Effects of integrated nursing mode of medical and nursing combined with drug therapy on analgesia, nursing effects and stress response of orthopedic patients

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Abstract: **Objective:** To explore the effect of integrated nursing mode of medical and nursing combined with drug therapy on analgesia and nursing effect and stress response of orthopedic patients. **Method:** From January 2021 to January 2022, 90 patients who were hospitalized in the department of orthopedics in our hospital were selected and divided into 2 groups (45 cases in each). The control group was treated with conventional nursing mode combined with drug treatment, while the treatment group was treated with integrated medical and nursing care mode combined with drug treatment. The nursing effects of the two groups were compared. **Results:** Before nursing, IL-6 (43.80±3.62), IL-8 (74.23±5.51) , TNF-α (67.00±6.02) in the treatment group and L-6 (45.61±2.80), IL-8 (74.35±6.02) ,TNF-α (66.53±6.25) in the control group had no significant difference (t=2.019, 1.631, 1.461, p=0.245, 0.031.0.102); after nursing, IL-6 (22.84±1.15), IL-8 (44.50±3.80) ,TNF-α (43.30±5.38) in treatment group and L-6 (29.13±3.20), IL-8 (55.44±4.26) , TNF-α (56.82±6.34) in control group had significant difference (t=15.943, 12.005, 13.325, p=0.001, 0.005, 0.005). Before nursing, there was no significant difference in VOS score (7.23±2.22) and JOA score (13.86±0.57) between the treatment group and the control group (t=7.943, 9.536, p =0.564, 0.826). After nursing, the VOS score (3.23±0.22) and JOA score (3.23±0.22) of the treatment group were significantly different from those of the control group (4.36±0.89) and JOA score (19.41±0.69) (t=16.274, 5.379, p =0.005, 0.000). After treatment, the SDS score (33.47±4.52) and SAS score (32.46±4.61) of the treatment group were significantly different from those of the control group SDS score (37.16±4.29) and SAS score (38.24±4.56) (t=11.913, 9.357, P=0.035, 0.001). The total effective rate of the treatment group was 91.11% (41/45), which was significantly better than that of the control group 86.67% (39/45), with a significant difference (χ2=9.458, P=0.015). Before nursing, the treatment group NE (168.5±11.4),

AD (103.4±0.2), CRP (61.5±6.3) compared with the control group NE (168.3±10.6), AD (102.2±0.3), CRP (61.7±7.2) had significant difference (t=1.568, 1.064, 1.263, p=0.012, 0.031, 0.015). After nursing, the NE (101.2±7.6), AD (87.2±4.3), CRP (38.2±5.1) of the treatment group were compared with those of the control group in NE (129.5±8.8), AD (91.8±3.4), CRP (47.6±4.3) had significant difference (t=12.018, 11.935, 10.881, p=0.001, 0.003, 0.001). **Conclusion:** The integrated medical care model refers to providing medical services to patients in the form of medical care and nursing groups; strengthening the connection between doctors, nurses and patients, and providing professional services to patients through communication and cooperation between doctors and nurses. It can relieve the pain of the patient, enhance the self-confidence of the patient and help the patient to recover as soon as possible, and improve the satisfaction of nursing.

1. Introduction

Pain is one of the key factors affecting the postoperative recovery of orthopaedic trauma patients, and improper treatment or intervention can lead to various complications. Clinically, due to the different degrees of pain tolerance of patients, there are great differences in the degree of coordination between treatment and rehabilitation training. Therefore, it is of great significance to take appropriate nursing intervention measures to control postoperative pain in patients with fractures, so as to enhance patients' compliance with treatment and improve clinical treatment effect [1]. Actively doing nursing interventions and providing health guidance to patients can better improve the prognosis of patients. The medical-nursing integrated nursing model under the concept of fast recovery surgery, which has been gradually developed in recent years, adopts a series of perioperative optimization measures proven to be effective by evidence-based medicine to reduce the stress response of surgical trauma and reduce postoperative complications[2]. At the same time, the close cooperation of doctors, nurses and patients is realized. Doctors and nurses form a relatively fixed diagnosis and treatment team, and provide patients with integrated responsibility medical services in the form of treatment, nursing and rehabilitation in the form of medical and nursing groups, reducing the hospitalization time of patients and achieving rapid purpose of rehabilitation[3]. Therefore, this article explores the effect of the integrated nursing model of medical and nursing combined with drug therapy on the analgesic and nursing effects and stress response of orthopedic patients.

2 Materials and methods

2.1 General materials

From January 2021 to January 2022, 90 patients who were hospitalized in the Department of Orthopedics in our hospital were selected and divided into 2 groups (45 cases in each), with 26 males and 19 females in the treatment group; the age threshold was (51.43±1.39) years; the control group included 28 males and 17 females; the age was (52.51±1.92) years old. All patients in this study gave informed consent, and the patients themselves or their representatives signed the relevant consent forms. The details of the baseline data of the included subjects are as follows (Table 1).

Inclusion criteria: No relevant processing was performed prior to inclusion in the study.

Exclusion criteria: Patients with severe infection, organ failure, malignancy, mental illness, drug allergy, pregnant and lactating women.

Table 1 General information of patients

General information	Treatment	Control	t /χ2	P
n	45	45		
Age	51.43±1.39	52.51±1.92	1.812	0.074
Gender			0.202	0.653
Male	26	28		
Female	19	17		
Nation			2.124	0.000
Han	42	43		
Other	3	2		
Education level			0.869	0.833
Primary school	8	5		
Junior high school	10	11		
High school	13	10		
University and above	15	19		
Mental illness			0.201	0.654
Yes	0	0		
No	45	45		
Pain reliever			0.544	1.421
No	31	30		
Occasionally	14	15		
Frequently	0	0		
Smoking			0.521	0.000
No	30	33		
＜10years	36	34		
＞10years	34	33		
Drinking			0.142	0.003
No	21	23		
＜10years	41	42		
＞10years	38	35		
Hypertension/ diabetes/ cerebrovascular			1.244	0.012

disease				
No	21	26		
Yes	79	74		

2.2 Methods

The control group was combined with drug treatment according to conventional nursing methods, and carried out disease observation, medication guidance, diet science, etc.

The treatment group adopts the "medical integration" nursing method after the operation, and its implementation steps include: (1) First of all, it is necessary to build a medical integrated medical system composed of five medical teams. One doctor, one head nurse and three responsible nurses, everyone taking care of an average of 10 patients[4]. The doctor diagnoses and provides the treatment plan, and is supervised and guided by the head nurse. The nurse follows the treatment plan and recommendations formulated by the doctor and the head nurse. (2) Before the ward, the nurse team should discuss and communicate with the patient's situation based on the patient's basic information, and consult on the treatment plan. According to the different conditions of patients, different nursing methods are adopted to achieve targeted, scientific, comprehensive and individualized purposes. (3) Two rounds in the morning and evening, accompanied by doctors and nursing staff. In the ward, the doctor will explain the causes, treatment methods, and how to prevent comorbidities for the patient, so that the patient has a deeper understanding of his condition. Nursing staff should patiently and meticulously explain the relevant nursing knowledge, such as reasonable diet, precautions for activities, and answer the patient's questions patiently and meticulously. After a comprehensive analysis of the patient's condition, the doctor will prescribe the appropriate prescription for the patient according to the development of the condition. Nursing staff under the guidance of doctors, active treatment[5]. (4) After the ward round, the nurse will summarize the work of the ward round according to the inspection situation, and adjust and improve it in a timely manner according to the advantages and disadvantages of the work.

2.3 Statistical processing

The data in this experiment need to be verified by SPSS21.0 software, in which the count is tested by $\chi 2$ (%), and the measurement is tested by t test（$\bar{x}\pm s$）, $P<0.05$ can determine that this experiment has statistical significance.

3. Results

3.1 Comparison of inflammatory factors before and after nursing in two groups of patients

Before nursing, IL-6 (43.80±3.62), IL-8 (74.23±5.51), TNF-α (67.00±6.02) in the treatment group and L-6 (45.61±2.80), IL-8 (74.35±6.02) in the control group 5.08), TNF-α (66.53±6.25) had no significant difference (t=2.019, 1.631, 1.461, p=0.245, 0.031.0.102); after nursing, the treatment group IL-6 (22.84±1.15), IL-8

(44.50±3.80), TNF-α (43.30±5.38) and control group L-6 (29.13±3.20), IL-8 (55.44±4.26), TNF-α (56.82±6.34), the difference was significant (t=15.943) , 12.005, 13.325, p=0.001, 0.005, 0.005). Table 2 for detailed data.

Table 2 Comparison of inflammatory factors （$\bar{x} \pm s$）

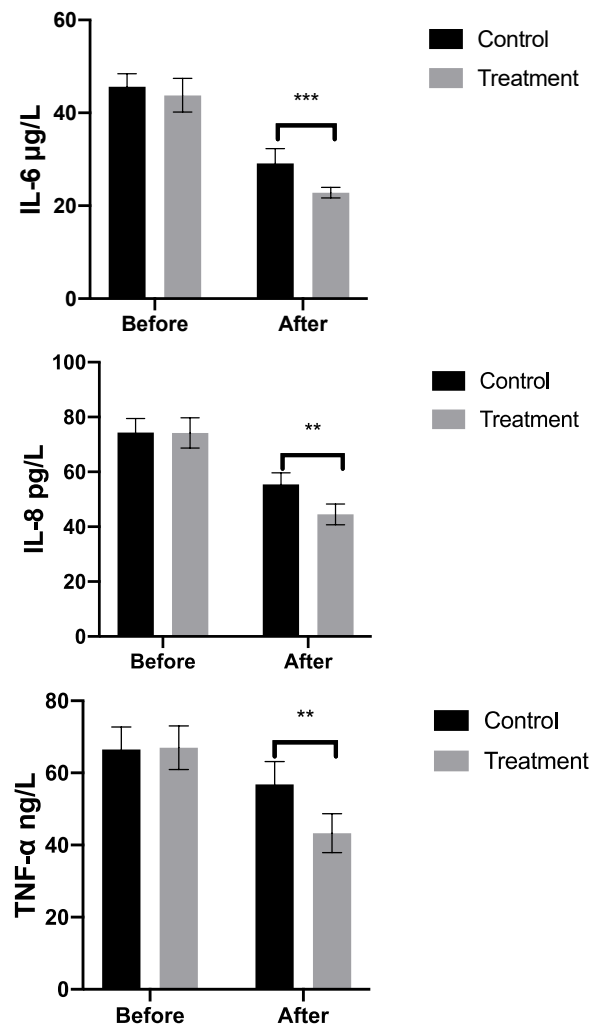| Group	n	IL-6 （μg/L）		IL-8 （pg/L）		TNF-α （ng/L）	
		Before	After	Before	After	Before	After
Control	45	45.61±2.80	29.13±3.20	74.35±5.08	55.44±4.26	66.53±6.25	56.82±6.34
Treatment	45	43.80±3.62	22.84±1.15	74.23±5.51	44.50±3.80	67.00±6.02	43.30±5.38
T		2.019	15.943	1.631	12.055	1.461	13.325
P		0.245	0.001	0.031	0.005	0.102	0.005

Figure 1: The abscissa represents before and after treatment respectively, and the ordinate represents the levels of IL-6, IL-8 and TNF-α;

*** means there is a significant difference in IL-6 between the two groups after treatment (t=15.943, P<0.001);

** means there is a significant difference in IL-8 between the two groups after treatment (t=12.055, P<0.005);

** means there is a significant difference in TNF-α between the two groups after treatment (t=13.325, P<0.005).

3.2 Comparison of VOS score and JOA score between the two groups before and after nursing

Before nursing, there was no significant difference in VOS score (7.23±2.22) and JOA score (13.86±0.57) between the treatment group and the control group (t=7.943, 9.536, p =0.564, 0.826). After nursing, the VOS score (3.23±0.22) and JOA score (3.23±0.22) of the treatment group were significantly different from those of the control group (4.36±0.89) and JOA score (19.41±0.69) (t=16.274, 5.379, p =0.005, 0.000). Table 3 for detailed data.

Table 3 Comparison of VOS and JOA scores between the two groups（$\bar{x} \pm s$）

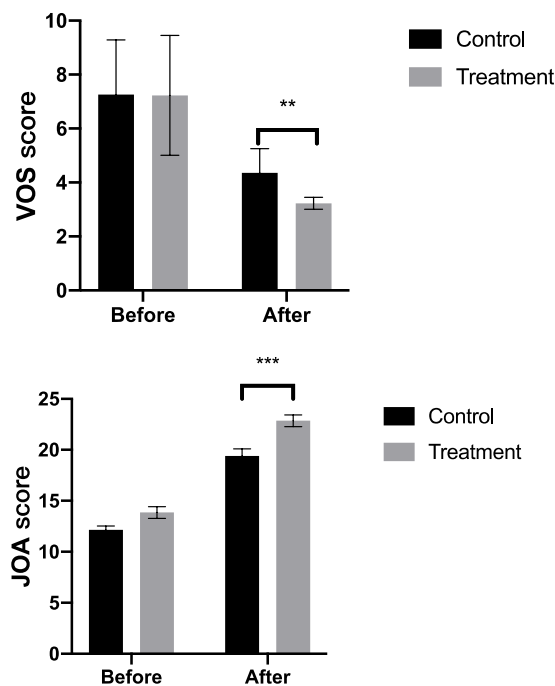| Group	VOS score		JOA score	
	Before	After	Before	After
Treatment（n=45）	7.23±2.22	3.23±0.22	13.86±0.57	22.86±0.57
Control（n=45）	7.26±2.03	4.36±0.89	12.15±0.38	19.41±0.69
t	7.943	16.274	9.538	5.379
P	0.564	0.005	0.826	0.000

Figure 2: The abscissa represents before and after treatment respectively, and the ordinate represents VOS score and JOA score;

** means there is a significant difference in VOS scores between the two groups after treatment (t=16.274, P<0.005);

*** means that there is a significant difference in the JOA score between the two groups after treatment (t=5.379, P<0.000).

3.3 Comparison of SDS and SAS scores between the two groups before and after treatment

After treatment, the SDS score (33.47±4.52) and SAS score (32.46±4.61) of the treatment group were significantly different from those of the control group (37.16±4.29) and (38.24±4.56) (t=11.913, 9.357, P=0.035, 0.001). Table 4 for detailed data.

Table 4 Comparison of SDS and SAS scores between the two groups before and after treatment（scores，$\bar{x}\pm s$）

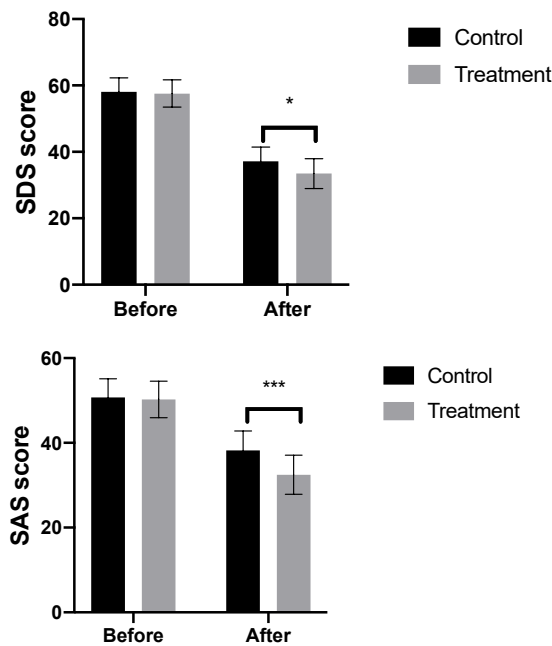| Group	SDS score		SAS score	
	Before	After	Before	After
Treatment（n=45）	57.59±4.12	33.47±4.52	50.25±4.32	32.46±4.61
Control（n=45）	58.13±4.14	37.16±4.29	50.72±4.38	38.24±4.56
t	9.548	11.913	8.736	9.357
P	0.682	0.035	0.748	0.001

Figure 3: The abscissa represents before and after treatment respectively, and the ordinate represents SDS score and SAS score;

* means that there is a significant difference in SDS scores between the two groups after treatment (t=11.913, P<0.035);

*** means that there is a significant difference in SAS scores between the two groups after treatment (t=9.357, P<0.001).

3.4 Comparison of nursing effect of two groups of patients

The total effective rate of the treatment group was 91.11% (41/45), which was significantly better than that of the control group, 86.67% (39/45), with a significant difference (χ^2=9.458, P=0.015). Table 5 for detailed data.

Table 5 Comparison of clinical efficacy between the two groups of patients

Group	Show effect	Effective	Ineffective	Total efficiency
Treatment （n=45）	22（48.89）	19（42.22）	4（8.89）	41（91.11）
Control （n=45）	18（40.00）	21（46.67）	6（13.33）	39（86.67）
χ^2	/			9.458
P	/			0.015

（n，%）
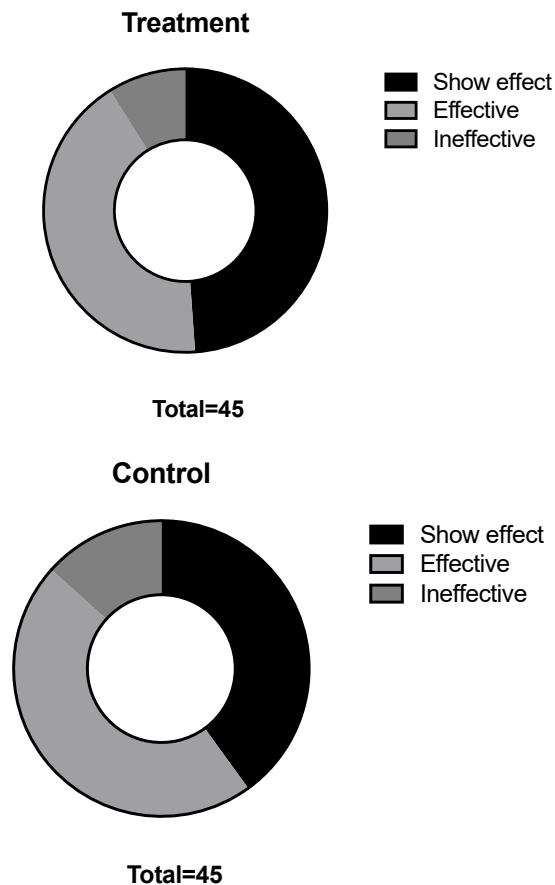
Treatment

Total=45

Control

Total=45

Figure 4: Black means markedly effective; dark grey means invalid; light grey means effective.

In the treatment group, 22 cases (48.89%) were show effective, 19 cases (42.22%) were effective, 4 cases (8.89%) were ineffective, and the total effective rate was 41 cases (91.11%).

In the control group, 18 cases (40.00%) were show effective, 21 cases (46.67%) were effective, 6 cases (13.33%) were ineffective, and 39 cases (86.67%) had a total effective rate.

3.5 Comparison of stress response between the two groups before and after treatment

Before nursing, the treatment group had NE (168.5±11.4), AD (103.4±0.2), CRP (61.5±6.3) compared with the control group NE (168.3±10.6), AD (102.2±0.3), CRP (61.7±7.2), no Significant difference (t=1.568, 1.064, 1.263, p=0.012, 0.031, 0.015). After nursing, the NE (101.2±7.6), AD (87.2±4.3), and CRP (38.2±5.1) of the treatment group were compared with those of the control group in NE (129.5±8.8), AD (91.8±3.4), and CRP (47.6±4.3). Significant (t=12.018, 11.935, 10.881, p=0.001, 0.003, 0.001). Table 6 for detailed data.

Table 6 Comparison of stress responses in the two groups of patients

$$（g/L，\quad \bar{x} \pm s ）$$

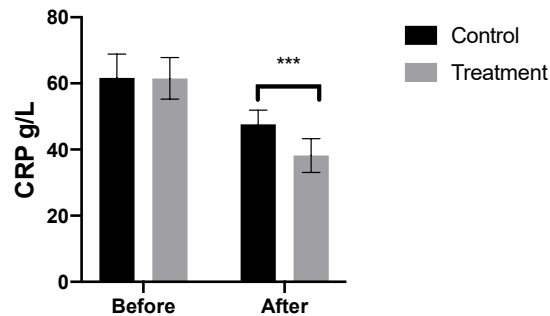| Group	n	NE		AD		CRP	
		Before	After	Before	After	Before	After
Control	45	168.3±10.6	129.5±8.8	102.2±0.3	91.8±3.4	61.7±7.2	47.6±4.3
Treatment	45	168.5±11.4	101.2±7.6	103.4±0.2	87.2±4.3	61.5±6.3	38.2±5.1
T		1.568	12.018	1.064	11.935	1.263	10.881
P		0.012	0.001	0.030	0.003	0.015	0.001
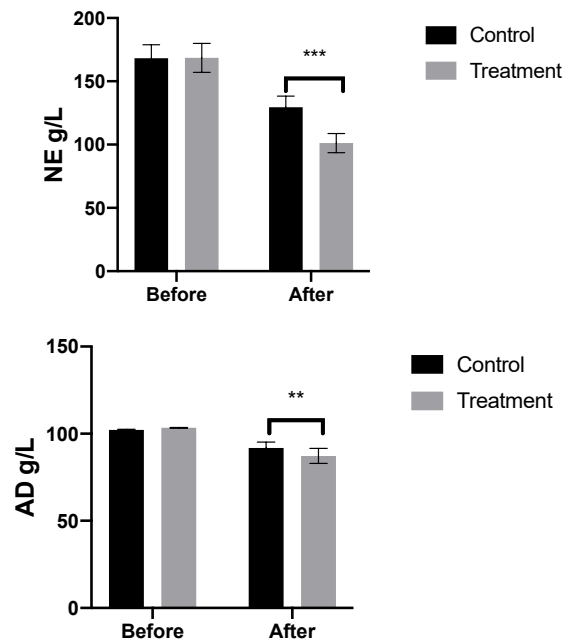
Figure 5: The abscissa represents before and after treatment, and the ordinate represents NE, AD and CRP;

*** means that there is a significant difference in NE between the two groups after treatment (t=12.018, P<0.001);

** means there is a significant difference in AD between the two groups after treatment (t=11.935, P<0.003);

*** means that there is a significant difference in CRP between the two groups after treatment (t=10.881, P<0.001).

4. Discussion

Orthopedic surgery is often considered one of the most painful surgeries. The severe pain that often occurs after orthopaedic surgery is largely due to the nature of the surgical procedure, which often involves extensive muscle cleaning and bone tissue repair or reconstruction[6]. In addition, many patients undergoing orthopaedic surgery have underlying chronic (persistent) pain that may complicate and add to the complexity of postoperative pain management if not optimally treated preoperatively. The adverse effects of poor postoperative pain management are multifaceted and profound for orthopaedic patients[7]. At the most basic level, severe pain can reduce the ability to accomplish postoperative goals, such as getting out of bed and participating in physical therapy, which are critical to recovery after orthopaedic surgery[8]. The association between poor acute postoperative pain management and increased long-term morbidity and mortality further underscores the consequences of poor pain management and the importance of providing these patients with optimal pain control. Every surgical patient should be screened preoperatively for potential chronic (persistent) pain. As mentioned earlier, many people undergoing orthopaedic surgery suffer from chronic pain, such as arthritis or low back pain, so screening is especially important in these patients[9]. If pain is present, a comprehensive evaluation should be performed, including assessing pain control and reviewing all medications the patient is taking. If a patient's pain does not appear to be well controlled, a primary care provider should be contacted for appropriate treatment immediately prior to surgery[10].

Although many techniques exist for the management of orthopaedic pain, there is no consensus on which technique is best, even for the same surgical procedure[11]. However, it is generally agreed that various pain management techniques are most effective when used in the context of a multimodal approach. Multimodal analgesia is a combination of analgesics that relieve pain through different mechanisms, usually

by more than one route of administration. For example, opioids bind to opioid receptor sites in the central and peripheral nervous systems to block neurotransmitters that promote pain transmission, local anesthetics relieve pain by blocking nerve conduction, and non-steroidal anti-inflammatory drugs inhibit promoting Pain-transmitting prostaglandins[12]. When local anesthetics, NSAIDs are used in combination with opioids, they produce significant opioid dose-sparing effects, and at lower doses of each analgesic, are comparable to any single analgesic or route of administration, they all provide better pain relief.

The integrated medical care model is to build a professional medical team, implement hierarchical management, maintain good medical cooperation under the premise of their respective responsibilities, and reduce the recovery time of patients. First of all, the active participation of medical workers is an important part of work development[13]. The nurse team will communicate and discuss according to the patient's data and situation, and propose targeted nursing countermeasures, so as to form a good working environment and increase the participation of medical workers. degree. Nurses supervise and guide each other to prevent nurses from missing a nursing process due to other work items and lead to adverse consequences. Based on this, the exchange of information, mutual complementation and enhanced cooperation will be realized[14]. The comprehensive nursing model of integrated medical and nursing introduces the basic principles and preventive measures of the development of the disease course, so that the patient has a detailed and correct understanding of his own situation, and can arrange the patient to cooperate actively and enhance the patient's compliance. At the same time, it can also strengthen the patient's self-control, start from the patient's own, and reduce the occurrence of complications. Nurses should instruct patients to pay attention to diet, exercise and other aspects of nursing to prevent wound infection, tearing and other conditions. Nurses perform corresponding treatment as required, thus breaking through the previous "parallel" management mode[15]. By increasing the communication between doctors and nurses and grasping the patient's condition, the hospitalization rate of patients can be effectively reduced. The medical staff should summarize and analyze the work after the ward round, find out the existing problems in time and make corresponding adjustments and improvements, and strive to provide high-quality services for the patients. This study found that after nursing, the pain score, the total effective rate of nursing effect, and the stress response index of the treatment group were lower than those of the control group. This means that the integrated medical and nursing care method can effectively reduce the patient's pain, reduce the patient's stress, and improve the patient's recovery speed. Through cooperation with medical workers, the patient's condition can be better grasped, targeted treatment can be carried out, the duplication of work can be reduced, and the work effect can be improved.

To sum up, the integrated medical and nursing care model refers to providing medical services to patients in the form of medical care and nursing groups, which strengthens the connection between doctors, nurses and patients. Through the communication and cooperation between doctors and nurses, we provide patients with

professional medical care, relieve their pain, and enhance their self-confidence. This approach can help patients recover sooner and improve nursing satisfaction.

Acknowledgement

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