intervention with measures covering the following aspects: nursing staff provided health education to patients and explained the relevant knowledge about malignancies. Changes in patients' conditions and adverse reactions during treatment were observed and timely reported to the doctor.

Patients in the high-quality group were provided with high-quality nursing care, specifically as follows: (1) Optimizing the hospitalization envi-

ronment: in the regularly ventilated ward, soft light, appropriate temperature and humidity, and clean and tidy bed sheets were provided to ensure a favorable environment for patients. Patients were regularly massaged and turned over. (2) Nursing for complications: medication guidance was provided to patients during treatment. The treatment methods, therapeutic effects, complications, and related precautions were explained to them. Patients were closely observed during the treatment. The doctor was informed in time for corresponding treatment in case of any adverse events. (3) Pain care: rational drug use was carried out in combination with the pain severity of the patient. Antondine was provided for mild and moderate pain. Demerol was administered if there was severe pain. For medication-induced adverse reactions, the nursing staff timely informed and cooperated with the doctor to address them. (4) Diet and exercise care: the patient's daily diet was managed. They were advised to eat vitamin and protein rich foods and drink plenty of water. This helped to maintain the energy supply of the body, improve immunity, reduce gastrointestinal reaction, and prevent constipation. The nursing staff guided patients to exercise appropriately, making reasonable arrangements according to patients' age and physical condition. Patients were allowed to select walking, practicing Tai Chi, or climbing stairs to reduce the CRF. Patients were supervised during the exercise to ensure their safety. (5) Psychological nursing: the nursing staff fully understood patients' condition, observed and paid attention to patients' life performance and psychological changes during treatment, and actively communicated with them to clarify the key factors leading to psychological problems. Communication with patients' family members was strengthened and education was conducted to alleviate anxiety, irritability, and depression adverse emotions of patients and their family members.

*Detection indicators*

(1) Occurrence of complications [18]: the number of cases of venous thrombosis, phlebitis, and infection, in both cohorts was observed and recorded. The incidence rate was calculated.

(2) Mental state [19]: the pre- and post-interventional depression and anxiety of patients in both cohorts were assessed using the Self-rating Depression Scale (SDS) and Self-rating Anxiety Scale (SAS), respectively. Both scales have 20 evaluation items and a score range of 0-80 points. Higher scores suggest more serious depression and anxiety symptoms of the patient.

(3) Pain intensity [20]: the pain intensity assessment of tumor patients was made using the Visual Analogue Scale (VAS; score range: 0-10), a measure with the score in direct proportion to the pain intensity.

(4) CRF [21]: the Piper Fatigue Scale (PFS) was employed for the evaluation of CRF from affective, cognitive, sensory, and behavioral subscales with a score of each ranging from 0 to 10. The score is positively associated with the degree of CRF of patients.

(5) QoL [22]: through the Generic Quality of Life Inventory-74 (GQOL-74), the QoL of both patient cohorts was assessed from psychological function, material life, social function, and somatic function (each with a total score of 100 points) for comparative analysis. The score is directly proportional to the QoL.

Occurrence of complications, mental state, pain intensity, and QoL were primary endpoints. CRF was a secondary endpoint.

*Statistical methods*

Data analysis and image processing were performed using Graphpad Prism 7.0 statistical software. Independent t-test and $\chi^2$-test were used to identify inter-group differences of counted data (denoted by number of cases/percentage [n/%]) and measured data (denoted by mean ± SEM), respectively. A multivariate linear regression model was constructed to analyze the influencing factors of patients' QoL. $P < 0.05$ was considered with statistical significance.

**Results**

*Baseline data*

Gender, age, course of disease, tumor type, and educational level had no significant difference between the two patient cohorts (P>0.05). These were comparable (**Table 1**).

**Table 2.** High-quality nursing service system reduced complications in patients with malignant tumors

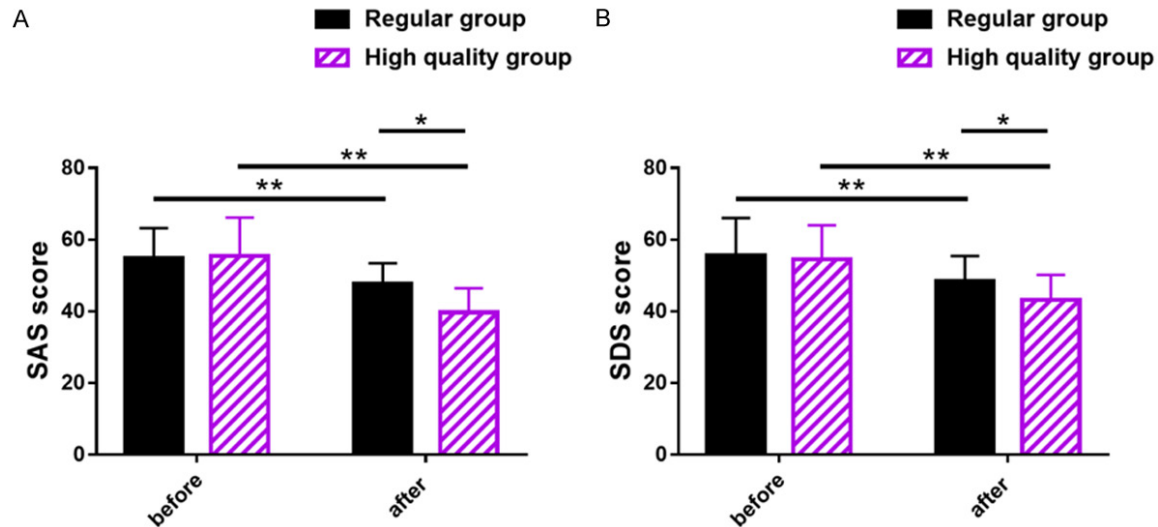| Events | Regular group (n=56) | high quality group | $X^2$ value | *P* value |
|---|---|---|---|---|
| Venous thrombosis | 1 (1.79) | 0 (0.00) | | |
| Phlebitis | 3 (5.36) | 0 (0.00) | | |
| Infection | 5 (8.93) | 2 (3.33) | | |
| Total | 9 (16.07) | 2 (3.33) | 5.476 | 0.019 |



Figure 1. Application effect of high-quality nursing service system on mental state of malignant tumor patients. A. Influence of high-quality nursing service system on SAS scores of malignant tumor patients. B. Influence of high-quality nursing service system on SDS scores of malignant tumor patients. Note: *P<0.05; **P<0.01. SAS, Self-Rating Anxiety Scale; SDS, Self-Rating Depression Scale.

*High-quality nursing service system reduced complications in patients with malignancies*

Through the observation and statistics of adverse events in the two patient cohorts, it was found that the incidences of venous thrombosis, phlebitis, and infection were significantly higher in the regular group compared with the high-quality group (16.07% vs. 3.33%, P<0.05), as shown in **Table 2**.

*High-quality nursing service system improved mental state in malignant tumor patients*

The improvement degree of the mental state (anxiety and depression) of patients with malignancies was quantitatively evaluated by the SAS and SDS scales, to determine the value of high-quality nursing service system in alleviating patients' adverse mood. As shown in **Figure 1**, SAS and SDS scores differed insignificantly between groups before nursing (P>0.05), but the two scores decreased statistically in both cohorts after care (P<0.05), with lower post-care SAS and SDS scores in the high quality group (P<0.05).

*High-quality nursing service system alleviated pain in malignant tumor patients*

We employed the VAS scale for quantitative evaluation of pain levels in malignant tumor patients to determine the application effect of high-quality nursing service system on pain relief (**Figure 2**). Data showed no significant difference in VAS scores between groups before nursing (P>0.05). After the care, the VAS scores showed a significant decreasing trend in both cohorts (P<0.05), with lower scores in the high-quality group (P<0.05).

*High-quality nursing service system mitigated CRF in malignant tumor patients*

We used the PFS scale to quantitatively evaluate the improvement degree of CRF of malig-
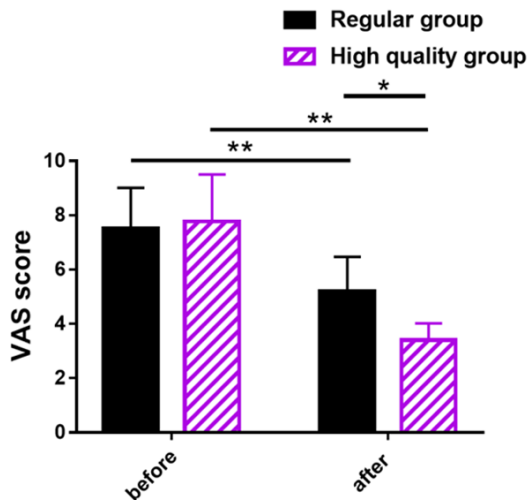
**Figure 2.** High-quality nursing service system alleviated pain in malignant tumor patients. *P<0.05; **P<0.01. VAS, Visual Analogue Scale.

nant tumor patients to determine the application effect of the high-quality nursing service system on mitigating CRF in such patients (**Figure 3**). There was no significant observation in the scores of affective, cognitive, sensory, and behavioral subscales between groups before nursing (P>0.05). There were significant reductions in the above four subscale scores found in both cohorts after care (P<0.05), with lower scores in the high-quality group (P<0.05).

*High-quality nursing service system enhanced QoL in malignant tumor patients*

Through GQOL-74, we quantitatively evaluated the improvement in QoL of malignant tumor patients after care to determine the application effect of high-quality nursing service system on boosting patients' QoL (**Figure 4**). The high-quality group showed significantly higher scores of QoL in psychological function, material life, social function, and somatic function than the regular group after nursing (P<0.05).

*Multivariate analysis of patient QoL*

In this study, gender, age, disease course, tumor type, educational level, and type of care were included to construct a multivariate linear regression model. The multivariate model was successfully constructed. It showed that at least one factor had a significant effect on patients' QoL (F=55.131, P<0.001). The type of care was identified to have a significant impact

on patients' QoL (B=-11.541, t=-17.565, P< 0.001), as shown in **Tables 3** and **4**.

**Discussion**

This study conducted a detailed analysis of the clinical application of high-quality nursing service system in malignancy care management. Significantly lower incidence rates of venous thrombosis, phlebitis, and infection were determined in the high-quality group as compared to the regular group. This suggested that the high-quality nursing service system has a good preventive effect on complications in these patients. This may be related to the complication prevention care implemented in the high-quality nursing service. By informing patients of complications during treatment in advance and timely targeted treatment of complications during treatment, the complication rate of patients receiving high-quality nursing service can be reduced [23]. In the study of Xiao S et al. [24], high-quality nursing effectively prevented elderly hypertensive patients from complications, like our findings. SAS and SDS scores were found to be reduced significantly after care and were lower in the high-quality group as compared to the regular group. This indicated that the high-quality nursing service system is more helpful to mitigate patients' negative mental state in malignancy care management than conventional care. Patients with malignant tumors are prone to psychological distress or bad mood due to factors such as illness during treatment. This is highly likely to affect the treatment efficacy. It is important to alleviate their negative psychology through nursing [25]. The psychological intervention carried out during the nursing process may explain the effectively mitigated adverse psychology in patients treated by the high-quality nursing service system. Through dynamic observation of patients' conditions and psychological changes, patients were provided with timely psychological intervention. This was consistent with the research results of Xu H et al. [26]. The VAS score of the high-quality group was found to be significantly lower than the regular group after nursing. This indicated that patients with malignant tumors had better pain relief treated by high-quality nursing than when compared with those receiving conventional care. The high-quality nursing system used in this study managed the pain of malignant tumor patients. Painkillers were pro-
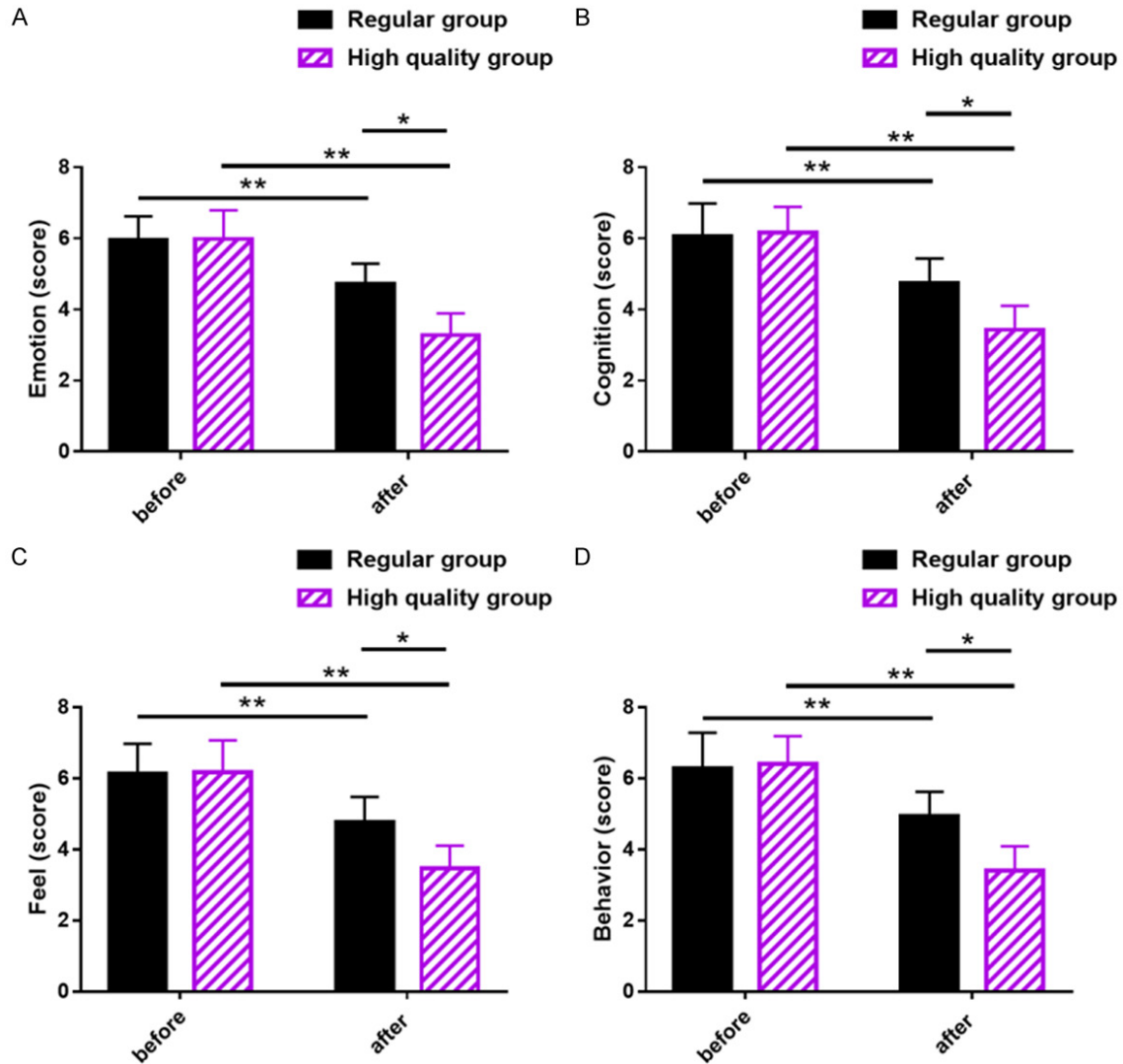
**Figure 3.** High-quality nursing service system mitigated cancer-related fatigue of malignant tumor patients. A. Influence of high-quality nursing service system on affective subscale of the Piper Fatigue Scale of malignant tumor patients. B. Influence of high-quality nursing service system on cognitive subscale of the Piper Fatigue Scale of malignant tumor patients. C. Influence of high-quality nursing service system on sensory subscale of the Piper Fatigue Scale of malignant tumor patients. D. Influence of high-quality nursing service system on behavioral subscale of the Piper Fatigue Scale of malignant tumor patients. Note: * indicates P<0.05, and ** indicates P<0.01.

vided to them based on pain severity [27]. Hu M et al. reported [28], high-quality nursing significantly controls or relieves pain in patients undergoing therapeutic laparoscopy for colon cancer. This supports our study. PFS results showed that after nursing, the scores of affective, cognitive, sensory, and behavioral subscales were significantly reduced in both patient cohorts and were all lower in the high-quality group. This suggested that high-quality nursing can more effectively relieve patients' CRF. This may be related to the diet and exercise intervention provided to patients under

high-quality nursing intervention. This helped patients improve their immunity and reduce CRF through changing into a high vitamin, high protein diet, and proper exercise guidance [29, 30]. He F et al. [31] reported a significant reduction in CRF in patients with gastric cancer under the intervention of high-quality nursing. This was consistent with our findings. The investigation of GQOL-74 scores revealed that the QoL score of the high-quality group assessed from psychological function, material life, social function, and somatic function after nursing was significantly higher than that of the regular
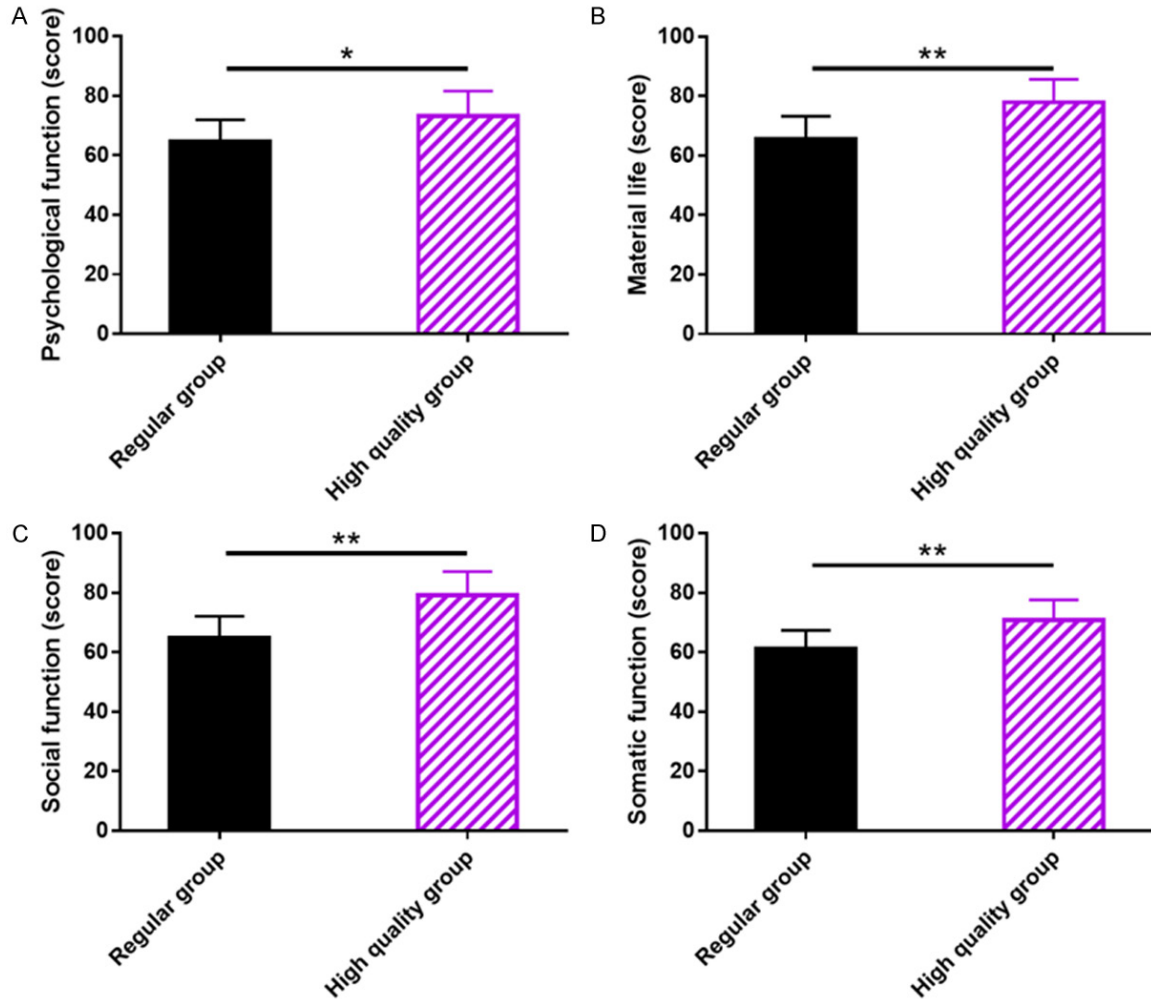
**Figure 4.** High-quality nursing service system enhanced life quality of malignant tumor patients. A. Influence of high-quality nursing service system on psychological function of patients with malignant tumors. B. Influence of high-quality nursing service system on material life of malignant tumor patients. C. Influence of high-quality nursing service system on social function of malignant tumor patients. D. Influence of high-quality nursing service system on somatic function of patients with malignant tumors. Note: * indicates P<0.05, and ** indicates P<0.01.

**Table 3.** Multivariate regression analysis of factors affecting patients' quality of life

| Model | Square sum | Degree of freedom | Mean square | F | P |
|---|---|---|---|---|---|
| Regression | 3753.981 | 6 | 625.664 | 55.131 | <0.001 |
| Residual | 1237.010 | 109 | 11.349 | | |
| Total | 4990.991 | 115 | | | |

Note: R=0.867, $R^2$=0.752, SE=3.36879, Durbin-Watson test =2.142.

group. This indicated that the high-quality nursing service system had a more significant role in improving the QoL of malignant tumor patients. The high-quality nursing provides high-quality and professional nursing intervention measures for the treatment and rehabilitation of malignant tumor patients from the aspects of hospitalization environment, complications, pain, diet, exercise, and psychology, helping to improve patients' QoL. Qian X et al. [32] pointed out that the QoL of patients with severe aneurysmal subarachnoid hemorrhage was significantly improved after receiving high-quality care. Based on the results of the multivariate linear regression model, gender, age, course of disease, tumor type, and educational level had no significant relationship with patients' QoL. The type of care significantly influenced patients' life quality, with high-quality care exerting a positive influence. This confirmed our view that

**Table 4.** Analysis of factors influencing patients' quality of life

| Factors | Unstandardized coefficient B | Standard error | Standard coefficient Beta | t | P |
|---|---|---|---|---|---|
| Gender | -0.157 | 1.597 | -0.012 | -0.099 | 0.922 |
| Age | 0.075 | 0.047 | 0.080 | 1.619 | 0.108 |
| Course of the disease | -0.081 | 0.093 | -0.042 | -0.865 | 0.389 |
| Tumor type | -1.020 | 0.622 | -0.168 | -1.640 | 0.104 |
| Educational level | -1.659 | 1.642 | -0.124 | -1.010 | 0.315 |
| Type of care | -11.541 | 0.657 | -0.879 | -17.565 | <0.001 |

high-quality care can significantly enhance patients' QoL.

This study needs more consideration and improvement. There may be bias in information collected because this was a small sample, single-center study. It would be beneficial to improve the accuracy of the study results if the sample size could be increased to expand the sample collection scope. There was no analysis of indicators such as compliance and sleep quality. When supplemented, this will be helpful to understand the advantages of high-quality nursing service system in tumor management. The tumor patients included in this study were heterogeneous in terms of cancer type and treatment. In the future, we will continue to improve the research project from the above points.

The high-quality nursing service system has a significantly better clinical application value than the conventional one in the care management of malignant tumors, with significant effects on preventing complications, alleviating negative mental state, pain, CRF, and boosting QoL. This provided a novel reference for clinical management of malignancies and a new choice for the care of malignant tumor patients.

**Disclosure of conflict of interest**

None.

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