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Study on Nursing Intervention of Patients Undergoing Choledocholithotomy Based on Roy Adaptation Model

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Abstract: *To explore the effect of nursing intervention based on Roy adaptation model on patients' self-management behavior after choledocholithotomy, a total of 110 patients with choledocholithotomy admitted to the Department of Hepatobiliary Surgery in the hospital from March 2021 to March 2022 were selected as the study subjects. According to the principle of basic feature matching, the patients were divided into observation group and control group, with 55 patients in each group. The control group were provided with the routine health instruction, while the observation group were offered the nursing intervention based on Roy adaptation model. The adverse emotion and self-management behavior of the two groups were compared before and after the intervention. After the nursing intervention, the results show that the scores of Hamilton Anxiety Scale (HAMA), Hamilton Depression Scale (HAMD) and Visual Analogue Scales (VAS) in the observation group were lower than those in the control group, with a statistically significant difference between the groups (P<0.05). After the nursing intervention, the total score of self-management behavior in the observation group was higher than that in the control group, and the time of first expelling gas, the time of first getting out of bed and length of stay in the observation group were shorter than those in the control group. The incidence of complications in the observation group was lower than that in the control group, with a statistically significant difference between the groups (P<0.05)*

Keywords: *Roy adaptation model; Nursing intervention; Choledocholithotomy; Self-management behavior*

1. Introduction

Gallstone is one of the common multiple diseases in Department of Hepatobiliary Surgery, and currently choledocholithotomy is the main treatment method for gallstones[1]. However, this operation will cause anxiety and depression to the patients in the perioperative period, which will lower the cooperation of patients, affect their confidence in treatment, and do harm to the patients' postoperative rehabilitation[2]. Self-management behavior refers to the health management measures taken by the individuals to keep them healthy. The study pointed out that the higher the level of the patients' self-management behavior, the greater their ability to cope with the disease, the more helpful it is for patients to positively face the disease and reduce their negative emotions. Roy adaptation model is a nursing theory put forward by Roy, an American nursing expert. This theory believes that the attention should be paid to the external stimulation received by the individuals in the nursing work. And the influence of patients' emotion on nursing effect shall be taken into consideration while offering the targeted intervention to the patients' physical symptoms[3]. Therefore, Roy adaptation model takes improving the individual's adaptability and self-care ability as the ultimate nursing goal. Since it is easy to understand and apply the the intervention measures, the application of Roy adaptation model has been applied in multiple disciplines and achieved good results in the past[4]. However, it lacks the relevant research on the application effect of Roy adaptation model in the nursing of the patients with choledocholithotomy. Therefore, this study explores the influence of nursing intervention based on Roy adaptation model on the self-management behavior of patients with choledocholithotomy after surgery. The report is as follows.

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2. Object and Methods

2.1 Research object

A total of 110 patients with choledocholithotomy admitted to the Department of Hepatobiliary Surgery in the hospital from March 2021 to March 2022 were selected as the study subjects. Inclusion conditions: the patients were clearly diagnosed by abdominal ultrasound or CT; The patients met the surgical indications for choledocholithotomy. Exclusion conditions: combined with acute severe cholangitis; Combined with biliary tract carcinoma; Combined with dysfunction of heart, liver and kidney; Combined with cognitive or mental disorders; Those who suffered a major mental attack three months before joining the group. According to the principle of comparability of general data, the patients were divided into observation group and control group, with 55 patients in each group. In the observation group, there were 28 males and 27 females; The age ranged from 24 to 68 years old, with an average of 44.12 ± 3.69; The diameter of gallstone was 3-12 mm, with an average of 8.12 ± 2.12 mm; Education background: 18 cases of junior high school or below, 22 cases of senior high school/technical secondary school and 15 cases of junior college or above. There were 27 males and 28 females in the control group; The age ranged from 23 to 68 years old, with an average of 43.98 ± 4.02; The diameter of gallstone was 3~13 mm, with an average of 8.36 ± 2.36 mm; Education background: 17 cases of junior high school or below, 21 cases of senior high school/technical secondary school and 17 cases of junior college or above; There was no significant difference in general data between the two groups (P>0.05). The patients and their family members were informed of the contents of this study and signed the informed consent for operation.

2.2 Nursing methods

The regular nursing after operation was applied to the control group, while the nursing intervention based on Roy adaptation model was applied to the observation group on the basis of regular nursing. The specific measures are as follows.

(1) Adaptation of physiological function: the postoperative pain is a normal physiological phenomenon after surgery. The pain in patients with choledocholithotomy is obvious from the first to third day after surgery, and some patients have poor tolerance. But the oral analgesics will cause some side effects. The application of Roy adaptation model to regulate the patients' subjective mood helps the patients relax themselves, distract their attention, and psychologically alleviate the pain. The specific methods are as follows: ① Offer breathing training for the patients. It will relieve the symptoms of tension such as rapid heartbeat via deep breathing. ② Play music or video for the patients. Allowing them to enjoy the things they like helps to improve their mood. ③ Provide posture exercise. The patient shall be informed of that the improper nursing of the drainage tube is one of the main causes of pain after surgery, which will improve the patient's cooperation. Check the condition of patients' drainage tube every two hours to avoid causing any problems, such as the prolapse, distortion or compression of the drainage tube, and keep the drainage tube drain freely.

(2) Psychological adaptation: That the patients fail to have the incomplete cognition of the disease and postoperative pain are the main causes of negative emotions such as fear, tension and anxiety. The nurses shall provide psychological guidance to the patients, analyze the influencing factors of the patients' bad emotions, offer the health information for their insufficient cognition, and introduce more successful cases to improve the patients' cognition of diseases.

(3) Adaptation of role function and self-concept: After having the choledocholithotomy, the changes in the physiological function will have an effect on the patients' cognition of their own roles. The nurse shall assist the patients to complete the role positioning, make them actively cooperate with the doctor for treatment, and improve the compliance. The dietitian and the physician in charge shall plan a one-week diet and a one-week rehabilitation training for the patients. The patients shall follow the plan for their rehabilitation exercise, and their family members shall supervise and provide support and encouragement for the patients.

(4) Patient's dependence adaptation: After having the surgery, the patients are psychologically and emotionally sensitive and easy to feel lonely and helpless. The nurses shall explain to the patients' family members that it is important to accompany the patients, and instruct them to provide enough encouragement and spiritual support to the patients.

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2.3 Observation indicators

(1) Adverse emotions: two groups of patients were evaluated with Hamilton Anxiety Scale (HAMA)[4] and Hamilton Depression Scale (HAMD)[5] before intervention and one day before leaving the hospital. The HAMA scale includes 14 items. Each item is assigned 0-4 points, with a total score of 0-64 points. The higher the score, the more obvious the anxiety. The HAMD scale includes 21 items. Each item is assigned 0-4 points, with a total score of 0-84 points. The higher the score, the more obvious the depression.

(2) Self-management behavior: the self-designed "Self-management behavior scale for the patients with gallstones" was adopted for evaluation. The scale included five dimensions, including the diet management, medication management, emotional management, daily life management, and disease monitoring. A total of 25 items were included. Each item was assigned 1-4 points, with a total score of 25-100 points. The higher the score, the higher the level of the patients' self-management behavior. The coefficient Cronbach's α of the scale is 0.712-0.798, and the reliability coefficient is 0.805-0.871, suggesting that the reliability and validity of the scale are ideal.

(3) Prognosis: including the postoperative pain score, the time of first expelling gas, the time of first getting out of bed, length of stay and incidence of complications. Postoperative pain score was evaluated by Visual Analogue Scales (VAS). The total score of the scale was 0-10 points. The higher the score, the more obvious the pain feeling of the patient. Complications include vomiting, diarrhea, fever and incision infection.

2.4 Statistical methods

SPSS 21.0 software was adopted to analyze the data. The measurement data was expressed as "mean ± standard deviation", and the inter-group mean was compared by *t* test. Size of a Test α=0.05, with P<0.05 as the difference with statistical significance.

3. Result Analysis

3.1 Comparison of adverse emotion scores between the two groups before and after intervention

Before nursing intervention, there was no significant difference in HAMA score and HAMD score between the two groups (P>0.05); After the intervention, the HAMA score and HAMD score of the two groups were significantly reduced, and the observation group was lower than the control group, with a statistically significant difference between the groups (P<0.05), as shown in Table 1.

3.2 Comparison of Self-management Behavior Scores between the Two Groups Before and After Intervention

Before nursing intervention, there was no significant difference between the two groups in the total score of self-management behavior and the score of related dimensions (P>0.05); After intervention, the total score of self-management behavior and related dimension scores of the two groups were significantly higher, and the observation group was higher than the control group, with a statistically significant difference between the groups (P<0.05), as shown in Table 2.

Table 1: Comparison of Adverse Emotions between the Two Groups Before and After Intervention (score)

Group	Case	HAMA		HAMD	
		Before intervention	After intervention	Before intervention	After intervention
Observation Group	55	45.36±5.10	21.25±4.10	61.10±4.78	34.10±3.98
Control Group	55	45.10±4.63	32.98±3.98	60.52±5.02	45.20±4.78
t Value		0.280	15.224	0.620	13.235
P Value		0.780	0.000	0.536	0.000

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Table 2: Comparison of Self-management Behavior Scores between the Two Groups Before and After Intervention (score)

Group	Case	Diet Management		Medication Management		Emotion Management	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Observation Group	55	11.23±2.10	17.12±4.25	10.52±2.96	17.02±3.02	9.48±1.02	16.45±3.26
Control Group	55	10.55±2.03	12.98±4.63	10.86±2.45	13.66±3.23	9.45±1.36	13.28±2.78
t Value		1.727	4.885	0.656	5.635	0.131	5.487
P Value		0.088	0.000	0.513	0.000	0.896	0.000

Group	Case	Daily Life Management		Disease Monitoring		Total Score of Self-management Behavior	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Observation Group	55	9.12±2.22	17.03±2.98	8.96±1.25	16.98±2.98	49.81±4.25	84.60±5.44
Control Group	55	8.45±2.63	13.55±3.26	9.20±1.69	13.26±2.63	48.51±5.63	66.73±5.63
t Value	1.444	5.843	0.847	6.941	1.367	16.928	
P Value	0.152	0.000	0.400	0.000	0.174	0.000	

3.3 Comparison of prognosis between two groups of patients

After the nursing intervention, the postoperative pain score of the observation group was lower than that of the control group, the time of first expelling gas, the time of first getting out of bed, and length of stay in the observation group were shorter than those of the control group, and the incidence of complications in the observation group was lower than that of the control group, with a statistically significant difference between the groups (P<0.05), as shown in Table 3.

Table 3: Comparison of Prognosis between Two Groups of Patients

Group	Case	VAS (point)	Time of First Expelling Gas(h)	Time of First Getting Out of Bed(h)	Length of Stay(d)	Complication(%)
Observation Group	55	4.56±0.98	12.98±2.10	24.98±3.96	5.98±0.98	2(3.64)
Control Group	55	6.98±1.32	24.52±2.63	48.23±4.26	7.12±1.23	9(16.36)
t Value		10.917	25.429	29.645	5.376	4.949*
P Value		0.000	0.000	0.000	0.000	0.026

* Refers to χ Value. The data in () is the incidence rate.

4. Result Discussion

4.1 Nursing intervention based on Roy adaptation model can reduce the adverse emotions of patients undergoing choledocholithotomy

Research shows that the negative emotion after surgery is an important factor that affects the patients' postoperative rehabilitation. When the patients have negative emotion, their rehabilitation cycle will slow down, which will increase the probability of complications. The study pointed out that[6], the more obvious the negative emotion, the higher the incidence of postoperative complications. Therefore, it is of great significance to actively improve the patients' adverse emotions in the perioperative period to reduce the incidence of complications and improve the patients' prognosis. Roy adaptation model regards the individual as an open and integral adaptive system, which is divided into four parts: input, process, effect and output. Among them, input is divided into two parts: stimulation and adaptation level, and stimulation can be specifically divided into main stimulation, related stimulation and intrinsic stimulation; The process is divided into two parts: the regulator and the cognitive regulator. The regulator refers to the physiological regulatory system, and the cognitive regulator refers to the cognitive regulatory system; The effectors are divided into four parts: physiological function, self-concept, role function and interdependence; The output is divided into the adaptive response and ineffective response. By applying the Roy adaptation model to the patients during the perioperative period, the patients can learn to self-regulate their emotions, thus reducing their negative emotions. In this study, the nursing intervention based on Roy adaptation model was applied to the patients with choledocholithotomy. The results showed that the HAMA score and HAMD score of the observation group were lower than those of the control group after intervention, which suggests that the nursing intervention based on Roy adaptation model can reduce the adverse emotions of patients with choledocholithotomy. It may be because the nursing intervention based on Roy adaptation model fully pays attention to the patients' physical and psychological comfort, improves the patients' psychological adaptability, reduces their fear and anxiety when staying in the

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unfamiliar environment, and helps to alleviate the patients' adverse emotions in the perioperative period [7].

4.2 Nursing intervention based on Roy adaptation model can improve the self-management behavior of patients undergoing choledocholithotomy

Self-management behavior refers to the positive behavior taken by the individuals to maintain their own health. The higher the level of individual self-management behavior, the more conducive it is to take a positive way to cope with the disease and promote the patients' rehabilitation. The nursing intervention carried out in this study based on Roy adaptation model for patients with choledocholithotomy. The results showed that the total score of patients' self-management behavior in the observation group after intervention was higher than that in the control group, which suggests that the self-management behavior of patients with choledocholithotomy could be improved based on Roy adaptation model. It may be due to the implementation of targeted nursing guidance for the patients from the perspective of psychology based on Roy adaptation model. Therefore the individuals can better adjust their own status in the face of their role change. Positively facing the role change will help to enhance the patients' confidence in treatment and inspire them to involve in the disease management, which is conducive to the improvement of the patients' self-management behavior[8].

4.3 Nursing intervention based on Roy adaptation model can promote the prognosis and rehabilitation of patients undergoing choledocholithotomy

The results showed that the postoperative pain score of the observation group was lower than that of the control group, and the time of first expelling gas, the time of first getting out of bed, and length of stay of the observation group were shorter than those of the control group. The incidence of complications in the observation group was lower than that of the control group, suggesting that the postoperative complications of patients with choledocholithotomy could be reduced and the patients' postoperative rehabilitation could be improved on the basis of Roy adaptation model. From the analysis, it may be due to that Roy adaptation model can better promote the patients' role transformation, enable the patients to better adapt to the role transformation caused by the disease, effectively alleviate the patients' adverse emotions, help the patients better focus on their physical and psychological symptoms and improve their awareness of health management. Therefore, it will inspire the patients to actively involve in the disease treatment, and increase their confidence in rehabilitation, which will contribute to the improvement of patients' condition and prognosis [9].

5. Conclusion

The nursing intervention based on Roy adaptation model can reduce the adverse emotions of patients with choledocholithotomy in the perioperative period, improve the patients' self-management ability, reduce the patients' postoperative complications, and promote the patients' postoperative rehabilitation. However, as this study was limited by time and human resources, the patients were not followed up after discharge. It is necessary to expand the sample size to further explore the effect of nursing intervention based on Roy adaptation model on the long-term prognosis of patients undergoing choledocholithotomy.

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