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Original Article

Application effects of comprehensive nursing intervention in intensive care units of the department of cardiology and its influences on prognosis of patients

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Abstract: Objective: To explore the application effects of comprehensive nursing intervention in intensive care units (ICUs) of the Department of Cardiology and its influence on the prognosis of patients. Methods: A total of 110 patients admitted to the Department of Cardiology of our hospital from July 2016 to October 2018 were enrolled as study subjects and studied prospectively, in which 54 patients nursed under a routine ICU nursing mode were assigned to the control group, and another 56 patients nursed under a comprehensive nursing mode were assigned to the study group. The following aspects of the two groups were assessed: Ventilator weaning time, housing days in ICU, negative emotions before and after nursing, sleep quality, complications, self-management ability, life quality at 30 days after discharge, and nursing satisfaction. Results: The study group underwent significantly less ventilator weaning time and housing days in ICU than the control group (both $P<0.05$), and also underwent much more negative emotion alleviation and sleep quality improvement than the control group (both $P<0.05$). In addition, the study group showed a significantly lower complication rate, and significantly higher self-management ability, life quality at 30 days after discharge, and nursing satisfaction than the control group (all $P<0.05$). Conclusion: Comprehensive nursing intervention in cardiovascular ICUs can effectively shorten the hospitalization time of patients, and can help relieve their negative emotions, and improve their sleep and prognosis, so it is worthy of clinical promotion.

Keywords: Comprehensive nursing intervention, intensive care units of the department of cardiology, application effects, prognosis

Introduction

Cardiovascular disease is a common clinical disease, and is characterized by a long course of disease and complicate conditions [1]. The intensive care unit (ICU) is a place for severe patients. Most cardiovascular patients in the ICUs suffer a severe and complicate cardiovascular disease that develops rapid and acutely, and they not only face a high probability of adverse cardiovascular events, but also show a high morbidity. This condition poses a great challenge in the treatment and nursing in the ICUs of the Department of Cardiology [2, 3]. The characteristics of ICU patients in the Department of Cardiology determine that ICU nursing is not just about improvement of basic nursing, but also about comprehensive and effective improvement of nursing quality and efficiency, which is important in the treatment and prognosis of patients [4].

Comprehensive nursing intervention is a relatively holistic nursing method. With a commitment to the patient-centered nursing philosophy, it nurses patients from physiological and psychological aspects, and performs well in many diseases at present [5, 6]. Comprehensive nursing intervention is also applied in ICUs of other departments. For example, a study on the nursing of ICU patients with septic shock found that comprehensive nursing intervention could improve the successful rescue rate of the patients [7]. Another study on the application of comprehensive nursing intervention in children with a severe chronic dis-

ease revealed that such a nursing modes contributed to the alleviation of disease [8], and one study on nursing in the Department of Cardiology also reported that comprehensive nursing intervention helped to lower the mortality of patients with acute heart failure [9]. Comprehensive nursing intervention has been applied in many aspects, but the application its effects in ICUs of the Department of Cardiology are yet to be studied.

Therefore, we explored the application effects of comprehensive nursing intervention in ICUs of the Department of Cardiology, and its influences on prognosis of the patients, so as to provide more reference standards for the selection of a nursing mode for cardiovascular patients in ICUs.

Materials and methods

General data

A total of 110 patients admitted to the Department of Cardiology in our hospital from July 2016 to October 2018 were enrolled as study subjects and analyzed prospectively. The patients consisted of 61 males and 49 females, with an average age of 65.79±4.31 years, and included 24 patients with coronary atherosclerosis, 29 patients with acute myocardial infarction, 31 patients with heart failure, and 26 patients with malignant abnormalities of the heart rate. Fifty-four patients were nursed under a routine ICU nursing mode and were assigned to a control group, and the other 56 patients were nursed under a comprehensive nursing mode that was assigned to a study group.

Inclusion and exclusion criteria

The inclusion criteria were as follows: patients meeting the admission criteria of the ICU in the Department of Cardiology [10]; Patients between 55 years old and 75 years old.

The exclusion criteria were as follows: patients with consciousness disorders, patients with comorbid malignant tumors; patients with serious liver or kidney dysfunction, patients with cognitive impairment or communication obstacles; patients reluctant to cooperate with the study.

All patients and their families agreed to participate in the experiment and signed an informed consent form. The experiment was carried out under the approval from the Ethics Committee of the Hospital.

Nursing methods

Nursing intervention to the patients was started at their admission to ICU. Patients in the control group were nursed under a routine ICU nursing mode, which involved real-time monitoring of the patients' condition, supervision and guidance about their medication, ward cleaning and sanitary practice, guidance in terms of a light diet, regulation of their emotions, and so on.

Patients in the study group were nursed under a comprehensive nursing intervention mode based on the nursing measures applied to the control group specifically as follows: Basic health nursing: most ICU patients were in a severe condition, so their movement was usually limited, and they had to stay in bed during their ICU stay. Therefore, they are nursed in terms of skin and oral cavity cleaning, clean and tidy sheet maintenance, ward ventilation and disinfection, and timely mattress refreshing, so as to prevent bedsore.

Psychological nursing: without company from family members, ICU patients were prone to high mental stresses, complex psychological changes, and adverse emotions. Therefore, nursing staff communicate with patients and their family members patiently and establish a mutual trust relationship with them. In addition, nursing staff actively observe the patients' emotions, and promptly adjust their psychological nursing schemes based on their psychological states. When severe symptoms of the patients were relieved, the causes of the disease and treatment measures are be explained to the patients and their families in a more detailed way, and sufficient encouragement and comfort is also conveyed to them, so as to help them eliminate tension and anxiety, and help them set the goal of healing diseases.

Nursing about diet and digestion: a sensible meal plan should be developed for each patient according to their body situation such as constitution and weight, so that they can intake rational nutrients such as protein, fat, and dietary fiber. Fresh vegetables and fruits are also appropriately included to ensure that they can intake sufficient vitamins. ICU patients suf-

fered slower gastrointestinal peristalsis due to limited movement ability, so it was required that patients drink a cup of warm boiled water every morning, and massage each umbilicus as the center to promote defecation.

Sleep nursing: almost all ICU patients breathe with the help of a noninvasive ventilator, but both mask oxygen inhalation and nasal cannula would give them a foreign body sensation, comprising their sleep quality. Therefore, it was required to regularly check and adjust the patients' auxiliary ventilators to reduce the foreign body sensation. In addition, measures were taken to lower the working sound from each set of medical equipment in the wards to be as low as possible, integrated to carry out nursing procedures, and keep the light in the wards soft, so as to create a quiet sleeping environment for the patients.

Other aspects: other nursing aspects included nursing during rescue and health education for patients and their families. Acute heart failure or other severe symptoms requiring immediate action in ICU patients in the Department of Cardiology and should be promptly reported to doctors, and assistance should be actively provided for rescue. Common rescue drugs in the Department of Cardiology should be familiarized, and rescue equipment should also be prepared in time. In addition, health education is provided to the patients and their families to inform them of the disease-related nursing knowledge so that they can make correct responses in case of emergencies. After 2 weeks of nursing, the indexes of the two groups were evaluated, and the nursing of a patient was terminated if he/she died.

Observation indexes

The ventilator weaning time and housing days in ICU of the two groups were recorded and compared.

The negative emotions of the two groups before and after nursing were assessed using the Self-rating Anxiety Scale (SAS) and Self-rating Depression Scale (SDS) [11].

The sleep quality of the two groups was assessed using the Pittsburgh Sleep Quality Index (PSQI) [12]. It has the maximum score of 21 points, and indicates poorer sleep quality with higher score.

The complications of the two groups were recorded and compared, including severe infection, respiratory failure, shock, and stressful gastrointestinal hemorrhage.

The self-management ability of the two groups after nursing was assessed and compared using the Exercise of Self-care Agency Scale (ESCA), including four dimensions, self-concept, self-care ability, health knowledge, and self-responsibility [13].

The life quality of the two groups was assessed and compared at 30 days after discharge using the ORTC Quality of Life Questionnaire (QLQ-C30) [14].

The nursing satisfaction of the two groups was evaluated according to a self-made nursing satisfaction questionnaire.

Statistical analysis

In this study, the collected data were analyzed statistically using SPSS 19.0, and visualized into figures using GraphPad 6. Data in a normal distribution were expressed by the mean ± standard deviation (Mean ± SD), and comparison between groups was performed using the independent-samples T test, and expressed by t. Enumeration data were subject to the chi-square test, and comparison of the situation before and after nursing was performed using the paired t test. $P<0.05$ indicated a significant difference.

Results

Comparison in general data

There were no obvious differences between the two groups in sex, age, body mass index (BMI), and disease type (all $P>0.05$), which were comparable. See **Table 1**.

Comparison between the two groups in ventilator weaning time and housing days in ICU

The study group underwent much less ventilator weaning time and housing days in the ICU than the control group (both $P<0.05$). See **Table 2**.

Table 1. General data

Factors	The study group n=56	The control group n=54	X^2	*P*-value
Sex			0.132	0.717
Male	32 (57.14)	29 (53.70)		
Female	24 (42.86)	25 (46.30)		
Age (Y)			0.003	0.960
≥65	35 (62.50)	34 (62.96)		
<65	21 (37.50)	20 (37.04)		
BMI			0.005	0.995
≥23	27 (48.21)	26 (48.15)		
<23	29 (51.79)	28 (51.85)		
Disease type			0.197	0.978
Coronary atherosclerosis	13 (23.21)	11 (20.37)		
Acute myocardial infarction	14 (25.00)	15 (27.78)		
Heart failure	16 (28.58)	15 (27.78)		
Malignant arrhythmia	13 (23.21)	13 (24.07)		
Smoking index			0.121	0.708
≥400	21 (37.50)	22 (40.74)		
<400	35 (62.50)	32 (59.25)		
Education level			0.000	0.989
With junior high school diploma or below	26 (46.43)	25 (46.30)		
With junior high school diploma or above	30 (53.57)	29 (53.70)		
Nutritional status			0.028	0.986
Good	21 (37.50)	20 (37.04)		
General	22 (39.29)	22 (40.74)		
Poor	13 (23.21)	12 (22.22)		

Table 2. Ventilator weaning time and housing days in ICU of the two groups

Factors	The study group n=56	The control group n=54	t-value	*P*-value
Ventilator weaning time (d)	4.19±0.76	6.82±1.15	14.20	<0.001
Housing days in ICU (d)	15.95±3.47	20.19±3.68	6.219	<0.001

Comparison between the two groups in negative emotion score and PSQI score before and after nursing

Before nursing, there were no distinct differences between the two groups in SAS, SDS and PSQI scores (both P>0.05), while after nursing, the study group had significantly lower SAS, SDS and PSQI scores than the control group (all P<0.05). See **Figure 1**.

Complications of the two groups during nursing

The study group showed an incidence of complications of 16.07%, with severe infection in 2 patients, respiratory failure in 3 patients, shock in 2 patients, and stressful gastrointestinal hemorrhage in 2 patients; while the control group showed an incidence of complications of 27.78%, with severe infection in 3 patients, respiratory failure in 4 patients, shock in 4 patients, and stressful gastrointestinal hemorrhage in 4 patients. The study group showed a significantly lower incidence of complications than the control group (P<0.05). See **Table 3**.

Comparison between the two groups in self-care ability, ESCA score

The study group had significantly higher scores than the control group in terms of self-concept, self-care ability, health knowledge, and self-responsibility (all P<0.05). See **Table 4**.

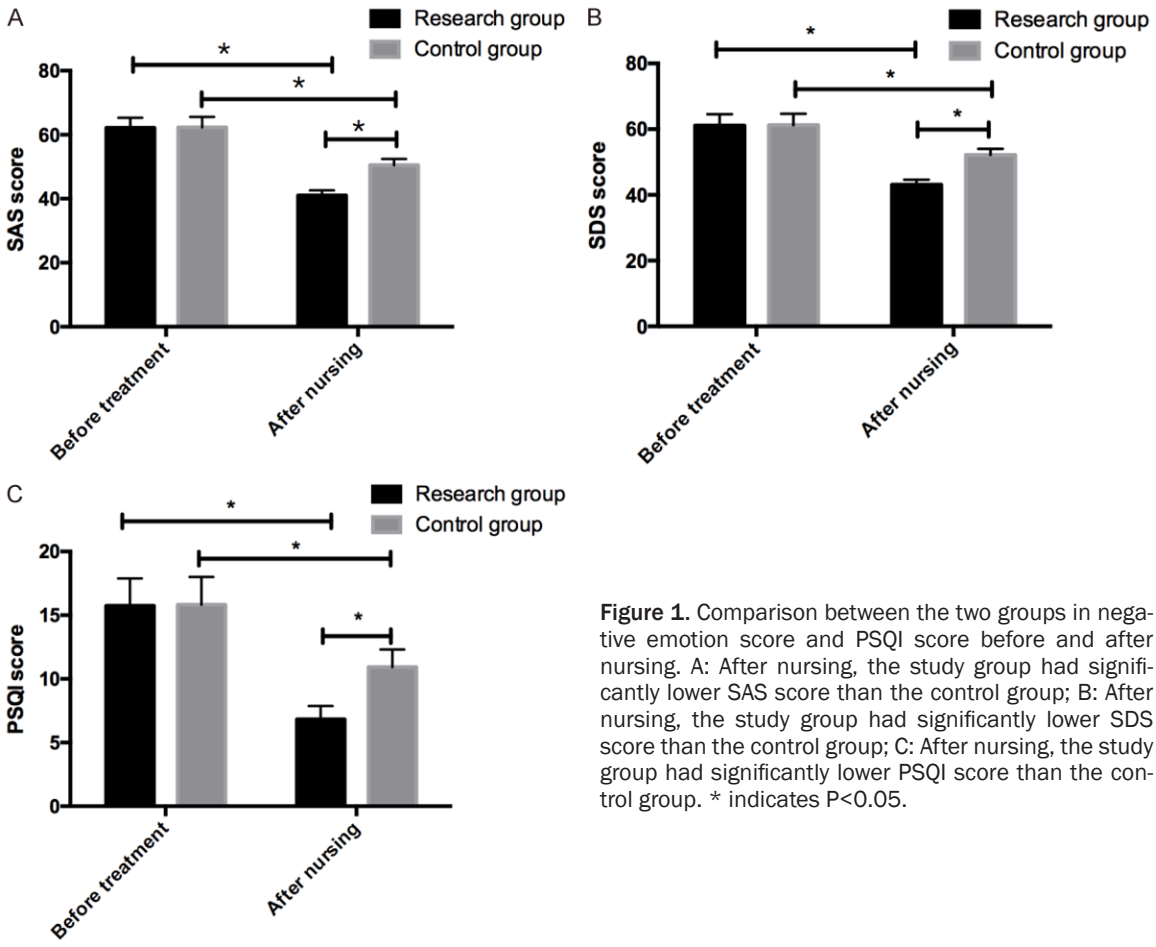

Figure 1. Comparison between the two groups in negative emotion score and PSQI score before and after nursing. A: After nursing, the study group had significantly lower SAS score than the control group; B: After nursing, the study group had significantly lower SDS score than the control group; C: After nursing, the study group had significantly lower PSQI score than the control group. * indicates P<0.05.

Table 3. Complications of the two groups

Complication	The study group n=56	The control group n=54	X^2	*P*-value
Severe infection	1 (1.79)	3 (5.56)	1.115	0.618
Respiratory failure	2 (3.57)	5 (9.26)	1.493	0.222
Shock	2 (3.57)	4 (7.41)	0.784	0.376
Stressful gastrointestinal hemorrhage	2 (3.57)	4 (7.41)	0.784	0.376
Overall incidence	7 (12.50)	16 (29.63)	4.878	0.027

Comparison between the two groups in life quality at 30 days after discharge

The study group had significantly higher scores in role function, body function, emotional function, cognitive function, and social function than the control group at 30 days after discharge (all P<0.05). See **Table 5**.

Comparison between the two groups in nursing satisfaction

The study group showed a nursing satisfaction of 94.64% with 43 patients very satisfied with the nursing, 10 patients satisfied with the nursing, and 3 patients dissatisfied with the nursing; while the control group showed a nursing satisfaction of 77.78%, with 32 patients very satisfied with the nursing, 10 patients satisfied with the nursing, and 12 patients dissatisfied with the nursing. The nursing satisfaction of the study group was significantly higher than that of the control group (P<0.05). See **Table 6**.

Discussion

ICUs in the Department of Cardiology are set for rescuing and treating severe issues in

Table 4. Self-care ability, ESCA score of the two groups

Item	The study group n=56	The control group n=54	t-value	*P*-value
Self-concept	21.14±3.15	14.62±2.47	12.05	<0.001
Self-care ability	117.33±11.82	92.61±7.96	12.82	<0.001
Health knowledge	22.65±5.46	13.76±2.88	10.62	<0.001
Self-responsibility	41.48±5.37	34.92±4.67	6.826	<0.001

Table 5. Comparison between the two groups in life quality at 30 days after discharge

Item	The study group (n=56)	The control group (n=54)	t-value	*P*-value
Role function	62.19±2.82	52.52±2.50	19.01	<0.001
Body function	61.22±2.71	52.80±2.39	17.26	<0.001
Emotion function	63.41±2.72	53.16±2.42	20.85	<0.001
Cognitive function	62.77±2.67	52.08±2.27	22.58	<0.001
Social function	62.48±2.49	51.68±2.06	24.74	<0.001

Table 6. Comparison between the two groups in nursing satisfaction

Nursing satisfaction	The study group n=56	The control group n=54	X^2	*P*-value
Very satisfied	43 (76.79)	32 (59.26)	3.893	0.049
Satisfied	10 (17.86)	10 (18.52)	0.008	0.928
Dissatisfied	3 (5.36)	12 (22.22)	6.640	0.010
Nursing satisfaction	53 (94.64)	44 (77.78)	6.640	0.010

patients admitted to the department, in which patients are all characterized by severe diseases and rapid disease progress [15]. At present, the treatment in ICUs of the Department of Cardiology mainly aims at relieving critical symptoms of the patients and improving their prognosis, and nursing, as an auxiliary means of treatment, is closely related to the treatment effect and prognosis of the patients [16]. However, there has been no definite conclusion about which nursing mode is more suitable in ICUs of the Department of Cardiology.

In this study, we investigated the application effects of comprehensive nursing intervention in ICUs of the Department of Cardiology and its influences on prognosis of the patients. As a nursing mode derived from evidence-based medicine, comprehensive nursing intervention is mainly comprised of comprehensive and scientific nursing measures developed based on specific conditions of patients [17]. We performed nursing to the patients from many aspects including psychology, hygiene, diet, and propaganda of rescue and disease knowledge. Most ICU patients wear a ventilator for respiration, and withdrawal of their ventilators and transfer of them from ICU to an ordinary ward suggest alleviation of their diseases [18]. Therefore, we first compared the two groups in ventilator weaning time and housing days in ICU, finding that the study group experienced much less ventilator weaning time and housing days in the ICU than the control group. This indicated that the study group had faster recovery or better treatment efficacy than the control group, and also experienced faster symptom stabilization and alleviation. ICU patients in the Department of Cardiology are prone to negative emotions such as anxiety and depression, because most of them are in a severe situation and face a high treatment cost [19]. What's worse, because of the negative emotions and others, they are very prone to sleep disorders [20]. In our study, we provided nursing for the patients in the study group specifically according to their psychological situation and sleep, and also compared the two groups in terms of SAS score, SDS score, and PSQI score after nursing, finding that although both groups obtained negative emotion mitigation and sleep improvement, the study group obtained a more significant mitigation and improvement. This indicated that comprehensive nursing intervention can effectively mitigate negative emotions of ICU patients in the Department of Cardiology, and improve their sleep. In terms of self-care ability, we found that the study group obtained a certain self-care ability after receiving comprehensive nursing intervention. We suspected that it was due to the following reasons: comprehensive nursing intervention involves knowledge about diseases to the patients, so the patients and their family members know more about the diseases, and treatment and nursing methods for them, which improved their self-care ability [21].

In addition to alleviation of negative emotions and symptoms, complications and life quality

after discharge also play important roles for ICU patients in the Department of Cardiology [22]. Therefore, we also compared the two groups in terms of complications during hospitalization and life quality at 1 month after discharge, finding that the study group showed a significantly lower incidence of complications than the control group, and had significantly higher life quality scores than the control group. This suggested that comprehensive nursing intervention was effective in lowering the incidence of complications and improving life quality for ICU patients in the Department of Cardiology, and makes a good effect on their prognosis. Under the comprehensive nursing intervention mode, we helped to alleviate the patients' negative emotions and improve their sleep through all-round psychological and physiological nursing. A study concluded that a patient in a good psychological state would have a stronger immunity ability [23]. We thought it was also one of the reasons for the relatively few complications in the study group. We fully considered the role of family members of the patients during nursing intervention, so we told the family members about disease knowledge and instruct them how to nurse the patients after discharge, which could increase patients' sense of security and sense of belonging, and was conducive to the improvement of their life quality after discharge [24]. Finally, we compared the two groups in nursing satisfaction, finding that the nursing satisfaction of the study group was much higher than that of the control group. It indicated that most patients hold a positive attitude towards the application of comprehensive nursing intervention. During nursing, comprehensive and detailed measures were taken for the patients according to their specific condition, and their feelings and demands were inquired about with an active attitude to make them feel care and understanding. The relief of patients' symptoms and improvement of their emotions can improve their nursing satisfaction [25].

To sum up, comprehensive nursing intervention in cardiovascular ICUs can effectively shorten the hospitalization time of patients, and can help to relieve their negative emotions, and improve their sleep and prognosis, so it is worthy of clinical promotion. However, this study still has some shortcomings. For example, we only chose the comprehensive nursing intervention for the patients, and did not compare it with other nursing modes except routine nursing, so further research is needed to confirm whether the comprehensive nursing mode is the most suitable mode for ICU patients in the Department of Cardiology. Secondly, the sample size of this study was small, which may cause some deviation in the research conclusions. We will increase the sample size in future research.

Disclosure of conflict of interest

None.

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