

## Review Article

# Comprehensive nursing combined with home care enteral nutrition on improving nutritional status and quality of life of patients with inflammatory bowel disease

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**Abstract:** This study aimed to explore the role of comprehensive nursing on the nutritional status and quality of life (QOL) of patients with inflammatory bowel disease (IBD) treated with home care enteral nutrition (HEN). Altogether, 84 patients with IBD who were treated in our hospital from February 2018 to February 2019 were selected as research participants. Among them, 42 patients were selected as the observation group (OG) to receive comprehensive nursing combined with HEN intervention, while 42 patients were included in the control group (CG) to receive routine nursing intervention. The nutritional status of the two groups of patients after the intervention, the nutritional indexes before and after the intervention, the SAS and SDS scores before and after the intervention, the compliance behaviors of the two groups of patients, the QOL of patients after the intervention, and the nursing satisfaction of the two groups were compared. The nutritional status of the patients in grade A of the OG was evidently higher than that of the CG ( $P < 0.001$ ), while the number of patients in the OG with grade B and grade C was evidently lower than that of the CG ( $P < 0.05$ ). BMI, ALB and PA in the OG were significantly different than those in the CG ( $P < 0.01$ ). SAS and SDS scores in the OG were clearly lower than that of the CG ( $P < 0.001$ ). The total compliance rate of the OG was higher than that of the CG ( $P < 0.05$ ). After intervention, IBDQ scores in the OG were higher than that of the CG ( $P < 0.001$ ), and the total satisfaction of nursing in the OG was higher than that of the CG ( $P < 0.05$ ). Comprehensive nursing combined with HEN can significantly improve the nutritional status and the QOL of IBD patients, which is helpful for clinical treatment.

**Keywords:** Comprehensive care, home care enteral nutrition, inflammatory bowel disease, nutritional status, quality of life

## Introduction

IBD is a chronic inflammatory bowel disease and it can be divided into ulcerative colitis and Crohn's disease. Its symptoms are severe diarrhea, pain, fatigue and weight loss, and it even has life-threatening complications, but its etiology is still unclear [1, 2]. Generally, the excessive immune response of intestinal microflora to antigen stimulation is considered as the reason for promoting the inflammatory process [3]. In the past ten years, the prevalence rate of IBD in some countries in East Asia has been more than doubled [4], which suggests that the prevention and treatment of IBD is urgent. Ma-

Intrusion is very common in IBD, in which patients need more calories and protein [5]. Therefore, it is particularly important to give IBD patients high-quality care and nutritional support.

HEN is used for patients who cannot absorb the required nutrients but need to retain gastrointestinal function. Under the guidance of a professional nutrition support team, home care enteral nutrition support is also supplemented as is the continuation of hospital enteral nutrition [6, 7]. HEN has been established as a reliable and effective nutritional intervention and has been used as a family therapy for a long

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time [8]. At present, the application of HEN is more common and has matured. Its application in severe senile dementia [9], diabetes [10] and nervous system disorder patients [11] has shown good effects and improved the nutritional status of patients. At the time of nutritional support, high quality nursing intervention is the key to promote the improvement of the patients' condition. Comprehensive nursing focuses on a series of factors that affects the recovery of patients, such as the environment, psychological state and other physical factors. It takes the patients as the core of the treatment ideals, it takes modern nursing concepts as the major medical guidance, it takes scientific nursing procedures as the foundational basis, and uses good nursing measures to achieve the purpose of curing disease [12]. At present, many studies have shown that comprehensive nursing is superior to conventional nursing [13, 14], so we guessed that the application of comprehensive nursing combined with HEN can significantly improve the nutritional status and quality of life (QOL) of IBD patients.

To sum up, this study carried out comprehensive nursing and HEN intervention for IBD patients, and studied its influence on the nutritional status and QOL of IBD patients.

### Clinical data and methods

#### *Clinical data of patients*

Altogether, 84 patients with IBD treated in the First Hospital of Wuhan from February 2018 to February 2019 were selected as research participants. Among them, 42 patients were randomly selected as the observation group (OG) to receive comprehensive nursing combined with HEN intervention, while 42 patients were included in the control group (CG) to receive routine nursing intervention. This study was approved by the Medical Ethics Committee of the First Hospital of Wuhan and was in accordance with the Helsinki Declaration. All participants and their families have signed informed consent forms.

#### *Inclusion and exclusion criteria*

**Inclusion criteria:** All patients were diagnosed with IBD by medical examination, which met the diagnostic criteria for IBD [15]; patients in IBD recovery period; patients who could toler-

ate HEN; patients who were expected to maintain in treatment compliance with HEN for 3 months; patients who had complete clinical data; patients who could be followed-up; patients and their families have signed the informed consent form.

**Exclusion criteria:** Patients with severe IBD, who were pregnant or lactating, with mental dysfunction, communication disorders, cardiovascular and cerebrovascular diseases, liver and kidney dysfunction; patients combined with other metabolic diseases; patients dropped out halfway during HEN.

#### *Nursing methods*

The CG was treated with routine nursing, including medication guidance and dietary guidance.

The OG was treated with comprehensive nursing combined with HEN intervention. The specific contents are as follows: (1) HEN training: The relevant HEN nursing knowledge, included aseptic concepts, aseptic operation, catheter care, preparation of enteral nutrition preparation, precautions and prevention of complications was introduced to patients and their families. (2) Follow-up: The follow-up was carried out weekly by telephone or visit to observe and record the HEN status of the patient, and answer and guide any existing problems. (3) Health education: The patients and their families were notified of the hazards of IBD and the importance of treatment, were explained about the causes, symptoms, prevention and treatment methods and nursing measures, and were patiently answered in regard to their questions. (4) Nursing of complications: Obstruction of the pipeline: Na HCO<sub>3</sub> solution was used to rinse and dissolve, water flushing was then carried out, and the catheter could also be dredged with a guide wire by the catheterization physician. Infection: Polyimide and silica gel feeding tubes were selected, and those who were intubated through the nose were observed for the integrity of nasal mucosa daily, and had their nasal cavity and oral cavity daily and lubricated and cleaned daily. Abdominal pain: The nature, location, pain degree and position of abdominal pain were defined to take appropriate sedative and analgesic methods and give patients spasmolytic drugs, so as to relieve pain. Bleeding: IBD patients are prone to gastrointestinal bleeding symptoms such as pus and

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**Table 1.** SGA nutrition assessment criteria

Indicators	A (good nutrition)	B (moderate malnutrition)	C (severe malnutrition)
Recent weight change	No/Rise	Reduction by less than 5%	Reduction by more than 5%
Diet change	No	Reduce	No food/low calorie fluid food
Gastrointestinal symptoms	No/loss of appetite	Slight nausea and vomiting	Severe nausea and vomiting
Changes in mobility	No/Decrease	Able to get out of bed and move	Bedridden
Stress response	No/Low	Moderate	Severe
Muscle consumption	No	Mild	Severe
Triceps skinfold (mm)	>8	6.5-8	<6.5
Ankle edema	No	Mild	Severe

bloody stool. The changes of patients' vital signs were closely observed, and measures such as hemostasis and fluid infusion were given to patients in a timely manner. Diarrhea: The number of occurrences of diarrhea, the color of stool and whether there is mucus or pus and blood were observed to carry out symptomatic treatment, and the patient's bed was ensured to be smooth and comfortable. After each bowel movement, the patients were cleaned and nursed with warm water. (5) Medication guidance: The principle and effect of medication, the medication time, dosage and precautions were explained to patients. The adverse reactions were informed to patients so that the patient can have a correct understanding of the above-mentioned relevant knowledge, thus better cooperating with the treatment. (6) Psychological nursing: The nursing staff actively and enthusiastically communicated with the patient, understood the patient's condition and psychological development, provided good suggestions according to the situation to reduce the anxiety, fear and other negative emotions, and to build courage and confidence for patients to overcome the disease. (7) Rehabilitation training: For patients with faster recovery, appropriate amount of exercise was encouraged to strengthen physical health.

### Outcome measures

Main outcome measures: SGA Nutrition Assessment Scale [16] was applied to assess the nutritional status after 3 months of intervention. The assessment criteria are shown in **Table 1**. The QOL after 3 months of intervention was evaluated by IBD Quality of Life Scale (IBDQ) [17], including intestinal symptoms, systemic symptoms, emotional health and social function, with a total score of 32-224 points. A high score was closely related to the better quality of life.

Secondary outcome measures: The nutritional index levels before and after intervention were observed, including Body Mass Index (BMI), Albumin (ALB) and serum Prealbumin (PA). The SAS and SDS scores were applied to explore the negative emotions before and after nursing intervention. A SAS/SDS total score lower than 50 indicates normal, and a high score is closely related to a more serious level of anxiety/depression. The compliance behavior of the two groups of patients during nursing was evaluated by the self-made compliance scale of our hospital. The self-made nursing satisfaction questionnaire of our hospital was used to evaluate the nursing satisfaction (total satisfaction = satisfactory + basically satisfactory), and the nursing satisfaction was observed.

### Statistical analysis

This study used SPSS 20.0 (SPSS Co., Ltd., Chicago, USA) to perform statistical analysis, GraphPad Prism 7 (Graphpad software Co., Ltd., San Diego, USA) to illustrate the figures. Counting data were represented as usage (%) and were analyzed by chi-square test, which expressed as  $\chi^2$ . Measurement data were represented by Mean  $\pm$  SD. All measurement data conformed to a normal distribution. Independent sample t test was applied for pair-wise comparison, and paired t test for intra-group comparison, both were expressed by t.  $P < 0.05$  indicated as statistically significant difference.

## Results

### Comparison of general clinical data

By comparing the general clinical data, it was revealed that there was no evident difference in age, sex, BMI, course of disease, disease type, educational level, smoking history, drinking history and residence between the OG and CG ( $P > 0.05$ ), as shown in **Table 2**.

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**Table 2.** Comparison of general clinical data

Factor	OG (n=42)	CG (n=42)	t/ $\chi^2$	P
Age	38.5±8.1	37.3±7.7	0.696	0.489
Gender				
Male	24 (57.14)	28 (66.67)	0.808	0.369
Female	18 (42.86)	14 (33.33)		
BMI (kg/m <sup>2</sup> )	17.81±1.87	17.64±1.75	0.430	0.668
Course of disease (years)				
<1	19 (45.24)	24 (57.14)	1.191	0.275
≥1	23 (54.76)	18 (42.86)		
Disease type				
Ulcerative colitis	22 (52.38)	26 (61.90)	0.778	0.378
Crohn's disease	20 (47.62)	16 (38.10)		
Education level				
Below high school	16 (38.10)	13 (30.95)	0.474	0.491
High school or above	26 (61.90)	29 (69.05)		
Smoking history				
Yes	36 (75.00)	39 (92.86)	1.120	0.290
No	6 (25.00)	3 (7.14)		
Drinking history				
Yes	33 (68.75)	35 (77.78)	0.309	0.578
No	9 (31.25)	7 (22.22)		
Residence				
Urban	16 (38.10)	19 (45.24)	0.205	0.651
Rural	26 (61.90)	23 (54.76)		

**Table 3.** Comparison of nutritional status

Group	Grade A	Grade B	Grade C
Observation group (n=42)	28 (66.67)	13 (30.95)	1 (2.38)
Control group (n=42)	11 (26.19)	23 (54.76)	8 (19.05)
$\chi^2$	13.83	4.861	6.098
P	<0.001	0.028	0.014

*The nutritional status of the observation group was better than that of the control group*

After evaluating the nutritional status of the two groups of patients after intervention, it was found that the nutritional status of the OG was grade A in 28 cases (66.67%), grade B in 13 cases (30.95%), grade C in 1 case (2.38%); while the nutritional status of the CG was grade A in 11 cases (26.19%), grade B in 23 cases (54.76%), grade C in 8 cases (19.05%). The number of patients found to be in grade A in the OG was greater than those in the CG ( $P<0.001$ ), while the number of patients in grade B and grade C were evidently less than those in the CG ( $P<0.05$ ), see **Table 3**.

*BMI, ALB and PA in the observation group were significantly higher than those in the control group*

By comparing the nutritional indicators, it was revealed that there was no evident difference in BMI (17.81±1.87) (17.64±1.75), ALB (29.78±1.21) (30.26±1.25), and PA (177.48±11.38) (174.83±12.17) between the OG and the CG before the intervention ( $P>0.05$ ). After the intervention, the BMI (19.62±2.03), ALB (33.76±1.26), and PA (256.34±12.27) of the OG were higher than those before the intervention ( $P<0.001$ ); while the BMI (18.32±2.12) of the CG had no significant difference ( $P>0.05$ ), the ALB (32.18±1.32) and PA (218.61±13.42) were both higher than those before intervention ( $P<0.001$ ). Moreover, BMI, ALB and PA in the OG evidently interfered with the CG ( $P<0.01$ ), as shown in **Figure 1**.

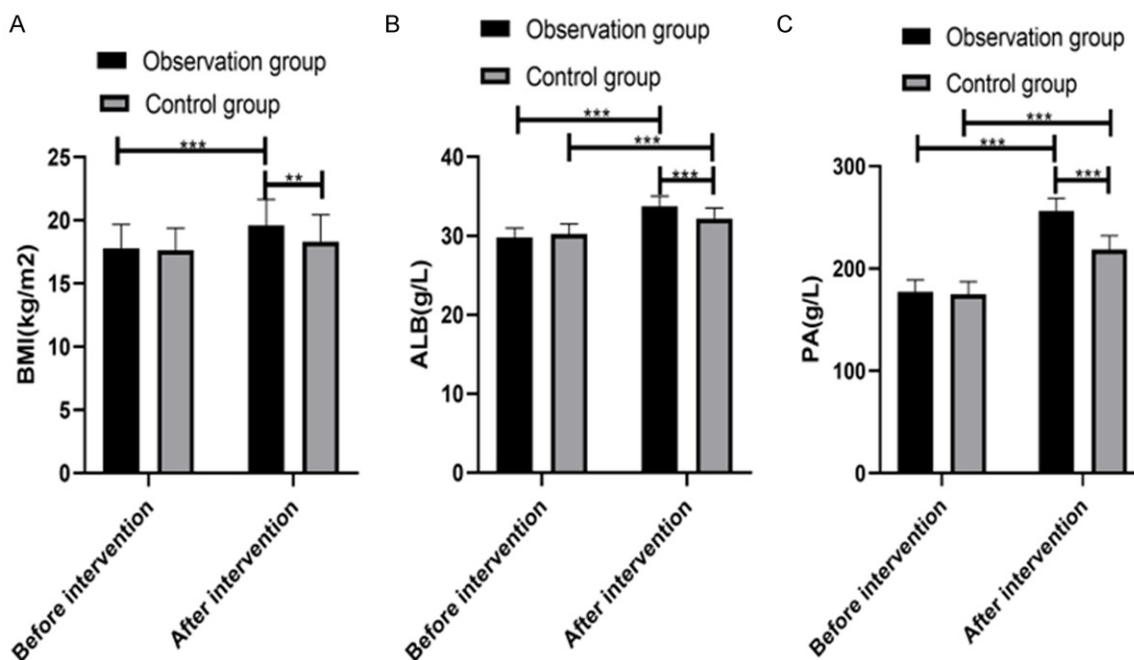
*SAS and SDS scores in observation group were significantly lower than those in control group*

There was no evident difference in SAS and SDS scores before intervention between groups ( $P>0.05$ ). After intervention, SAS and SDS scores were lower than

before intervention ( $P<0.05$ ), and SAS and SDS scores of the OG were lower than those of the CG ( $P<0.001$ ), as shown in **Table 4**.

*Compliance of the observation group was significantly higher than that of control group*

By comparing the compliance behaviors of the two groups of patients, it was revealed that there was no evident difference between the OG and the CG in complete compliance and basic compliance ( $P>0.05$ ); while the non-compliance of the OG was significantly less than that of the CG ( $P<0.05$ ), and the total compliance rate of the OG was higher than that of the CG ( $P<0.05$ ), as shown in **Table 5**.



**Figure 1.** Comparison of nutritional indexes between two groups of patients before and after intervention. A. There was no significant difference in BMI between the two groups. The BMI of patients in observation group after intervention was significantly higher than that before intervention. B. There was no significant difference in ALB between the two groups before the intervention. ALB in the two groups after intervention was significantly higher than that before the intervention, and ALB in the observation group was significantly higher than that in the control group. C. There was no significant difference in PA before the intervention. After the intervention, PA was significantly higher than that before the intervention. PA in the observation group was significantly higher than that in the control group. \*\* means  $P < 0.01$ , \*\*\* means  $P < 0.001$ .

**Table 4.** Comparison of SAS and SDS scores

Group	SAS		SDS	
	Before intervention	After intervention	Before intervention	After intervention
Observation group (n=42)	70.63±4.76	42.16±3.21*	66.28±4.48	38.24±3.59*
Control group (n=42)	68.84±4.52	48.79±4.16*	67.78±4.67	45.58±4.25*
t	1.767	8.177	1.502	8.550
P	0.081	<0.001	0.137	<0.001

\* $P < 0.001$ .

**Table 5.** Comparison of compliance behavior

	Observation group (n=42)	Control group (n=42)	$\chi^2$	P
Complete compliance	15 (35.71)	10 (23.81)	1.424	0.233
Basic compliance	23 (54.76)	21 (50.00)	0.191	0.662
Non-compliance	4 (9.53)	11 (26.19)	3.977	0.046
Total compliance	38 (90.47)	31 (73.81)		

IBDQ score of observation group was significantly higher than that of control group

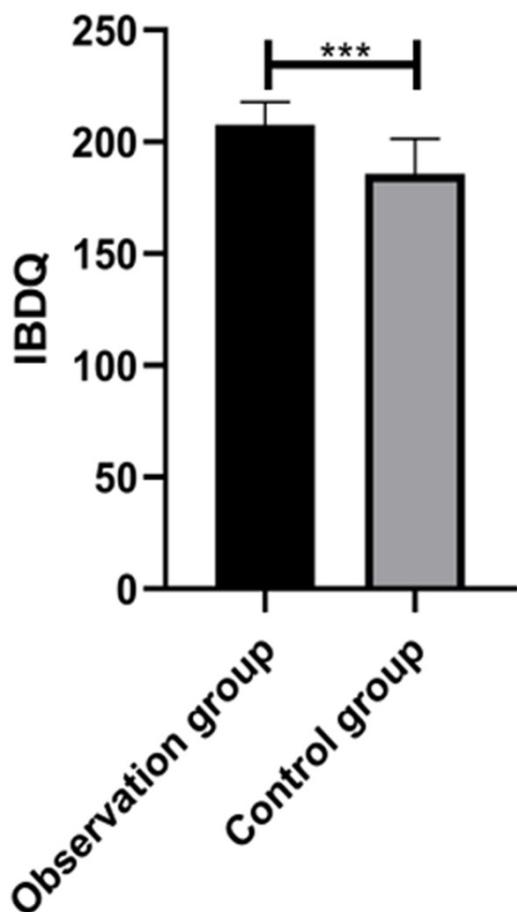
The IBDQ score of the OG (207.52±10.24) was higher than that of the CG (185.74±15.56)

( $P < 0.001$ ) after the intervention, as shown in **Figure 2**.

The nursing satisfaction of the observation group was higher than that of the control group

By comparing the satisfaction results of the two groups of patients with the nursing work, it

was found that the observation group was satisfied with the nursing work in 17 cases, basically satisfied in 22 cases, unsatisfied in 3 cases, with a total satisfaction rate of 92.86%. In the CG, 10 cases were satisfied, 21 cases



**Figure 2.** Comparison of IBDQ scores between the two groups after intervention. The IBDQ scores after intervention in the observation group were significantly higher than those in the control group, \*\*\* indicates  $P < 0.00$ .

were basically satisfied, 11 cases were not satisfied, and the total satisfaction was 73.81%. The total satisfaction rate of nursing in the OG was significantly higher than that in the CG ( $P < 0.05$ ), as shown in **Table 6**.

### Discussion

IBD has become a global disease. Although the incidence rate in western countries has gradually stabilized, in newly industrialized countries it has increased rapidly and the burden of IBD is still very high. The global spread of IBD seems to be related to the westernization of diet and environment, which will affect the intestinal microflora and increase the risk of IBD for susceptible populations. Therefore, prevention and management of IBD are particularly important [18, 19]. IBD is associated with malnutrition

and weight loss in patients. HEN, as a nutritional support method, can effectively supplement the nutrition needed by patients. Studies have shown that nutritional support can promote wound healing, reduce complications, shorten hospital stay and reduce mortality. Therefore, the application of home enteral nutrition (HEN) has been increasing worldwide [20]. In view of the benefits of HEN, we consider that comprehensive care for patients receiving HEN may lead to better curative effects. Therefore, this experiment intended to explore the role of comprehensive care with HEN on improving the nutritional status and QOL of IBD patients, and provide valuable basis for better clinical management of IBD patients.

In this study, the CG was treated with routine treatment and nursing, and the OG was treated with comprehensive nursing combined with HEN. First, we evaluated the nutritional status of the patients after receiving nursing for three months. The results revealed that the number of patients with good nutritional status in the OG were evidently more than in the CG, while the number of patients with moderate and severe malnutrition in the OG were evidently less than in the CG, which revealed that comprehensive nursing with HEN could effectively improve the nutritional status of the patients and promote the improvement of the patient's condition. Then we tested the nutritional indexes of the two groups of patients. The results showed that BMI, ALB and PA of the OG were clearly higher than those of the CG. Malnutrition is a common problem in IBD patients. Most of them are underweight, anemic and lack of basic nutrients, especially protein [21]. In this study, the BMI and protein in the OG were improved, further indicating that comprehensive nursing combined with HEN could effectively supplement the nutrition needed by the patients, thus improving the nutritional status of the patients. Levine et al. [22] revealed that enteral nutrition (EN) could improve the nutritional status of IBD patients, alleviate the disease and promote the recovery of health, which was similar to our research results. IBD is a disease related to immune dysfunction and chronic inflammation of digestive tract, which leads to deficiency of related micronutrients and can be treated by changing diet type [23]. Studies have shown that dietary fiber can be metabolized by intestinal microbiota; and short chain

**Table 6.** Comparison of nursing satisfaction

Group	Observation group (n=42)	Control group (n=42)	X <sup>2</sup>	P
Satisfied	17 (40.48)	10 (23.81)	1.899	0.168
Basic satisfied	22 (52.38)	21 (50.00)	0.167	0.409
Unsatisfied	3 (7.14)	11 (26.19)	5.486	0.019
Total satisfaction	39 (92.86)	31 (73.81)		

fatty acids (SCFA), a microbial metabolite, can regulate intestinal homeostasis [24], so diet is crucial to the development and maintenance of healthy microbiota. In our study, HEN administration of nutritional supplements suitable for patients played a key role in maintaining the steady state of intestinal flora, thus improving inflammatory response and promoting nutrient absorption.

IBD patients have an increased prevalence of anxiety and depression, and an increased prevalence of severe IBD [25]. Studies by Mikocka et al. [26] showed that depression and anxiety were independently related to the relapse of IBD, so it's also worthy for improving the psychological state of patients. We evaluated the SAS and SDS scores and found that the SAS and SDS scores before the intervention between groups were not evidently different, but decreased evidently after the intervention. The SAS and SDS scores of the OG were evidently lower than those of the CG, indicating that the anxiety and depression of IBD patients before intervention were obvious, while comprehensive nursing combined with HEN could effectively improve the psychological status of the patients, and the effect was better than that of routine nursing. Based on the concept of people-oriented care, this study carried out targeted comprehensive nursing from the aspects of health education, psychological nursing and prevention of complications. Combined with HEN treatment, it improved the patients' confidence in treatment and the recovery of patients' health, thus improving their psychological status. The patient's treatment compliance is very important for the patient's recovery. Poor compliance behavior will affect the patient's therapeutic effect and postoperative improvement [27], so improving the patient's compliance is the key to recovery. Many patients suffer from psychological burden due to lack of understanding of the disease, and the compliance is low due to lack of

understanding of the treatment plan [28]. Therefore, we evaluated the patient's compliance behavior during the intervention period and found that the compliance of the OG was higher than that of the CG, indicating that comprehensive nursing with HEN could significantly improve the patient's compliance. The psychological

intervention in this study gained the patients' confidence in the treatment and the health education for the patients deepened the patients' understanding of the disease and the treatment methods, thus improving the compliance. Patients understanding of the disease and its treatment is an important connection between the health and QOL of patients with chronic diseases, which is also a cause of individual differences in chronic disease adaptation [29]. Health-related QOL for IBD patients is poor [30], especially for IBD patients of working age with depression and anxiety symptoms, who suffer from serious physical, psychological and social impairments [31]. Therefore, we evaluated the QOL after nursing intervention and found that the IBDQ score of the OG was higher than that of the CG, which indicated that comprehensive nursing combined with HEN intervention could effectively improve the QOL of patients with IBD. We encouraged patients with faster recovery to carry out appropriate rehabilitation training, and we intervened in any possible complications. The results showed the benefits of this intervention method. Research by Calvet et al. [32] pointed out that comprehensive nursing for patients with inflammatory bowel disease could avoid disease progression and treatment-related complications, and enable patients to achieve normal social functions and improve their quality of life. This was basically consistent with our research results. Finally, we compared the satisfaction with nursing work and found that the satisfaction in the OG was higher than that in the CG, which showed that comprehensive nursing combined with HEN was beneficial for patients and is worthy of treatment.

There are still some deficiencies in this research. For example, the nutritional status and QOL before nursing were not evaluated. The deficiencies will be supplemented in future studies to further support the research conclusion.

To sum up, comprehensive nursing combined with HEN intervention for patients with IBD can significantly improve the nutritional status and the QOL of patients, which is worthy of clinical application.

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### Disclosure of conflict of interest

None.

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