

Original Article

The application effect analysis of personalized health education in acute leukemia nursing

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Abstract: Objective: To analyze the effectiveness of personalized health education care in the nursing of patients with acute leukemia. Methods: A total of 108 patients with leukemia who were admitted to our hospital were randomly selected as research subjects. A random number table was used to allocate the patients into the observation group and the control group, with 54 patients in each group. The control group had routine health education care and the observation group received personalized health education care in addition to treatment given to the control group. The knowledge of leukemia, bad moods, adverse reaction and nursing satisfaction were compared between the two groups. Results: The observation group had better knowledge of leukemia and nursing satisfaction than the control group, and the incidence of bad moods (anxiety, depression) and adverse reactions were lower than that in the control group (all $P < 0.05$). Conclusion: The application of personalized health education in the nursing of acute leukemia patients was significant, which improved the knowledge of acute leukemia, reduced the incidence of bad moods and adverse reactions, and improved nursing satisfaction.

Keywords: Acute leukemia, nursing, personalized health education, nursing satisfaction, bad mood

Introduction

According to epidemiological investigations, in recent years, the annual number of new cases of leukemia exceeds 400,000, and the number of deaths exceeds 300,000; with a population incidence rate of nearly 0.007%. Children and elderly people over 80 years old are higher-risk groups for leukemia. The clinical manifestations are mainly anemia, hemorrhage and infection, with the characteristics of an acute onset, severe illness and poor prognosis; all of which are important causes of death [1-6]. At present, there are many classifications of leukemia, and more than 80% of them are acute lymphoblastic leukemia. Since the majority of people affected are children and elderly, the requirements for nursing work are higher than those of normal adults [5, 7-9]. Therefore, active and effective clinical measures (clinical diagnosis, treatment and nursing) are the main solutions to improve the treatment outcomes of these patients [10-12]. At present, the treatment of acute leukemia is mainly chemotherapy, while preventing infection and other complications, and alleviating tension, anxiety and other bad moods can increase the coordination of and

compliance with treatment [13]. The improvement of patients' negative emotions through active nursing measures can improve the degree of cooperation in treatment to a certain extent. Previous studies have also confirmed that nursing measures can also play a vital role in acute lymphoblastic leukemia [14]. In the past, nursing work mainly followed the doctor's advice and lacked active participation, which can delay treatment. The latest research has shown that personalized health education nursing can increase the coverage of care knowledge, so it can improve the efficiency of nursing work and the clinical treatment of patients [15]. Therefore, this study investigated the effectiveness of personalized health education in acute leukemia care and aimed at providing more clinical evidence-based medicine for the effectiveness of personalized health education nursing measures.

Materials and methods

General information

A total of 108 patients with leukemia who were admitted to The First Affiliated Hospital of

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Soochow University between June 2018 and June 2019 were selected. Through random number table assignment, the patients were divided into an observation and a control group, with 54 cases in each group. Patients who were included in the study: those whose age was over 18; those who met the criteria for acute leukemia diagnosis and efficacy, and were confirmed by cell morphology and immunophenotype based on bone marrow aspiration [16]. Patients who were excluded: patients who suffered from other hematologic diseases; patients whose leukemia was not an indication for hospitalization for the first time in The First Affiliated Hospital of Soochow University; patients who had hearing and speech impairments and were unable to communicate effectively; patients who had major organ dysfunction such as liver and kidney failure; patients who suffered from diseases of immune system, malignant tumors and cachexia; patients who did not have a medical background; patients who had history of mental diseases, cognitive dysfunction or brain metastasis. All patients enrolled agreed to participate in the study, and signed an informed consent form. The study was approved by the Ethics Committee of The First Affiliated Hospital of Soochow University.

Methods

Treatment methods: After admission, the two groups of patients were given conventional treatment measures in accordance with the doctor's instructions. The measures were mainly chemotherapy regimens according to the patients' clinical classification and guidelines. The measures were also mainly radiotherapy treatment regimens according to the patients' clinical classification and guidelines. Patients with acute lymphoblastic leukemia who did not achieve complete remission were given DCVLP (daunorubicin, Wuhan Huaxiang Kejie Biotechnology Co., Ltd., China), cyclophosphamide (Lianyungang Guike Pharmaceutical Co., Ltd., China), vincristine (Guangzhou Baiyunshan Mingxing Pharmaceutical Co., Ltd., Guangdong), L-Asparagine (Concord Fermentation Kirin Co., Ltd., Japan) and prednisone (Hubei Xing Galaxy Chemical Co., Ltd., Hubei). Patients in complete remission were treated with combination chemotherapy regimen based on high-dose methotrexate (Lianyungang Guike Pharmaceutical Co., Ltd., China). For acute myeloid leukemia patients, "3 + 7" regimen was mainly adopted, in which 3 referred to the use of anthracycline

chemotherapy drugs for 3 days. These drugs included roxithromycin, nordoxorubicin, mitoxantrone and so on. Seven of the regimen indicated that cytarabine should be used continuously for 7 days, together with relevant adjuvant therapy.

Routine nursing methods: The control group was given conventional education and nursing methods, which mainly included monitoring of the conditions and vital signs during chemotherapy, such as increased frequency of nurses' visits (if there were any abnormalities, doctors were notified immediately and relevant treatment were carried out according to the doctor's instructions). Other care included guidance on a reasonable diet, routine health education and daily care measures.

Personalized health education and nursing measures: The observation group received personalized health education and nursing measures, based on its application for rheumatism, cardiovascular and cerebrovascular and orthopedics. It mainly included the following aspects. First, caregivers carried out health education of leukemia-related knowledge according to the age of the patient, mainly including the cause of the disease, current treatment progress and related nursing knowledge. Second, caregivers provided psychological care. Due to the high fatality rate of leukemia and the potential fear of radiotherapy and chemotherapy, patients have high psychological pressure. In response to this situation, active communication was made to alleviate the patients' bad mental mood in a timely and effective manner, which was conducive to the treatment-related activities of the patient. Third, caregivers carried out health education knowledge related to complications. Because the treatment of leukemia requires acute chemotherapy, the patient were informed in advance of possible complications (such as the hair loss, infection, etc.). Based on this, the nursing staff guided the patient to buy a wig or hat. The prevention of infection depended on hospital isolation measures and the family's awareness of sterility, so caregivers emphasized sterile procedures and the points of attention in life.

Outcome measures

Primary observation indicators: A questionnaire survey was used to explore the awareness rate of leukemia-related knowledge in

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Table 1. Comparison of general information between the two groups of patients (n, $\bar{x} \pm sd$)

Items	Observation group	Control group	t/ χ^2	P
Age (year)	45.1 \pm 10.1	44.8 \pm 9.7	0.157	0.875
Gender (Male/Female)	30/24	28/26	0.372	0.847
Disease type				
Acute lymphocytic leukemia	21	27	0.000	0.988
Acute myeloid leukemia	33	27		
Disease course (month)	1.8 \pm 0.4	1.7 \pm 0.3	1.470	0.145
Disease state				
No complete remission	38	16	1.015	0.314
Complete remission	32	22		
Educational background				
High school degree and below	21	24	0.152	0.696
High school degree or above	33	30		
Complications				
Anemia	30	28	0.037	0.847
Hemorrhage	1	1		1.000
Fever	4	2		1.000

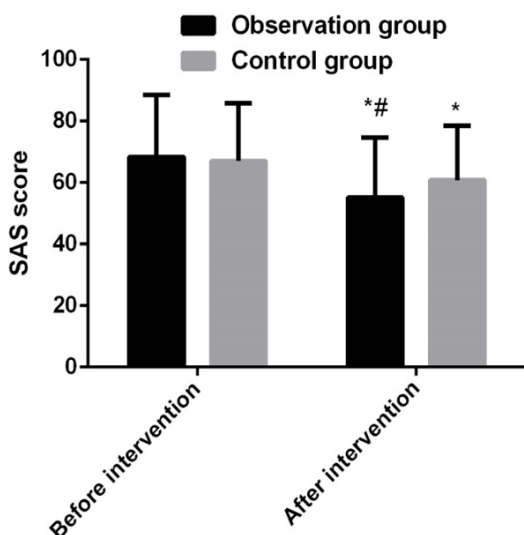


Figure 1. Comparison of SAS scores between the two groups before and after intervention. Compared with before intervention, * $P < 0.05$; compared with the control group after intervention, # $P < 0.05$. SAS: self-rating anxiety scale.

both groups of patients. On the day before discharge from the hospital, patients' knowledge was assessed using a leukemia-related knowledge survey scale designed by the department (total score of 100 points, the higher the score, the better the mastery) and patients were classified into the following levels: mastery (score

≥ 80 points); basic mastery (scores between 60-80 points, including 60 points); no mastery (score < 60 scores), mastery rate = (number of mastery + number of basic mastery)/total number of people * 100%.

This study also evaluated the changes in the patients' mental health before and after intervention. The Self-rating Anxiety Scale (SAS) and the Hamilton Depression Scale (HAMD) were used to evaluate the psychological conditions of the two groups of patients before treatment and the day before discharge. SAS score < 50 , 50-59, 60-69 and > 70 was considered as no anxiety, mild anxiety, moderate anxiety and severe anxiety, respectively [17, 18].

For HAMD, the treatment effect was evaluated according to the reduction rate, $\geq 75\%$ was cured, 50%-75% was markedly effective (excluding 75%), 25%-50% was effective (excluding 50%), $< 25\%$ was invalid. Total effective rate = (cured + markedly effective + effective)/the number of patients in this group * 100%.

Secondary observation indicators: This study adopted the nursing satisfaction score which was based on the evaluation of nursing job satisfaction of discharged patients and its influencing factors in North America [19]. The content mainly included the nursing staff's attitude, comprehensiveness of nursing and operation skills. Each item used a 1-4 point system with a total of 25 items. The total score for each item was a satisfaction score, with higher scores indicating higher satisfaction with nursing care. This study identified patients with phlebitis, catheter blockage, infection, and venous thrombosis during hospitalization as adverse reactions, and the incidence rate = complications/number of patients in this group * 100%.

Statistics methods

SPSS 20.0 statistical software was used for analysis. The measurement data were tested

Table 2. Comparison of the effective rate of reduction of HAMD scale between the two groups (n)

Groups	Cured	Markedly effective	Effective	Invalid	Total effective rate
Observation group	10	16	10	18	36/54 (68.52%)
Control group	6	10	7	31	23/54 (46.30%)
χ^2			5.199		5.379
P			0.074		0.020

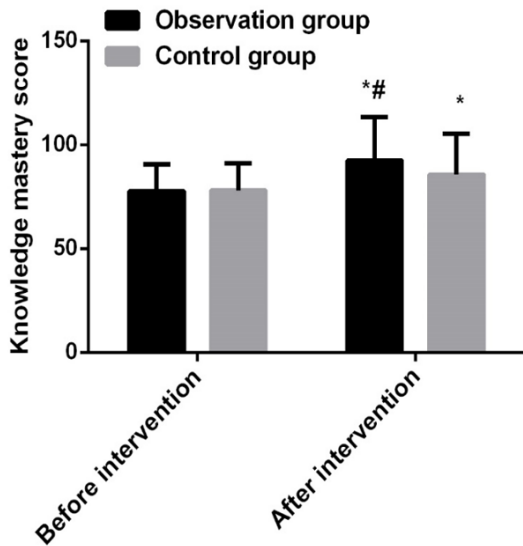


Figure 2. Comparison of knowledge mastery scores between the two groups. Compared with before intervention, *P<0.05; compared with the control group after intervention, #P<0.05.

for conformity to a normal distribution and expressed as mean \pm standard deviation ($\bar{x} \pm sd$). Paired t test was used for comparison before and after within groups, and independent sample t was used for comparison between groups. All count data were expressed by the number of cases/percentage (n/%), and comparisons were made using the χ^2 test. P<0.05 was considered as statistically significant.

Results

Comparison of general information between the two groups of patients

The two groups had no statistical difference in general information such as age, gender, disease type, disease course, disease state, complications, and educational background (all P>0.05), and the two groups were comparable (Table 1).

Changes of negative emotion assessment indicators (SAS and HADM) in the two groups

The statistical results showed that there was no statistical difference in the anxiety score (SAS) of the two groups of patients before treatment. After treatment, the negative emotion scores of the two groups of patients were lower than that before treatment (P<0.05), but the scores decreased more significantly in the observation group than in the control group (P<0.05), as shown in Figure 1 and Table 2.

The results of this study showed that the clinical effective rate of HAMD in the observed patients was higher than that in the control group, and there was a statistical difference (P = 0.020), indicating that the observation group was better than the control group in alleviating HAMD, as shown in Table 2.

Comparison of knowledge mastery between the two groups

The results of this study showed that there was no statistical difference in the scores related to the treatment of leukemia between the two groups (P>0.05). After nursing intervention, patients in the observation group were significantly better than those in the control group in terms of knowledge and scoring (P<0.05), which preliminarily indicated that personalized health education and nursing measures can increase the knowledge of patients, as shown in Figure 2 and Table 3.

Comparison of complications between the two groups

It was found in this study that the incidence of complications in the observation group was significantly lower than that in the control group (9.25% vs 25.93%, P<0.05), indicating that personalized health education and nursing measures can reduce the incidence of complica-

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Table 3. Comparison of knowledge mastery between the two groups (n)

Groups	Mastery	Basic mastery	No mastery	Mastery rate
Observation group	35	17	2	52/54 (96.30%)
Control group	20	25	9	45/54 (83.33%)
χ^2	7.262	1.909	3.644	4.466
P	0.007	0.167	0.056	0.035

Table 4. Comparison of complications between the two groups (n, %)

Group	Complications				Total incidence rate
	Infection	Phlebitis	Catheter blockage	Venous thrombosis	
Observation group	1 (1.85)	1 (1.85)	1 (1.85)	2 (3.70)	5 (9.25)
Control group	6 (11.11)	3 (5.56)	2 (3.70)	3 (5.56)	14 (25.93)
χ^2	2.444	0.260			0.088
P	0.118	0.610	1.000	1.000	0.043

Table 5. Comparison of nursing satisfaction scores between the two groups (points, $\bar{x} \pm sd$)

Group	Nursing staff's attitude	Comprehensiveness of nursing	Operation skills
Observation group	94.36±4.69	95.57±4.84	96.84±4.57
Control group	92.60±3.03	93.39±5.01	94.69±3.54
χ^2	2.316	2.300	2.733
P	0.022	0.023	0.007

tions in patients with acute leukemia, as shown in **Table 4**.

Comparison of nursing satisfaction between the two groups

The results of this study showed that the nursing satisfaction of the observation group was significantly better than that of the control group in terms of nursing staff's attitude, comprehensiveness of nursing and operation skills, and the difference was statistically significant (all $P < 0.05$), as shown in **Table 5**.

Discussion

Previous studies have confirmed that leukemia patients or their family members suffer from different degrees of depression and anxiety due to lack of relevant knowledge. Health education and personalized nursing measures are based on the individual characteristics of the patient or guardian, combined with their needs and doubts, so as to alleviate their inner fear and anxiety, and ultimately relieve their anxiety, depression and other psychological emotions [20, 21]. The results of this study showed that the depression and anxiety scores of patients

in the observation group were significantly lower than those before hospitalization, which further proved that personalized health education can alleviate patients' anxiety, depression and other unhealthy emotions. Similar conclusions have also existed in the past [22].

The patients' comprehensive knowledge of leukemia was of great significance to increase patients' enthusiasm for participating in disease diagnosis and treatment activities. Nursing staff took active measures to increase the knowledge of acute leukemia, which improved the patient's understanding of the knowledge. The results of this study also showed that the mastery rate of knowledge and scores in the observation group were significantly better than those in the control group, further confirming the conclusions of previous studies that personalized health education measures could improve patients' grasp of relevant knowledge [23].

This study further analyzed the inherent relationship between personalized health education, nursing measures and complications. The incidence of complications in the observation group was significantly lower than that in the

control group, which was related to the observation group's higher knowledge mastery rate and active participation. This was consistent with previous research reports [24]. Nursing satisfaction was an important indicator for assessing nursing work. Personalized health education nursing measures were proactively targeted from the patient's condition. The nursing measures related to acute leukemia that were actively carried out from the time patients were admitted to the hospital could improve patients' knowledge and make them actively participate in the whole treatment. In addition, nurses actively communicated with patients to understand the changes in the patient's inner feelings, relieve anxiety and tension, to enhance the relationship between nurses and patients, reduce the gap, and ultimately promote the harmony of the nurse-patient relationship. Our research results also suggested that the nursing satisfaction score of the observation group was significantly higher than that of the control group, which was consistent with other research reports [25].

In summary, compared with previous routine health education in the early stages of acute leukemia, this study confirmed that personalized health education achieved better patient care by incorporating the patients' individual characteristics, significantly improving acute leukemia patients' mastery of relevant knowledge, mitigating patients' negative emotions, increasing patients' motivation to participate in treatment, and ultimately reduced the incidence of complications. It assisted in the treatment of acute leukemia, which demonstrated the effectiveness of personalized health education. However, this study was a single-center study with a small number of subjects, so a multicenter randomized controlled study is needed to confirm the clinical effects. In addition, how to improve the follow-up standardized nursing measures for patients with acute leukemia is also a focus of the next research steps.

Disclosure of conflict of interest

None.

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