Effects of health education based on mobile platform on cognitive function and quality of life of children with pneumonia

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[Abstract] Objective: To explore the effects of health education based on mobile platform on cognitive function and quality of life of children with pneumonia. Methods: Eighty parents with pneumonia admitted to our hospital from March 2018 to March 2020 were selected as the research subjects. The parents of the control group received routine nursing intervention, and the parents of the observation group received health education intervention based on the mobile platform. After nursing, the nursing effect of the two groups was compared. The cognitive function and quality of life of the two groups were compared after nursing. The time of cough, dyspnea, shortness of breath and lung rales were compared between the two groups. The incidence of rash, abdominal pain, dizziness and headache and parents' satisfaction with nursing were compared between the two groups. Results: Compared with the control group, the nursing effective rate of the observation group was significantly increased (P<0.05). The scores of cognitive function and quality of life in observation group were significantly higher than those in control group (P<0.05). Compared with the control group, the disappearance time of clinical symptoms in the observation group was significantly decreased (P<0.05). The satisfaction of parents in the observation group was significantly higher than that in the control group (P<0.05). Conclusion: Health education based on mobile platform can effectively improve the cognitive function and quality of life of children with pneumonia, contribute to the early recovery of children, and has high clinical application value.

[Key words] Mobile platform; Health education; Children with pneumonia; Cognitive function; Quality of life; Effect

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Pneumonia is a common respiratory disease in pediatrics, which mostly occurs in children aged 5 ~ 15 years old. Pneumonia is caused by Mycoplasma pneumoniae infection and can be divided into mild pneumonia and severe pneumonia [1]. Clinical research shows [2] that pediatric pneumonia has the characteristics of acute onset, rapid progress and severe illness, and there are many complications, which seriously affect the normal development of children. The main clinical manifestations of patients at the time of onset include dry cough, fever, headache, sore throat and other symptoms under stimulation, and other systems of mild children are slightly involved. However, severe children will suffer from heart failure and respiratory failure due to the involvement of nerve, circulation and other systems. Children have poorer resistance, weaker constitution and hypoplasia of lung function than adults. If children are not treated in time, they will easily develop into severe pneumonia, which will pose a threat to their lives [3-4]. According to relevant research [5], the therapeutic effect and prognosis of children with pneumonia are closely related to the choice of nursing and nursing treatment. Children are a special group in clinic, and their mental level is not yet fully developed, who cannot accurately express their true inner demands, with poor self-control. Parents' mastery of nursing knowledge about children's pneumonia can promote children's physical rehabilitation [6]. Conventional health education is mainly carried out through oral content supplemented by paper materials, and parents' understanding of diseases is biased. Today, with the development of electronic equipment, video health education is vivid and can be played circularly, which ensures the accuracy of health education content, improves parents' understanding of diseases and the operation level of caring for children, so as to promote the rehabilitation of children [7]. Therefore, this article will explore the influence of health education based on mobile platform on cognitive function and quality of life of children with pneumonia, aiming at promoting the therapeutic effect of children with pneumonia. It is reported as follows.

1. Data and Methods

1.1 General data

Eighty parents with pneumonia admitted to our hospital from March 2018 to March 2020 were selected as the research objects. Among them, there were 47 male parents and 33 female parents. The age ranged from 25 to 35 years old, with an average age of 30.48 ± 2.69 years old. Education level: 39 cases of undergraduate, 23 cases of junior college and 18 cases of technical secondary school. There were 55 cases in cities and 25 cases in rural areas. There were 47 parents of one child and 33 parents of two children. The age of children ranged from 2 to 10 years old, with an average age of 5.95 ± 2.15 years old. The course of disease was 2 ~ 15 days, with an average course of 8.16 ± 2.01 days; According to the random number method, all parents of children were divided into observation group and control group, with 40 cases in each group. Among them, there were 23 males and 17 females in the observation group, with an average age of 30.16 ± 2.59 years old. There were 24 males and 16 females in the control group, with an average age of 30.58 ± 2.57

years. Parents of all children are aware of this study and have signed informed consent forms.

1.2 Inclusion criteria and exclusion criteria

Inclusion criteria: (1) patients with complete clinical data. (2) children who meet the diagnostic criteria for pneumonia. (3) patients who were diagnosed by CT, X-ray and pathological examination. (4) patients who can tolerant with study drug. (5) patients who can continue this researcher. Exclusion criteria: (1) patients with brain, heart, kidney, liver and other diseases. (2) patients with coagulation dysfunction. (3) patients who were diagnosed as mild pneumonia clinically. (4) patients with pulmonary embolism. (5) patients with severe autoimmune diseases.

1.3 Methods

Routine oral education was given to the control group, including medication guidance, cooperation methods of various examinations and disease nursing, and health education manuals were distributed to parents of children.

Health education intervention based on mobile platform was carried out on the observation group, which mainly included: (1) Establishing a nursing group: the group was composed of an experienced head nurse and four nurses, one of whom was a psychological nurse. (2) Establishing an intervention group: the group included all parents and all nursing staff in the observation group. (3) Contents of health education: Nursing staff recorded videos on mobile phones to tell parents about the related knowledge system of pneumonia, including the etiology, clinical manifestations, examination items, treatment methods and care measures of pneumonia. Nursing staff can ask parents questions at any time to understand their mastery of relevant knowledge. In this process, nursing staff correct the problems of parents. During the hospitalization of the child, the nursing staff called all parents to attend the health promotion meeting, and the nurse personally demonstrated the operation related to pneumonia and recorded it, which could include high temperature care, respiratory tract cleaning, inefficient breathing care, chest pain care, atomization inhaler care, infection prevention care and expectoration care, etc., which were carried out every 10-15 minutes. Parents can carry out simulation training to correct their mistakes. (4) Psychological nursing: The psychological nurse patiently communicates with the parents of the children to relieve the nervous and anxious mood of the parents of the children and give corresponding psychological counseling. Psychological lectures can be held regularly every week, including emotional communication, stress release and psychological support for children. (5) Online communication: Nursing staff answer the questions of parents in the group every day, and urge parents to watch videos and children's psychological and physiological changes repeatedly and report to nursing staff in time.

1.4 Observation indexes

(1) Nursing effect: The nursing effective rate of the two groups of children was compared, which was divided into obvious effect, effective and ineffective. Significant effect: after nursing, the clinical symptoms such as cough, dyspnea, shortness of breath and lung rales of the children

basically disappeared. Effective: After nursing, the clinical symptoms of children such as cough, dyspnea, shortness of breath and lung rales were relieved. Ineffective: After nursing, the clinical symptoms of the child did not relieve or worsen. Nursing effective rate = (markedly effective + effective)/total effective rate.

(2) Cognitive function: The cognitive function of the two groups of children after nursing was evaluated and compared with the self-made survey scale in our hospital.

(3) Quality of life: SF-36 quality of life questionnaire was used to evaluate the quality of life of the two groups of children, including physical function, emotional function and social function. The full score of the three scores was 100 points. The higher the score, the higher the quality of life of the children.

(4) Disappearance time of clinical symptoms: The disappearance time of cough, dyspnea, shortness of breath and lung rales of the two groups were compared.

(5) Occurrence of complications: The occurrence of rash, abdominal pain, dizziness and headache in the two groups were statistically compared.

(6) Nursing satisfaction: The parents' satisfaction with nursing was compared between the two groups.

1.5 Statistical processing

SPSS 22.0 statistical software was used to analyze the data. The measurement data conforming to normal distribution were expressed as mean ± standard deviation ($\bar{x} \pm s$), and the comparison between groups was tested by T test. Counting data were expressed as the number of cases (n) or percentage (%), and the data comparison was tested by $\chi 2$ test. When $P < 0.05$, the difference was statistically significant.

2. Results

2.1 Comparison of general data between the two groups

The average age, gender ratio, educational level, household registration nature, the number of parents with one child and the number of parents with two children, as well as the average age and average course of disease of the children were compared, the results showed no significant differences ($P > 0.05$), as shown in table 1.

Table 1 Comparison of general data between the two groups

Group		Observation group (n=40)	Control group (n=40)	Statistical value	P value
Gender (cases)	Male	23	24	5.267	0.492
	Female	17	16		
Mean age of parents (years old)		30.16±2.59	30.58±2.57	4.269	1.003
Mean age of children (years		6.01±1.05	5.96±0.58	4.119	2.098

old)					
Mean duration of disease (d)		8.12±2.04	8.20±2.31	6.238	0.068
Education level (case)	Undergraduate	20	19	-	-
	Junior college	11	12	-	-
	Technical secondary school	9	9	5.268	0.659
Nature of **household registration**	Rural areas	12	13	-	-
	City	28	27	2.110	1.006
One-child parents		23	24	6.223	1.002
Two-child parents		17	16	5.147	0.248

2.2 Comparison of nursing efficiency between the two groups

The nursing effective rate of children in the observation group was significantly higher than that in the control group, and the difference was statistically significant ($P < 0.05$), see table 2.

Table 2 Comparison of nursing efficiency between the two groups

Group	Observation group (n=40)	Control group (n=40)	X^2	P value
Remarkably effective	19(47.50)	17(42.50)	-	-
Valid	20(50.00)	16(40.00)	-	-
Invalid	1(2.50)	7(17.50)	-	-
Total effective rate	39(97.50)	33(82.50)	5.227	0.005

2.3 Comparison of cognitive function between two groups of children after nursing

The cognitive function of children in the observation group after nursing was significantly higher than that in the control group, and the difference was statistically significant ($P < 0.05$), see figure 1.

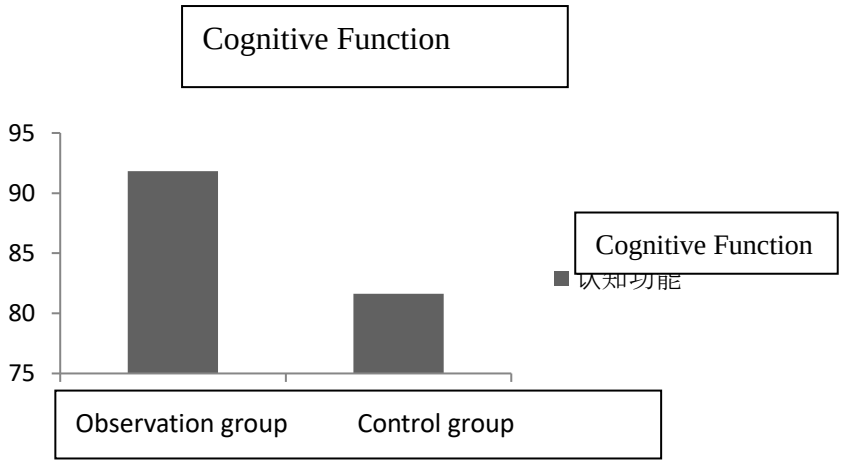


Fig. 1 Comparison of cognitive function between two groups of children after nursing

2.4 Comparison of quality of life between two groups of children after nursing

After nursing, the physical function, emotional function and social function of the children in the observation group were significantly higher than those in the control group, and the differences were statistically significant ($P < 0.05$), see Fig. 2.

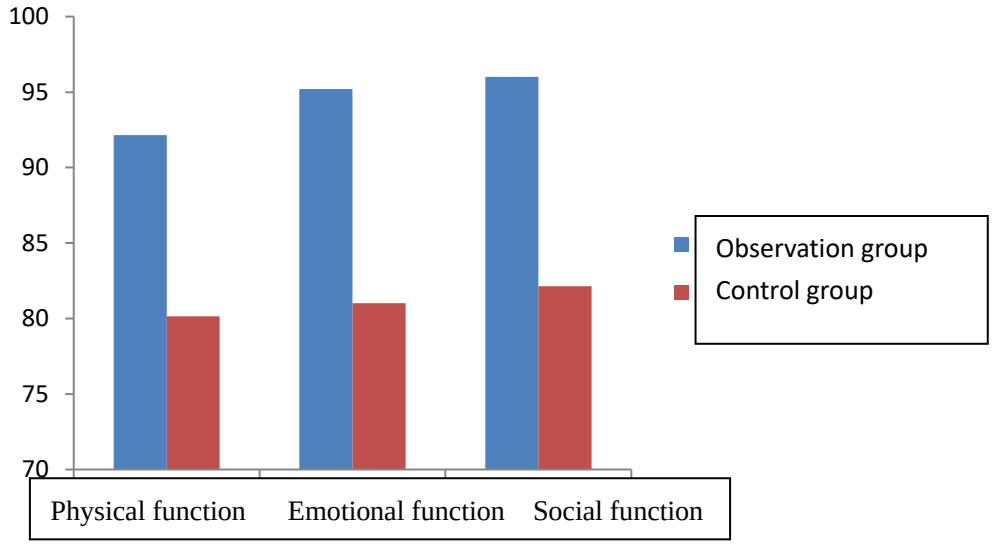


Fig. 2 Comparison of quality of life between two groups of children after nursing

2.5 Comparison of the disappearance time of clinical symptoms between the two groups

The cough, dyspnea, shortness of breath and the disappearance time of pulmonary rales in the observation group were significantly lower than those in the control group, and the differences were statistically significant ($P < 0.05$), see Fig. 3.

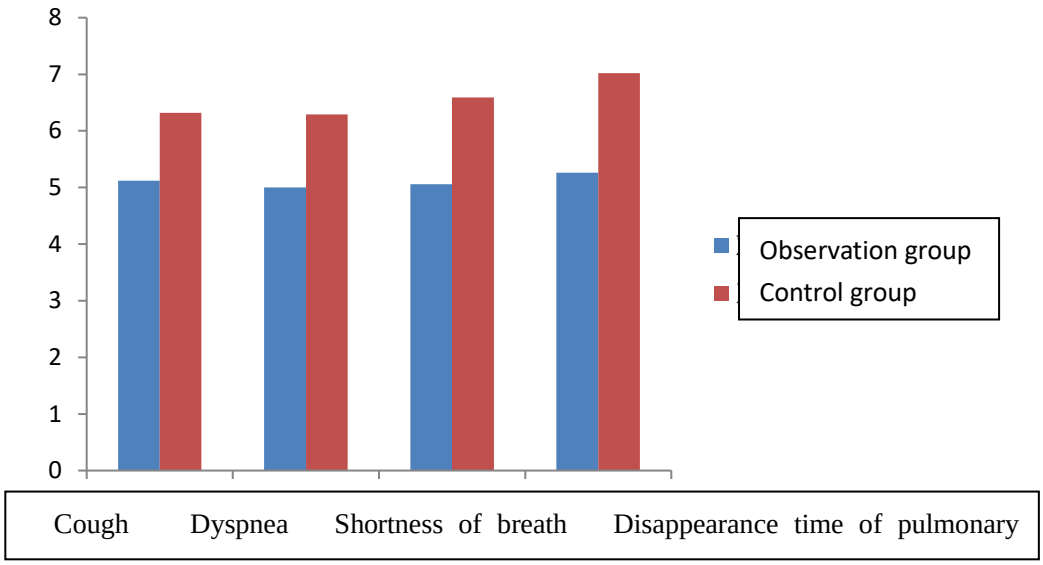
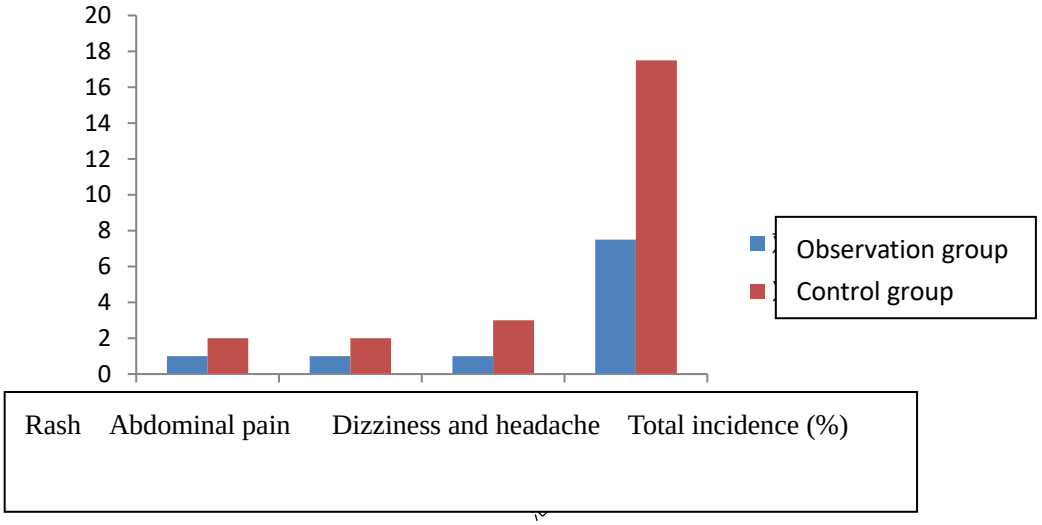


Fig. 3 Comparison of the disappearance time of clinical symptoms between the two groups

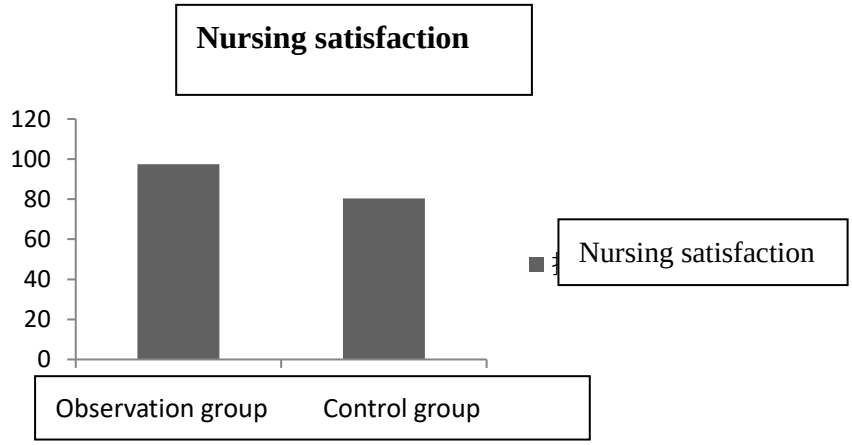
2.6 Comparison of complications between two groups

The total incidence of complications such as rash, abdominal pain, dizziness and headache in the observation group was significantly lower than that in the control group, and the difference was statistically significant ($P < 0.05$), see Fig. 4.



2.7 Comparison of parents' nursing satisfaction between two groups

The satisfaction of parents of children in the observation group was significantly higher than that in the control group, and the difference was statistically significant ($P < 0.05$), see Fig. 5.



3. Discussion

Pneumonia in children is a kind of pulmonary infectious disease with high incidence. It has the characteristics of acute disease, long course of disease and easy recurrence, If children are not treated in time, it will even threaten the life safety of children. Clinically, children with pneumonia bronchus are usually treated by atomization inhalation. However, most of the children are younger, have lower psychological development and poor understanding ability, which makes the nursing staff unable to communicate with the children accurately and the children cannot understand the intention of the nursing staff, resulting in a decline in the treatment compliance of the children. Therefore, timely and effective nursing is of great significance to the treatment of the children [8]. Clinical research found that [9], children's own behavior, lifestyle and living environment will affect the recovery of their illness. Therefore, it is especially important for parents to keep a correct cognition and improve the treatment compliance of children to recover their illness. Health education means that the introduction of disease-related knowledge to patients through a variety of simple and interesting ways, including pathogenesis, risk factors, relevant precautions, etc., which can deepen patients' understanding of the disease and improve patients' treatment compliance. Through clinical research, it is found that the intervention effect of traditional health education mode on children is not good, and children are prone to psychological tension [10]. Traditional health education usually adopts oral education or written materials, which are relatively stiff, difficult to understand and easy to forget [11]. Health education based on mobile platform can be displayed by playing video, which is vivid, intuitive and easy to understand. Through mobile phone grouping, parents of children can communicate with each other, exchange parenting experience, and solve problems existing in children and difficulties encountered in nursing in time [12].

Lu Buya et al. [13] have adopted video health education to intervene in children with pneumonia. The results showed that compared with conventional nursing methods, the nursing effect of this method on children has increased significantly. The above research also showed that the nursing effective rate of children in the observation group was significantly higher than that in the control

group. The reason may be that in the process of health education, the communication between nurses and parents of children was frequent, which relieves children's resistance to treatment and fear, and improved the cooperation of parents of children with treatment, thus improving the nursing effect. In the above study, it was also found that the cognitive function of children in the observation group after nursing was significantly higher than that in the control group. It was suggested that health education based on mobile platform can significantly improve the cognitive function of children with pneumonia. This may be related to the disappearance of clinical symptoms in the observation group, which was similar to the research results of Herval Á M et al. [14] in health education. Teston EF et al. [15] found that health education and respiratory tract care can significantly improve the quality of life of children. The above results showed that after nursing, the physical function, emotional function and social function of children in the observation group were significantly higher than those in the control group. This showed that health education based on mobile platform can improve the quality of life of children with pneumonia. This may be due to the deepening of parents' understanding of diseases in health education intervention, which can pay attention to children in all directions and promote their physical rehabilitation. The research results of the above scholars and Haruna H et al. [16] were consistent. Tudor Car L et al. [17] have shown in their research on online health education that online health education mode can promote the early rehabilitation of patients. In the above study, it was found that the disappearance time of cough, dyspnea, shortness of breath and lung rales in the observation group was significantly lower than that in the control group. It is suggested that health education based on mobile platform can significantly shorten the treatment time of children with pneumonia and promote their physical rehabilitation. The reason may be that the video can intuitively show the operation content of nursing staff, and the parents of children are easy to learn and understand, thus shortening the treatment time. This was consistent with the research results of Bajpai S et al. [18]. After nursing, it was found that the incidence of complications of rash, abdominal pain, dizziness and headache in the observation group was significantly lower than that in the control group. It is suggested that the health education model based on mobile platform can improve the prognosis of children with pneumonia. This may be closely related to the parents' timely feedback of children's problems through WeChat group, which can be corrected in time, and the wrong way of daily operation can be corrected in time through video operation of nursing staff. This was consistent with the research results of Willis EM et al. [19] on the application of health education to children with pneumonia. The above research results showed that the parents' satisfaction with nursing in the observation group was significantly higher than that in the control group, which indicated that the health education nursing method based on mobile platform can alleviate the doctor-patient relationship. This was related to the responsible attitude of nursing staff to communicate with parents of children. Zhang Jincao and other [20] scholars also found the existence of this phenomenon in their research on health education.

To sum up, health education based on mobile platform can significantly improve the therapeutic effect of children with pneumonia, improve their cognitive function and quality of life, reduce the occurrence of various complications of children, and also improve the positive attitude of parents of children towards diseases, so that children can get more social support.

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