

Analysis of Influencing Factors of Postoperative Quality of Life in Patients with Renal Cancer under the Continuing Care Model Based on the Omaha System

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Background: Scientific nursing is of great significance for improving negative emotions, self-management ability and quality of life of patients after cancer surgery. The Omaha system has been widely used in the field of care in many countries and regions, and although it helps to improve the quality of life of cancer patients after surgery, there are still large differences between different patients. This study examines factors affecting postoperative quality of life in renal cancer patients under the continuous care Omaha system, aiming to refine nursing plans.

Methods: We retrospectively analyzed clinical data from 108 renal cancer patients undergoing radical treatment, all of whom received care via the Omaha system. The score for quality of life and the scores for Strategies Used by People to Promote Health (SUPPH), Social Support Rate Scale (SSRS), and Medical Coping Modes Questionnaire (MCMQ) of patients with different baseline data were compared. **Results:** Patients with spouses as primary caregivers scored higher across psychological, physical, physiological, and societal dimensions of quality of life than those with children or others as caregivers ($p < 0.001$). Patients without underlying diseases have higher physiological, societal dimensions, overall satisfaction total score for quality of life (compared to those with underlying diseases, $p < 0.001$), patients with clinical stage III have lower physiological, societal dimensions, overall satisfaction, and total score for quality of life (compared to stage I/II, $p < 0.001$). The physiological, societal dimensions, overall satisfaction, and total quality of life score for patients with medical or commercial insurance as the settlement method for medical expenses are higher (compared to self-funded, $p < 0.001$). In the SUPPH scale, the positive attitude score, stress reduction score, making decisions score, and total score were positively correlated with the total score for quality of life ($p < 0.001$, $p < 0.001$, $p = 0.008$, $p < 0.001$, respectively). In the SSRS scale, the objective support score, subjective support score, useless support score, and total score were positively correlated with the total score for quality of life (all $p < 0.001$). In the MCMQ scale, the confrontation score was positively correlated with the total score for quality of life ($p < 0.001$). The acceptance-resignation and avoidance scores were negatively correlated with the total score for quality of life ($p < 0.001$).

Conclusion: The quality of life of patients is not only affected by primary caregivers, underlying diseases, clinical staging, and medical expense settlement methods, but also positively correlated with self-efficacy and social support, and negatively correlated with coping styles.

Keywords: Omaha system; extended care; kidney cancer

Introduction

Renal cancer is a malignant tumor in renal parenchymal cells [1]. As one of the diseases with increasing incidence worldwide, it is estimated that there are 400,000 new cases of renal cancer each year, and about 175,000 renal cancer patients die each year [2]. Surgical treatment is a common and effective treatment method for renal cancer [3]. Deichmann *et al.* [4] conducted a questionnaire survey on 94 patients who underwent pancreatic surgery between 2013 and 2017 and pointed out that surgery has long-term adverse

effects on quality of life. Other studies have shown that the quality of life of cancer patients after surgery is influenced by factors such as fear of recurrence [5] and postoperative complications [6]. Postoperative care can help cancer patients detect and manage postoperative complications promptly and alleviate patients' negative emotions, thereby improving their confidence and quality of life [7, 8].

Continuous care refers to a period after the patient is discharged from the hospital and continues to receive guidance and services from medical institutions or professionals to ensure the treatment effect. Research has found that patients with a T-tube who receive continuous care after hepatolithiasis surgery have better home self-care ability and nursing effects [9].

The Omaha system is a standardized tool for nursing practice, documentation, and information management. In the

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early 1970s, Omaha practitioners, managers, and administrators of the Omaha Visiting Nurses Association (VNA) first developed OS as a management system for home care services [10]. The continuing care model based on the Omaha system refers to the use of health education, guidance, consultation, treatment, and supervision programs to provide continuity of care for kidney cancer patients in four areas: Environmental field, psychological field, physical area, and health-related behavior area.

The Omaha system has been applied in the nursing field in Turkey and China [11, 12]. Although it helps to improve the quality of life of colorectal cancer patients after surgery and coronary heart disease patients after percutaneous coronary intervention, there are still great differences among different patients, which may be related to patients' physical and disease conditions as well as psychosocial factors. This paper explores the factors influencing the postoperative quality of life of patients with renal cancer under the Omaha system of continuous care model to optimize the nursing plan for such patients.

Methods

Research Subjects

The study included 108 patients undergoing radical resection for renal cancer from January 2020 to January 2023 (Observation group, all of whom received care via the Omaha system). A total of 108 patients who undergoing radical resection for renal cancer from January 2017 to December 2019 were used as controls (Control group, all of whom not received care via the Omaha system). The data for this study comes from the department of the First Affiliated Hospital of Wenzhou Medical University after approval by the Institutional Ethical Committee (KY-2023-108). This study complies with the Declaration of Helsinki. Informed consent was obtained from all subjects. Inclusion criteria are as follows:

- (a) Patients were diagnosed with renal cell carcinoma by histopathology and cytology;
- (b) Underwent radical nephrectomy;
- (c) Patients in observation group adopted a continuous care model based on the Omaha system;
- (d) Are able to read and understand Chinese;
- (e) Clinical data is complete.

The exclusion criteria are as follows:

- (a) Patients have existence of surgical contraindications or inability to tolerate surgery;
- (b) Coagulation disorders, hematological disorders, or acute infections;
- (c) Serious postoperative complications occur;
- (d) Impairment of other essential organ functions;
- (e) History of chemotherapy or radiotherapy, accompanied by Bone marrow suppression;
- (f) Presence of other malignant tumors;
- (g) Mental illness or other communication disorders.

Continuing Care Model Based on the Omaha System

First, a multidisciplinary cooperative continuation nursing visiting group composed of tumor specialist nurses, doctors, dietitians, and psychological consultants was established.

Three days before discharge, team members trained patients and their families on the extended care plan as follows: Environmental field (tumor specialist nurses): Evaluated whether the patient's living environment is suitable for rehabilitation, learned about the patient's community resources and the working time and work intensity should be strictly assessed, and the impact on the patient's physical condition should be informed. Psychological field (psychological consultants): Emotional support, stress management, and community support: Provided psychological counseling services, conducted appropriate mindfulness intervention, judged whether the patient's coping style is correct, and gave guidance when necessary. Physical area (tumor specialist nurses and doctors): Provided appropriate pain management programs according to the patient's pain level. Ensured that patients and their caregivers understood the name, dosage, method of use, duration, and possible side effects and interactions of the medication. Informed patients of potential complications in advance and provided some management methods. Health-related behavior area (dietitian and tumor specialist nurses): Provided nutritional counseling and personalized dietary recommendations for patients' conditions. Provided appropriate exercise recommendations according to the patient's physical condition and gave guidance on sleep management.

The oncology specialist nurses assessed the patients and their families, and those who failed to pass the examination were given targeted training until they passed it one day before discharge.

The paper nursing record form and nursing-related knowledge brochure were distributed on the day of discharge, and the contact number and WeChat were exchanged.

From discharge to 6 months after surgery:

Telephone follow-up: Twice a week (every Wednesday and Saturday), including asking patients about pain, cancer fatigue, psychological, nutritional status, and other nursing problems, giving answers, and requiring patients to be admitted to the hospital for examination if necessary.

Online video conference (twice/week; the specific time was announced in advance by the WeChat group): Explained nursing-related knowledge, supervised the implementation of the nursing plan, encouraged patients to participate in the discussion actively, and shared the problems encountered in nursing practice. The medical staff answered the questions in time.

Patient communication (the specific time depends on the actual situation of patients): Encouraged patients in the same city to communicate face-to-face and share their nursing experience.

Table 1. Comparison of quality of life scores between two groups of patients.

Quality of life scale	Observation group (<i>n</i> = 108)	Control group (<i>n</i> = 108)	<i>t</i>	<i>p</i>
Physical	11.02 ± 3.69	8.61 ± 3.76	4.747	<0.001
Physiological	11.69 ± 3.68	9.07 ± 4.03	4.989	<0.001
Psychological	8.46 ± 2.72	7.13 ± 2.38	3.840	<0.001
Societal dimensions	14.59 ± 4.48	13.38 ± 4.01	2.095	0.037
Overall satisfaction	3.94 ± 1.38	3.31 ± 1.73	2.958	0.003
Total	49.70 ± 8.94	41.5 ± 7.08	7.475	<0.001

Outpatient review: 1 month, 2 months, 3 months, and 6 months after discharge, oncology nurses and physicians assessed patients' self-care ability, quality of life, and related complications.

Scales Used in the Study

Quality of life post-radical nephrectomy was assessed using a questionnaire from Professor Liu Wei *et al.* [13]. The scale mainly contains four dimensions, namely physiological, physical, psychological, social, and overall satisfaction. A total of 24 items using a 5-level scoring method were assigned 0 to 4 points, from 1 (not at all) to 5 points (very). Among them, items 1, 4, 5, 6, 11, 14, 16, 17, 18, 21, 22, and 23 are positive scores. The rest are reverse scored, with a score range of 0–96 points; The higher the score, the better the quality of life.

Self-efficacy was measured using the Strategies Used by People to Promote Health (SUPPH) questionnaire developed by Professor Lev EL [14] through expert consultations, patient interviews, and a literature review. The scale mainly contains three dimensions, namely, positive attitude, stress reduction, and making decisions, with a total of 29 items, using a 5-level scoring method, assigned 1–5 points, representing different degrees of confidence, from 1 point (no confidence) to 5 points (very confident), with a score range of 29–145 points, the higher the score, the stronger the self-efficacy.

Patients' social support was assessed using the Social Support Rate Scale (SSRS), which Chinese Professor Xiao Shuiyuan developed in 1994 [15]. This scale includes three dimensions—objective support, subjective support, and perceived usefulness—with 10 items rated on a 4-point scale from 1 to 4. Questions 6 and 7 have multiple options; each one will be added 1 point, with a score range of 10–40 points; a higher score indicates more social support.

The Medical Coping Modes Questionnaire (MCMQ) assessed patients' coping styles. The scale, compiled by Feifel H *et al.* [16], mainly includes three coping strategies: Confrontation, acceptance-resignation, and avoidance. There are 20 items, using a 4-level scoring method, corresponding to 4 options. Scores ranging from 1 to 4 represent different degrees of coping tendency, among which items 4, 6, 8, 9, 11, 14, 18, and 20 are reverse scores. The rest are positive scores, with a score range of 20–80 points; The higher the value, the stronger the coping tendency of this factor.

Statistical Analysis

Continuous variables were reported as means ± SD, and quantitative variables were compared using independent samples *t*-tests. Correlation analysis was performed using the *Pearson* correlation test. A *p*-value of <0.05 was considered statistically significant. Data were analyzed using IBM SPSS 23rd edition (SPSS Institute, Inc., Chicago, IL, USA).

Results

Quality of Life Score

The psychology, physical, physiological, societal dimensions and total score for quality of life in the observation group patients was higher than that of the control group, and the difference between the two groups was statistically significant (*p* < 0.001, *p* < 0.001, *p* < 0.001, *p* = 0.037, *p* = 0.003, *p* < 0.001, respectively), as detailed in Table 1.

Comparison of Quality of Life Scores of Patients with Different Baseline Data

Patients with a spouse as the primary caregiver have higher psychology, physical, physiological, societal dimensions and total score for quality of life (compared to their children or others, *p* < 0.001); Patients without underlying diseases have higher physiological, societal dimensions, overall satisfaction total score for quality of life (compared to those with underlying diseases, *p* < 0.001), patients with clinical stage III have lower physiological, societal dimensions, overall satisfaction and total score for quality of life (compared to stage I/II, *p* < 0.001). The physiological, societal dimensions, overall satisfaction, and total quality of life score for patients with medical or commercial insurance as the settlement method for medical expenses are higher (compared to self-funded, *p* < 0.001). No statistically significant differences were observed in quality of life scores by age, gender, education level, tumor location, or diameter (*p* > 0.05), as detailed in Table 2.

SUPPH Score, SSRS Score, MCMQ Score

SUPPH scores were as follows: Positive attitude (29.76 ± 4.69), stress reduction (21.2 ± 4.15), and making decisions (6.39 ± 1.94), with a total of (57.35 ± 7.54). SSRS scores were as follows: Objective support (15.91 ± 2.40), subjective support (7.80 ± 1.89), and perceived useless support (7.15 ± 2.38), totaling (30.85 ± 5.12) points. MCMQ

Table 2. Comparison of total score for quality of life of patients with different baseline data.

Factor		Physical	Physiological	Psychology	Societal dimensions	Overall satisfaction	Total score for quality of life
Age	≥65 years old (<i>n</i> = 35)	11.29 ± 3.85	11.94 ± 3.75	9.06 ± 2.35	14.86 ± 4.55	3.89 ± 1.47	51.03 ± 10.23
	<65 years old (<i>n</i> = 73)	10.89 ± 3.63	11.58 ± 3.67	8.18 ± 2.84	14.47 ± 4.48	3.96 ± 1.35	49.07 ± 8.25
	<i>t</i>	0.519	0.483	1.586	0.423	−0.256	1.067
	<i>p</i>	0.605	0.630	0.116	0.673	0.798	0.288
Gender	male (<i>n</i> = 77)	11.25 ± 3.68	11.66 ± 3.91	8.55 ± 2.71	14.84 ± 4.57	3.91 ± 1.41	50.21 ± 8.93
	female (<i>n</i> = 31)	10.45 ± 3.71	11.77 ± 3.12	8.26 ± 2.77	13.97 ± 4.28	4.00 ± 1.34	48.45 ± 9.00
	<i>t</i>	1.013	−0.142	0.496	0.918	−0.308	0.923
	<i>p</i>	0.313	0.887	0.621	0.361	0.759	0.358
Education level	junior high school and below (<i>n</i> = 40)	11.53 ± 3.45	11.3 ± 3.65	8.78 ± 2.67	14.63 ± 4.91	4.13 ± 1.49	50.35 ± 9.20
	high school and above (<i>n</i> = 68)	10.72 ± 3.82	11.93 ± 3.71	8.28 ± 2.74	14.57 ± 4.25	3.82 ± 1.32	49.32 ± 8.83
	<i>t</i>	1.095	−0.852	0.915	0.057	1.095	0.574
	<i>p</i>	0.276	0.396	0.362	0.954	0.276	0.567
Primary caregivers	spouse (<i>n</i> = 50)	11.82 ± 3.82	12.64 ± 3.58	9.12 ± 2.63	15.64 ± 4.58	4.18 ± 1.42	53.40 ± 9.47
	children or others (<i>n</i> = 58)	10.33 ± 3.46*	10.88 ± 3.61*	7.9 ± 2.68*	13.69 ± 4.23*	3.72 ± 1.32	46.52 ± 7.11*
	<i>t</i>	2.129	2.538	2.386	2.298	1.724	4.304
	<i>p</i>	0.036	0.013	0.019	0.024	0.088	<0.001
Basic diseases	yes (<i>n</i> = 46)	10.61 ± 3.65	9.83 ± 2.77	8.11 ± 2.47	13.48 ± 3.93	3.52 ± 1.15	45.54 ± 4.99
	none (<i>n</i> = 62)	11.32 ± 3.72	13.08 ± 3.69*	8.73 ± 2.88	15.42 ± 4.72*	4.24 ± 1.47*	52.79 ± 9.95*
	<i>t</i>	−0.994	−5.027	−1.170	−2.267	−2.758	−4.530
	<i>p</i>	0.323	<0.001	0.245	0.025	0.007	<0.001
Tumor location	left kidney (<i>n</i> = 55)	11.71 ± 3.68	11.65 ± 4.04	8.8 ± 2.68	14.45 ± 4.33	3.96 ± 1.35	50.58 ± 8.88
	right kidney (<i>n</i> = 53)	10.39 ± 3.6	11.74 ± 3.31	8.11 ± 2.74	14.74 ± 4.68	3.91 ± 1.43	48.79 ± 8.99
	<i>t</i>	1.883	−0.114	1.319	−0.325	0.217	1.040
	<i>p</i>	0.062	0.909	0.190	0.746	0.829	0.301
Tumor diameter	≥5 cm (<i>n</i> = 54)	10.78 ± 3.82	11.39 ± 3.77	8.37 ± 2.82	14.48 ± 4.49	3.83 ± 1.21	48.85 ± 7.61
	<5 cm (<i>n</i> = 54)	11.26 ± 3.57	12 ± 3.6	8.56 ± 2.63	14.7 ± 4.52	4.04 ± 1.54	50.56 ± 10.10
	<i>t</i>	−0.676	−0.861	−0.353	−0.256	−0.764	−0.990
	<i>p</i>	0.500	0.391	0.725	0.798	0.447	0.324
Clinical stages	phase III (<i>n</i> = 38)	10.66 ± 3.36	9.26 ± 2.42	7.74 ± 2.67	13.61 ± 4.45	3.53 ± 1.25	44.79 ± 5.00
	phase I/II (<i>n</i> = 70)	11.21 ± 3.87	13.01 ± 3.59*	8.86 ± 2.68*	15.13 ± 4.45	4.16 ± 1.41*	52.37 ± 9.49*
	<i>t</i>	−0.746	−5.762	−2.079	−1.701	−2.31	−4.586
	<i>p</i>	0.457	<0.001	0.040	0.092	0.023	<0.001
Medical expense settlement method	medical insurance or commercial insurance (<i>n</i> = 72)	11.28 ± 3.93	12.38 ± 3.62	8.74 ± 2.88	15.57 ± 4.44	4.18 ± 1.36	52.14 ± 8.83
	self-funded (<i>n</i> = 36)	10.5 ± 3.15	10.33 ± 3.46*	7.92 ± 2.3	12.64 ± 3.96*	3.44 ± 1.32*	44.83 ± 7.04*
	<i>t</i>	1.033	2.8	1.487	3.351	2.683	4.322
	<i>p</i>	0.304	0.006	0.140	0.001	0.008	<0.001

**p* < 0.05.

scores were confrontation (20.96 ± 2.66), acceptance-resignation (21.44 ± 2.51), and avoidance (12.91 ± 1.90), as detailed in Table 3.

Table 3. SUPPH score, SSRS score, and MCMQ score of 108 renal cancer patients undergoing radical treatment.

Scale		Score/points
SUPPH scale	positive attitude	29.76 ± 4.69
	stress reduction	21.2 ± 4.15
	making decisions	6.39 ± 1.94
	total score	57.35 ± 7.54
SSRS scale	objective support	15.91 ± 2.40
	subjective support	7.80 ± 1.89
	useless support	7.15 ± 2.38
	total score	30.85 ± 5.12
MCMQ scale	confrontation	20.96 ± 2.66
	acceptance-resignation	21.44 ± 2.51
	avoidance	12.91 ± 1.90

SUPPH, Strategies Used by People to Promote Health; SSRS, Social Support Rate Scale; MCMQ, Medical Coping Modes Questionnaire.

Pearson Correlation Coefficients

In the SUPPH scale, the positive attitude score was positively correlated with psychology, physiological, societal dimensions, and total score for quality of life ($p = 0.005$, $p = 0.021$, $p = 0.010$, $p < 0.001$, respectively). The stress reduction score was positively correlated with physical, psychological, physiological, societal dimensions, overall satisfaction, and total score for quality of life ($p = 0.004$, $p = 0.015$, $p = 0.008$, $p = 0.028$, $p = 0.012$, $p < 0.001$, respectively). The making decisions score positively correlated with the total quality of life score ($p = 0.008$). Total scores positively correlated with physical, psychological, physiological, and social dimensions, overall satisfaction, and total quality of life scores ($p = 0.001$, $p = 0.001$, $p = 0.001$, $p = 0.001$, $p = 0.002$, $p < 0.001$ respectively), detailed in Tables 4,5.

In the SSRS scale, the objective support score was positively correlated with psychology, physiological, societal dimensions, overall satisfaction, and total score for quality of life ($p = 0.031$, $p = 0.015$, $p < 0.001$, $p = 0.010$, $p < 0.001$, respectively). The subjective support score was positively correlated with physiological, societal dimensions, and total score for quality of life ($p < 0.001$, $p < 0.001$, $p < 0.001$, respectively). The useless support score was positively correlated with physical, physiological, and total scores for quality of life ($p < 0.001$, $p < 0.001$, $p < 0.001$, respectively). The total score was positively correlated with physical, physiological, societal dimensions, overall satisfaction, and total score for quality of life ($p = 0.006$, $p < 0.001$, $p < 0.001$, $p = 0.008$, $p < 0.001$, respectively), detailed in Tables 4,5.

In the MCMQ scale, the confrontation score was positively correlated with physical, psychological, physiological, and total scores for quality of life ($p = 0.001$, $p = 0.034$, $p = 0.033$, $p < 0.001$, respectively). The acceptance-resignation score was negatively correlated with physiological, societal dimensions, overall satisfaction and total score for quality of life ($p = 0.021$, $p < 0.001$, $p = 0.002$, $p < 0.001$, respectively). The avoidance score was negatively correlated with societal dimensions, overall satisfaction, and total score for quality of life ($p < 0.001$, $p = 0.002$, $p < 0.001$, respectively), detailed in Tables 4,5.

Discussion

Surgery is the preferred treatment for patients with early-stage kidney cancer. However, patients need to face physiological effects such as wound pain, infection, complications, and renal function damage after surgery, as well as psychological effects such as anxiety, depression, and fear [17, 18]. Appropriate postoperative care can effectively reduce the adverse effects of surgery on patients and promote recovery of health. Based on the Omaha system as the theoretical framework, this study provides patients continuous care from the hospital to the community or home. Providing health education, guidance, consultation, and monitoring helps nurses diagnose health problems, formulate and implement nursing plans, and evaluate effects. In this study, the total quality of life score was (49.70 ± 8.94) points, which is higher than the (41.5 ± 7.08) points before the application of continuing care model based on the Omaha system, indicating that this model is beneficial for promoting patients' rehabilitation and self-management to improve their quality of life. The reason is that a multidisciplinary collaborative continuing care visit team has been established based on the continuity of care in the Omaha system, which formulates comprehensive and effective nursing measures based on the specific condition of patients, fully understands the problems that exist in each period, and improves the quality of care in the environmental field, psychological field, physical area, and health related behavior area, follow-up channels such as telephone, WeChat, online video conference, face-to-face communication between patients in the same city, and outpatient review are used to provide scientific guidance to patients, improve their treatment compliance and self-management ability, and thus improve their quality of life.

Li J *et al.* [19] conducted a group study on 76 children with hypospadias. It was found that compared with conventional nursing intervention, the physiological and psychological environment and health behavior of children in the study group based on Omaha system continuous nursing intervention were higher than those in the control group. This suggests that this intervention mode can significantly improve the clinical status of children with hypospadias, reduce the risk of infection complications, and improve children's physical and mental health. Fang X *et al.* [20] stud-

Table 4. Correlation analysis (*r*-value).

Scale		Physical	Physiological	Psychology	Societal dimensions	Overall satisfaction	Total score for quality of life
SUPPH scale	positive attitude	0.175	0.271**	0.222*	0.248**	0.185	0.404**
	stress reduction	0.278**	0.234*	0.254**	0.212*	0.240*	0.432**
	making decisions	0.170	0.112	0.141	0.142	0.166	0.256**
	total score	0.306**	0.327**	0.314**	0.307**	0.290**	0.556**
SSRS scale	objective support	0.137	0.208*	0.233*	0.428**	0.246*	0.466**
	subjective support	0.002	-0.008	0.409**	0.656**	0.160	0.475**
	useless support	0.423**	0.158	0.538**	0.144	0.174	0.503**
	total score	0.261**	0.168	0.510**	0.509**	0.255**	0.627**
MCMQ scale	confrontation	0.322**	0.205*	0.205*	0.100	0.170	0.356**
	acceptance-resignation	-0.181	-0.187	-0.222*	-0.499**	-0.299**	-0.516**
	avoidance	-0.040	-0.110	-0.120	-0.654**	-0.294**	-0.472**

***p* < 0.01, **p* < 0.05.

Table 5. Correlation analysis (*p*-value).

Scale		Physical	Physiological	Psychology	Societal dimensions	Overall satisfaction	Total score for quality of life
SUPPH scale	positive attitude	0.070	0.005	0.021	0.010	0.055	<0.001
	stress reduction	0.004	0.015	0.008	0.028	0.012	<0.001
	making decisions	0.079	0.248	0.146	0.143	0.086	0.008
	total score	0.001	0.001	0.001	0.001	0.002	<0.001
SSRS scale	objective support	0.157	0.031	0.015	<0.001	0.010	<0.001
	subjective support	0.985	0.937	<0.001	<0.001	0.099	<0.001
	useless support	<0.001	0.103	<0.001	0.136	0.072	<0.001
	total score	0.006	0.082	<0.001	<0.001	0.008	<0.001
MCMQ scale	confrontation	0.001	0.034	0.033	0.304	0.079	<0.001
	acceptance-resignation	0.060	0.053	0.021	<0.001	0.002	<0.001
	avoidance	0.683	0.258	0.214	<0.001	0.002	<0.001

ied 42 patients with stroke and falls and found that patients receiving Omaha system care had better self-care abilities after 1 year. Ning L *et al.* [21] selected 102 hospitalized lung cancer patients who received chemotherapy as the survey subjects. After four chemotherapy cycles, the continuous care group based on the Omaha system theory had lower physical, cognitive, emotional, and overall fatigue scores. In this study, the scores of physical, physiological, psychology, societal dimensions, and overall satisfaction of 108 patients were (11.02 ± 3.69) points, (11.69 ± 3.68) points, (8.46 ± 2.72) points, (14.59 ± 4.48) points, (3.94 ± 1.38) points, and the total score of quality of life was (49.70 ± 8.94) points, which is at a high level. This indicates that the model is beneficial for promoting patients' rehabilitation and self-management to improve their quality of life; similar to the above research conclusions, this again confirms the importance of the Omaha system and continuous care interventions.

In this study, renal cancer patients with a spouse as the primary caregiver, no underlying disease, clinical stages I/II, and medical expense settlement method of commercial insurance/medical insurance had higher quality of life scores. Getu MA *et al.* [22] and Essadi I *et al.* [23] both pointed out

a significant correlation between the quality of life of cancer patients and cancer staging; this is because patients with no underlying diseases and clinical stage I/II have better physical conditions, less physical burden, lower risk of postoperative adverse reactions, and higher quality of life. Diseases and treatments may bring economic burdens to patients and their families. Medical or commercial insurance can alleviate the financial pressure on patients. Ladabaum U *et al.* [24] pointed out that medical insurance is more cost-effective than commercial insurance in screening for colon cancer. Currently, there is no correlation study between caregivers and the quality of life of cancer patients. However, this study found that cancer patients whose spouses are the main caregivers have better quality of life. This is because spouses, as the main caregivers, can provide more support for patients.

This study found that the SUPPH, SSRS, and MCMQ scales correlated with the total quality of life score. Klinis S *et al.* [25] found through a survey of 92 elderly diabetes patients that self-efficacy and stress levels can help improve the diet, sleep, and daily life attitude of diabetes patients, thereby enhancing their quality of life. Guo Y *et al.* [26] found that self-efficacy can affect the quality of life by changing

health literacy by analyzing 300 polycystic ovary syndrome patients. Oktaviani *et al.* [27] pointed out that the quality of life of cancer children aged 8–12 is closely related to their parents' self-efficacy. Ban Y *et al.* [28] found that social support, to a certain extent, mediated the relationship between breast cancer patient's fear of progress (FOP) and quality of life. Gudina *et al.* [29] found through a survey of 23,939 adult cancer survivors that obtaining more social and emotional support can help improve health-related quality of life. The acceptance-resignation and avoidance scores were negatively correlated with physical, physiological, psychological, and societal scores and total score of life quality; this result is consistent with the above research conclusions. Mohammadipour M *et al.* [30] surveyed 224 women with breast cancer and found that coping style can be a significant predictor of their quality of life. Huang Z *et al.* [31] concluded through a survey of 163 patients with chronic lymphedema that coping styles, social support, pain levels, and education levels are closely related to their quality of life. These findings align with our research on renal cancer patients under the Omaha system's continuous care model.

It is worth pointing out that this study has the following limitations: First, the small sample size and single-center nature of the study may result in information bias. Additionally, the SUPPH, SSRS, and MCMQ scales, being self-reported, may be influenced by the external environment or patients' memory bias. To this end, a large sample, multi-center, long-term trial will be conducted to further explore the factors affecting the postoperative quality of life of patients with kidney cancer under the Omaha system-based continuation of care model.

Conclusion

In conclusion, the quality of life score were higher than that before the application of continuing care model based on the Omaha system. Patients' quality of life is influenced by primary caregivers, underlying diseases, clinical staging, medical expense methods, self-efficacy, social support, and coping styles. Medical staff and other caregivers should closely observe patients' psychological, emotional, and behavioral changes, help them find effective support strategies, and ultimately improve their quality of life.

Availability of Data and Materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Author Contributions

XWW designed the research study. LNH, XQX and XSH participated in the questionnaire survey and collation. XWW, CXH analyzed the data. All authors contributed to editorial changes in the manuscript. All authors read and

approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

The data for this study comes from the department of the First Affiliated Hospital of Wenzhou Medical University after approval by the Institutional Ethical Committee (KY-2023-108). This study complies with the Declaration of Helsinki. Informed consent was obtained from all subjects.

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Conflict of Interest

The authors declare no conflict of interest.

References

- [1] Bahadoram S, Davoodi M, Hassanzadeh S, Bahadoram M, Barahman M, Mafakher L. Renal cell carcinoma: an overview of the epidemiology, diagnosis, and treatment. *Giornale Italiano Di Nefrologia: Organo Ufficiale Della Societa Italiana Di Nefrologia*. 2022; 39: 2022–vol3.
- [2] Cirillo L, Innocenti S, Becherucci F. Global epidemiology of kidney cancer. *Nephrology, Dialysis, Transplantation: Official Publication of the European Dialysis and Transplant Association - European Renal Association*. 2024. (online ahead of print)
- [3] Singh S, Chaurasia A, Gopal N, Malayeri A, Ball MW. Treatment Strategies for Hereditary Kidney Cancer: Current Recommendations and Updates. *Discovery Medicine*. 2022; 34: 205–220.
- [4] Deichmann S, Manschikow SG, Petrova E, Bolm L, Honselmann KC, Frohneberg L, *et al.* Evaluation of Postoperative Quality of Life After Pancreatic Surgery and Determination of Influencing Risk Factors. *Pancreas*. 2021; 50: 362–370.
- [5] Yang X, Li Y, Lin J, Zheng J, Xiao H, Chen W, *et al.* Fear of recurrence in postoperative lung cancer patients: Trajectories, influencing factors and impacts on quality of life. *Journal of Clinical Nursing*. 2024; 33: 1409–1420.
- [6] Hara T, Kogure E, Kubo A. Factors influencing early postoperative health-related quality of life in patients with alimentary system cancer. *Supportive Care in Cancer: Official Journal of the Multinational Association of Supportive Care in Cancer*. 2021; 29: 6145–6154.
- [7] Wang TF, Li YJ, Chen LC, Chou C, Yang SC. Correlation Between Postoperative Health-Related Quality of Life and Care Needs of Oral Cancer Patients. *Cancer Nursing*. 2020; 43: 12–21.
- [8] Liu X, Yuan K, Ye X, Liu R. Proposing a novel care

program: reminiscence therapy involved care for anxiety, depression, and quality of life in postoperative cervical cancer patients. *Irish Journal of Medical Science*. 2022; 191: 2019–2027.

[9] Peng Y, Wan H, Hu X, Xiong F, Cao Y. Internet+Continuous Nursing Mode in Home Nursing of Patients with T-Tube after Hepatolithiasis Surgery. *Computational and Mathematical Methods in Medicine*. 2022; 2022: 9490483.

[10] Topaz M, Golfenshtein N, Bowles KH. The Omaha System: a systematic review of the recent literature. *Journal of the American Medical Informatics Association: JAMIA*. 2014; 21: 163–170.

[11] Karahan A, Erdoğan S. Reporting of Nursing Care Preventing Surgical Site Infection in Colorectal Cancer Patients with Omaha System. *Florence Nightingale Hemsirelik Dergisi*. 2019; 27: 38–47.

[12] Yin S, Ou Y, Ting E. Impacts of Omaha System-Based Continuing Care on the Medication Compliance, Quality of Life, and Prognosis of Coronary Heart Disease Patients After PCI. *Brazilian Journal of Cardiovascular Surgery*. 2022; 37: 472–480.

[13] Liu W, Liu QG, Shi TY, Wang QF. The Investigation of Postoperative Quality of Life(QOL)in Patients with Renal Carcinoma. *Zhe Xue Yu Yi Xue*. 2017; 38: 55–58. (In Chinese)

[14] Lev EL, Owen SV. A measure of self-care self-efficacy. *Research in Nursing & Health*. 1996; 19: 421–429.

[15] Xiao SY. Theoretical basis and research application of the Social Support Rate Scale. *Lin Chuang Jing Shen Yi Xue Za Zhi*. 1994; 4: 98–100. (In Chinese)

[16] Feifel H, Strack S, Nagy VT. Coping strategies and associated features of medically ill patients. *Psychosomatic Medicine*. 1987; 49: 616–625.

[17] Kierstan A, Konecki T, Jabłonowski Z. Assessment of complications after laparoscopic surgery of kidney tumors using Clavien-Dindo classification. *Polski Przegląd Chirurgicalny*. 2020; 92: 7–11.

[18] Safaie N, Zeinali H, Ghahramanfard F, Mirmohammadhani M, Moonesan M. Anxiety and depression among new cancer patients. *Journal of Family Medicine and Primary Care*. 2022; 11: 4146–4150.

[19] Li J, Fan X, Deng Q, Sun J, Jin L, Chen P, et al. Significance of Continuous Nursing of Omaha System in Children after Hypospadias Surgery and Its Influence on Infection Complications. *Contrast Media & Molecular Imaging*. 2022; 2022: 8346848.

[20] Fang X, Jia S, Wang Q, Liu H, Zhou Y, Zhang L, et al. The Application of the Omaha System in Community Rehabilitation Nursing for Patients With Stroke and Previous Falls. *Frontiers in Neurology*. 2022; 13: 711209.

[21] Ning L, Yuan C, Li Y, Wang L, Chen Y, Tang A, et al. Effect of continuous nursing based on the Omaha System on cancer-related fatigue in patients with lung cancer undergoing chemotherapy: a randomized controlled trial.

Annals of Palliative Medicine. 2021; 10: 323–332.

[22] Getu MA, Chen C, Wang P, Kantelhardt EJ, Addissie A. Quality of life and its influencing factors among breast cancer patients at Tikur Anbessa specialised hospital, Addis Ababa, Ethiopia. *BMC Cancer*. 2022; 22: 897.

[23] Essadi I, Kaakoua M, Lalya I, Bejjou FE, Zyani M, Belbaraka R. Factors influencing Quality of life in Moroccan patients with cancer: A monocentric Prospective study. *The Gulf Journal of Oncology*. 2021; 1: 30–35.

[24] Ladabaum U, Mannalithara A, Brill JV, Levin Z, Bundorf KM. Contrasting Effectiveness and Cost-Effectiveness of Colorectal Cancer Screening Under Commercial Insurance vs. Medicare. *The American Journal of Gastroenterology*. 2018; 113: 1836–1847.

[25] Klinis S, Symvoulakis EK, Stefanidou M, Bertsias A, Christodoulou N, Tsiouri I. Self-efficacy, stress levels and daily style of living among older patients with type 2 diabetes in a rural primary care setting: a cross-sectional study. *Medicine and Pharmacy Reports*. 2022; 95: 267–274.

[26] Guo Y, Liu Y, Ding R, Yan X, Tan H, Wang Y, et al. A structural equation model linking health literacy, self-efficacy, and quality of life in patients with polycystic ovary syndrome. *BMC Women's Health*. 2023; 23: 98.

[27] Oktaviani I, Allenidekania A. Correlation between parents' self-efficacy and quality of life of children with cancer aged 8-12 years. *Pediatric Reports*. 2020; 12: 8703.

[28] Ban Y, Li M, Yu M, Wu H. The effect of fear of progression on quality of life among breast cancer patients: the mediating role of social support. *Health and Quality of Life Outcomes*. 2021; 19: 178.

[29] Gudina AT, Cheruvu VK, Gilmore NJ, Kleckner AS, Arana-Chicas E, Kehoe LA, et al. Health related quality of life in adult cancer survivors: Importance of social and emotional support. *Cancer Epidemiology*. 2021; 74: 101996.

[30] Mohammadipour M, Pidad F. Coping Strategies, Locus of Control, and Quality of Life in Patients with Early-Stage Breast Cancer. *The Journal of Psychology*. 2021; 155: 375–386.

[31] Huang Z, Wu S. Acceptance of disability, coping style, perceived social support and quality of life among patients with chronic lymphedema: a cross-sectional study. *Supportive Care in Cancer: Official Journal of the Multinational Association of Supportive Care in Cancer*. 2022; 30: 4099–4108.

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