

## Original Article

# Rapid rehabilitation nursing in relieving unhealthy mood and improving the prognosis of children who underwent cardiac surgery

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**Abstract:** Objective: To explore the effect of rapid rehabilitation nursing in relieving unhealthy mood and improving prognosis of children who underwent cardiac surgery. Methods: One hundred and eleven patients who underwent cardiac surgery for congenital heart disease were retrospectively analyzed. Fifty-six children received rapid rehabilitation nursing (the observation group), while 57 received routine nursing (the control group). The scores on the Taylor Manifest Anxiety Scale before and after surgery were assessed; and data regarding extubation time, length of hospital stay, quality of family life score (WHOQOL-BREF), and degree of satisfaction were recorded. Results: Two days after the surgery, the anxiety scores of the control group began to decrease and continued to decrease compared with that before surgery and 1 day after surgery ( $P < 0.05$ ). In the observation group, the anxiety scores began to decrease and continued to decrease after surgery ( $P < 0.05$ ). The average extubation time and length of hospital stay of the observation group were significantly shorter than those in the control group ( $P < 0.001$ ). The quality of family life score in the observation group was higher than that in the control group ( $P < 0.05$ ). The score of nursing satisfaction in the observation group was significantly higher than that in the control group. There was a significant difference between the two groups ( $P < 0.05$ ). A significant difference was observed in the incidence of complications between the two groups ( $\chi^2 = 6.051$ ,  $P = 0.014$ ). Conclusion: Rapid rehabilitation nursing can significantly improve the mental status of patients, shorten the extubation time and hospital stay, reduce the incidence of complications.

**Keywords:** Rapid rehabilitation concept, cardiac surgery, SAS, SDS

## Introduction

Congenital heart disease involves congenital malformations with the highest incidence in infants and accounts for approximately 1% of live births. This disease mainly occurs owing to the development of disorders in the heart and large blood vessels in the early stages of pregnancy or occlusion of heart channels after birth. The disease mainly manifests conditions, such as cardiac insufficiency and cyanosis, among others [1, 2]. The vast majority of children with congenital heart disease need surgical treatment. Clinical nursing is an effective method to ensure the efficacy of surgery. In recent years, it plays a critical role in improving survival and prognosis of children with congenital heart disease [3, 4].

The concept of rapid rehabilitation nursing is a multidisciplinary and new surgical treatment strategy proposed in recent years. Compared with conventional nursing, the concept of rapid rehabilitation requires a full understanding of the pathophysiological changes of patients with various diseases before and after surgery. Improving the surgical method, optimizing the anesthetic method, and fully relieving pain can reduce surgical stress, shorten the length of hospital stay, reduce complications, increase patient satisfaction, and reduce medical costs, under the premise of ensuring the surgical treatment effect [5, 6]. At present, the concept of rapid rehabilitation nursing was successfully applied among children who underwent laparoscopic and open surgery, especially those who had colorectal surgery [7, 8]. However, the con-

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cept of rapid rehabilitation nursing is rarely reported in children with congenital heart disease [9, 10].

In this study, a retrospective analysis was conducted in 113 children with congenital heart disease who received routine and rapid rehabilitation nursing to explore the effectiveness of rapid rehabilitation nursing in children with congenital heart disease.

## Methods and materials

### *Study participants*

From July 2011 to June 2014, data of 113 patients who underwent cardiac surgery for congenital heart disease at our hospital were retrospectively analyzed. Among them, 45 patients were male and 68 were female. A total of 56 children received rapid rehabilitation nursing (the observation group), while 57 received routine nursing (the control group). All patients who met the following diagnostic criteria for congenital heart disease were included in the study: those who developed congenital heart disease at the age of 2, those who underwent cardiac surgery for the first time, and those who were categorized as without familial cardiomyopathy (class I-II) based on the American Anesthesiologists Association classification system [11]. By contrast, children with hepatic and renal insufficiency, with complex congenital heart disease with split ventricles, developed hemolytic disease or severe complications during treatment, with 21 trisomy syndrome or congenital mental disabilities, and with incomplete medical records were excluded from the study. This study was approved by the Medical Ethics Committee of Children's Hospital of Zhengzhou, and the family members of the children signed informed consent.

### *Nursing method*

**Routine nursing:** Children in the control group received routine nursing, including preoperative and postoperative care for cardiac surgery, nutritional assessment, symptomatic treatment, psychological support, postural management, care tubing, and health education.

**The concept of rapid rehabilitation:** Children in the observation group received rapid rehabilitation nursing, including preoperative psychologi-

cal care. This concept mainly involves communication with the child's family about the treatment process, which can help establish a good nurse-patient relationship. Moreover, preoperative nutritional assessment was performed and guidance was provided. The child's family was guided about various fasting methods. In addition, the child's body temperature was stabilized intraoperatively. Intraoperatively, fast-channel anesthesia was used because it allowed rapid recovery and early mobilization after surgery. Fluid intake was limited during surgery. Postoperative care includes early mobilization, early food and water intake, and relieving pain with language, music, medications, and reducing anxiety.

### *Observation indicators*

The anxiety scores before surgery and days 1, 2, and 3 after surgery were recorded separately with the Manifest Anxiety Scale by doctors. A higher score in the Manifest Anxiety Scale indicates severe anxiety; a higher extubation time, length of hospital stay, and quality of family life score (WHOQOL-BREF) indicates better quality of family life and a higher degree of satisfaction [12, 13]. A higher score in the Newcastle Satisfaction with Nursing Scale indicates that the patient is highly satisfied with the nursing care provided.

### *Statistical method*

All statistical analyses were performed using the SPSS19.0 (Asia Analytics Formerly SPSS, China). Enumeration data is expressed in n (%), and the rates were compared using an  $\chi^2$  test. Measurement data is expressed as mean  $\pm$  standard deviation. The t-test was used to compare the two groups. Repeated variance measurement experiments were used at different times within the group. A *P* value of  $<0.05$  was considered significant.

## Results

### *General data*

This study included 113 children. The control group was comprised of 56 participants, including 20 male and 36 female patients, with an average age of (8.3 $\pm$ 5.8) years. In contrast, the observation group was comprised of 57 participants, including 25 male patients and 32

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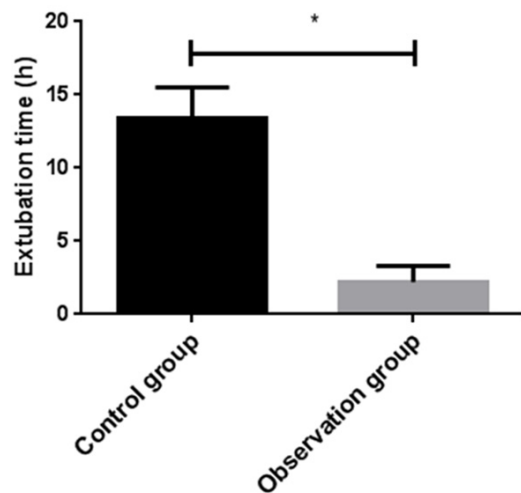
**Table 1.** Comparison of baseline data between the two groups

	Control (n=56)	Observe (n=57)	Statistics	P-value
Sex (n, %)			0.782	0.377
male	20	25		
female	36	32		
Age (year)	8.3±5.8	8.9±4.4	0.620	0.536
ASA grade (n, %)			0.074	0.786
I-II	31	33		
III	25	24		
Classify (n, %)			0.100	0.951
ASD	20	19		
VSD	29	30		
PDA	7	8		
Parents education (n, %)			0.197	0.906
Junior high school	25	25		
High school to undergraduate	21	20		
Bachelor or above degree	10	12		
Residence (n, %)			0.078	0.780
Country	28	30		
City	28	27		

**Table 2.** Comparison of anxiety scores between the two groups

	Control (n=56)	Observe (n=57)	Statistics	P-value
Pre-operation	50.99±7.64	48.01±7.23	2.130	0.035
Postoperative day 1	48.75±7.13	44.98±6.89*	2.100	0.038
Postoperative day 2	43.47±6.25* <sup>#</sup>	40.36±5.77* <sup>#</sup>	2.749	0.007
Postoperative day 3	41.12±6.12* <sup>#,&amp;</sup>	37.25±5.33* <sup>#,&amp;</sup>	3.586	0.001

Note: \*shows P<0.05 compared with pre-operation; <sup>#</sup>shows P<0.05 compared with 1 day after surgery; <sup>&</sup>shows P<0.05 compared with 2 days after surgery.



**Figure 1.** Extubation time of two groups of children. \*P<0.05.

female patients, with an average age of (8.9±4.4) years. No difference was observed in gender and age between the two groups (P>0.05). Other basic data such as ASA grade ratio, type of congenital heart disease, ratio of the level of parental education, and place of residence were not found to be statistically different (P>0.05) (**Table 1**).

### Anxiety scores between the two groups

Some significant differences were observed in the anxiety scores of the two groups before surgery and 1 day, 2 days, and 3 days after surgery (P<0.05). The anxiety scores in the observation group were lower than that in the control group. There was no difference in anxiety scores of the control group before surgery and 1 day after surgery (P>0.05). Until two days after surgery, the anxiety scores of the control group began to decrease and continued to decrease compared with that before surgery and 1 day after surgery (P<0.05). In the obser-

vation group, anxiety scores began to decline after surgery and continued to decrease (P<0.05) (**Table 2**).

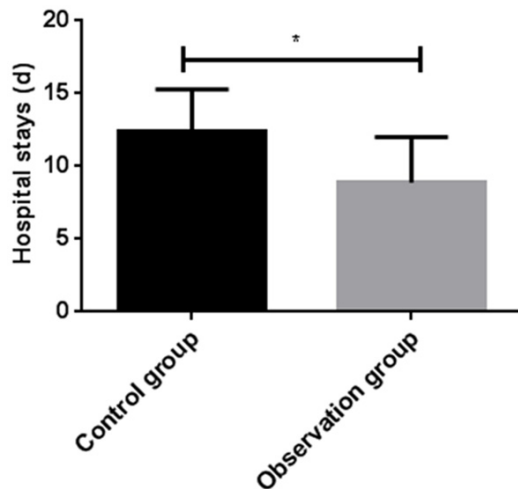
### Extubation time between the two groups

The average extubation time was 13.4±2.1 hours in the control group and 2.2±1.1 hours in the observation group. The average extubation time in the observation group was significantly shorter than that in the control group; there was a significant difference between the groups (t=35.602, P<0.001) (**Figure 1**).

### Length of hospital stay between the two groups

The mean length of hospital stay was 12.4±2.9 days in the control group and 8.9±3.1 days in

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**Figure 2.** Two groups of children were hospitalized. \* $P < 0.05$ .

the observation group. The average hospital stay in the observation group was significantly shorter than that in the control group. There was a statistically significant difference between the groups ( $t = 6.199$ ,  $P < 0.01$ ) (**Figure 2**).

### *Quality of family life score between the two groups*

A significant difference was observed in the total average quality of family life scores between the two groups.

The quality of family life score in the observation group was higher than that in the control group ( $P < 0.05$ ). When comparing the scores of patients' environmental, physiological, psychological, and social data, the scores of the families in the observational group in each field were higher than that in the families in the control group (all  $P < 0.05$ ) (**Table 3**).

### *Nursing satisfaction scores in both groups*

The nursing satisfaction score of the control group was  $65.67 \pm 8.48$ , while the observation group was  $84.39 \pm 9.36$ . The nursing satisfaction score of the observation group was significantly higher than that of the control group. The difference was considered significant ( $P < 0.05$ ) (**Figure 3**).

### *Statistical results of the incidence of complications between the two groups*

In the control group, 8 patients (14.29%) developed complications, of which 3 had postopera-

tive infections, and 5 had respiratory complications. By contrast, 1 patient (1.75%) from the observation group developed postoperative infection. The complications of both groups got cured after receiving appropriate treatments. The difference in the incidence of complications between the two groups was considered significant ( $\chi^2 = 6.051$ ,  $P = 0.014$ ).

## **Discussion**

Congenital heart disease accounts for about 28% of all kinds of congenital malformations [9]. Most children with congenital heart disease need surgery, and the incidence of congenital heart disease has also increased every year [10]. Therefore, research on the nursing care of children with congenital heart disease is extremely important to improve its therapeutic effect. The concept of rapid rehabilitation nursing is a widely used clinical care method [11]. This study conducted a retrospective analysis of the application of rapid rehabilitation concept in children with congenital heart disease, to provide guidance for clinical care.

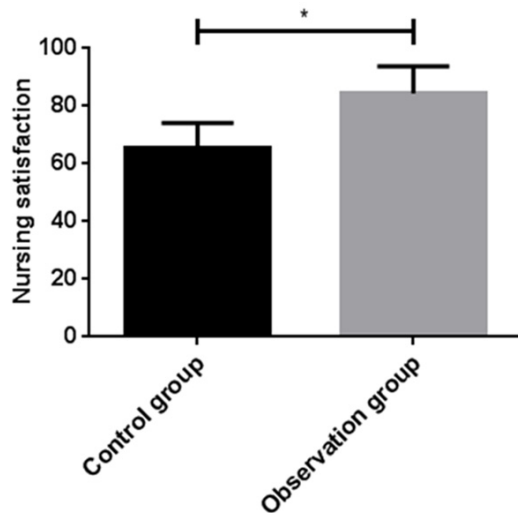
A total of 113 children with congenital heart disease were included in this study and were divided into two groups according to the nursing interventions they received. No statistical difference was observed in demographic information between the two groups. This result suggests that the data of the two groups are comparable.

We first performed a statistical analysis on the anxiety scores of parents of the two groups. The analysis results showed that the anxiety scores of the parents of the observation group before surgery and 1 day, 2 days, and 3 days after surgery were lower than those in the control group. For hospitalized children, especially those who received surgical treatment, anxiety or depression is the focus of clinical care. Fear of the disease, strangers, and surgery often cause unhealthy emotion such as anxiety or depression [14, 15]. By understanding the situation of children and their parents and friendly exchanges with children, the nursing staff can establish a close relationship between nurses and patients, thus improving the patients' level of anxiety and ensuring successful performance of the surgical treatment [16]. Previous studies reported that the perioperative period in which parents tend to feel more anxious is the period when they wait for the surgery to fin-

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**Table 3.** Comparison of family's quality of life scores between the two groups

	Control (n=56)	Observe (n=57)	Statistics	P-value
Overall average score	80.35±7.36	93.33±5.15	10.878	<0.001
Environmental area	62.38±11.49	84.19±8.34	11.563	<0.001
Physiological field	65.44±14.83	91.47±9.18	11.240	<0.001
Physical field	68.32±12.27	92.86±5.58	13.725	<0.001
Social field	57.85±14.59	88.29±7.06	14.156	<0.001



**Figure 3.** The nursing satisfaction scores of the family members of both groups. \*P<0.05.

ish or when they are discouraged from visiting patients in the intensive care units who are under isolation precautions [17, 18]. The lack of information on the status of children is an important factor. Parental anxiety can also affect children's perception about their disease and behavioral responses. Therefore, it is necessary to actively assess and intervene in parents' psychological status to ensure that the child's treatment is successful [19].

The routine nursing care for patients who underwent traditional cardiac surgery focuses on the needs of the child and the level of care during the course of treatment. With this, rapid rehabilitation nursing emphasizes that the family members should be actively involved in the treatment process, but the disadvantage of this study was that the psychological status of the children's family members was not statistically analyzed [20, 21]. Hence, we will further supplement it in future studies. We only compared the quality of family life scores of the two groups.

WHOQOL-BREF is a family life quality assessment scale recommended by the World Health Organization; our analysis showed that quality of life in the observation group was significantly higher than that of the control group [22]. Wang et al. also found that the concept of rapid rehabilitation

nursing can effectively improve patients' quality of life [23]. We also conducted statistics on patients' satisfaction with nursing care and found that level of satisfaction of the family members in the observation group was higher than that in the control group, which may be related to higher quality of family life in the observation group. The incidence of complications during rapid rehabilitation was lower. This has a positive effect on the improvement of prognosis of patients, which may also be the reason why patients were more satisfied with the concept of rapid rehabilitation nursing [24]. We also carried out a statistical analysis on extubation time and length of hospital stay of children. Results showed that extubation time and length of hospital stay of the observation group were significantly lower than those in the control group. Extubating the child early was better as it allows him or her to perform activities early [25]. A shorter hospital stay can also effectively relieve the economic burden on children's families [26]. These factors may also be the two reasons why the families of children are more satisfied with the concept of rapid rehabilitation. However, the number of samples in this study is small, and the results of the study still need more clinical data to validate.

In summary, the concept of rapid rehabilitation nursing can significantly improve the mental status of patients, shorten the extubation time and hospital stay, reduce complications, enhance the family's quality of life, increase nursing satisfaction, and ameliorate the prognosis of children.

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### Disclosure of conflict of interest

None.

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