



Retrospective Study

Effect of internet multiple linkage mode-based extended care combined with in-hospital comfort care on colorectal cancer patients undergoing colostomy

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Abstract

BACKGROUND

Patients with colorectal cancer may need postoperative nursing to improve prognosis, and conventional nursing is not effective. Clinical research is needed to explore nursing methods that can more effectively improve postoperative conditions on colorectal cancer patients undergoing colostomy.

AIM

To explore the effect of internet multiple linkage mode-based extended care combined with in-hospital comfort care on colorectal cancer patients undergoing colostomy.

METHODS

Data from 187 patients with colostomy treated in our hospital from May 2019 to March 2022 were collected and divided into three groups, A ($n = 62$), B ($n = 62$) and C ($n = 63$), according to different intervention methods. Group A received internet multiple linkage mode-based extended care combined with in-hospital comfort care. Group B received internet multiple linkage mode-based extended care. Group C received usual care intervention. Complications were compared among the three groups. The stoma self-efficacy scale, Hamilton Anxiety Scale,

Hamilton Depression Scale, Brief Fatigue Inventory and City of Hope-quality of Life-ostomy Questionnaire before and after intervention were compared among the three groups.

RESULTS

The complication rate of group A, B and C (16.13%, 20.97% and 60.32%, respectively) was significantly different (all $P < 0.05$). The incidence of complications in groups A and B was lower than that in group C, and there was no significant difference between groups A and B ($P > 0.05$). After intervention, the scores of ostomy care, social contact, diet choice, confidence in maintaining vitality, confidence in self-care of ostomy, confidence in sexual life, confidence in sexual satisfaction and confidence in physical labor in the three groups were all higher than before intervention, and the scores of groups A and B were higher than those of group C, with statistical significance ($P < 0.05$). The Hamilton Anxiety Scale and Hamilton Depression Scale scores of the three groups after intervention were lower than those before intervention. The scores of groups A and B were lower than those of group C, and the score of group A was lower than that of group B, all with statistical significance (all $P < 0.05$). There was a statistically significant difference in cancer-induced fatigue among the three groups ($P < 0.05$). After intervention, the scores of physical health, psychological health, social health and mental health of the three groups were lower than before the intervention. The scores of group A and B were lower than that of group C; and the score of group A was lower than that of group B, all with statistical significance (all $P < 0.05$).

CONCLUSION

Internet multiple linkage mode-based extended care combined with in-hospital comfort care can effectively improve self-efficacy, bad mood, cancer-related fatigue and life quality of colorectal cancer patients undergoing colostomy.

Key Words: Internet multiple linkage mode; Extended care; In-hospital comfort care; Colorectal cancer patients; Patients undergoing colostomy

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Core Tip: Comfort care and continuous care are widely used in patients with colorectal cancer. The internet multiple linkage model was introduced into the continuous nursing of patients with colorectal cancer ostomy, and the traditional nursing methods were integrated into the internet multiple linkage model. The purpose of this study was to compare the nursing effect of the combined comfort nursing in the hospital based on the internet multiple linkage model, the traditional conventional nursing and the internet multiple linkage model of the extended nursing. The internet multiple linkage mode-based extended care combined with in-hospital comfort care had a good effect.

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INTRODUCTION

Colorectal cancer refers to the malignancy occurring at the junction of the rectum and sigmoid colon and is the second most common gastrointestinal malignancy after gastric cancer. The main clinical manifestations of patients are mucousy and bloody stool, constipation and diarrhea. The incidence of colorectal cancer is related to diet, environment, genetics and other factors[1-3]. The 2018 Chinese cancer statistics showed that the incidence and mortality of colorectal cancer in China ranks fifth among all malignant tumors, including 376000 new cases and 191000 deaths[4].

At present, laparoscopic-assisted transabdominal perineal combined radical rectal resection (Miles operation) has the same indications as traditional laparotomy. Generally, tumors less than 5 cm away from the anal verge are surgically removed. This procedure requires a permanent colostomy in the left lower abdomen[5]. In China there are about 100000 new colostomy patients every year, and the cumulative number of colostomy patients has exceeded 1 million. It is expected that this number will continuously increase[6]. Permanent colostomy is required in 50%-60% of colorectal cancer patients[7]. The incidence of enterostomy complications abroad is 11%-60%, and the domestic literature reports 16.3%-53.8%[8]. Patients will lose their normal defecation ability and be unable to defecate independently. Additionally, the installation of an ostomy bag brings severe psychological pressure to patients, which causes anxiety, depression and other adverse emotions, affecting the prognosis of patients. Thus, it is of great significance to give scientific and effective care to patients with colorectal cancer[9].

Routine nursing refers to the normative regulations of nursing prevention and control measures formulated under the guidance of basic theory and combined with long-term clinical nursing practice experience[10]. For patients undergoing

colostomy, routine care only meets basic needs. Comfort care is a new mode of nursing, which refers to a nursing method that encourages patients to the happiest mental, physical and socio-spirit state[11]. Due to the special situation of patients undergoing colostomy, sufficient nursing guidance should be paid not only during hospitalization but also after discharge to extend the nursing of patients from the clinic to the family and further improve the nursing effect[12-14].

Multiple linkage mode refers to the integration of hospital, community and family to avoid disjointed nursing intervention after discharge[15-17]. Internet-based continuous care has also been widely used in clinical practice. Recent studies have applied it to the care of adrenal tumor patients, and the nursing effect was good[18]. The present study explored the application effect of the internet-based continuous care mode hospital guidance-community participation-family cooperation combined with in-hospital comfort care in patients undergoing colorectal cancer colostomy.

MATERIALS AND METHODS

General data

Data from 187 patients with colostomy who were treated in our hospital from May 2019 to March 2022 were collected and divided into three groups, A ($n = 62$), B ($n = 62$) and C ($n = 63$), according to different intervention methods. In group A, there were 39 males and 23 females. The ages ranged from 32 years to 68 years, with an average of 47.82 ± 5.42 years; 29 cases completed junior middle school or below, 27 cases completed technical secondary school/senior high school, and 6 cases completed junior college or higher. Patients were divided by Dukes stage as follows: 30 cases were in stage I; 24 cases were in stage II; and 8 cases were in stage III. Thirty-five cases were in ostomy stage II, and 27 cases were in ostomy stage III. In group B, there were 44 males and 18 females. The ages ranged from 30 years to 70 years, with an average of 48.15 ± 5.37 years; 26 cases completed junior middle school or below, 25 cases completed technical secondary school/senior high school, and 11 cases completed junior college or above. Patients were divided by Dukes stage as follows: 33 cases were in stage I; 21 cases were in stage II; and 8 cases were in stage III. Twenty-three cases were in ostomy stage II, and 39 cases were in ostomy stage III. In group C, there were 39 males and 24 females. The ages ranged from 28 years to 66 years, with an average of 47.36 ± 4.59 years; 32 cases completed junior middle school or below, 22 cases completed technical secondary school/senior high school, and 9 cases completed junior college or above. Patients were divided by Dukes stage as follows: 33 cases were in stage I; 23 cases were in stage II; and 7 cases were in stage III. Twenty-five cases were in ostomy stage II, and 38 cases were in ostomy stage III. The general data of the two groups were comparable (all $P > 0.05$). This study was approved by the ethics committee of the hospital.

Inclusion criteria

(1) Diagnosed with colorectal cancer by clinicopathological diagnosis; (2) Older than 18-years-old; and (3) Complete clinical case data.

Exclusion criteria

(1) Patients with severe physical dysfunction; (2) Patients with severe hearing impairment and visual impairment; (3) Patients with consciousness dysfunction; (4) Patients with palliative surgical resection; and (5) Patients with vascular dementia, mental disorders and disturbance of consciousness caused by stroke.

Methods

Group A received internet multiple linkage mode-based extended care combined with in-hospital comfort care. Group B received internet multiple linkage mode-based extended care. Group C received usual care intervention.

Group A: Group A was given internet multiple linkage mode-based extended care combined with in-hospital comfort care. Internet multiple linkage mode-based extended care was the same as group B and is described below. The details of in-hospital comfort care were as follows: (1) Creation of comfortable sickroom environment. Comfortable ward environment was created for patients to ensure adequate light and cleanliness in the ward, to ensure indoor quiet and to ensure that patients get comfortable sleep; (2) Psychological comfort care. Colorectal cancer patients with colostomy have great psychological pressure and emotional instability and are prone to irritability, fear and other adverse emotions. Nursing staff can take the initiative to provide psychological support for patients, chat with patients more and alleviate patients' adverse emotions so patients can reach a comfortable state psychologically; (3) Pain care. Medical staff can explain the law of postoperative pain to patients, guide patients to distract themselves from the pain by listening to music and chatting with their families, evaluate the degree of pain and give painkillers appropriately; (4) Dietary care. The nursing staff should instruct the patients to avoid eating greasy, flatulent and crude fiber-rich foods, minimize the number and amount of defecation, protect the artificial anus, eat more foods with high protein, high vitamins and low fiber, eat on time and to not overeat; (5) Stoma comfort care. The patients were required to expose the stoma and clean the excrement from the stoma 2-3 d after the operation. Physiological saline was used to clean the skin around the stoma, and relevant skin care solution was used to protect the skin around the stoma and reduce fecal pollution; and (6) Rehabilitation comfort care. Medical staff should tell patients to wear loose and comfortable clothes and prevent friction stomatology. Patients should avoid water wetting their stomatology bags when bathing. They can cover the stomatology bags and replace the stomatology bags after bathing. They should regularly clean up excreta and make bags and put deodorant in the stoma bag to remove the smell.

Group B: Group B was given internet multiple linkage mode-based extended care. An intervention group for colorectal cancer patients with colostomy based on internet + multiple linkage mode was established. One network engineer with more than 5 years of working experience and 15 medical oncology staff were selected to form the intervention group. The 15 medical staff included 2 attending doctors and 13 nurses. The 13 nurses included 1 chief superintendent nurse, 1 deputy chief superintendent nurse, 5 supervisor nurses and 6 nurses, all of whom had more than 6 years of ostomy nursing experience. The chief superintendent nurse was responsible for the overall guidance of the nursing process. The deputy chief superintendent nurse was responsible for the data-push and training of nursing knowledge. The supervisor nurses were responsible for the training and guidance of the nurses in the community hospital. They also cooperated with the network engineer to adequately design the network platform and update the push content, check and reply to the messages of patients and their families and collect background feedback. Among the 6 nurses, 4 were responsible for nursing training of family members and patients themselves, and the other 2 were responsible for collecting intervention data and sorting data.

The network engineer built a WeChat applet called “colorectal microplatform” and created patient communication groups. The applet included the medical side and the patient side. The medical side had three sections: information verification; health knowledge; and physician-patient interaction. Information verification was used to audit and verify the registration information of patients and their families. The health knowledge section aimed to collect videos, pictures and texts about colostomy nursing knowledge of colorectal cancer and push it three times a week for 1 mo. The content of the 1st week included psychological counseling and ostomy bag replacement method. Physical needs included exercise, bathing, clothing, diet and sexual life and social interaction (traveling, working and gathering). The content of the 2nd week included observation and prevention of the occurrence of ostomy complications, ostomy defecation and abdominal conditions, observation of local and surrounding skin conditions of ostomy, guidance of enterostomy methods and the time and method of the appointment of ostomy clinic review. After 1 mo, the above content can be sent repeatedly. In the physician-patient interaction section, daily observation records, message response and online follow-up can be viewed.

The patient side included the patient’s personal data, information platform and interaction. The personal data included the patient’s sex, age and other basic information as well as ostomy information. The information platform provided psychological and physiological knowledge of colorectal cancer ostomy. The interactive section provided the function of leaving messages in the background. Patients and their families can leave messages in the interaction section for consultation if they have any questions. Intervention group members checked background messages every day and answered them in time. Patients could also express their questions through WeChat group chat. The interaction section also included a service evaluation content, which enabled patients and their families to put forward opinions and suggestions to the interventionists and the platform, which was conducive to continuous improvement of the platform.

Group C: Group C was given usual care intervention. During the period of hospitalization, patients were instructed in routine daily behavior, and usual care was carried out according to the nursing method of enterostomy. The patient was instructed in a series of daily activities such as diet, exercise, washing, rest and defecation and was told to clean the enterostomy and surrounding skin. The emergency treatment measures for possible abnormalities after the completion of the enterostomy were explained. Appropriate psychological intervention was performed for patients with colostomy of colorectal cancer.

Observation targets

Baseline data, the occurrence of complications, the stoma self-efficacy scale (SSES)[19] rating, Hamilton Anxiety Scale (HAMA)[20], Hamilton Depression Scale (HAMD)[21], Brief Fatigue Inventory[22], City of Hope-Quality of life-Ostomy Questionnaire (COH-QOL-OQ)[23] were collected from all patients. Complications were compared among the three groups. The SSES, HAMA, HAMD and COH-QOL-OQ scores of the three groups were compared before and after intervention. SSES included two dimensions and six individual items, with a total of 28 items and a total score of 28-140 points calculated with a 5-point scoring system. The score of ostomy care efficacy was 13-65 points, and the score of social efficacy was 9-45 points. HAMA had 14 items in total, and the score was 0-4 with 5 grades. The total score was 0-56. The higher the score, the worse the anxiety symptoms. HAMD had 17 items in total, and the score was 0-4 with 5 grades. The total score was 0-68. The higher the score, the worse the depression symptoms. The Brief Fatigue Inventory consisted of nine items, which were scored on a scale of 0 to 10, including no fatigue (0), mild fatigue (1 to 3), moderate fatigue (4 to 6) and severe fatigue (7 to 10). COH-QOL-OQ included four dimensions with a total of 32 items: physical health (11 items); psychological health (9 items); social health (7 items); and mental health (5 items) It adopted the scoring method of 0-10 points, and the total score was 0-320 points. The higher the score, the worse the quality of life.

Statistical methods

SPSS 11.0 statistical software was used to analyze and process the obtained data, and the measurement data was expressed as ($\bar{x} \pm s$). Independent sample *t* test was used for inter-group comparison, and paired *t* test was used for intra-group comparison before and after intervention. Counting data were expressed as frequency and constituent ratio. χ^2 test or Fisher exact probability method was used to compare disordered classification data, and rank sum test was for ranked data. *P* < 0.05 indicated that the difference was statistically significant.

RESULTS

Comparison of complication rate among the three groups

The complication rate in group A, B and C (16.13%, 20.97% and 60.32%) was significantly different (all $P < 0.05$). The complication rate in groups A and B was lower than that in group C, and there was no significant difference between groups A and B (all $P > 0.05$, Table 1).

Comparison of self-efficacy among the three groups

Before intervention, there were no significant differences in stoma care, social contact, diet choice, confidence in maintaining vitality, confidence in stoma self-care, confidence in sexual life, confidence in sexual satisfaction and confidence in physical labor among the three groups (all $P > 0.05$). After intervention, the scores of stoma care, social contact, diet choice, confidence in maintaining vitality, confidence in stoma self-care, confidence in sexual life, confidence in sexual satisfaction and confidence in physical labor in the three groups were all higher than before intervention. The scores of groups A and B were higher than those of group C (all $P > 0.05$, Table 2).

Comparison of anxiety and depression among the three groups

Before intervention, there were no significant differences in HAMA and HAMD scores among the three groups (all $P > 0.05$). After intervention, the HAMA and HAMD scores of the three groups were lower than before intervention. The scores of groups A and B were lower than that of group C. The scores of group A were lower than that of group B (all $P < 0.05$, Table 3).

Comparison of cancer-induced fatigue among the three groups

There were significant differences in cancer-induced fatigue among the three groups (all $P < 0.05$, Table 4).

Comparison of quality of life among the three groups

Before the intervention, there were no significant differences in the scores of physical health, psychological health, social health and mental health among the three groups (all $P > 0.05$). After the intervention, the scores of physical health, psychological health, social health and mental health of the three groups were lower than before the intervention. The scores of group A and B were lower than group C. The scores of group A were lower than group B (all $P < 0.05$, Table 5).

DISCUSSION

The main clinical treatment for colorectal cancer is surgical resection, but patients often need to perform ostomy after resection to promote the discharge of intestinal contents to protect the distal intestinal anastomosis and promote the recovery of intestinal diseases. Although ostomy can save the lives of patients, it violates the objective laws of the human body and can lead to the abnormal excretion pathway of patients, increase the psychological burden of patients and cause anxiety and depression in patients. Therefore, it is very important to provide long-term care in and out of the hospital for patients with colorectal cancer after ostomy[24-26].

Internet + mode is a new nursing mode that has emerged in the era of big data. The multiple linkage mode of the internet breaks the limitation of conventional nursing time and space, expands the scope of nursing services and can meet the health needs of patients at multiple levels. The use of information can encourage a close relationship between the hospital and patients, timely monitoring of the patients' conditions and promotion of patient recovery. This study integrated the multiple linkage cooperation mode into nursing work. Information sharing and maintenance reminders were carried out through an internet platform, and hospital-community-home nursing was linked to provide comprehensive extended care for patients with colorectal cancer colostomy[27,28]. In-hospital comfort care is a humanized nursing measure, whose intervention aims to reduce patient discomfort, promote patient physical and mental comfort and ultimately promote patient postoperative recovery[29].

In this study, group A adopted the internet-based multiple linkage mode combined with in-hospital comfort care intervention, group B adopted the internet-based multiple linkage mode intervention, and group C adopted routine intervention. The results showed that the incidence of complications in groups A and B was lower than that in group C, and that no significant difference was seen between groups A and B. Intervention based on the multiple linkage mode of internet could effectively reduce the incidence of complications in colorectal cancer patients with colostomy. Complications of enterostomy patients may lead to the inability of the stoma bag to effectively collect excreta, seriously affecting patient emotions. In the intervention scheme based on internet multiple linkage mode, patients with abnormal conditions when dealing with the stoma can contact the medical staff through the WeChat platform, and the nursing staff can provide intervention support as soon as possible, effectively reducing the incidence of complications.

After intervention, scores of self-efficacy in groups A and B were significantly higher than those in group C, indicating that intervention based on internet multiple linkage mode can effectively improve self-efficacy in colorectal cancer patients with colostomy. This scheme pushed colostomy knowledge through the WeChat applet and provided colostomy patients and their families with colostomy-related medical knowledge by means of pictures and texts, which promoted colostomy patient understanding of their own state. By applying the knowledge learned in the WeChat applet to daily life, patients also further deepened their impression of colorectal cancer ostomy knowledge. Related psychological counseling pictures and texts in the information section were also conducive to improve patient confidence in treatment,

Table 1 Comparison of complication rate among the three groups

Item	Group A, <i>n</i> = 62	Group B, <i>n</i> = 62	Group C, <i>n</i> = 63	χ^2 value	<i>P</i> value
Stomal necrosis	0 (0.00)	1 (1.61)	1 (1.59)	N/A	N/A
Stomal bleeding	1 (1.61)	0 (0.00)	1 (1.59)	N/A	N/A
Stomal edema	1 (1.61)	0 (0.00)	9 (14.29)	N/A	N/A
Parastomal hernia	1 (1.61)	1 (1.61)	5 (7.94)	N/A	N/A
Stomal infection	3 (4.84)	3 (4.84)	8 (12.70)	N/A	N/A
Stomal stenosis	3 (4.84)	5 (8.06)	11 (17.46)	N/A	N/A
Stomal prolapse	1 (1.61)	3 (4.84)	3 (4.76)	N/A	N/A
Total complication rate	10 (16.13)	13 (20.97)	38 (60.32)	33.490	< 0.001

Data are presented as *n* (%). Group A received internet multiple linkage mode-based extended care combined with in-hospital comfort care; Group B received internet multiple linkage mode-based extended care; Group C received usual care intervention. N/A: Not applicable.

Table 2 Comparison of self-efficacy among the three groups

Item	Intervention timing status	Group A, <i>n</i> = 62	Group B, <i>n</i> = 62	Group C, <i>n</i> = 63	<i>t</i> value	<i>P</i> value
Stoma care	Before	37.97 ± 6.58	37.39 ± 5.47	37.41 ± 4.85	0.209	0.811
	After	48.47 ± 7.48 ^a	46.21 ± 6.63 ^a	40.67 ± 5.18 ^{a,b,c}	23.918	< 0.001
Social contact	Before	24.19 ± 6.59	24.40 ± 5.72	23.83 ± 6.05	0.138	0.871
	After	35.63 ± 5.27 ^a	31.66 ± 3.96 ^{a,b}	27.94 ± 6.68 ^{a,b,c}	31.388	< 0.001
Diet choice	Before	2.06 ± 0.70	2.02 ± 0.78	1.92 ± 0.77	0.577	0.562
	After	3.74 ± 0.79 ^a	3.40 ± 0.93 ^{a,b}	2.92 ± 0.77 ^{a,b,c}	15.311	< 0.001
Confidence in maintaining vitality	Before	1.82 ± 0.80	1.65 ± 0.75	1.62 ± 0.63	1.360	0.259
	After	3.65 ± 0.79 ^a	3.34 ± 0.87 ^{a,b}	2.63 ± 0.66 ^{a,b,c}	28.313	< 0.001
Confidence in stoma self-care	Before	1.97 ± 0.79	2.05 ± 0.88	1.95 ± 0.81	0.255	0.775
	After	3.90 ± 0.78 ^a	3.55 ± 0.88 ^{a,b}	2.95 ± 0.81 ^{a,b,c}	21.257	< 0.001
Confidence in sexual life	Before	1.95 ± 0.84	1.90 ± 0.69	1.75 ± 0.76	1.157	0.317
	After	3.32 ± 0.85 ^a	3.24 ± 0.80 ^a	2.75 ± 0.76 ^{a,b,c}	9.232	< 0.001
Confidence in sexual satisfaction	Before	1.56 ± 0.59	1.45 ± 0.59	1.43 ± 0.59	0.876	0.418
	After	3.05 ± 0.58 ^a	2.79 ± 0.68 ^{a,b}	2.42 ± 0.59 ^{a,b,c}	16.408	< 0.001
Confidence in physical labor	Before	1.18 ± 0.43	1.15 ± 0.36	1.21 ± 0.48	0.309	0.734
	After	3.66 ± 0.85 ^a	3.37 ± 1.00 ^{a,b}	2.57 ± 0.86 ^{a,b,c}	24.330	< 0.001

Data are presented as mean ± SD.

^a*P* < 0.05, compared with the same group before intervention.

^b*P* < 0.05, compared with group A.

^c*P* < 0.05, compared with group B.

Group A received internet multiple linkage mode-based extended care combined with in-hospital comfort care; Group B received internet multiple linkage mode-based extended care; Group C received usual care intervention.

and patient self-efficacy was significantly improved.

The HAMA and HAMD scores after intervention of the three groups were lower than before intervention. After intervention, the scores of groups A and B were lower than that of group C, and the score of group A was lower than that of group B. This showed that internet multiple linkage mode-based care combined with in-hospital comfort care can effectively improve anxiety and depression conditions in colorectal cancer patients with colostomy. Internet-based multimode intervention enabled patients to feel the support and care from medical staff all the time, shortened the distance between doctors and patients and nurses and patients and helped patients correctly face anxiety and depression. The WeChat public platform had message function, and medical staff encouraged patients through this board to relieve

Table 3 Comparison of anxiety and depression among the three groups

Item	Intervention timing status	Group A, n = 62	Group B, n = 62	Group C, n = 63	t value	P value
HAMA score	Before	43.15 ± 3.97	43.58 ± 4.63	43.51 ± 4.91	0.162	0.851
	After	23.42 ± 4.44	29.45 ± 4.44 ^{a,b}	35.38 ± 6.48 ^{a,b,c}	82.105	< 0.001
HAMD score	Before	52.74 ± 5.32	52.05 ± 7.90	52.08 ± 5.98	0.224	0.799
	After	30.06 ± 2.22	34.68 ± 5.73 ^{a,b}	38.60 ± 3.46 ^{a,b,c}	68.965	< 0.001

Data are presented as mean ± SD.

^aP < 0.05, compared with the same group before intervention.

^bP < 0.05, compared with group A.

^cP < 0.05, compared with group B.

Group A received internet multiple linkage mode-based extended care combined with in-hospital comfort care; Group B received internet multiple linkage mode-based extended care; Group C received usual care intervention. HAMA: Hamilton Anxiety Scale; HAMD: Hamilton Depression Scale.

Table 4 Comparison of cancer-induced fatigue among the three groups

Item	Group A, n = 62	Group B, n = 62	Group C, n = 63	z value	P value
No fatigue	18 (29.03)	12 (19.35)	8 (12.70) ^b	N/A	N/A
Mild fatigue	30 (48.39)	24 (38.71)	17 (26.98) ^b	N/A	N/A
Moderate fatigue	11 (17.74)	18 (29.03)	25 (39.68) ^b	N/A	N/A
Severe fatigue	3 (4.84)	8 (12.90)	13 (20.63) ^b	17.510	< 0.001

Data are presented as n (%).

^bP < 0.05, compared with group A.

Group A received internet multiple linkage mode-based extended care combined with in-hospital comfort care; Group B received internet multiple linkage mode-based extended care; Group C received usual care intervention.

Table 5 Comparison of quality of life among the three groups

Group	Intervention timing status	Group A, n = 62	Group B, n = 62	Group C, n = 63	t value	P value
Physical health	Before	47.61 ± 4.61	48.21 ± 3.46	47.54 ± 4.04	0.511	0.601
	After	32.19 ± 1.80	37.37 ± 2.79 ^{a,b}	42.76 ± 4.86 ^{a,b,c}	150.346	< 0.001
Psychological health	Before	61.89 ± 5.31	62.44 ± 5.22	62.62 ± 5.27	0.325	0.723
	After	47.23 ± 5.04	52.35 ± 5.64 ^{a,b}	57.16 ± 4.69 ^{a,b,c}	58.414	< 0.001
Social health	Before	51.60 ± 6.08	51.21 ± 5.20	52.37 ± 5.05	0.732	0.483
	After	38.18 ± 2.56	43.22 ± 4.44 ^{a,b}	47.38 ± 6.10 ^{a,b,c}	62.401	< 0.001
Mental health	Before	25.03 ± 2.30	25.18 ± 2.22	25.87 ± 2.74	2.125	0.122
	After	14.13 ± 3.36	18.10 ± 2.06 ^{a,b}	21.02 ± 3.29 ^{a,b,c}	84.898	< 0.001

Data are presented as mean ± SD.

^aP < 0.05, compared with the same group before intervention.

^bP < 0.05, compared with group A.

^cP < 0.05, compared with group B.

Group A received internet multiple linkage mode-based extended care combined with in-hospital comfort care; Group B received internet multiple linkage mode-based extended care; Group C received usual care intervention.

patient anxiety and depression symptoms. In-hospital comfort care enables patients to feel the care from medical staff through the creation of a comfortable ward environment, psychological comfort nursing, pain nursing, diet nursing and stoma comfort nursing. Thus, patient anxiety and depression were significantly improved, and the improvement of group A was better than group B and C.

After intervention, the cancer-induced fatigue condition in group A was better than that in group B and group C, the scores of quality of life in groups A and B were lower than that in group C, and the scores of quality of life in group A were lower than that in group B. These results showed that internet-based multi-linkage model intervention combined with in-hospital comfort care can effectively relieve the cancer-induced fatigue and improve the quality of life of colorectal cancer patients with colostomy. The multiple linkage mode of the internet provided extended care through the WeChat platform, which not only provides health information but also includes communication with medical staff to answer questions, which allows patients to receive professional guidance more conveniently. In-hospital comfort care pays more attention to the physical and mental comfort of the patient and adopts a variety of measures to promote physical and mental comfort. The combined application of the two schemes further improved the cancer-related fatigue state and quality of life.

This study also had certain shortcomings. The sample size of this study was small, and it was a single-center study. In the future, a multi-center study will be undertaken to expand the sample size to ensure the accuracy of this study.

CONCLUSION

The application of extended care based on internet multiple interaction mode combined with in-hospital comfort care in patients with colorectal cancer colostomy can effectively reduce the occurrence of complications, improve their self-efficacy, relieve their cancer-induced fatigue and improve their quality of life, showing clinical application value.

ARTICLE HIGHLIGHTS

Research background

The occurrence of postoperative complications in patients with colorectal cancer stomy can affect patient emotions and self-efficacy. Therefore, attention should be given to the improvement of nursing methods on postoperative complications in patients with colorectal cancer stomy. The extensive application of various nursing methods and traditional routine nursing in patients with colorectal cancer stomostomy is currently being studied. Exploring new nursing methods that can more effectively improve the postoperative recovery of patients with colorectal cancer stomostomy will be beneficial.

Research motivation

The purpose of this study was to explore more effective nursing methods to improve patient quality of life and self-efficacy in postoperative colorectal cancer patients. The significance of this study was to affirm the effectiveness of new nursing methods for patients with colorectal cancer ostomy, encourage clinical nursing teams to continue to introduce more effective and humanized nursing methods for patients with colorectal cancer ostomy and promote the improvement and progress of clinical nursing work.

Research objectives

This study compared the effects of three nursing methods and observed the advantages of internet multiple linkage mode-based extended care combined with in-hospital comfort care compared with internet multiple linkage mode-based extended care and conventional nursing.

Research methods

The clinical data of patients were analyzed retrospectively and grouped according to different nursing methods. Paired *t* test and χ^2 test were used to analyze the general data, complication rate, self-efficacy, anxiety and depression, cancer-related fatigue, quality of life and other clinical data of the three groups of patients.

Research results

The results of this study showed that the internet multiple linkage mode-based extended care combined with in-hospital comfort care had a good nursing effect and significantly improved the occurrence of complications, self-efficacy, anxiety and depression, cancer-related fatigue and quality of life, providing a new nursing method for postoperative nursing of colorectal cancer.

Research conclusions

This study confirmed that the internet multiple linkage mode-based extended care combined with in-hospital comfort care has a better effect on patients.

Research perspectives

In the future, a multi-center study should be undertaken to expand the sample size to ensure the accuracy of this study.

FOOTNOTES

Author contributions: Xu L initiated the project and designed the experiment, conducted clinical data collection and performed postoperative follow-up and recorded data; Zhou MZ conducted a number of collation and statistical analysis, wrote the original manuscript and revised the paper; Both authors reviewed and approved the paper; All authors read and approved the final manuscript.

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REFERENCES

- Mauri G, Sartore-Bianchi A, Russo AG, Marsoni S, Bardelli A, Siena S. Early-onset colorectal cancer in young individuals. *Mol Oncol* 2019; **13**: 109-131 [PMID: 30520562 DOI: 10.1002/1878-0261.12417]
- Heinimann K. [Hereditary Colorectal Cancer: Clinics, Diagnostics and Management]. *Ther Umsch* 2018; **75**: 601-606 [PMID: 31232663 DOI: 10.1024/0040-5930/a001046]
- Thanikachalam K, Khan G. Colorectal Cancer and Nutrition. *Nutrients* 2019; **11** [PMID: 30646512 DOI: 10.3390/nu11010164]
- Cheng S, Chen M, Cai J, Sun J, Guo R, Bi X, Lau WY, Wu M. Chinese Expert Consensus on Multidisciplinary Diagnosis and Treatment of Hepatocellular Carcinoma with Portal Vein Tumor Thrombus (2018 Edition). *Liver Cancer* 2020; **9**: 28-40 [PMID: 32071907 DOI: 10.1159/000503685]
- Zheng HH, Zhao EH. Thinking and prospect of laparoscopic sphincterectomy for low rectal cancer. *Yazhou Linchuang Yixue Zazhi* **3**: 32 [DOI: 10.26549/yzlcyxzz.v3i5.5253]
- Yu DH. Status and prospect of enterostomy treatment in my country. *Zhonghua Huli Zazhi* 2005; **40**: 415-417 [DOI: 10.1088/0031-9120/40/5/f10]
- Koshiyama A, Ichibangase T, Imai K. Comprehensive fluorogenic derivatization-liquid chromatography/tandem mass spectrometry proteomic analysis of colorectal cancer cell to identify biomarker candidate. *Biomed Chromatogr* 2013; **27**: 440-450 [PMID: 22991145 DOI: 10.1002/bmc.2811]
- Lu ZH, Wan DS. Complications and management of enterostomy surgery. *Guangdong Yixue* 2009; **30**: 1029-1030 [DOI: 10.3969/j.issn.1001-9448.2009.08.003]
- Yang XX, Fu JF, Li Q, Duan JB, Liu Y. Study on the quality of life of patients with permanent. *Huli Yanjiu* 2011; **(10)**: 3 [DOI: 10.3969/j.issn.1009-6493.2011.29.012]
- Dong JH, Dong XF, Cardiology DO. Comparison of the Effects of Case Management and Routine Nursing on Cardiovascular Risk Factors in Diabetic Patients. *Tangniaobing Xinsheji* 2019; **22**: 3 [DOI: 10.4093/jkd.2019.20.3.157]
- Umar A, Chang EY, Odeunmi I. Ambiguities in Comfort Care Discussions. *JAMA Intern Med* 2019; **179**: 273-274 [PMID: 30715108 DOI: 10.1001/jamainternmed.2018.7489]
- Ping H, Ling X, Xue Y, Dong F. Effect of ERAS Combined with Comfortable Nursing on Quality of Life and Complications in Femoral Neck Fractures of the Aged People. *Evid Based Complement Alternat Med* 2021; **2021**: 8753076 [PMID: 34777537 DOI: 10.1155/2021/8753076]
- Ye Y, Ge J. Clinical application of comfort nursing in elderly patients with advanced lung cancer. *Am J Transl Res* 2021; **13**: 9750-9756 [PMID: 34540105]
- Qian H, Zhou J, Huang T, Cao X, Zhou C, Yang M, Chen Y. Comfort nursing can alleviate pain and negative emotion of patients after surgery for LVCs and improve their living ability. *Am J Transl Res* 2021; **13**: 2939-2946 [PMID: 34017459]
- Ross P, Cross R. Rise of the e-Nurse: the power of social media in nursing. *Contemp Nurse* 2019; **55**: 211-220 [PMID: 31280696 DOI: 10.1080/10376178.2019.1641419]
- Wang J, Tong Y, Jiang Y, Zhu H, Gao H, Wei R, Que X, Gao L. The effectiveness of extended care based on Internet and home care platform for orthopaedics after hip replacement surgery in China. *J Clin Nurs* 2018; **27**: 4077-4088 [PMID: 29851157 DOI: 10.1111/jocn.14545]
- Feng L, Wang W, Wu M, Ma H. Effect of WeChat-Based Health Education Combined with Satir Model on Self-Management Behaviors and

- Social Adaptation in Colorectal Cancer Patients during the Perioperative Period. *J Healthc Eng* 2021; **2021**: 2701039 [PMID: [34925730](#) DOI: [10.1155/2021/2701039](#)]
- 18 **Yao J**, He W, Chen H, Qi Y. Nursing effect of continuous nursing intervention based on "Internet Plus" on patients with severe adrenal tumor. *Medicine (Baltimore)* 2023; **102**: e33187 [PMID: [36897676](#) DOI: [10.1097/MD.00000000000033187](#)]
- 19 **Karaçay P**, Toğluk Yigitoglu E, Karadağ A. The validity and reliability of the Stoma Self-Efficacy Scale: A methodological study. *Int J Nurs Pract* 2020; **26**: e12840 [PMID: [32301580](#) DOI: [10.1111/ijn.12840](#)]
- 20 **Thompson E**. Hamilton Rating Scale for Anxiety (HAM-A). *Occup Med (Lond)* 2015; **65**: 601 [PMID: [26370845](#) DOI: [10.1093/occmed/kqv054](#)]
- 21 **Fenton C**, McLoughlin DM. Usefulness of Hamilton rating scale for depression subset scales and full versions for electroconvulsive therapy. *PLoS One* 2021; **16**: e0259861 [PMID: [34752484](#) DOI: [10.1371/journal.pone.0259861](#)]
- 22 **Nunes AF**, Bezerra CO, Custódio JDS, Friedrich CF, Oliveira IS, Lunardi AC. Clinimetric Properties of the Brief Fatigue Inventory Applied to Oncological Patients Hospitalized for Chemotherapy. *J Pain Symptom Manage* 2019; **57**: 297-303 [PMID: [30391653](#) DOI: [10.1016/j.jpainsymman.2018.10.508](#)]
- 23 **Konjevoda V**, Zelić M, Munjas Samarin R, Petek D. City of Hope Quality of Life-Ostomy Questionnaire Validity and Reliability Assessment on a Croatian Sample. *Int J Environ Res Public Health* 2020; **17** [PMID: [31991817](#) DOI: [10.3390/ijerph17030768](#)]
- 24 **Carli F**, Bousquet-Dion G, Awasthi R, Elsherbini N, Liberman S, Boutros M, Stein B, Charlebois P, Ghitulescu G, Morin N, Jagoe T, Scheede-Bergdahl C, Minnella EM, Fiore JF Jr. Effect of Multimodal Prehabilitation vs Postoperative Rehabilitation on 30-Day Postoperative Complications for Frail Patients Undergoing Resection of Colorectal Cancer: A Randomized Clinical Trial. *JAMA Surg* 2020; **155**: 233-242 [PMID: [31968063](#) DOI: [10.1001/jamasurg.2019.5474](#)]
- 25 **van Rooijen S**, Carli F, Dalton S, Thomas G, Bojesen R, Le Guen M, Barizien N, Awasthi R, Minnella E, Beijer S, Martínez-Palli G, van Lieshout R, Gögenur I, Feo C, Johansen C, Scheede-Bergdahl C, Roumen R, Schep G, Slooter G. Multimodal prehabilitation in colorectal cancer patients to improve functional capacity and reduce postoperative complications: the first international randomized controlled trial for multimodal prehabilitation. *BMC Cancer* 2019; **19**: 98 [PMID: [30670009](#) DOI: [10.1186/s12885-018-5232-6](#)]
- 26 **Ni X**, Jia D, Chen Y, Wang L, Suo J. Is the Enhanced Recovery After Surgery (ERAS) Program Effective and Safe in Laparoscopic Colorectal Cancer Surgery? A Meta-Analysis of Randomized Controlled Trials. *J Gastrointest Surg* 2019; **23**: 1502-1512 [PMID: [30859422](#) DOI: [10.1007/s11605-019-04170-8](#)]
- 27 **Guo R**, Wang H. Analysis of Lung Imaging Intelligent Diagnosis System for Nursing Intervention of Lung Cancer Patients' Quality of Life. *Contrast Media Mol Imaging* 2021; **2021**: 6750934 [PMID: [34867113](#) DOI: [10.1155/2021/6750934](#)]
- 28 **Koivunen M**, Saranto K. Nursing professionals' experiences of the facilitators and barriers to the use of telehealth applications: a systematic review of qualitative studies. *Scand J Caring Sci* 2018; **32**: 24-44 [PMID: [28771752](#) DOI: [10.1111/scs.12445](#)]
- 29 **Cui M**, Sun M, Bu L. The effect of comfort nursing on liver function and nursing satisfaction of patients with liver cirrhosis. *Am J Transl Res* 2021; **13**: 6973-6979 [PMID: [34306451](#)]



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