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ARTICLE

Effect of Intensive Nursing Management on Quality of Life and Mental Health in Elderly Gastric Cancer Patients Undergoing Chemotherapy: A Retrospective Study

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Abstract

Aims/Background Implementing effective nursing management is particularly critical in the case of elderly gastric cancer (GC) patients receiving chemotherapy, who are more vulnerable to risk events. Therefore, this study explored the effect of intensive nursing management on quality of life (QoL) and mental health in elderly GC patients receiving chemotherapy.

Methods A total of 155 elderly patients with GC undergoing chemotherapy in Central Hospital Affiliated to Shandong First Medical University from July 2021 to July 2023 were selected as the study subjects. The sample was divided into two groups according to different nursing methods: 74 patients who received intensive nursing management were classified in the observation group, while 81 patients treated with routine nursing management were classified under the reference group. The QoL, mental health and adverse reactions to chemotherapy were compared between the two groups.

Results Before nursing management was implemented, there was no significant difference in the scores of the quality of life questionnaire-core 30 (QLQ-C30), patient health questionnaire-9 items (PHQ-9), and the Chinese version of the M.D. Anderson Symptom Inventory (MDASI-C) ($p > 0.05$). After management, in comparison with the reference group, the observation group showed significantly higher scores in each dimension of QLQ-C30, as well as significantly lower scores in PHQ-9 and MDASI-C ($p < 0.001$). The incidences of gastrointestinal reaction, myelosuppression, neurotoxicity, and hepatorenal damage were lower in the observation group than in the reference group (45.95% vs 70.37%, 40.54% vs 65.43%, 35.14% vs 53.09%, and 33.78% vs 51.25%, respectively; $p < 0.05$).

Conclusion The application of intensive nursing management in treating elderly GC patients during chemotherapy effectively improves their physical and mental states, ameliorates clinical symptoms and enhances the QoL, showing certain clinical application value.

Key words: gastric cancer; clinical management; chemotherapy; elderly patients; clinical symptoms

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Introduction

Gastric cancer (GC) is the fifth most common malignant tumor worldwide (Warsinggih et al, 2022), and due to its insidious onset, it is typically diagnosed during the middle or late stage (Safaralizadeh et al, 2019). Adding to the current disease burden is the constant increase in the number of elderly GC patients owing to the rapid aging of the global population (Shan et al, 2020). At present, chemotherapy,

with or without surgery, is the first-line treatment for GC in stages III/IV (Taniguchi et al, 2019), serving to kill tumor cells, inhibit disease progression, and prolong patient survival. However, chemotherapy demands highly of the patients, physically and psychologically (Grapp et al, 2022). A desirable therapeutic effect is often unattainable in elderly patients due to their poor tolerance to chemotherapy and its adverse reactions. Hence, implementing proper nursing care for elderly GC patients during chemotherapy is of great clinical significance.

Routine clinical nursing care is instrumental to the efficacy and safety of chemotherapy, but it often neglects the particular needs of comprehensive and individualized management for elderly patients. An intensive nursing program is an emerging mode designed to improve and optimize routine nursing care, aiming to better meet the needs of patients through improving the quality of nursing and enhancing nursing services. Compared with routine nursing management, intensive nursing takes into account the physiological needs of patients and promotes their overall rehabilitation through psychological, social and environmental supports. Intensive nursing has been applied in the clinical management of patients with liver cancer, yielding good clinical results (Zhang et al, 2020). Given the limited literature pertaining to the application of intensive nursing in the management of elderly GC patients during chemotherapy, this study aims to explore its clinical effects, providing a solid foundation for enhancing chemotherapy management through intensive nursing.

Methods

General Data

A retrospective study was conducted, involving 160 elderly GC patients receiving chemotherapy in Central Hospital Affiliated to Shandong First Medical University from July 2021 to July 2023. The sample was divided into two groups according to the different nursing methods implemented. Out of the 77 patients experiencing intensive nursing management we selected, 74 patients were included in the observation group after excluding 1 patient with malignant tumor, 1 patient with a history of mental illness, and 1 patient with severe anemia. Eighty-three patients underwent routine nursing management, and 81 patients were included in the reference group after excluding 1 patient with liver failure, and 1 patient with communication disorder.

Patients meeting the following inclusion criteria were included in the present study: (1) patients with pathologically confirmed GC (Lordick et al, 2022); (2) patients without chemotherapy contraindication; (3) patients aged >60 years old; and (4) patients with an expected survival period of more than 6 months.

Exclusion criteria for this study were as follows: (1) patients with other malignant tumors; (2) patients with severe dysfunctions in liver and kidneys; (3) patients with consciousness disorder, communication disorder or history of mental illness; and (4) patients with severe anemia and coagulation dysfunction.

Nursing Management Methods

Patients in the reference group received routine nursing management during chemotherapy. The major features of the routine nursing management are briefly described in the following:

(1) Medical staff closely monitored patients' vital signs, guided them to take medications as per doctors' advice, assisted them during systematic examination, appeased the patients' and their family members' emotions, and educated them about health maintenance.

(2) During chemotherapy, patients were required to consume high-energy and -protein food for recovery. Thus, they were recommended to take multiple meals throughout the day but with small amounts for each meal (for instance, 5–6 meals a day) and to consume digestible food.

(3) Patients were educated about chemotherapy to help allay their fear and anxiety due to disease progression.

(4) Elderly patients were requested to maintain regular work-rest periods so that they had adequate rest time. Besides, they could receive body scrub to prevent infection, and the temperature and humidity in wards should be maintained at moderate levels.

The patients in the observation group received intensive nursing management. The prime characteristics of intensive nursing management are briefly described in the following:

(1) The intensive nursing team was established by the department's superintendent, and having nursing experience was the foremost requisite for recruiting the team members. The nursing staff in this team were trained on risk prevention and regular assessments were carried out to evaluate their performance.

(2) Intensive nursing management should strengthen risk identification and determine the influencing factors of nursing risk for elderly GC patients undergoing chemotherapy. This form of management also combines the previous work experience of attending nurses in clarifying the causes of risk events and facilitating targeted treatment in the future.

(3) Characterized by an optimized nursing process and workflow, intensive nursing management adopts holistic nursing care framed with an accountability system. The allocation of human resources in the noon shift and night shift was given much emphasis to ensure a clear division of labor, and a feedback mechanism was established to allow active feedback by the nursing staff regarding the problems arising in the workplace.

(4) Under this nursing mode, patients' safety was given the utmost priority, which was made possible by administering safety measures and emergency treatments, when necessary. Meanwhile, the usage of antibiotics and the management of blood transfusion and implant material should be standardized by listing the requirements of operational specifications. Besides, patients should be aware of the precautions. Nursing staff was required to emphasize the importance of patients' right to know to avoid nurse-patient disputes.

Observation Indexes

General Information

General information such as sex, age, course of disease, pathological types, tumor node metastasis (TNM) stage, and education levels were compared between the two groups.

Quality of Life

The quality of life questionnaire-core 30 (QLQ-C30) (Zhao and Kanda, 2000) was used to compare changes in quality of life (QoL) between the two groups before and after management, and measured QoL of patients with malignant tumors, in terms of their sleep quality, mental state, appetite, understanding and cooperation from family, daily life, and cancer-related understanding; each item was rated with 1 to 5 points. The extreme-range method was adopted for linear transformation, and the raw score was converted into the standardized score in the range of 0–100. A higher score indicated better QoL.

Mental Health

The patient health questionnaire-9 items (PHQ-9) (Kroenke et al, 2001) compared the changes in psychological status between the two groups before and after the nursing management was implemented. This self-rating scale has 10 items, containing 9 symptom scales and 1 function scale. PHQ-9 is scored with 4-level points, and the total score ranged from 0 to 27 (0–4 points = no depressive symptom, 5–9 points = mild, 10–14 points = moderate, and >15 points = severe).

Adverse Reactions of Chemotherapy

The incidence of adverse reactions including gastrointestinal reactions (nausea, vomiting, and diarrhea), myelosuppression, neurotoxicity (paresthesia, decreased tendon reflex, mild weakness, and dyskinesia or paralysis) and hepatorenal damages was compared between the two groups.

Symptom Scores

The Chinese version of the M.D. Anderson Symptom Inventory (MDASI-C) (Wang et al, 2004) was utilized to compare the cancer symptoms of the two groups before and after nursing management. MDASI-C consisted of 19 items, split into two parts. The first part assessed the severity of symptoms in patients in the past 24 hours before the assessment. Thirteen common symptoms including pain, fatigue, and nausea were included in the assessment. Each item was rated with 0–10 points, with 0 point denoting asymptomatic while 10 points representing the most severe degree of the symptom assessed. The second part evaluated the symptom effects on patients, including 6 aspects like general activity, emotion, and work. Each item was scored in 0–10 points, with 0 point indicating no effect and 10 points denoting complete effect. A higher score represented more severe patients' symptoms and a higher degree of symptom distress.

Table 1. Comparison of general information.

Items		Observation group (n = 74)	Reference group (n = 81)	z/χ^2	p
Sex	Male	43 (58.11)	45 (55.56)	0.103	0.749
	Female	31 (41.89)	36 (44.44)		
Age, years [M (P_{25}, P_{75})]		69.00 (64.00, 74.00)	72.00 (66.00, 76.00)	–1.459	0.145
Course of disease, months [M (P_{25}, P_{75})]		13.50 (9.00, 17.00)	13.00 (9.00, 18.00)	–1.184	0.236
Pathological types	Tubular adenocarcinoma	29 (39.19)	34 (41.97)	0.126	0.939
	Mucinous carcinoma	27 (36.49)	28 (34.57)		
	Medullary carcinoma	18 (24.32)	19 (23.46)		
TNM stage	Stage II	28 (37.84)	33 (40.74)	0.137	0.934
	Stage III	24 (32.43)	25 (30.86)		
	Stage IV	22 (29.73)	23 (28.40)		
Education level	Illiterate	29 (39.19)	30 (37.04)	0.797	0.850
	Primary school	27 (36.49)	30 (37.04)		
	Junior-senior high school	11 (14.86)	10 (12.34)		
	College and above	7 (9.46)	11 (13.58)		
Marital status	Married	59 (79.73)	62 (76.54)	0.229	0.632
	Divorced/widowed	15 (20.27)	19 (23.46)		
Payment methods	Medical insurance	52 (70.27)	59 (72.84)	0.126	0.723
	Private expense	22 (29.73)	22 (27.16)		
Chemotherapeutic agents	Cisplatin and fluorouracil	21 (28.38)	24 (29.63)	0.583	0.747
	Oxaliplatin and fluorouracil	27 (36.49)	25 (30.86)		
	Platinum, fluorouracil and taxanes	26 (35.13)	32 (39.51)		
Complications	Diabetes mellitus	11 (14.86)	16 (19.75)	0.982	0.612
	Hypertension	27 (36.49)	25 (30.86)		
	Hyperlipidemia	19 (25.68)	23 (28.40)		
Monthly per capita income, USD	>773	10 (13.51)	14 (17.28)	1.037	0.596
	421–773	34 (45.95)	31 (38.28)		
	<421	30 (40.54)	36 (44.44)		

TNM, tumor node metastasis.

Table 2. Comparison of QLQ-C30 scores between the observation and reference groups.

Time/dimensions		Observation group (n = 74)	Reference group (n = 81)	z	p
Before management	Sleep quality	48.00 (43.00, 53.00)	46.00 (41.00, 52.00)	–1.177	0.239
	Mental state	47.00 (36.00, 52.00)	42.00 (36.00, 51.00)	–0.871	0.384
	Appetite	28.50 (20.00, 35.00)	26.00 (21.00, 33.00)	–0.511	0.609
	Understanding and cooperation from family	51.00 (39.00, 58.00)	49.00 (41.00, 59.00)	–0.552	0.581
	Daily life	34.00 (27.00, 38.00)	31.00 (28.00, 37.00)	–0.493	0.622
	Cancer-related cognition	34.50 (28.00, 39.00)	34.00 (29.00, 42.00)	–0.217	0.828
After management	Sleep quality	53.50 (47.00, 60.00)	47.00 (39.00, 54.00)	–4.914	<0.001
	Mental state	46.50 (41.00, 58.00)	42.00 (34.00, 47.00)	–3.527	<0.001
	Appetite	38.00 (34.00, 47.00)	34.00 (30.00, 41.00)	–3.706	<0.001
	Understanding and cooperation from family	55.00 (46.00, 62.00)	48.00 (39.00, 54.00)	–4.516	<0.001
	Daily life	52.00 (42.00, 60.00)	44.00 (38.00, 53.00)	–3.906	<0.001
	Cancer-related cognition	54.50 (47.00, 62.00)	48.00 (41.00, 55.00)	–4.897	<0.001

Note: Dimension data were presented in points, expressed as median (P_{25}, P_{75}). QLQ-C30, quality of life questionnaire-core 30.

Statistical Analysis

SPSS26.0 software (International Business Machines Corporation, Armonk, NY, USA) was used for data processing. Shapiro–Wilk test was utilized to test the normal distribution of continuous variables. The data that did not conform to the normal distribution were expressed as median (P_{25}, P_{75}) and were analyzed using the Mann–Whitney U test. Data of categorical variables were expressed as count and percentage, and were tested with Chi-square test. Differences with $p < 0.05$ were regarded as statistically significant.

Results

General Information

Table 1 showed no significant difference in general information such as sex, age, course of disease, pathological types, TNM stage, education level, marital status and chemotherapeutic agents ($p > 0.05$).

Quality of Life

Before management, the two groups showed no significant difference in QLQ-C30 scores ($p > 0.05$). Following the implementation of nursing management, the observation group showed significantly higher scores in QLQ-C30 dimensions compared to the reference group, reflecting better QoL than before management ($p < 0.001$), as shown in Table 2.

Table 3. Comparison of PHQ-9 scores between the observation and reference groups.

Time	Observation group (n = 74)	Reference group (n = 81)	z	p
Before management	19.00 (15.00, 22.00)	20.00 (15.00, 24.00)	–1.294	0.196
After management	11.00 (8.00, 15.00)	17.00 (13.00, 21.00)	–6.314	<0.001

Note: Data were presented in points, expressed as median (P_{25}, P_{75}). PHQ-9, patient health questionnaire-9 items.

Table 4. Comparison of incidence of adverse reactions between the observation and reference groups.

Adverse reactions	Observation group (n = 74)	Reference group (n = 81)	χ^2	p
Gastrointestinal reaction	34 (45.95)	57 (70.37)	9.516	0.002
Myelosuppression	30 (40.54)	53 (65.43)	9.633	0.002
Neurotoxicity	26 (35.14)	43 (53.09)	5.045	0.025
Hepatorenal damage	25 (33.78)	41 (51.25)	4.482	0.034

Note: Data are expressed as counts (percentages).

Mental Health

Before nursing management, no significant difference in PHQ-9 scores between the reference and observation groups was noted ($p > 0.05$). However, the PHQ-9 scores of the observation group were significantly lower than those of the reference group ($p < 0.001$) after management was implemented, as shown in Table 3.

Adverse Reactions of Chemotherapy

After management, the subjects in the observation group suffered from significantly lower incidence of adverse reactions, such as gastrointestinal reaction, myelosuppression, neurotoxicity and hepatorenal damage, than the reference group ($p < 0.05$), as detailed in Table 4.

Symptom Scores

There was no significant difference in MDASI-C scores between the observation and reference groups prior to the implementation of respective nursing management ($p > 0.05$). However, the post-management MDASI-C scores were significantly lower than pre-management scores, and it was observed that the scores in the observation group were significantly lower than those in the reference group ($p < 0.001$), as shown in Table 5.

Discussion

Chemotherapy is currently the mainstay of treatment for most cancers (Voutsadakis, 2018). Unfortunately, in addition to cancer cells, chemotherapy has a deleterious impact on neighboring cells to a certain extent (Prieto-Callejero et al, 2020), which is the foremost cause of most adverse reactions. It is essential to exercise extra caution while administering chemotherapy to elderly patients with cancers,

Table 5. Comparison of MDASI-C scores between the observation and reference groups.

Time/dimension		Observation group (n = 74)	Reference group (n = 81)	z	p
Before management	Severity of symptoms	8.00 (7.00, 9.00)	9.00 (7.00, 10.00)	–1.727	0.084
	Symptom effects	9.00 (8.00, 10.00)	9.00 (6.00, 10.00)	–0.842	0.400
After management	Severity of symptoms	5.00 (4.00, 6.00)	7.00 (5.00, 8.00)	–6.098	<0.001
	Symptom effects	5.00 (3.00, 6.00)	7.00 (6.00, 8.00)	–7.564	<0.001

Note: Dimension data were presented in points, expressed as median (P_{25}, P_{75}). MDASI-C, the Chinese version of the M.D. Anderson Symptom Inventory.

in particular, since individuals of this age group are affected by comorbidities and major organ dysfunctions (Ina et al, 2018). This justifies why improving the QoL and mental health of patients during chemotherapy has become a momentous issue in clinical management. Therefore, intensive nursing management can be considered to prevent the occurrence of emergencies in cancer patients by controlling the changes of tumors.

The study results showed that after the management, the observation group had significantly higher scores for each dimension in the QLQ-C30 than the reference group, indicating that intensive nursing management improved the QoL of elderly GC patients. This is because GC patients have fatigue-related, malnutrition-related, epithelial, neurological, and psychological symptom clusters during chemotherapy (Fu et al, 2022), and the severity of these symptoms is directly related to patients' QoL. In addition, weakness could affect the decisions and outcomes of cancer treatment (Jeon et al, 2022), and disease-associated malnutrition—a very common condition in GC patients—is the main cause of morbidity and mortality among cancer patients (Vahid et al, 2020). The nutritional status of these patients is improved by the higher-quality basic care entailed in the intensive management. At the same time, this management mode affords the patients and their families multiple support systems, with the most prominent being emotional support and help for patients, which perfectly caters to their needs and thereby improves their QoL.

The patients in the oncology department often experience rapidly deteriorating conditions, which necessitate higher demands for clinical nursing work. The present study showed that after implementing nursing management, the PHQ-9 score of the observation group was significantly lower compared with the reference group, indicating that intensive nursing management effectively improves the psychological status of elderly GC patients during chemotherapy. The significant improvement in this group of patients can be attributed to the psychological counseling carried out during the intensive nursing management, which substantially reduces cancer pain and cancer-related fatigue to a certain extent, alleviating their emotional problems like anxiety, restlessness and depression, and improves the psychological status, especially in elderly patients. The data of this study showed that after the management, the observation group had a significantly lower incidence of adverse reactions including gastrointestinal reaction, myelosuppression, neurotoxicity and hepatorenal damages, indicating that intensive nursing management

can effectively diminish the incidence of adverse reactions in elderly GC patients receiving chemotherapy, which puts the patients at risk of malnutrition and a high symptom burden (Harvey et al, 2023). Intensive nursing management, a predictive nursing model, improves on the passive coping management seen in routine practice, taking a proactive attitude to confront, or even predict the occurrence of adverse events. Therefore, under this management mode, the nursing staff needs to actively discover the potential risks and the vulnerable aspects during nursing work, so as to help effectively avert adverse events and reduce the occurrence of adverse reactions arising after chemotherapy.

Gastric cancer is most frequently diagnosed in patients aged in their 70s, and most of these cancer cases have already reached the metastatic stage upon diagnosis (Tatli et al, 2020). Among the GC survivors, frailty is a common condition, which increases the burden of care (Miao et al, 2024) and adversely affects their QoL, especially in elderly patients receiving treatment. An inter-group comparison of the clinical symptoms found that the MDASI-C scores in the observation group were significantly lower, indicating that intensive nursing management improves the clinical symptoms of elderly GC patients receiving chemotherapy. This is because intensive nursing includes a variety of management mechanisms such as precise symptom management, whole-course multidisciplinary management, and evidence-based nursing, and integrating comprehensive geriatric assessment and management into nursing plans effectively enhances the patients' self-efficacy (i.e., patients' confidence in managing their diseases and symptoms), and thus significantly relieves the clinical symptoms in elderly cancer patients. This theory resonates with a multi-center randomized controlled trial (Sun et al, 2023) that a multimodal prehabilitation program enhances the functional capacity of elderly GC patients, reduces the surgical stress response and accompanying systemic inflammation, and may modulate the tumor microenvironment, thereby improving their short-term and long-term clinical outcomes as well as their QoL.

There were some limitations in this study. As a single-center retrospective study, this study has a narrow study scope and a small sample size that is unfavorable in yielding truly representative data for generalization in other populations. Secondly, long-term dynamic tracking of patients' outcomes after a prolonged implementation of intensive nursing management was lacking in this study. In the future, long-term and rigorous prospective studies should be carried out to provide a reference for the clinical management of elderly GC patients receiving chemotherapy.

Conclusion

Intensive nursing management can effectively stabilize the psychological status of elderly GC patients undergoing chemotherapy, reduce the adverse reactions arising from chemotherapy, improve their QoL, and mitigate clinical symptoms. Hence, intensive nursing management has significant application values, warranting its widespread adoption in clinical settings.

Key Points

- Intensive nursing management can effectively improve the quality of life of elderly patients with gastric cancer during chemotherapy.
- Intensive nursing management can stabilize the psychological status of elderly patients with gastric cancer during chemotherapy.
- Intensive nursing management can reduce the adverse reactions of elderly patients with gastric cancer during chemotherapy.
- Intensive nursing management can relieve the clinical symptoms of elderly patients with gastric cancer during chemotherapy.

Availability of Data and Materials

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

Author Contributions

LZ, HY and JZ designed the study; all authors conducted the study; HY and JZ collected and analysed the data; LZ and HY participated in drafting the manuscript, and all authors contributed to critical revision of the manuscript for important intellectual content. All authors gave final approval of the version to be published. All authors participated fully in the work, take public responsibility for appropriate portions of the content, and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or completeness of any part of the work are appropriately investigated and resolved.

Ethics Approval and Consent to Participate

This study was in line with the Declaration of Helsinki and has been approved by the ethics committee of Central Hospital Affiliated to Shandong First Medical University (approval No. 20210701). The informed consent has been obtained from patients.

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Conflict of Interest

The authors declare no conflict of interest.

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