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Original Article

Continuous nursing reduces postoperative complications and improves quality of life of patients after enterostomies

Wei Geng[1*], Na Tao[2*], Ting Wang[1], Yu Zhang[3], Yuanyuan Wang[4]

[1]Department of Gastrointestinal Surgery, The First Hospital of Jilin University, Changchun, Jilin, China; [2]Department of Pediatric Surgery, The First Bethune Hospital of Jilin University, Changchun, Jilin, China; [3]Department of Emergency, The Second Hospital of Jilin University, Changchun, Jilin, China; [4]Department of Dermatology, The First Hospital of Jilin University, Changchun, Jilin, China. [*]Equal contributors and co-first authors.

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Abstract: Purpose: The aim of this study was to investigate whether continuous nursing care can improve QOL and reduce complications of adult and pediatric patients after enterostomies. Methods: A total of 120 patients were enrolled, consisting of 60 adults and 60 pediatrics. They were randomly divided into the adult test group receiving continuous nursing care (N=30), adult control group receiving routine nursing care (N=30), pediatric test group receiving continuous nursing care (N=30), and pediatric control group receiving routine nursing care (N=30). The adult control group and pediatric control group were followed up every month with routine telephone interviews after discharge. Complications of the four groups during the six months after discharge were compared. Negative emotions were evaluated by the Self-rating Anxiety Scale (SAS) and Self-rating Depression Scale (SDS). Quality of life (QOL) scores of the four groups of patients and awareness levels of the family members of the three groups about intestinal stoma, as well as nursing satisfaction, were evaluated and compared. Results: After intervention, incidence of complications in the adult test group and pediatric test group was significantly lower than that in the adult control group and pediatric control group ($P<0.05$), respectively. SAS and SDS scores of the adult test group and pediatric test group were significantly lower than those of adult control group and pediatric control group ($P<0.05$). QOL scores of the study groups were significantly higher than those of the control group ($P<0.05$). Knowledge of intestinal stoma in the adult test group and pediatric test group was significantly higher than that in the adult control group and pediatric control group ($P<0.05$). Nursing satisfaction scores of the adult test group and pediatric test group were significantly higher than those of the control groups ($P<0.05$). Conclusion: Continuous nursing care after discharge can mitigate patient complications and improve QOL, as well as improve patient satisfaction.

Keywords: Continuous care, enterostomy, complications, quality of life

Introduction

Changes in living habits and diet have contributed to the increasing incidence of gastrointestinal malignant tumors, such as colorectal cancer. The number of patients undergoing enterostomies is on the rise [1, 2]. Enterostomy refers to changing the normal defecation mode of the patient through creating a durable opening (called a stoma) through the abdominal wall into an intestine [3]. This changes the body shape and causes defecation problems, thereby affecting patient quality of life (QOL), as well as their physical and mental health [4]. Despite the high incidence of complications after enterostomies, most patients are discharged one week after surgery and receive less care [5]. However, most patients and their families do not have professional nursing knowledge, leading to a series of problems after discharge that cannot be solved in a timely manner [6]. Thus, the QOL of these patients is generally low. They are also prone to developing psychological problems [7]. Therefore, to improve the QOL and mitigate complications in postoperative patients with postpartum surgery, care for patients after intestinal fistula after discharge is a clinical issue that requires attention.

Continuous nursing care, in which patients can continue to enjoy professional care services even after they are discharged, is an extension

Table 1. General information table

Project	Adult Test group n=30	Children Test group n=30	Adult control group n=30	Children control group n=30	t/X^2	P
Gender					0.272	0.965
Male	17 (56.67)	16 (53.33)	18 (60.00)	17 (56.67)		
Female	13 (43.33)	14 (46.67)	12 (40.00)	13 (43.33)		
Age (years)	45.37±13.28	5.12±1.31	45.37±13.28	5.23±1.27	181.5	<0.001
MBI (kg/m^2)	21.31±1.24	14.33±0.69	21.31±1.24	14.25±0.58	507.1	<0.001
Whether or not drinking					0.067	0.795
Yes	16 (53.33)	-	17 (56.67)	-		
No	14 (46.67)	-	13 (43.33)	-		
Whether or not smoking					0.069	0.793
Yes	12 (40.00)	-	13 (43.33)	-		
No	18 (60.00)	-	17 (56.67)	-		
Types of enterostomy					0.667	0.881
Colostomy	16 (53.33)	15 (50.00)	14 (46.67)	13 (43.33)		
Ileostomy	14 (46.67)	15 (50.00)	16 (53.33)	17 (56.67)		

of post-discharge care [8]. After discharge from the hospital, personalized care can be set up according to the patient's specific conditions. Patients can receive comprehensive nursing guidance throughout the postoperative recovery period by telephone, internet messenger service WeChat, and follow-up visits. These methods reduce the incidence of postoperative complications and improve the QOL [9]. At present, continuous nursing care has some applications in tumor [10] and urology [11] cases. A study exploring the use of continuous nursing care in breast cancer [12] found that continuity can effectively improve the QOL of breast cancer patients and promote recovery. Although many studies have explored the application of continuous care in patients after enterostomies, most have focused on self-care ability and QOL of patients with postoperative intestinal ostomy [13]. Few studies have compared incidence of complications after discharge.

The present study aimed to provide a comprehensive solution for postoperative care of patients undergoing enterostomies, at different ages, by comparing the effects of continuous care on improving QOL and mitigating complications of adult and pediatric patients.

Materials and methods

Participants

A total of 120 patients were enrolled, including 60 adults and 60 pediatrics. They were randomly divided into the adult test group receiving continuous nursing care (N=30), adult control group receiving routine nursing care (N=30), pediatric test group receiving continuous nursing care (N=30), and pediatric control group receiving routine nursing care (N=30). The adult control group and pediatric control group were followed up with routine telephone calls after discharge. In addition to telephone follow-ups, the adult test group and pediatric test group were interviewed by specialist nurses and guided by doctors and nurses through WeChat groups. Patients and their families were invited to participate in the Ostrich Association to obtain a better understanding of the nursing program.

The average age of adults was 45.37±13.28 years, including 27 men and 19 women. The average age of children was 5.12±1.31 years, including 22 boys and 17 girls. No significant differences were found in gender and age between the control group and adult group, nor in gender and type of enterostomy between the pediatric group and adult group. Participant data is shown in **Table 1**.

Inclusion criteria: Adult and pediatric patients with successful enterostomies and patients with primary education and above. Exclusion criteria: Patients with surgical contraindications; Patients with infections and complications during hospitalization; Patients with other serious organ diseases; Patients with a postoperative survival of less than one year; Patients that did not cooperate with the study (or their families); Adult patients with communication

impairments or pediatric patients with families that have communication problems.

All participants and families agreed to participate in the study and provided informed consent. This experiment was approved by the Ethics Committee.

Nursing methods

All participants underwent the same routine care during hospitalization. Upon entering the ward after surgery, the nurse informed the patients and their families about the nursing methods and nursing precautions. At the time of discharge, the patients were given psychological and dietary guidance, then subjected to regular reviews. The control group was not given any form of nursing support after discharge from the hospital. Adult and pediatric groups were given continuous nursing intervention after discharge from the hospital. Specific methods were as follows: 1. With the assistance of a doctor, the continuous nursing team established by the professional nursing staff sorted clinical data of the patients in the adult and pediatric test groups after the enterostomy. They evaluated comprehensively the patient's situation. A six-month continuous care plan was developed for the specific circumstances of each patient; 2. Nursing training was conducted for families of postoperative patients after the procedure. The training covered dietary guidance for patients and issuance of a dietary plan. For family members, there was an evaluation of the intestinal foramen and surrounding skin, proper use of the matching washing pot to flush the pocket, explanation on the matters needing attention and operation of the pocket, means to address complications effectively, and importance of contacting paramedics and doctors in unmanageable situations; 3. Mental health care: In the regular return visit, patient psychological conditions were evaluated. Patients were encouraged to vent their negative emotions. They were given psychological counseling to help establish confidence in overcoming the disease and to adjust their mentality, thereby promoting recovery; 4. Nursing supervision and follow-up: Patients were instructed to come to the hospital for regular reviews and to receive regular education on care and nursing training guidance. Patients were followed up by phone once a week. Social activities were organized regularly. Moreover, a WeChat community was established to resolve problems for patients and their families in a timely manner.

Outcome measures

Complications of the four groups of patients during the six months after discharge were recorded and compared. Complications included perioral dermatitis, invagination, stoma stenosis, and paralysis. Negative psychological emotions of the four groups of patients were evaluated according to the Self-rating Anxiety Scale (SAS) and Self-rating Depression Scale (SDS) [14]. The QOL of the four groups of patients was evaluated [1]. This evaluation included sleep quality, activity, mental state, and appetite. A higher score indicates better QOL. The degree of mastery of knowledge related to enterostomies was compared between family members of the three groups after six months of continuous nursing. Using the questionnaire survey method, nursing satisfaction of the three groups (family members representing the pediatric group) were evaluated and compared. They were asked to indicate whether they were very satisfied, satisfied, or dissatisfied. Total nursing satisfaction = (satisfaction + very Satisfied) × 100%.

Statistical analysis

SPSS 18.0 (Bo Yi Zhixun (Beijing) Information Technology Co., Ltd.) was used to perform statistical analyses on collected data. Measurement data are expressed using mean ± standard deviation. Independent *t*-test was used for comparisons between two groups, while one-way ANOVA with post-hoc Bonferroni's test was used for comparisons among groups. $P<0.05$ indicates statistical significance.

Results

Comparison of baseline data

There were no significant differences in gender and intestinal stoma type between pediatric groups and adult groups ($P>0.05$) (**Table 1**).

Complications during the six months after discharge

In the adult test group, three participants reported complications, one with peripheral dermatitis, one with invagination, and one with

Table 2. Incidence of complications during the 6 months after discharge from the three groups of patients [n, (%)]

Complication	Adult Test group n=30	Children Test group n=30	Adult control group n=30	Children control group n=30	X^2	P
Peripheral dermatitis	1 (3.33)	2 (6.66)	6 (20.00)	7 (23.33)	7.500	0.058
Invagination	1 (3.33)	1 (3.33)	2 (6.66)	2 (6.66)	0.873	0.702
Stenosis	1 (3.33)	1 (3.33)	2 (6.66)	3 (9.99)	1.669	0.644
Parahernia	0	0	2 (56.66)	2 (6.66)	4.138	0.247
Incidence of adverse reactions	3 (10.00)*	4 (13.33)*	12 (40.00)	14 (46.67)	15.51	<0.001

Note: *Compared with the control group, P<0.05.

Table 3. Comparison of SAS and SDS scores in three groups of patients 6 months after the operation

	Adult Test group n=30	Children Test group n=30	Adult control group n=30	Children control group n=30	F	P
SAS	28.67±5.18*	29.69±5.03*	51.07±5.82	50.66±4.98	170.0	<0.001
SDS	29.26±5.11#	29.42±5.17#	50.33±5.62	50.12±4.73	163.4	<0.001

Note: *, #Compared with the control group, P<0.05.

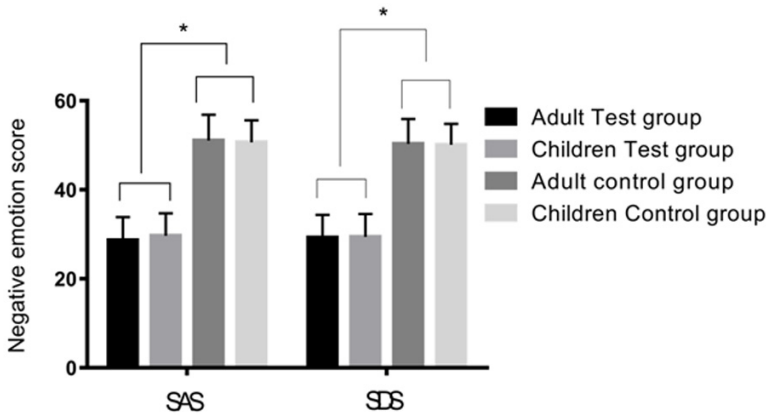

Figure 1. Negative psychological emotion evaluation scores of the four groups at six months after the operation. SAS and SDS scores of the adult and pediatric test groups were significantly lower than those of the control group (P<0.05). No significant differences were observed in SAS and SDS scores before and after nursing in the adult group and pediatric group (P>0.05). Note: *Compared with the control group, P<0.05.

stoma stenosis. Incidence of adverse reactions was 10.00%. In the pediatric test group, incidence of adverse reactions was 13.33%. Two participants reported peripheral dermatitis, one reported invasiveness, and one reported stoma problems. In the adult control group, there were 6 patients with peripheral dermatitis, 2 patients with invagination, 2 patients with stoma stenosis, and 2 patients with parastomal hernia. Incidence of adverse reactions was 40.00%. In the pediatric test group, incidence of complications was 46.67%. Incidence of adverse reactions in the test groups was significantly lower than that in control groups (P<0.05) and incidence of adverse reactions in the pediatric group was slightly higher than that in the adult group (P>0.05) (**Table 2**).

Evaluation of negative psychological emotions six months after the operation

The adult test group reported SAS and SDS scores of 28.67±5.18 and 29.26±5.11 points, respectively, six months after the operation. The pediatric test group reported SAS and SDS scores of 29.69±5.03 and 29.42±5.17 points, respectively. SAS and SDS scores of adult and pediatric groups were significantly lower than those of the control group at six months after the operation. Scores were 51.07±5.82 and 50.33±5.62, respectively (P< 0.05). When the test group and control group were compared within the group, there were no significant differences in SAS and SDS scores in the adult group and pediatric group (P>0.05) (**Table 3** and **Figure 1**).

Evaluation of QOL six months after operation

No significant differences were observed in sleep quality, activity, mental status, and appetite scores between the adult test group and

Table 4. Quality of life of the two groups of patients 6 months after the operation

Project	Adult Test group n=30	Children Test group n=30	Adult control group n=30	Children control group n=30	F	P
Sleep quality	56.57±6.15*	57.39±6.22*	45.92±6.31	44.76±6.12	35.50	<0.001
Activity situation	57.92±4.18#	58.94±4.24#	49.21±4.09	48.93±4.31	49.85	<0.001
Mentality	79.69±4.97&	80.61±5.04&	60.13±5.79	59.67±5.69	141.6	<0.001
Appetite	64.87±6.81¥	65.94±7.01¥	50.88±6.53	50.42±6.15	49.64	<0.001

Note: *, #, &, ¥indicated comparison with the control group, P<0.05.

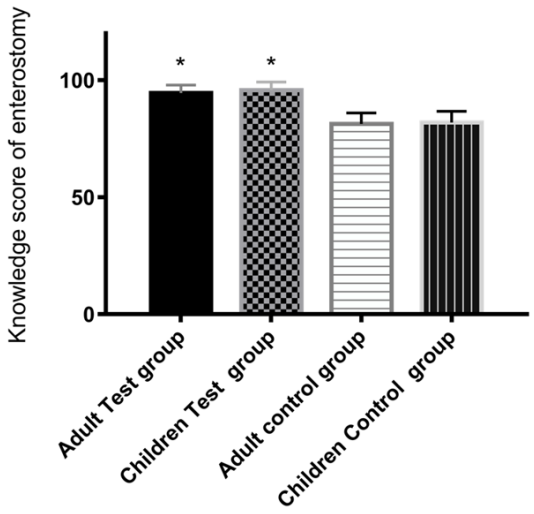

Figure 2. Degree of mastery of knowledge related to enterostomies of the adult and pediatric test groups was significantly higher than that of control groups (P<0.05). No significant differences were noted in degree of mastery of knowledge related to enterostomies within the adult group and the families of the pediatric group (P>0.05). Note: *Compared with the control group, P<0.05.

pediatric test group (P>0.05). Scores of both the adult and pediatric test groups were significantly higher than those of the control group (P<0.05) (**Table 4**).

Degree of mastery of enterostomy knowledge six months after the operation

Enterostomy-related knowledge of the adult test group was 94.57±3.36 points, while that of family members of the pediatric group was 95.71±3.51 points. Relevant knowledge score of the adult control group was (81.33±4.72) points, while that of the pediatric control group was (82.19±4.85) points. Thus, adult and pediatric test groups had a significantly higher level of knowledge related to enterostomies (P< 0.05), compared with the control group. However, no significant differences were found between families of the adult test group and pediatric test group (P>0.05) (**Figure 2**).

Nursing satisfaction

For the adult test group, 19, 10, and 1 patient reported being very satisfied, satisfied, and dissatisfied with nursing, respectively. The satisfaction degree of nursing was 96.67%. The corresponding numbers for family members of the pediatric test group were 17, 11, and 2, respectively, with a satisfaction degree of 93.33%. There were no significant differences in nursing satisfaction between the adult test group and pediatric test group (family members) (P>0.05). However, they scored significantly higher than those in the control group (P<0.05) (**Table 5**).

Discussion

For cases with gastrointestinal malignant tumors, enterostomies can effectively improve the survival of patients. Therefore, it has been widely used in clinical practice [15]. Enterostomy requires pulling the intestine tube to the outside of the abdominal cavity, then suturing the port to the abdominal wall to change the way of defecation. Consequently, the feces discharged from the enterostomy can make the patient susceptible to complications. Severe complications can cause systemic infections, which require a second operation. This causes great pain to the patient and seriously impacts the QOL [16, 17]. Given the short hospitalization of patients after enterostomies, the lack of professional medical care after discharge is highly likely to cause many adverse complications and affect patient QOL [18]. Therefore, the care of patients after discharge is particularly important.

A type of nursing mode after discharge, continuous nursing refers to the use of a series of information-based tools after discharge, including the telephone, internet messaging (WeChat), and door-to-door follow-ups. The aim is to provide professional guidance for daily home nursing of patients and to solve nursing problems in a timely manner [19]. In recent years,

Table 5. Comparison of nursing satisfaction of control group, adult group, and family members of children group [n (%)]

Satisfaction	Adult Test group n=30	Children Test group n=30	Adult control group n=30	Children control group n=30	X^2	P
Very satisfied	19 (63.33)	17 (56.67)	10 (33.33)	9 (30.00)	10.04	<0.050
Satisfied	10 (33.33)	11 (36.67)	6 (20.00)	6 (20.00)	3.469	0.325
Dissatisfied	1 (3.33)	2 (6.67)	14 (46.67)	15 (50.000	28.98	<0.001
Nursing satisfaction	29 (96.67)*	28 (93.33)*	16 (53.33)	15 (50.00)	28.98	<0.001

Note: *Compared with the control group, P<0.05.

studies have reported positive outcomes of continuous nursing in patients with acute myocardial infarction after percutaneous coronary intervention [19] and end-stage renal disease [20]. At present, there is no systematic nursing standard for outpatient care of enterostomies. Few studies have investigated the use of continuous care in patients with enterostomies. Thus, the current research sought to bridge this gap.

The current study first discussed complications of the four groups of patients. Results showed that incidence of adverse reactions in the test group was significantly lower than that in the control group (P<0.05). Although incidence of adverse reactions in children was slightly higher than that in the adult group, no statistically significant differences were observed (P>0.05). Children are more likely to contract infections because they tend to be more active and have poorer immunity, compared with adults. Studies [9] have confirmed that continuous care measures, such as telephone follow-ups, can effectively reduce incidence of complications associated with enterostomies.

This study also evaluated and compared negative emotion scores, QOL, and relevant knowledge of the four groups of patients after six months. Again, the test groups showed scores superior to those of the control group (P<0.05). Studies [21] have explored the impact of continuous care on the QOL of patients with enterostomies, finding that continuous care can effectively improve the QOL and skills of patients. Indeed, continuous care helps improve the confidence of self-care in patients, alleviating depression, anxiety, and other negative emotions of patients and their families [22]. There have been few studies on the application of continuous care in pediatric patients with enterostomies. Therefore, it is necessary to expand the sample to verify the application of continuous care in pediatric patients. Some studies [23] have reported that complications of patients with enterostomies can also aggravate patient negative emotions. Thus, improvement of the negative emotions may be related to the improvement of patient complications.

Finally, this study evaluated nursing satisfaction of the participants. Results showed higher nursing satisfaction in test groups, compared with control groups (P<0.05). Studies [24] have shown that maintaining the continuity of the doctor-patient relationship can effectively improve patient satisfaction, confirming present conclusions.

However, due to inadequate experimental conditions, adult and pediatric care were not compared. The effects of different severities or different pathological factors on nursing were not explored. Also, this study did not conduct detailed quantitative analysis and discussion on nursing results of the four groups.

In summary, regular telephone follow-ups and continuous nursing measures after discharge for adults and children with enterostomies can mitigate the occurrence of complications, improve the QOL of patients, and improve medical care satisfaction of patients and their family members. Therefore, continuous nursing is worthy of clinical promotion.

Disclosure of conflict of interest

None.

Address correspondence to: Yuanyuan Wang, Department of Dermatology, The First Hospital of Jilin University, No. 71 Xinmin Street, Changchun 130000, Jilin, China. Tel: +86-0431-81875683; E-mail: wangyyuan8@163.com

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