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Effect of Nursing Model Based on the Concept of Homogeneous Medical Service on Mood and Quality of Life of Patients with Colorectal Cancer Stoma

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Abstract

Objective: To explore the impact of the nursing model based on the concept of homogeneous medical service on the mood and quality of life of patients with colorectal cancer stoma, in order to provide a reference for clinical colorectal cancer stoma care. **Methods:** From April 30, 2017 to December 1, 2019, 120 patients with permanent colostomy for colorectal cancer in Second Affiliated Hospital of Zhejiang University School of Medicine were selected. Among them, the patients admitted from April 30, 2017 to July 31, 2018 were set as the control group, and the patients admitted from August 1, 2018 to December 1, 2019 were set as the observation group, with 60 cases in each group. Patients in the control group were given routine nursing measures for colorectal cancer stoma, and patients in the observation group were given innovative nursing measures based on homogeneous medical services. The adverse emotion score, health hope level, quality of life, complications and nursing satisfaction were compared between the two groups before and after the intervention. **Results:** After the intervention, the scores of patient health questionnaire-9 (PHQ-9) and generalized anxiety disorder-7 (GAD-7) in the observation group (10.53 ± 2.27, 9.73 ± 1.91) were significantly lower than those in the control group (11.85 ± 2.73, 11.03 ± 2.03, $p < 0.05$), and the scores of health hope inventory (HHI) and quality of life in the control group were significantly higher than those in the control group ($p < 0.05$). During the intervention, the incidence of complications in the observation group (29.59 ± 7.38, 60.02 ± 6.73) was significantly lower than that in the control group (25.69 ± 5.87, 76.48 ± 7.39, $p < 0.05$), and the nursing satisfaction was significantly higher than that in the control group ($p < 0.05$). **Conclusion:** The implementation of homogeneous medical-based intervention care for patients with permanent colorectal cancer stoma can effectively alleviate the patients' bad mood, improve the level of health hope, and reduce the occurrence of stoma complications. It will help to promote the harmony between doctors and patients, and is helpful. It has a positive effect to improve the quality of life of patients.

1 Introduction

The incidence and mortality of Colorectal cancer (CRC) are on the rise worldwide, and it has become one of the important malignant tumors that threaten human life and health and cause social burden, driven by lifestyle and dietary changes [1,2]. Surgical interventions, including stoma formation, are often necessary to alleviate obstruction or preserve anastomotic integrity [3]. However, stoma-related complications and body image alterations impose significant physiological and psychological burdens, adversely affecting recovery [4–6]. In recent years, with the development and promotion of advanced nursing concepts at home and abroad, the quality of perioperative nursing for colorectal cancer has been significantly improved, and the lives of patients have been prolonged. However, in the face of problems such as an excessive number of patients, tight and hard-to-find beds, and a shortage of nursing staff in reality, the concept of all-round nursing for patients with colorectal cancer stoma is still difficult to be fully and effectively implemented in clinical nursing, resulting in the inability to guarantee the physical and mental health of patients simultaneously [7]. The homogeneous medical service (HMS) model addresses these gaps by standardizing care protocols across institutions, ensuring equitable, high-quality care through trained multidisciplinary teams [8]. Prior studies demonstrate HMS's efficacy in enhancing care coordination and patient satisfaction [9]. This study investigates the impact of an HMS-based nursing model on CRC stoma patients' emotional and QoL outcomes.

2 Materials and methods

2.1 Clinical Data

A total of 120 patients who underwent permanent colorectal cancer stoma surgery at the Second Affiliated Hospital of Zhejiang University School of Medicine between April 30, 2017, and December 1, 2019, were enrolled in this study. Patients admitted from April 30, 2017, to July 31, 2018, were assigned to the control group (n = 60), while those admitted from August 1, 2018, to December 1, 2019, were assigned to the observation group (n = 60). There was no statistically significant difference in the general data between the two groups ($p > 0.05$, Table 1), ensuring comparability. This study was approved by the Institutional Ethics Committee of our hospital, and all participants provided written informed consent. Inclusion Criteria: Histologically and radiologically confirmed diagnosis of colorectal cancer; Underwent permanent stoma surgery at our institution; No cognitive impairment or history of mental illness, with normal communication ability; Complete clinical records available. Exclusion Criteria: Severe dysfunction of vital organs (e.g., heart, brain, or kidneys); Severe hematologic disorders; Active severe infectious diseases; Requirement for additional surgical interventions.

Table 1 Comparison of general data between two groups.

Group	Cases	Gender (cases)		Age (years)	BMI (kg/m^2)	Tumor staging (cases)			
		Male	Female			Ⅰ	Ⅱ	Ⅲ	Ⅳ
Control group	60	37	23	60.25 ± 11.87	21.87 ± 2.87	17	18	21	4
Observation group	60	35	25	62.17 ± 12.13	21.35 ± 2.39	13	19	22	6
Statistics		0.139 [a]		-0.876 [b]	1.078 [b]	-0.845 [c]			
p		0.709		0.383	0.283	0.398			

Group	Cases	Disease type (cases)		Educational attainment (cases)		
		Rectal cancer	Colorectal cancer	Junior high school and below	Senior middle school	Bachelor degree or above
Control group	60	39	21	31	19	10
Observation group	60	34	26	33	18	9
Statistics		0.874 [c]		-0.375 [c]		
p		0.350		0.708		

Note: [a] is χ^2 value, [b] is t value, [c] is Z value.

2.2 Methods

2.2.1 Control Group

Patients in the control group received conventional nursing care, which included: (1) Preoperative Phase: Standard health education covering colorectal cancer knowledge, disease progression, surgical procedures, dietary/activity precautions, and the necessity/safety of stoma creation. (2) Intraoperative Phase: Preoperative fasting (8 hours) and fluid restriction (6 hours). Intraoperative monitoring of operating room temperature, pneumoperitoneum pressure, and vital signs to prevent hypercapnia. (3) Postoperative Phase: Early semi-recumbent positioning upon awakening. On postoperative day 1, stoma care specialists provided hands-on training to families on peristomal skin cleaning and stoma maintenance. Psychological interventions emphasizing stoma acceptance, social reintegration, and monthly follow-ups post-discharge.

2.2.2 Observation Group

The innovative nursing intervention based on homogeneous medical service (HMS) principles was implemented through two core components: (1) Establishment of a specialized HMS nursing team comprising senior colorectal and oncology surgeons and nurses selected for their clinical expertise, professional knowledge, technical proficiency, communication skills, resilience, and quality control capabilities, enabling them to provide timely, patient-centered explanations and proactively address care challenges; prior to implementation, all team members underwent standardized training on stoma care conducted by colorectal specialists and HMS protocol training by head nurses to ensure professional, consistent care delivery; each patient was assigned a dedicated primary nurse (responsible for direct patient contact, delivering theory-guided compassionate care, and establishing continuous clinician-patient-family networks from pre-admission through post-discharge follow-up) and attending physician (overseeing comprehensive treatment and recovery monitoring); (2) Unified and standardized nursing process: ① The patient is issued an inpatient

certificate by the outpatient doctor, and the homogeneous medical care model is immediately initiated. The doctor informs the patient of the precautions for diet and activities, and informs the patient that a series of encouraging matters after admission will be the responsibility of the attending physician. The patient should bring the inpatient certificate to the hospital to complete the pre-hospitalization procedures and make appointments to complete various pre-hospital examinations. During the period when the department beds are tight and the patient is waiting for a bed outside the hospital, the completion status of the examinations should be closely monitored. Be admitted to the hospital in time; ② Inpatient Phase: After the patient is admitted, the responsible nurse informs them of the Admission Guidelines; leads them to the bedside, introduces the ward and department environment, registers patient information, and establishes a patient file. The responsible nurse and attending physician participate throughout the rounds, consultations, treatment plan formulation, surgical arrangements, and pathology discussions, gaining a comprehensive understanding of the actual condition of the patients under their care. They promptly provide feedback on any difficult issues that arise during the treatment process to enhance execution effectiveness. Additionally, for special cases, key observations, and handover precautions, they ensure the professionalism, consistency, and continuity of nursing care throughout. Before surgery, they strengthen communication with the patient through videos, images, and other forms, disseminating knowledge about colorectal cancer surgery, explaining the causes, risks, clinical manifestations, stoma care, necessity of stoma surgery, dietary and exercise matters, etc., to improve the patient's understanding of disease treatment and correct misconceptions. Furthermore, they pay attention to guiding the patient's psychological state, continuously encouraging them to boost their confidence in treatment and foster a positive attitude towards the disease. For the patient's negative emotions, behavioral interventions are taken, such as arranging the patient in a rehabilitation room with soft music for progressive muscle relaxation training, using deep breathing to gradually relax all muscles. This is done twice daily, once in the morning and once in the evening, each session lasting 20 minutes. The training time can be appropriately extended three days before surgery, with specialized nurses and volunteers providing guidance. During surgery, they strictly monitor the patient's vital signs and implement anti-infection measures. On the first day after surgery, the responsible nurse used ipda to show the "stoma education video"; to the patient and their family. A consultation was arranged for a stoma specialist nurse to provide on-site teaching, ensuring they mastered the skills of cutting, attaching, and changing ostomy bags, as well as key points in observing the stoma. During the second change, the responsible nurse provided guidance, allowing the patient and their family to complete it together. Gradually, this process was changed so that the patient could do it independently. They learned to observe changes in the color of the stoma mucosa, manage and prevent stoma complications. Throughout the nursing process, healthcare providers showed the patient ample respect and encouragement, paying attention to protecting the patient's privacy and dignity to reduce postoperative stigma and boost treatment confidence. From 3 to 14 days after surgery, dietary guidance was provided based on the patient's recovery, with nutritional supplementation and encouragement for early ambulation, increasing activity time and range. For patients about to be discharged, discharge instructions were given, including precautions for stoma care outside the hospital, condition status, dietary guidance, follow-up and revisit times, satisfaction surveys, and a verbal reminder from the

attending physician about daily life precautions to address any questions the patient might have; ③ Post-discharge care comprised 48-hour telephone follow-ups for stoma care evaluation, one-month clinic visits, and ongoing WeChat-based education until lifestyle adaptation, ensuring continuous care transition across all treatment phases through this integrated, standardized approach.

Both groups received 6 months of care post-enrollment.

2.3 Outcome Measures

(1) Emotional Distress : Assessed using the Patient Health Questionnaire-9 (PHQ-9) [10], comprising 9 items (e.g., mood, sleep, appetite) scored 0-3 (total: 27). Higher scores indicated greater severity. ; Evaluated via the Generalized Anxiety Disorder-7 (GAD-7) [11], with 7 items (e.g., tension, uncontrollable worry) scored 0-3 (total: 21). Higher scores reflected worse anxiety. (2) Health Hope Level : Measured by the Health Hope Inventory (HHI) [12], a 12-item tool (scored 1-4; total: 48) assessing attitudes toward reality/future, interpersonal relationships, and proactive behaviors. Higher scores denoted more positive outlooks. (3) Quality of Life (QoL) : The Functional Assessment of Cancer Therapy-General (FACT-G) [13] evaluated QoL across 4 domains (emotional, social/family, physical, functional) via 27 items (scored 0-4; total: 108). Higher scores indicated better QoL. (4) Complications : Stoma-related adverse events (e.g., injury, infection, prolapse, stenosis) were recorded. (5) Nursing Satisfaction : A 20-item hospital-developed survey (1-5 points per item; total: 100) rated environment, service, and rehabilitation guidance. Scores were categorized: < 60 (dissatisfied), 60-74 (general), 75-89 (satisfied), ⩾ 90 (great satisfied).

2.4 Statistical analysis

Data were analyzed using SPSS 20.0. Categorical variables were compared via χ^2 tests; ordinal data used rank-sum tests. Continuous data (mean ± standard deviation) employed independent t-tests (between groups) and paired t-tests (within groups). $p < 0.05$ indicated significance.

3 Results

3.1 Anxiety and Depression Scores

Before intervention, PHQ-9 and GAD-7 scores showed no intergroup differences ($p > 0.05$). After intervention, both groups exhibited significant reductions ($p < 0.05$), with greater declines in the observation group ($p < 0.05$, Table 2).

Table 2 Comparison of PHQ-9 and GAD-7 scores between groups (mean ± standard deviation, scores).

Group	Cases	PHQ-9		GAD-7	
		Before intervention	After intervention	Before intervention	After intervention
Control group	60	13.76 ± 3.39	11.85 ± 2.73 [a]	12.28 ± 2.52	11.03 ± 2.03 [a]
Observation group	60	13.93 ± 3.43	10.53 ± 2.27 [a]	11.91 ± 2.39	9.73±1.91 [a]
t		-0.273	3.098	0.825	3.613
p		0.785	0.002	0.411	< 0.001

Note: Compared with the before intervention, [a] $p < 0.05$.

3.2 Comparison of Health Hope Inventory (HHI) scores between groups

Before intervention, there were no statistically significant differences in HHI scores between the two groups ($p > 0.05$). After intervention, both groups demonstrated significant improvements in all HHI

subdomains-attitudes toward reality and future, interpersonal relationships, and proactive behaviors ($p < 0.05$). Notably, the observation group exhibited significantly greater improvements compared to the control group ($p < 0.05$, Table 3).

Table 3 Comparison of HHI scores before and after intervention (mean ± standard deviation, scores).

Group	Cases	Attitude towards the present and the future		Maintain intimate relationships with others		Take positive action		Total pointsPore	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Control group	60	7.23 ± 1.87	8.29 ± 2.09 [a]	7.93 ± 1.91	8.69 ± 2.11 [a]	7.91 ± 2.21	8.71 ± 2.01 [a]	23.07 ± 6.52	25.69 ± 5.87 [a]
Observation group	60	7.59 ± 2.03	9.57 ± 2.27 [a]	8.13 ± 2.23	9.97 ± 2.19 [a]	7.67 ± 2.05	10.05 ± 2.23 [a]	23.39 ± 7.17	29.59 ± 7.38 [a]
t		-1.010	-3.213	-0.528	-3.260	0.617	-3.457	-0.256	-3.203
p		0.314	0.002	0.599	0.001	0.539	<0.001	0.799	0.002

Note: Compared with the before intervention, [a] $p < 0.05$.

3.3 Quality of Life (QoL) comparisons between groups

Before intervention assessments revealed no statistically significant differences in QoL scores between the two groups across all domains (emotional well-being, social/family status, physical condition) or in total QoL scores ($p > 0.05$). After intervention, both groups showed significant improvements in total QoL scores and all individual domain scores compared to before intervention ($p < 0.05$). Importantly, the observation group demonstrated significantly greater improvements than the control group in all measured QoL parameters ($p < 0.05$, Table 4).

Table 4 Comparison of total and domain-specific QoL scores before and after intervention (mean ± standard deviation, scores).

Group	Cases	Emotional state		Social/family situation		Physiological status	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Control group	60	10.88 ± 1.79	12.11 ± 2.11 [a]	15.93 ± 2.41	17.77 ± 3.13 [a]	15.01 ± 2.31	17.33 ± 2.63 [a]
Observation group	60	10.71 ± 2.01	15.89 ± 2.43 [a]	16.03 ± 2.27	20.83 ± 3.49 [a]	15.17 ± 2.25	21.33 ± 2.51 [a]
t		0.489	-9.098	-0.234	-7.234	-0.384	-8.523
p		0.625	< 0.001	0.815	< 0.001	0.701	< 0.001

Group	Cases	Function status		Total score of Quality of life	
		Before intervention	After intervention	Before intervention	After intervention
Control group	60	13.81 ± 2.35	15.33 ± 2.26 [a]	55.64 ± 6.97	60.02 ± 6.73 [a]
Observation group	60	14.09 ± 2.57	18.43 ± 2.38 [a]	56.00 ± 7.13	76.48 ± 7.39 [a]
t		-0.623	-7.316	-0.280	-12.756
p		0.535	< 0.001	0.780	< 0.001

Note: Compared with the before intervention, [a] $p < 0.05$

3.4 Comparison of 2 kinds of complications

During the nursing period, the incidence of complications in the observation group was significantly lower than that in the control group ($p < 0.05$), as shown in Table 5.

Table 5 Comparison of complications between the two groups (example (%)).

Group	Cases	Stoma injury	Stoma infection	Stoma prolapse	Stomal stenosis	Total
Control group	60	3 (5.00)	7 (11.67)	3 (5.00)	8 (13.33)	21 (35.00)
Observation group	60	1 (1.67)	1 (1.67)	2 (3.33)	2 (3.33)	6 (10.00)
χ^2						10.753
p						0.001

Note: Compared with before intervention, * $p < 0.05$.

3.5 Comparison of nursing satisfaction in two groups

The nursing satisfaction of patients in the observation group was significantly higher than that in the control group ($p < 0.05$), as shown in Table 6.

Table 6 Comparison of nursing satisfaction between two groups (example (%)).

Group	Cases	Great satisfaction	Satisfaction	General	Dissatisfaction	Satisfaction rate
Control group	60	15 (25.00)	20 (33.33)	20 (33.33)	5 (8.33)	35 (58.33)
Observation group	60	24 (40.00)	25 (41.67)	11 (18.33)	0 (0.00)	49 (81.67)
χ^2/Z			-2.773			7.778
p			0.006			0.005

4 Discussion

Permanent stoma surgery represents a critical intervention for addressing defecation dysfunction following intestinal resection in colorectal cancer patients, while creating essential conditions for subsequent therapeutic interventions; however, the disease management process and postoperative physiological alterations frequently induce significant psychological distress and negative emotional states that can substantially compromise recovery outcomes [14,15]. Contemporary evolution in medical paradigms has driven a transformation toward comprehensive, systematic, and multidimensional clinical care approaches [16], with the homogeneous medical service (HMS)-based innovative nursing model emerging as an integrated solution that combines specialized healthcare teams with standardized protocols to deliver continuous high-quality perioperative guidance. This model demonstrates three distinct advantages: enhanced interdisciplinary collaboration, optimized patient-provider relationships, and the simultaneous embodiment of both specialized expertise and standardized care delivery [17], thereby addressing the complex biopsychosocial needs of patients through a unified care framework that maintains clinical excellence while ensuring consistent service quality across all treatment phases.

4.1 HMS-based comprehensive nursing improves emotional distress and enhances hope levels

Research indicates that patients with colorectal cancer stomas exhibit high rates of psychological distress [18], as they endure not only the challenges of cancer treatment but also significant psychological pressures stemming from body image concerns and social adaptation difficulties, frequently leading to anxiety, depression, and diminished hope - all of which may adversely affect treatment outcomes. Our findings demonstrate that the PHQ-9 and GAD-7 scores of patients in the observation group were significantly lower than those in the control group after intervention, while the HHI score was significantly higher than that in the control group, confirming the efficacy of the homogeneous medical service (HMS)-based comprehensive nursing approach in alleviating negative emotions and enhancing hope levels. The HMS model delivers seamless, systematic care guidance throughout the entire treatment continuum from pre-admission to post-discharge, while its consultative service model provides tailored, high-quality health education that improves patients' disease understanding, enables rational assessment of their condition, and facilitates comprehension and active participation in treatment processes. This multifaceted intervention effectively reduces patients' fears regarding both cancer and stoma surgery, builds therapeutic confidence, and ultimately elevates health hope levels through improved health literacy and empowered engagement in care.

4.2 HMS-based comprehensive nursing reduces postoperative stoma complications

Although stoma surgery can be life-saving, complications such as inflammation, necrosis, and prolapse due to inadequate postoperative care remain a significant concern, with severe cases potentially leading to intestinal re-obstruction and impaired recovery [19]. The current study found that the observation group had significantly fewer stoma complications than the control group, indicating that HMS-based comprehensive nursing effectively reduces such adverse events. The success of this model stems from its emphasis on collaborative physician-nurse rounds, where coordinated patient assessments and tailored interventions foster mutual reinforcement between medical and nursing care. This structured teamwork not only enhances clinical outcomes but also strengthens caregiver accountability, preventing lapses in care quality due to communication breakdowns and establishing a solid foundation for long-term recovery. Furthermore, the HMS model designates primary nurses to oversee all aspects of care, implementing rigorous quality control that enables timely, personalized guidance. This systematic approach cultivates patients' self-care competence, alleviates uncertainties, and promotes sustainable adherence to proper stoma management practices, thereby minimizing complication risks.

4.3 HMS-based comprehensive nursing enhances quality of life and care satisfaction

After intervention quality of life (QoL) and care satisfaction serve as critical indicators of hospital management quality, with patient-centered evaluations driving advancements in healthcare delivery. The current results demonstrate that the quality of life and nursing satisfaction of patients in the observation group were significantly higher than those in the control group after intervention, confirming the efficacy of HMS-based nursing in optimizing these outcomes. This model achieves its benefits through standardized educational content and care protocols delivered by dedicated primary nurses, ensuring uniform, high-quality attention to patients' physiological, psychological, and social needs. Such systematic implementation improves disease-specific knowledge acquisition, enhances treatment adherence, and fosters adaptive coping strategies, collectively elevating postoperative QoL. In addition, establishing and implementing shift handovers for special cases, observation priorities, and precautions in this study is a crucial measure to overcome issues such as neglect or forgetting in nursing work. It can remind nursing staff to complete their tasks promptly and satisfactorily at any time, reducing errors and effectively minimizing conflicts and disputes between medical and nursing staff. This has a positive promoting effect on improving the efficiency and quality of nursing work. It also ensures that patients receive professional, consistent, and continuous full-process care services, which helps maintain a harmonious doctor-patient relationship and thereby enhances patient satisfaction with care [20].

In summary, the HMS-based nursing model effectively alleviates psychological distress in permanent colostomy patients, promotes positive postoperative adjustment, reduces stoma-related complications, and demonstrably improves both QoL and care satisfaction-establishing it as a comprehensive solution for holistic patient management.

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Conflicts of Interest

All authors declare that the research was conducted in the absence of any commercial or fnancial relationships that could be construed as a potential confict of interest.

Author Contributions

Conceptualization, J.Z.; Data curation, X.B.; Formal analysis, J.Z.; Methodology, J.Z.; Writing-original draft, X.B.; Writing-review and editing, X.B.; All authors have read and agreed to the published version of the manuscript.

Ethics Approval and Consent to Participate

This study was approved by the Institutional Ethics Committee of our hospital, and all participants provided written informed consent.

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Availability of Data and Materials

The original contributions presented in the study are included in the article, further inquiries can be directed to the corresponding authors.

Supplementary Materials

Not applicable.

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