

# The influence of the comprehensive nursing intervention on the clinical effect of a right sub-axillary small incision in the treatment of congenital heart disease among children

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## Abstract

**Background:** Congenital heart deformities which affect children, are of various types. Some possess a simple structure, whilst others are complex. Simple designs are easy to deal with and can be passed off without any treatment, whereas complex structures must be handled with upheaval surgeries, perhaps over a lengthy stint. Furthermore, congenital heart ailments are affected by the incorrect maneuvering of blood through the heart. Children are at times born with deformities, which might range from simple to life-threatening situations and every abnormality does not require complex interventions. **Objective:** The aim of this study is to explore the effect of brief nursing intrusion on the right sub-axillary small incision in the treatment of congenital health diseases among children. **Methods:** A total of 40 children who were handled by the correct sub-axillary incision method with congenital heart disease were chosen as study subjects, from June 2016 to May 2020. According to different nursing methods, the children were split further into two groups: the control and intervention groups. The control group adopted the general nursing method, and the intervention group adopted the comprehensive nursing method. Ventilator assisted time, chest drainage, and hospitalization days were recorded in the two groups. Post-operative complications of the two groups were recorded to express the standard of life and compliance of the children.

**Results:** The ventilator use was even longer in the test category than in the control group, including chest drainage, and hospitalization days. The control group's complication rate was significantly higher than that of the intervention group. The standard of living and obedience of children in the control group was significantly lower as compared to those in the intervention group. **Conclusion:** Comprehensive nursing intervention effectively treats congenital heart disease in children with the right sub-axillary small incision.

**Keywords:** Comprehensive nursing; Right sub-axillary small incision; congenital heart disease

## Introduction

Congenital heart ailment is a widespread anomaly, dating from birth, which occurs in more than 1% of neonates. About 30% of minors with coronary heart disease have other extracardiac abnormalities [1]. Research in North America exhibits that every year between 30000 and 40000 children are born with various heart-related ailments; unfortunately, one-third of them require surgery even in the initial years of their life [2,3]. Children with coronary heart disease will be accompanied by symptoms of physical weakness and need to bear the burden of unpredictable complications and discrimination [4]. In the past few decades, a new branch known as pediatric cardiology has developed,

due to the rapidly increasing numbers of children who reach adulthood with congenital heartache [5].

Interestingly, the modernization in the treatment of congenital heart ailments, the life expectancy, and the survival of these patients has increased spectacularly over the years [6]. With the improvement of survival rates, it has also been observed that neonates and minors suffering from congenital heart illness have a greater chance of stunting. However, good surgical treatment is imperative for quick recovery and attaining a long-term standard of life for those who have unfortunately, been exposed to heart ailments from birth [7].

Right sub-axillary thoracotomy is a standard surgical method for congenital heart disease that may produce excellent results [8]. In addition, right sub-axillary thoracotomy is identified as a viable alternative to median sternotomy. It plays a crucial role in Healthy aesthetic benefit and an excellent therapeutic effect for closure of the double artery ventricular septal defect [9]. Studies have found that sufficient treatment has been shown in the adult population for heart failure to minimize mortality [10]. Coronary heart disease surgery has a significant impact on children's mood and daily life, so high-standard pre-operative, intra-operative and post-operative nursing is very important for rehabilitating children. Therefore, the key aim of this research is to investigate how the therapeutic utility of the correct sub-axillary method of minor incisions for the treatment of congenital heart illness in children is affected by systematic nursing action.

## **Materials and Methods**

### ***General Information***

In this study, 40 children with congenital heart disease were treated by the right sub-axillary small incision approach in the Hunan Children's Hospital from June 2016 to May 2020. Based on the different nursing methods, the children were equally split into two separate groups, i.e., the control group and the intervention group. There were 12 males and eight females in the control group, aged from 5 months to 15 years of age, with an average age of (6.2 ±2.5) years, including 14 patients suffering from atrial septal defect and six patients suffering from ventricular septal defect. The intervention group consists of 11 boys and nine girls, aged from 6 months to 16 years, with an average age of (6.6 ±2.5) years, including 8 cases of ventricular septal defect and 12 instances of the atrial septal defect. There was no such disparity in sex, age, and disease type between the two groups ( $P > 0.05$ ).

### ***Surgical methods***

Intravenous and inhalation hybrid anesthesia is used for single-lumen endotracheal intubation. The patient took a left recumbent position and raised the right side by 8-10 cm. The right arm was suspended over the head and fixed on the head frame. The intersection of the right posterior axillary line and the third rib was taken as the rear upper edge of the incision, The anterior and

the lower edge of the incision is crossed by the anterior axillary line and the sixth Thunder sword, and a long 6-8 cm arc incision was made between the two points. After exposing the pericardium and phrenic nerve, the pericardium was longitudinally cut along the 2cm of the anterior edge of the phrenic nerve to the aorta and pericardium, and then to the inferior vena cava and pericardium. The pericardium was suspended from exposing the heart. After aortic intubation, cardiopulmonary bypass was established. Circulation and cooling were performed in parallel, and the circulation was blocked after dissociating the septum between the main and pulmonary arteries. Cold St. Thomas solution was infused through the Root aorta on the hearts surface to secure the myocardium, and ice rubbers were placed [11-12].

### ***Nursing methods***

The general nursing method was used in the control group, and the comprehensive nursing method was then performed in the intervention group. The contents of the extensive nursing methods are as follows:

#### ***Pre-operative nursing***

(1) Psychological nursing. Patiently introduce the basic knowledge of congenital heart disease to patients and their families, guide them to correctly understand the causes, clinical symptoms, treatment methods, and matters which require attention in terms of the disease, enhance the understanding of patients and their families about the disease and treatment, improve their cognitive level, and relieve their psychological disorders such as tension, anxiety, and fear; (2) Health guidance: inform patients' families that their diet should be high-calorie, high-protein, and high-fiber foods, in order to strengthen their physique; encourage patients to eat more fresh fruits and vegetables, drink more water to promote excretion, and alleviate their heart burden; urge patients to develop healthy work and rest habits to ensure adequate sleep. Strengthen medication guides for patients and their families to degrade the specific name of the drug, pharmacological action, dosage, and possible adverse reactions in the treatment and coping methods; (3) pre-operative preparation. The nursing staff carefully prepared and examined the related items before the operation to ensure that they could use them appropriately during the procedure. Thirty minutes before operation, the

paramedics went to the operating room to adjust the humidity and temperature. The temperature was set at about 25 °C, and the humidity was between 50% and 60%.

#### ***Intraoperative nursing***

- (1) Establish venous passage and infusion management,
- (2) use precision infusion equipment,
- (3) select the puncture point at the child's upper limb during infusion, reasonably control low speed,
- (4) closely observe the condition of intravenous injection and blood transfusion to avoid transfusion exudation,
- (5) maintain a stable body temperature,
- (6) minimize the intraoperative exposure area,
- (7) and reasonably utilize the infusion thermostat.

Nurses should skillfully master the role of various positions in operation to ensure the correct position during the process to ensure the smooth progress of the procedure.

#### ***Post-operative nursing***

The nursing staff carefully observed whether the skin was under pressure and became red after the operation. Carry on the comprehensive monitoring and record the patient's vital signs, follow the peripheral circulation of the child, and inform the doctor immediately if there is any abnormal condition. Instruct the children's families to eat less and/or eat more, prevent the child from choking on milk, and gradually add steamed egg custard and meat porridge to their diet to strengthen nutrition. After the operation, patients often need to use the catheter drainage tube. It should be marked and appropriately fixed. Then, the drainage tube is inserted, observed and the character, quantity, and color of the drainage fluid is recorded, and the aseptic operation is strictly carried out, along with the timeous changing of the drainage bag. The children were guided on how to carry out rehabilitation exercises three days after the

procedure, and staff assisted them in lifting the and moving the right upper limb with ease, and on how to practice touching the ear with the right hand over the head to avoid the dysfunction of the right upper limb.

#### **Observation indicators**

The ventilator assisted time, chest drainage volume, and hospitalization days of the two groups were recorded. The incidences of postoperative pain, atelectasis, and pulmonary infection in the two groups were recorded. Patients' standard of life was scored using a self-made scale, including role conversion problems, communication problems, anxiety problems, etc. The higher the ranking, the greater the standard of life for patients. Most of the findings for patient compliance were measured in terms of time use, daily inspection, successful working, rest, and reasonable diet, etc. The total score was 100. Furthermore, the higher the ranking, the greater the enforcement of the patient.

#### **Data Statistics**

The data was analyses using SPSS 22.0 software. The counting data was expressed using (%), and the chi-square test was carried out. The measurement data was described using means,  $\pm$  standard deviation and using an independent sample t-test. The contrast was statistically meaningful ( $P < 0.05$ ).

#### **Results**

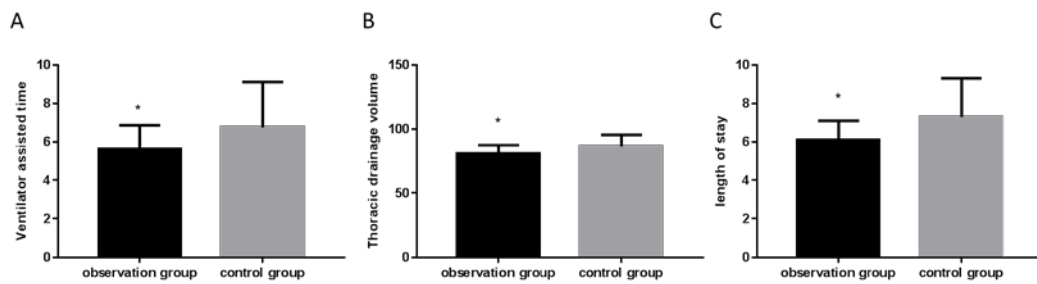
##### ***Comparison of ventilator assisted time, thoracic drainage volume, and hospitalization days between the two groups***

The operation was performed successfully in both groups, and there was no death. As shown in **Table 1** and **Figure 1**, the ventilator assisted time, chest drainage, and hospitalization days were considerably more in the test community than in the control group ( $P < 0.05$ ).

Table 1: Comparison of ventilator assisted time, thoracic drainage volume, and hospitalization days between the two groups

<b>Group</b>	<b>n</b>	<b>Ventilators assist time (h)</b>	<b>Intervention group (mL)</b>	<b>Length of stay (d)</b>
Intervention group	20	5.63 $\pm$ 1.24	80.5 $\pm$ 7.4	6.1 $\pm$ 1.7
Control group	20	6.76 $\pm$ 2.35	86.5 $\pm$ 9.0	7.3 $\pm$ 2.9

<i>T</i> value	2.3532	2.8246	2.5276
<i>P</i> -value	0.022	0.006	0.014



**Figure 1.** Comparison of ventilator-assisted time, chest drainage, and hospitalization days between the two groups. \*Compared with the control group,  $P < 0.05$ .

#### Comparison of complications between the two groups

In **Table 2**, there were 2 cases of post-operative pain and 1 case of pulmonary infection in the intervention group. On the other hand, 5 cases of post-operative

pain, 4 cases of pulmonary disease, and 3 cases of atelectasis were seen in the control group. The frequency of complications was slightly fewer in the interventional community than in the control group, with statistically relevant variations ( $P < 0.05$ ).

**Table 2:** The incidence rate of complications in two groups of children [n (%)]

Group	n	Post-operative pain	pulmonary infection	Atelectasis
Intervention group	20	2 (10)	1 (5)	0 (0)
control group	20	5 (25)	4 (20)	3 (15)
$\chi^2$		0.640		
<i>P</i>		0.003		

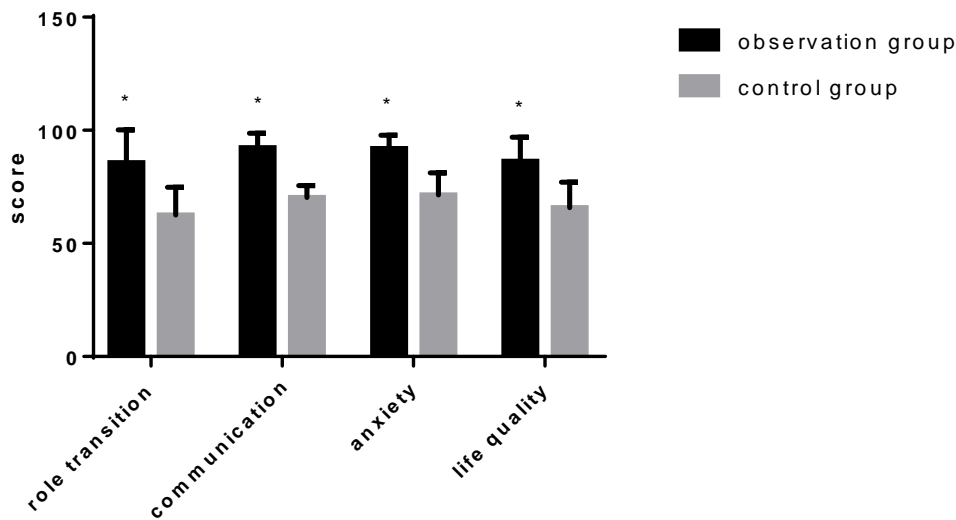
#### Comparison of the standard of life scores between the two groups

As shown in **Table 3** and **Figure 2**, the scores of children in the intervention group in the aspects of role

transformation, communication, anxiety, and standard of life were significantly greater than those in the control group. Statistically, significant variations existed between the two groups ( $P < 0.05$ ).

**Table 3:** Comparison of the standard of life scores between two groups of children

Group	Role transition	Communication issues	Anxiety	The total score of the standard of life
Intervention group	85.73±14.46	92.26±6.44	91.89±5.89	86.35±10.57
control group	62.61±12.14	70.35±5.27	71.39±9.74	65.76±11.34
<i>t</i>	6.708	14.410	9.876	7.262
<i>P</i>	0.000	0.000	0.000	0.000



**Figure 2.** Comparison of the standard of life scores between two groups. \*Compared with the control group,  $P < 0.05$ .

**Comparison of compliance between the two groups**  
 As shown in **Table 4**, the number of children in the intervention group taking medicine on time, regular reexamination, Responsible rest, and an appropriate

diet were far greater than in the control group ( $P < 0.05$ ), indicating that the intervention community enforcement of children was higher than the control group.

**Table 4:** Comparison of compliance between the two groups [n (%)]

Group	Take medicine on time	Regular review	Reasonable rest	Reasonable diet
Intervention group	12 (60)	14 (70)	13 (65)	14 (70)
control group	5 (25)	6 (30)	6 (30)	5 (25)
$\chi^2$	5.013	6.400	4.912	8.120
$P$	0.025	0.011	0.027	0.004

**Discussion**

Congenital heart disease is a common disease in children, mainly related to the fetal developmental environment or preterm delivery [13-15]. At present, Children's congenital heart disease is predominantly handled by surgery, but surgery causes tremendous trauma to the body of the children [16-18]. It also has a significant impact on the psychology of the children and their families. Therefore, child-based peri-operative breastfeeding is essential for smooth procedural development and boosts the post-operative standard of life [19,20]. Comprehensive nursing intervention means that all aspects of nursing can be perfected through Omni-directional nursing management measures. All the medical staff participates in the nursing process for patients to avoid unexpected conditions or accidents in nursing in as far

as possible. All medical staff should enhance their awareness of prevention and avoid the potential deficiencies in advance.

In this study, comprehensive childcare in the intervention category was carried out with children. The findings revealed that the standard of life ratings in the intervention community was considerably higher than in the control group. It suggested that the standard of life of children with congenital heart failure would dramatically enhance intensive nursing. The main reason is that the concept of secondary nursing management requires nurses to do without any shortcomings in the process of nursing and thoroughly correct the past point of view to avoid the occurrence of mistakes as much as possible in subjective consciousness. By their high sense of responsibility

and keen insight, nurses discover the hidden dangers in nursing in advance, strengthen the examination of nursing schedules, and finally provide meticulous nursing services for children to improve their standard of life.

Some studies have found that postoperative pain [21-22], pulmonary infection [23-25], and atelectasis [26-28] are common post-operative complications in children with congenital heart disease. The findings revealed that the complication rate was slightly lower in the intervention community than in the control group. In addition, in this study, the intervention group's nurse satisfaction was more important. Based on the analysis of the research, the comprehensive nursing service emphasizes effective prevention and avoidance before the occurrence of defects, strengthens the nursing standard of nursing staff, and enables the medical standard to be error free in as far as possible. To ensure an error free medical standard, the following measures need to be in place; strictly standardize the operation and cooperation process during the operation, precisely control infection, prevent hypothermia, and do an excellent job of intraoperative postural nursing to promote smooth completion. After the procedure, the condition of the children was closely observed to maintain the stability of their vital signs to effectively ensure the safety of the children and to reduce the incidence of complications [29-30]. Children receive such meticulous care, thereby improving they're with the nursing services received.

### Conclusion

In conclusion, a complete infirmity operation significantly increases the standard of life of children who undergo congenital heart surgery, thereby reducing the frequency of complications, and raising valuable treatment satisfaction.

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