

# Application Value of Targeted Nursing Intervention for Pediatric Nutritional Iron-Deficiency Anemia

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**Abstract:** *Objective:* To evaluate the nursing effects of targeted care for children with nutritional iron-deficiency anemia (IDA). *Methods:* A total of 88 children with IDA admitted to the hospital from November 2021 to November 2023 were selected (each child included one accompanying family member). Using a random number table, the participants were divided into two groups: the observation group, which received targeted nursing care, and the reference group, which received standard nursing care. The anemia correction rate, nutritional indicators, and family knowledge level were compared. *Results:* The anemia correction rate in the observation group was higher than in the reference group, with post-nursing nutritional indicators superior to those in the reference group. Additionally, family members in the observation group had a higher level of knowledge ( $P < 0.05$ ). *Conclusion:* Targeted nursing can effectively correct anemia symptoms in children with IDA, improve nutritional indicators, and increase family members' knowledge, demonstrating high nursing effectiveness.

**Keywords:** Pediatric nutritional iron-deficiency anemia; Targeted nursing; Anemia correction rate; Nutritional indicators; Knowledge level

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## 1. Introduction

Iron deficiency anemia (IDA) is a common form of anemia in children, with causes linked to organ dysfunction, environmental changes, malnutrition, and immune system diseases. IDA persistently reduces the immune function of affected children, impacting their physical and mental health. Iron supplements and other pharmacological treatments are effective therapies for children with IDA, as they can improve nutritional status and correct anemic symptoms. However, due to the young age of these patients, their compliance with medication is often low<sup>[1]</sup>. Additionally, IDA prognosis is influenced by multiple factors, including dietary structure and sleep quality. Therefore, children with this condition require targeted nursing to adjust individual dietary and lifestyle habits,

enhance medication adherence, and control the progression of anemia<sup>[2]</sup>. Based on this, the present study selected 88 children with IDA and 88 family members to analyze the effects of targeted nursing interventions.

## 2. Materials and methods

### 2.1. General information

A total of 88 children with IDA who were treated at the hospital from November 2021 to November 2023 were included, along with 88 accompanying family members. The participants were divided into groups using a random number table. In the observation group, there were 44 children, including 27 boys and 17 girls, aged 1 to 6 years, with an average age of  $3.18 \pm 0.42$  years. Among the 44 family members, there were 11 males and 33 females, aged 26 to 56 years, with an average age of  $34.65 \pm 3.17$  years. In the reference group, there were 44 children, including 26 boys and 18 girls, aged 1 to 5 years, with an average age of  $3.02 \pm 0.39$  years. The 44 family members included 13 males and 31 females, aged 24 to 55 years, with an average age of  $34.71 \pm 3.29$  years. There was no significant difference between the groups in terms of demographic data ( $P > 0.05$ ).

Inclusion criteria: Comprehensive diagnosis of IDA based on blood tests, clinical symptoms, and signs; age  $< 7$  years; normal mental state of the child; informed consent obtained.

Exclusion criteria: Severe liver disease, cognitive impairment, malignant tumors, or missing clinical data.

### 2.2. Methods

The reference group received standard nursing care: regular monitoring of vital signs, guidance on healthy eating, and appropriate supplementation with trace elements to improve nutritional status.

The observation group received targeted nursing care:

- (1) Psychological care: Assess the child's age. For children under 3 years old, whose language and cognitive abilities are limited, toys, games, and cartoons were used to bridge communication gaps, with nicknames like "baby" or "sweetie" to create a friendly atmosphere, helping to ease the child's unfamiliarity and encourage cooperation with care procedures. For children 3 years or older, who can express themselves and have a stronger sense of independence, comic-style educational materials or videos were provided, combining images and sound to enhance understanding of nursing concepts. Family members' cultural level, occupation, and personality were assessed to understand their psychological state and IDA awareness, allowing for tailored psychological support. In cases of panic or worry, successful cases were introduced with explanations of IDA's preventability and treatability, highlighting treatment and nursing processes to increase self-care awareness. For those experiencing anxiety or restlessness, family members were encouraged to read parenting books and IDA information booklets, helping them better understand disease care and management. Support groups or educational lectures were organized to alleviate feelings of helplessness and isolation, promoting communication among caregivers and continuous learning about IDA.
- (2) Dietary care: For mild anemia (hemoglobin level of 90–110 g/L), caregivers were advised to encourage iron-rich foods such as lean meat, animal liver, green leafy vegetables, fish, soy products, egg yolks, and blood-based products, along with vitamin C supplementation. For moderate to severe anemia (hemoglobin 60–90 g/L or  $< 60$  g/L), iron supplements were also provided in addition to dietary changes. Children with poor digestion were advised to eat small, frequent meals with thorough

chewing; for those with reduced appetite, frequent changes in food flavor were recommended to enhance the appeal of meals.

- (3) Lifestyle care: For children with stable conditions, light exercise was recommended, such as sun exposure and light jogging, with a daily exercise time of around 20 minutes, avoiding intense activity. Sufficient sleep was also encouraged, with bedtime set before 9 p.m. and sleep duration of approximately 10 hours to improve overall well-being.
- (4) Medication care: Iron supplements may cause gastrointestinal irritation, resulting in nausea, vomiting, and diarrhea. Therefore, low doses were administered, timed between meals, and combined with vitamin C. Caregivers and children were informed that iron intake may lead to darkened teeth and black stools to prevent unnecessary concern. For injections, the appropriate dose was calculated and administered in divided doses via intramuscular injection to enhance absorption.

### 2.3. Observation indicators

- (1) Anemia correction rate: (a) Significant correction as normal nutritional indicators and resolution of anemia symptoms after 1 week of intervention; (b) Basic correction as improved nutritional indicators and relief of anemia symptoms after 1 week of intervention; (c) No correction as abnormal nutritional indicators and no change in anemia symptoms after 1 week of intervention.
- (2) Nutritional indicators: Fasting venous blood samples were collected from the children. Hemoglobin levels were measured with an automated blood cell analyzer, ferritin with a chemiluminescence immunoassay analyzer, and serum iron with a spectrophotometric test kit.
- (3) Family knowledge level: A custom knowledge assessment scale was used, covering disease knowledge, dietary knowledge, exercise knowledge, medication knowledge, and precautions. Each category was scored out of 100 points, with higher scores indicating better knowledge mastery.

### 2.4. Statistical analysis

Data analysis was conducted using SPSS 28.0 software. Measurement data were expressed as mean  $\pm$  standard deviation (SD) and compared with *t*-tests. Count data were expressed as [*n* (%)] and compared with  $\chi^2$  tests. Results were considered statistically significant at  $P < 0.05$ .

## 3. Results

### 3.1. Comparison of anemia correction rates between the two groups

**Table 1** shows that the anemia correction rate in the observation group was higher than in the reference group ( $P < 0.05$ ).

**Table 1.** Comparison of anemia correction rates between the two groups [*n* (%)]

Group	<i>n</i>	Significant correction	Basic correction	No correction	Correction rate
Observation	44	24	18	2	42 (95.45)
Reference	44	19	16	9	35 (79.55)
$\chi^2$					5.091
<i>P</i>					0.024

### 3.2. Comparison of nutritional indicators between the two groups

Before nursing, there was no difference in nutritional indicators between the two groups ( $P > 0.05$ ). After nursing, the nutritional indicators in the observation group were higher than those in the reference group ( $P < 0.05$ ), as shown in **Table 2**.

**Table 2.** Comparison of nutritional indicators between the two groups before and after nursing (mean  $\pm$  SD)

Group	n	Hemoglobin (g/L)		Ferritin ( $\mu$ g/L)		Serum iron ( $\mu$ mol/L)	
		Before	After	Before	After	Before	After
Observation	44	91.65 $\pm$ 6.78	112.05 $\pm$ 7.98	13.61 $\pm$ 2.15	27.68 $\pm$ 3.11	13.35 $\pm$ 2.11	20.73 $\pm$ 3.11
Reference	44	91.69 $\pm$ 6.27	103.67 $\pm$ 7.41	13.57 $\pm$ 2.19	17.83 $\pm$ 3.06	13.29 $\pm$ 2.14	15.96 $\pm$ 3.04
<i>t</i>	-	0.029	5.104	0.086	14.975	0.132	7.275
<i>P</i>	-	0.977	0.000	0.931	0.000	0.895	0.000

### 3.3. Comparison of knowledge mastery scores between family members of both groups

**Table 3** shows that the knowledge mastery scores of family members in the observation group were higher than those in the reference group ( $P < 0.05$ ).

**Table 3.** Comparison of knowledge mastery scores between the two groups (mean  $\pm$  SD)

Group	n	Disease knowledge	Dietary knowledge	Exercise knowledge	Medication knowledge	Precautions
Observation	44	88.98 $\pm$ 4.13	90.57 $\pm$ 3.53	88.94 $\pm$ 3.51	92.12 $\pm$ 3.41	92.48 $\pm$ 3.27
Reference	44	84.02 $\pm$ 4.10	85.16 $\pm$ 3.42	84.02 $\pm$ 3.46	87.19 $\pm$ 3.20	89.15 $\pm$ 3.22
<i>t</i>	-	5.654	7.301	6.622	6.993	4.813
<i>P</i>	-	0.000	0.000	0.000	0.000	0.000

## 4. Discussion

The pathogenesis of IDA involves an iron deficiency, leading to decreased hemoglobin levels and subsequent microcytic anemia, which is prevalent in pediatric populations [3]. Symptoms of this condition include indigestion, pale skin and mucous membranes, reduced immunity, and are often accompanied by malnutrition, which further affects the child's physical and intellectual development. Children with this condition require dietary adjustments or iron supplements to adequately replenish iron levels and improve anemia. To enhance medication adherence and ensure effective treatment, targeted nursing care is often combined with other interventions [4].

Targeted nursing care, rooted in a human-centered approach, is a new nursing method that considers the physiological and psychological state of the child holistically. This approach allows for detailed nursing services that enhance the rationality and comprehensiveness of nursing interventions. The goals are more refined, enabling dynamic assessment of the child's nursing needs and adjustments to nursing measures to comprehensively improve the quality of care [5].

In this study, the anemia correction rate in the observation group was higher than in the control group, and post-nursing nutritional indicators were superior in the observation group ( $P < 0.05$ ). Analysis suggests

that targeted nursing can comprehensively assess the severity of anemia in children, provide tailored dietary guidance, and gradually normalize the child's eating habits, encouraging adherence to an iron-rich diet. Additionally, enhanced medication nursing improves caregivers' understanding of medication, ensuring adherence to prescribed regimens, reducing instances of unauthorized dosage changes or premature discontinuation, significantly improving anemia treatment outcomes and effectively enhancing the child's nutritional indicators<sup>[6,7]</sup>. The knowledge level among caregivers in the observation group was also higher than that of the control group ( $P < 0.05$ ). This may be attributed to targeted nursing's emphasis on psychological support, where education is tailored to the child's age with personalized communication and psychological counseling provided to caregivers. This approach enables caregivers to effectively support treatment and nursing procedures, gradually strengthening their self-care capabilities<sup>[8]</sup>. Furthermore, life care helps caregivers adjust the child's lifestyle habits, improving their overall health. Through these humanized and individualized nursing practices, caregivers recognize the professionalism and rigor of the nursing plan and gain comprehensive knowledge of the relevant topics<sup>[9,10]</sup>.

## 5. Conclusion

In summary, targeted nursing care can improve the severity of IDA in pediatric patients, adjust their nutritional status, and significantly increase caregivers' knowledge of the condition, offering substantial nursing advantages.

## Disclosure statement

The author declares no conflict of interest.

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