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Original Article

The therapeutic effects of comfortable nursing on digestive endoscopy patients

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Abstract: Objective: To study the therapeutic effects of comfortable nursing on digestive endoscopy patients. Methods: A retrospective study was conducted on 500 digestive endoscopy patients. In the control group, 250 patients were treated with routine nursing. In the experimental group, 250 patients received both comfortable and routine nursing. Anxious and depressive moods, the degree of pain, the physiological stress response, the incidence of adverse reactions, and the satisfaction with the nursing were compared between the patients in the two groups. Results: When compared with the patients in the control group, the self-rating anxiety scale (SAS) scores, (self-rating depression scale), the SDS scores, the visual analogue scale (VAS) scores, the heart rate, the mean arterial pressure (MAP), and the incidence of adverse reactions in the experimental group were decreased significantly (all $P<0.05$). Meanwhile, the satisfaction with the nursing in the experimental group was significantly higher than it was in the control group ($P<0.001$). Conclusion: Comfortable nursing provides patients with improved moods, relief from pain, a decreased physiological stress response, and a reduced incidence of adverse reactions.

Keywords: Digestive endoscope, comfortable nursing, therapeutic effect

Introduction

With the advent of changed eating habits, increased social pressure, and the accelerated pace of life, the incidence of digestive diseases has been increasing year by year. According to the results of epidemiological investigations, the incidence rate of digestive diseases worldwide is at 10-12%, posing a great threat to human physical and mental health [1, 2]. An important method for the diagnosis and treatment of digestive system diseases, digestive endoscopies are widely used in clinical practice [3, 4]. With the assistance of digestive endoscopy, structural changes in the digestive tract wall can be clearly observed, making the evaluation of patients' conditions more accurate. Therefore, digestive endoscopy plays an important role in making treatment plans and improving patents' prognoses [5, 6]. However, digestive endoscopies are traumatic to patients, resulting in an aggravated physiological stress response, fluctuating vital signs, and varied degrees of pain [7]. Due to their lack of knowledge of digestive endoscopy, patients have different levels of anxiety, depression, and even rejection of the examination, leading to a delayed optimal treatment time [8, 9]. During the examination, patients have various adverse reactions such as nausea, vomiting, and coughing, resulting in adverse emotions like psychological resistance [10]. In order to alleviate patients' discomfort and pain, nursing intervention is applied to improve the patients' compliance with the examination and the success rate of the examination [11]. Researchers have been confronted with the challenge of developing an effective nursing model to improve digestive endoscopy patients' anxiety and depression, degree of pain, physiological stress response, incidence of adverse reactions, and satisfaction with nursing.

The routine nursing prepared for patients in digestive endoscopy fails to produce a satisfactory therapeutic effect. There are many reasons for this. First, the health guidance is insufficient. Second, the knowledge dissemination is inadequate. Third, the treatment of the adverse reactions is not immediate. Fourth, the pati-

ents' negative emotions are not appreciated. Last but not least, the compliance with the examinations and satisfaction in nursing are low [12]. As a brand-new nursing model, comfortable nursing provides a more reasonable and high-quality service for patients. Patient-centered nursing is undertaken to minimize the physical, psychological, social, and spiritual discomfort. In other words, it aims to generate a sense of pleasure to the greatest extent [13]. It was reported that comfortable nursing can make patients be satisfied, relaxed, and free, resulting in a reduced stress response and reduced negative emotions, and increased medical compliance [14]. At present, reports on the application of comfortable nursing in the process of diagnosis and treatment with digestive endoscopy focuses on different aspects [15]. Ekkelenkamp et al. reported the influence of comfortable nursing on the success rate of the examination with digestive endoscopy [16]. Devitt reported the therapeutic effect of comfortable nursing on medical compliance and adverse reactions during digestive endoscopy examinations [17]. Here, 500 patients were enrolled in this study to determine the therapeutic effects of comfortable nursing on the diagnosis and treatment with digestive endoscopy. Anxious and depressive moods, the degree of pain, the physiological stress response, the incidence of adverse reactions, and the satisfaction with nursing were the focus of our observations.

Materials and methods

General information

In this study, 500 patients undergoing digestive endoscopies in the Affiliated Hospital of Medical School of Ningbo University from June 2016 to June 2017 were enrolled as the study cohort.

Inclusion criteria: Patients under 70 years old; patients who met the criteria for a digestive endoscopy and who had not undergone the examination previously; patients classified in the American Society of Anesthesiologists (ASA) groups I and II [18].

Exclusion criteria: Patients with severe liver or kidney dysfunction; patients with cardiovascular and cerebrovascular diseases; patients with contraindications to digestive endoscopy, including corrosive intestinal inflammation, acute gastrointestinal tract, and esophageal perforation; patients with infectious diseases; patients with contraindications to anesthesia or analgesia; patients with mental illnesses; patients with incomplete medical records; patients who were unable to cooperate in this study.

According to the inclusion and exclusion criteria, patients who underwent a digestive endoscopy were enrolled in this retrospective study. For the control group, 250 patients received routine nursing. For the experimental group, 250 patients were treated with both comfortable and routine nursing.

This study was approved by the Ethics Committee of Affiliated Hospital of Medical School of Ningbo University. Informed consents were signed by the patients.

Methods

All the patients enrolled in this study received nursing intervention, which started one day before the digestive endoscopy and ended one day after the procedure.

The patients in the control group were treated with routine nursing. In this group, the patients received routine health education, their medical and drug allergy histories were taken, their vital signs were recorded, and laboratory tests, such as viral hepatitis type B and electrocardiograms, were performed. To prepare for the procedure, the patients drank no water for 6 hours and ate no food for 12 hours before the procedure. Afterwards, the patients were instructed to avoid eating and coughing. The patients and their families were informed of the adverse reactions that may occur during the procedure, and they were told to ask for help if needed.

The patients in the experimental group received both comfortable and routine nursing. In this group, the patients received environmental intervention, psychological nursing, and care for adverse reactions. As for the hospital environment, the patients were examined in a quiet, hygienic and comfortable environment. The relative humidity was 55% and the room temperature was 24°C-26°C; soft and soothing music was played to eliminate the impact of the examination on patients' physical and mental health; moreover, the patients' privacy was well protected. As for psychological nursing, the

patients were provided with relevant information about the procedure. They were made aware of the precautions and potential adverse reactions during the examination, resulting in alleviated or eliminated discomfort, or a stress response occurred during the process. The patients' psychological changes during the whole process were closely followed, and guidance was immediately performed. The patients' psychological discomfort was minimized, and a gentle and sincere communication was built between medical staff and patients to help them vent their negative emotions. In this way, the patients were more confident and active in undergoing the procedure. In order to improve the capacity of self-regulating inner emotions, the patients were instructed to train their muscles and take a deep breath. As for the care of the adverse reactions, their adverse reactions, like serious vomiting, shortness of breath, abdominal pain, and a sensation of bloating were closely monitored, and they were trained to deal with complications using simple nursing methods. The doses and injection speeds of the anesthetic drugs were determined according to each patient's situation. The patients' vital signs were closely monitored, and the doctors were made aware of the changes immediately. In addition, first-aid medicine was prepared in advance. When the patients were short of breath, their jaws were immediately lifted and enhanced oxygen flow were provided. As for the patients with nausea and vomiting, their vomit was cleaned up in time to avoid any airway obstruction and to make the patients feel comfortable again. Patients with abdominal pain and a sensation of bloating were treated with abdominal massage or Zusanli acupressure to accelerate their venting and to relieve pain. The patients and their families were informed of the detailed reasons for the adverse reactions [19].

Outcome measures

The self-rating anxiety scale (SAS) and the self-rating depression scale (SDS) were applied to evaluate the mental state of patients in the two groups before and after treatment [20, 21]. Both the SAS and SDS scores are composed of 20 items, and the scores were determined using a 4-point scoring method. For the SAS score, 50 points was the cut-off value; patients with scores below 50 points were considered to be free of anxiety, while patients with scores equal to and above 50 points were considered to be anxious. The higher the score, the more severe the anxiety. For the SDS score, 53 points was the cut-off value; patients with scores below 53 points were considered to be free of depression, while the patients with scores equal to and more than 53 points were considered to be depressed; The higher the score is, the more severe the depression.

The visual analogue score (VAS) was used to assess the pain degree of patients in the two groups after treatment. The total possible score was 10 points; no pain was 0 points; endurable pain was 1-3 points; endurable pain that interrupted sleep was 4-6 points; intolerable pain that interrupted sleep and diet was 7-10 points.

Heart rate and mean arterial pressure (MAP) were applied to evaluate the physiological stress response of patients in the two groups before and after treatment.

The incidences of adverse reactions between the two groups was also compared. During the examination, the patients' adverse reactions, like abdominal pain, the sensation of bloating, nausea, coughing, and restlessness, were recorded.

The assessment of the nursing satisfaction was subjectively made according to the environment, health education, nursing professionality, working attitudes, and nursing effects. The total possible score was 100 points; very satisfied (≥90 points); satisfied (≤90 points and ≥70 points); unsatisfied (≤70 points) [22].

Statistical methods

The data were analyzed using SPSS statistical software version 22.0 (IBM, USA). The measurement data were calculated as the mean ± standard deviation ($\bar{x}$ ± SD). Independent sample t tests were used for the inter-group comparisons, and paired t-tests were applied for the before-after comparisons within the same group. The enumeration data were expressed as number/percentage (n/%); comparisons were conducted using chi-square tests. A difference was statistically significant when the *P* value was less than 0.05.

Results

Basic data

As displayed in **Table 1**, there were no significant differences concerning age, gender, dura-

Table 1. Comparison of the basic data

Group	Control group (n=250)	Experimental group (n=250)	χ^2 value	*P* value
Age (years)	54.6±4.5	55.3±4.8	1.682	0.093
Gender (n)			3.284	0.070
Male	155	135		
Female	95	115		
Duration of the disease (months)	3.5±0.8	3.4±0.6	1.581	0.115
BMI (kg/m^2)	21.2±1.3	20.8±1.1	0.571	0.568
Digestive endoscopy			0.350	0.840
Gastroscopy	120	126		
Enteroscopy	100	97		
Gastroscopy and enteroscopy	30	27		
Underlying disease			0.591	0.442
Hypertension (n)	56	49		
Diabetes (n)	42	38		

Note: BMI, body mass index.

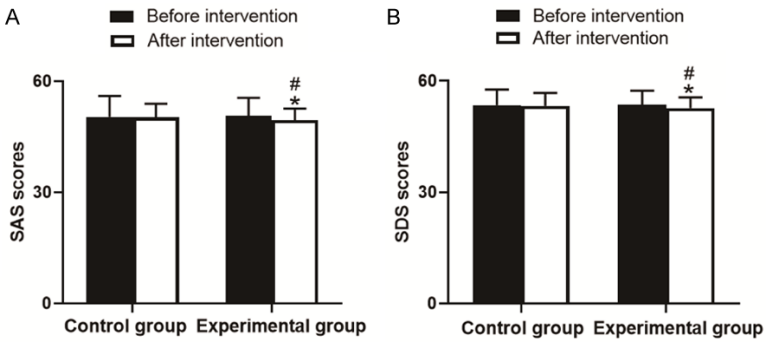

Figure 1. Comparison of the SAS and SDS scores. A. SAS score. B. SDS score. Note: Compared with the patients in the same group before the intervention, *P<0.05; compared with the patients in the control group after the intervention, #P<0.05; SAS, self-rating anxiety scale; SDS, self-rating depression scale.

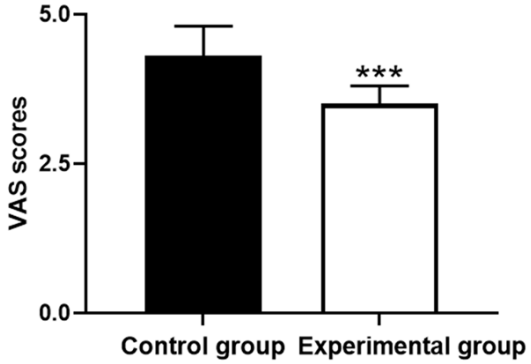

Figure 2. Comparison of the VAS scores. Note: Compared with the control group, ***P<0.001.

tion of the disease, type of endoscopic diagnosis and treatment, and underlying diseases in the two groups (all P>0.05).

SAS and SDS score

As shown in **Figure 1**, there were no significant differences in the SAS and SDS scores between the two groups before the intervention (50.4±5.6 vs 50.6±4.9, P>0.05; 53.5±4.2 vs 53.6±3.8, P>0.05); the SAS and SDS scores were significantly decreased in the experimental group after the intervention when compared with the scores before the intervention (both P<0.05); Compared with the control group, the SAS and SDS scores were significantly lower than the scores in the experimental group after the intervention (50.2±3.7 vs 49.5±3.1, P<0.05; 53.3±3.5 vs 52.7±2.9, P<0.05).

Degree of pain

As illustrated in **Figure 2**, the VAS scores in the experimental group were significantly lower than they were in the control group (3.5±0.3 vs 4.5±0.5, P<0.001).

Physiological stress response

As shown in **Figure 3**, there were no significant differences in heart rate or MAP in the two groups before the intervention (73.2±8.6 vs 73.0±8.1, P>0.05) (79.2±6.8 vs 78.9±6.4, P>0.05). The heart rate and MAP in the two

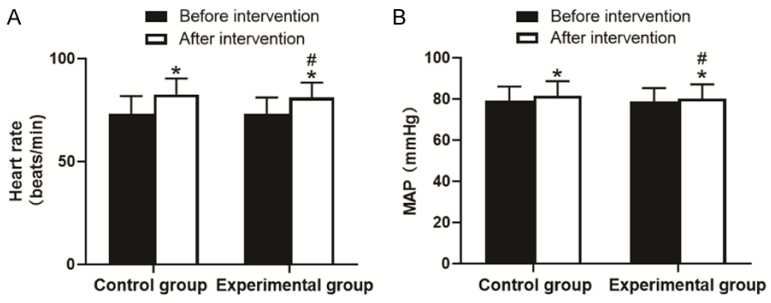

Figure 3. Comparison of the heart rates and MAP. A. Heart rate. B. MAP. Note: Compared with patients in the same group before the intervention, *P<0.05; compared with the patients in the control group after the intervention, #P<0.05; MAP, mean arterial pressure.

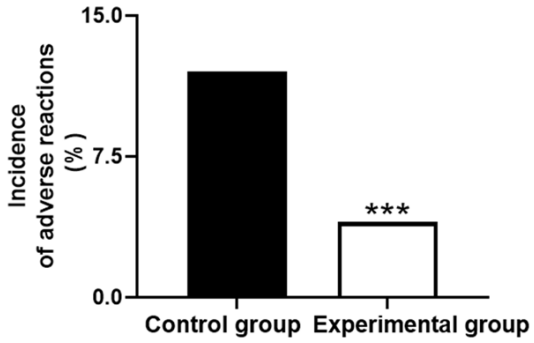

Figure 4. Comparison of the incidences of adverse reactions. Note: Compared with the control group, ***P<0.001.

groups after the intervention were significantly increased when compared with the levels before the intervention (both P<0.05). Compared with the control group, the heart rate and MAP were significantly lower than they were in the experimental group after the intervention (82.6±7.8 vs 81.1±7.3, P<0.05; 81.5±7.1 vs 80.2±6.9, P<0.05).

Incidence of adverse reactions

The incidence of adverse reactions in the experimental group, which was composed of abdominal pain (1 case), the sensation of bloating (2 cases), nausea (4 cases), coughing (2 cases), and restlessness (1 case), was significantly lower than it was in the control group, which consisted of the sensation of bloating (7 cases), nausea (9 cases), coughing (6 cases), and restlessness (3 cases) (4% vs 12%, P<0.001, **Figure 4**).

Satisfaction in nursing

The satisfaction with the nursing in the experimental group was significantly higher than it was in the control group (93.6% vs 82.0%, P<0.001, **Table 2**).

Discussion

As a commonly used method for the diagnosis and treatment of digestive diseases, digestive endoscopy has some advantages, including high accuracy, high safety, and little trauma. The disadvantages of the procedure include an increased risk of adverse reactions, such as serious vomiting, abdominal pain and the sensation of bloating, exacerbated physiological stress reactions, and anxious and depressive moods. These drawbacks seriously lower the success rate of the examination. Recently, the concept of clinical nursing has changed, and the nursing model is being updated. The quality of medical care plays an important role in improving the effect of diagnosis and treatment [23].

As a novel nursing model, comfortable nursing, which mainly consists of environmental intervention, psychological nursing, and care for adverse reactions, is adopted during the digestive endoscopies. Comfortable nursing is personalized, holistic, and effective. In this model, attention is not only paid to the condition and nursing of the disease, but also the psychological and physical care of patients. With enhanced satisfaction and comfort, patients' compliance with the examination is raised. Successful completion of the examination contributes to the accelerated recovery of patients [24]. In recent years, comfortable nursing has been used in many areas like cancer treatment, and a relative satisfactory therapeutic effect is achieved [25]. It was reported that improved psychological states, alleviated pain, and a higher quality of life in patients with tumors can be realized with comfortable nursing [26]. Wittenberg et al. reported that comfortable nursing can improve a negative mood, minimize discomfort, and improve compliance. With improved symptoms, life quality, and mental health, patients are more likely to recover from diseases [27].

Anxious and depressive moods caused by the endoscopies severely decrease the procedure's success rate [32]. The SAS and SDS scores are authoritative and clinically applica-

Table 2. Comparison of the satisfaction with the nursing (n)

Group	Very satisfied	Satisfied	Unsatisfied	Very satisfied and satisfied
Experimental group	95	110	45	82.0%
Control group	134	100	16	93.6%
χ^2 value				15.70
P value				<0.001

ble in quantitatively assessing psychological conditions [33]. The results of our study showed that the SAS and SDS scores of the patients in the experimental group were significantly reduced when compared with the scores in the control group (P<0.05), suggesting that patients are in significantly anxious and depressive moods during the examinations. This is consistent with the result reported by Lauriol et al. [34].

It was reported that comfortable nursing is beneficial for the improvement of patients' life-quality indicators, such as degree of pain, physical performance, and mental health [29]. During the procedure, the patients' pain tolerance is raised when they are in a comfortable environment. Here, the VAS scores in the experimental group were significantly lower than they were in the control group (P<0.001). This means that comfortable nursing efficaciously reduces endoscopy patients' pain.

Comfortable nursing can effectively reduce patients' physiological stress responses. Patients' cortisol and catecholamine levels, which are regulated by the nervous and endocrine systems, are rapidly increased due to their physiological stress responses and fears. Patients heart rates and blood pressure increase [30]. For intensive care unit (ICU) patients, comfortable nursing can significantly enhance the effect of sedative and analgesic drugs, leading to a reduced application of anesthetic drugs [31]. In this study, the heart rate and MAP were used to assess the patients' physiological stress responses. Our results showed that the heart rates and MAP in the experimental group after the intervention were significantly lower than they were in the control group (P<0.05). This suggests that comfortable nursing is beneficial in maintaining a good physiological state, resulting in a steady heart rate and MAP.

Improvement of patients' comfort is the principle of comfortable nursing. In this new model, comprehensive and high-quality nursing intervention is provided. This means that comfortable nursing is helpful for the immediate treatment of patients' discomfort and abnormal conditions and the conscious avoidance of adverse reactions. Ultimately, the quality of medical care is improved. In our study, the incidence of adverse reactions in the experimental group was significantly lower than it was in the control group (P<0.001). This suggests that comfortable nursing effectively reduces endoscopy patients' adverse reactions. This is consistent with the results reported by Unroe et al. [28].

Medical staff engaged in comfortable nursing have a higher service attitude and professional level. They are have a higher awareness to the nursing content of patients in digestive endoscopy, achieving more comprehensive care for patients. In this study, the nursing satisfaction of the patients in the experimental group was significantly higher than it was in the control group (P<0.001). The results reported by both Wright et al. and Fisher et al. are consistent with ours [35, 36].

However, this study was single-centered, and it was conducted with a limited number of patients and a very short follow-up time. In order to provide more scientific results, we will perform a multi-centered, randomized control, and long-term follow up study.

In summary, comfortable nursing provides patients with improved moods, relieves their pain, decreases their physiological stress responses, and reduces the incidence of adverse reactions.

Disclosure of conflict of interest

None.

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