SIN-CHN
SCIENTIFIC PRESS PTE.LTD.

Molecular & Cellular Biomechanics 2024, 21(1), 219.
https://doi.org/10.62617/mcb.v21i1.219

Article

Application of fine nursing mode in nursing management of blood oncology department

Dan Liu, Desheng Fu, Huimin Xing, Yuanyuan Tang, Xiaoqing Ren, Mengtong Zhang, Xin Yao*

College of Nursing, Changchun University of Chinese Medicine, Changchun 130117, China
*** Corresponding author:** Xin Yao, 15306413586@163.com

CITATION

Liu D, Fu D, Xing H, et.al. Application of fine nursing mode in nursing management of blood oncology department. Molecular & Cellular Biomechanics. 2024; 21(1): 219. https://doi.org/10.62617/mcb.v21i1.219

ARTICLE INFO

Received: 25 June 2024
Accepted: 9 September 2024
Available online: 4 November 2024

Abstract: Objective: To explore the effect of fine nursing on cancer-related fatigue (CRF), anxiety, and depression in patients with hematological tumors undergoing chemotherapy, and to provide a feasible intervention plan for clinical management of these symptoms. **Methods:** A quasi-experimental study was conducted on patients with hematological tumors undergoing chemotherapy, admitted to our hospital from June 2018 to November 2021. A total of 84 eligible patients were randomly divided into two groups: 44 in the experimental group and 40 in the control group. The control group received routine nursing care, including psychological support, diet guidance, catheter care, bleeding prevention, and chemotherapy guidance. The experimental group received an additional 4 weeks of intensive nursing care on top of the routine care. **Results:** Three patients withdrew from the study, leaving 42 in the experimental group and 40 in the control group. No significant differences were observed between the two groups in terms of demographic and clinical baseline characteristics. Before the intervention, there were no significant differences in CRF, anxiety, and depression scores between the groups. After the intervention, the experimental group showed significantly lower scores in CRF, anxiety, and depression compared to the control group and their own baseline scores. **Conclusion:** Fine nursing can effectively reduce cancer-related fatigue, anxiety, and depression in patients with hematological tumors undergoing chemotherapy.

Keywords: fine nursing; blood tumor; cancer-related fatigue; anxiety; depression

1. Introduction

Hematologic malignancies (HM) are malignant clonal diseases originating from the hematopoietic system, including various types of malignant lymphoma, leukemia, myelodysplastic syndrome, multiple myeloma, and malignant histiocytosis [1]. The incidence of these diseases has shown a consistent upward trend worldwide. Statistically, HMs rank sixth among all tumors globally and are the most prevalent form of disease in Europe and the United States, while ranking second in Asian countries. In China, the incidence rate is reported at 2.76 per 100,000 individuals [2,3].

The peripherally inserted central catheter (PICC) is a deep vein catheterization technique where the catheter is inserted through a peripheral vein and advanced to a central vein. Compared to traditional methods such as subclavian or jugular vein administration, PICC is easier to operate, safer, and can be used long-term [4]. This reduces vascular damage from repeated venipuncture and the administration of chemotherapy drugs or hypertonic solutions, thereby alleviating patient discomfort. As a result, PICC is widely used for the infusion of chemotherapy drugs, blood products, and nutritional support in patients with hematologic malignancies.

However, due to factors like poor coagulation, low immunity, and bone marrow

suppression post-chemotherapy, patients with blood tumors are more susceptible to complications following catheterization [5]. These include puncture site bleeding, mechanical phlebitis, venous thrombosis, and infections. Research indicates that the incidence of PICC-related complications can be as high as 30.9%, with the first month post-catheterization being particularly critical due to insufficient patient knowledge or inadequate catheter care [6].

Current treatment modalities such as chemotherapy and stem cell transplantation have significantly extended the survival period for patients with blood tumors, allowing many to achieve long-term remission. However, the adverse reactions associated with these treatments—such as nausea, vomiting, anorexia, alopecia, pain, infection, and bleeding—combined with the financial burden of long-term care, impose significant physical and psychological stress on patients. With advances in medical technology and treatment, there is now a greater emphasis on improving the quality of life and mental health of these patients [7].

Refined nursing intervention, a newer nursing model, addresses these needs more effectively than traditional nursing methods. This approach is grounded in medical science and tailored to meet the physiological, psychological, and social needs of patients. Guided by humanistic care, refined nursing provides detailed and individualized care from admission through treatment. It emphasizes practical and precise care plans aimed at enhancing treatment outcomes, patient comfort, and satisfaction [8]. When developing these nursing plans, nurses should consider the specific disease types, surgical outcomes, rehabilitation potential, and the actual conditions of the hospital to create individualized care strategies. This approach strongly reflects the "patient-centered" concept [9,10].

To strengthen the background of this study, it is recommended to incorporate more recent theoretical references from the last two years, as this would provide a more current context for the research.

To sum up, situation of CRF, anxiety and depression in patients with hematological tumor undergoing chemotherapy is severe, which requires urgent intervention. At present, there are few reports on intervention measures of CRF, anxiety and depression [11]. Fine nursing has effect of relieving cancer-related fatigue and negative emotions. Therefore, this study adopts fine nursing under guidance of the knowledge, attitude, and practice (KAP), to provide a practical intervention plan for clinical effective intervention of CRF, anxiety and depression in patients with blood tumor chemotherapy [12]. The intervention method in this study is more specific and feasible than conventional measures currently applied in China by adding guidance of theoretical model to make intervention plan follow certain principles.

2. Data and methods

2.1. Research objects

The subjects of this study are patients admitted to our hospital from June 2018 to November 2021 who were diagnosed as leukemia, multiple myeloma or lymphoma by pathological diagnosis and were receiving chemotherapy [13].

2.1.1. Inclusion criteria

(1) Patients who have been diagnosed as hematological tumors (leukemia, lymphoma, or multiple myeloma) and are receiving chemotherapy, and have been hospitalized for more than 4 weeks.

(2) Chemotherapy regimen: leukemia (DA: daunorubicin cytarabine); Lymphoma (R-CHOP: rituximab + cyclophosphamide + doxorubicin + vincristine + prednisone); Multiple myeloma (VAD: vincristine + doxorubicin + dexamethasone) [14].

(3) Age < 18;

(4) Have normal communication ability, clear consciousness, and willing to participate in this study.

2.1.2. Exclusion criteria

(1) Have cognitive dysfunction, mental problems or have reported a history of mental disorders.

(2) Patients with cachexia, extreme weakness, and serious organic diseases such as heart, liver, and kidney [15].

2.1.3. Rejection criteria

(1) Midway discharge or transfer.

(2) Those who cannot insist on and complete nursing cycle.

2.2. Calculation of sample size

The sample size calculation method of comparing mean of two samples is used to estimate sample size required for this study, as shown in Equation (1)

$$N1 = N2 = 2\left[\sigma\left(t_{\alpha/2} + t_{\beta}\right)/(\mu 1 - \mu 2)\right]^2 \quad (1)$$

Among them, *N*1 and *N*2 are sample size required by experimental and control respectively: σ is two general fatigue samples. The estimated standard deviation of this scoring level is assumed to be equal; $\mu 1 - \mu 2$ is difference between mean fatigue scores of two samples; $t_{\alpha/2}$ and t_{β} are respectively t values corresponding to inspection level and type II error probability. Among them, $\alpha = 0.05\ \beta = 010$, according to research on impact on CRF $\mu 1 - \mu 2 = 0.74,\ \sigma = 0.99,\ N1 = N2 = [2 \times 0.99^2 \times (1.96 + 1.282)^2]/0.74^2 = 38$, it is concluded that 38 samples are required for experimental and control. Considering sample loss rate of 6%, final sample size required for experimental and control is about 40.

2.3. General information questionnaire

The general information questionnaire used in this study was developed by the researchers after an extensive literature review and was further refined through expert consultations [16]. The questionnaire was designed to collect relevant demographic and clinical information from the participants, ensuring that the data gathered could adequately reflect variables that might influence the study outcomes. These variables include age, gender, educational background, medical history, and chemotherapy cycles, among others. The rationale for selecting these variables was based on their potential impact on fatigue, anxiety, and depression levels in patients

with hematologic malignancies. An example of the questionnaire is provided in the Appendix to offer a clearer understanding of the questions asked and the type of data collected.

2.4. Cancer Fatigue Scale (CFS)

This study employed the Chinese version of the Cancer Fatigue Scale (CFS), a widely recognized tool used to assess fatigue among cancer patients both domestically and internationally [17]. The scale consists of 15 items across three dimensions: physical fatigue (7 items), emotional fatigue (4 items), and cognitive fatigue (4 items). Each item is rated on a 5-point Likert scale, with responses ranging from "never" (1 point) to "most of the time" (5 points). Higher scores indicate more severe fatigue. The scoring system is as follows:

a) Physical Fatigue: Sum of items 1, 2, 3, 6, 9, 12, and 15, with a possible range of 0–28.
b) Emotional Fatigue: Sum of items 5, 8, 11, and 14, with a possible range of 0–16.
c) Cognitive Fatigue: Sum of items 4, 7, 10, and 13, with a possible range of 0–16.
d) Total Fatigue: The overall score is the sum of the three dimensions, with a total possible score of 0–60 points.

The Chinese version of the CFS has demonstrated good reliability and validity, with test-retest reliability ranging from 0.55 to 0.77 and internal consistency between 0.63 and 0.86. Exploratory factor analysis revealed that the three factors together accounted for 59.04% of the variance, indicating the scales strong construct validity [18].

2.5. Hospital Anxiety and Depression Scale (HADS)

The Hospital Anxiety and Depression Scale (HADS), developed in 1983, is a commonly used tool for screening anxiety and depression in general hospital patients [19]. The scale consists of 14 items, with 7 items each for anxiety and depression. Each item is rated on a 4-point scale (0–3), with total scores ranging from 0 to 21 for both anxiety and depression:

a) 0–7: Asymptomatic
b) 8–10: Mild anxiety/depression
c) 11–14: Moderate anxiety/depression
d) 15–21: Severe anxiety/depression

HADS is praised for its simplicity and ability to reflect patients' subjective feelings, making it a reliable and effective tool for assessing anxiety and depression. However, its effectiveness is supported by its internal consistency and construct validity. In this study, Cronbach's alpha coefficients for the overall HADS scale, anxiety subscale, and depression subscale were 0.879, 0.806, and 0.806, respectively. Exploratory factor analysis extracted three common factors, accounting for 61.415% of the variance, confirming the scales good reliability and validity [20,21,22].

In summary, while both CFS and HADS are widely recognized and validated tools for assessing cancer-related fatigue, anxiety, and depression, their application in this study was carefully considered. The use of these scales allows for a comprehensive assessment of the psychological and physical burdens experienced by

patients with hematologic malignancies undergoing chemotherapy. The strengths of these scales lie in their ease of use, validity, and reliability. However, it is also important to acknowledge that these scales are based on self-reported data, which can be influenced by patients' subjective perceptions and current mental states.

2.6. Intervention plan

2.6.1. Control group

Adopt traditional routine nursing mode. Main contents: 1) Health education and psychological counseling. Health education on relevant knowledge shall be given to patients and their families, so that patients can have a correct understanding of disease, correct wrong cognition, improve level of self-management of disease, and establish healthy living habits [23]. Nurses should establish a smooth communication relationship with patients, take initiative to care for and encourage patients, and target negative emotions [24]. 2) Do a good job of medication nursing. The patient should be instructed to use drugs strictly according to doctor's instructions, predict adverse reactions in advance, be prepared psychologically, and actively respond [25]. 3) Create a comfortable hospitalization environment for patients. The ward shall be cleaned and ventilated frequently to maintain comfortable temperature and humidity and be disinfected regularly.

2.6.2. Research team

The fine nursing mode is adopted, and main contents are as follows:

1) Elaborate shift scheduling management: nursing team leader and night shift nurses should match old and new, perform their respective duties, and be responsible for each person. In fine scheduling management, flexible shift scheduling is divided into three shifts according to different personality characteristics and abilities of nurses: Class A, Class P, and Class N, with at least four people per shift. Each shift of nursing staff needs to make corresponding records, including shift records, shift time records, patient status records, and do a good job in shift handover.

2) To strengthen management of nursing staff: to improve comprehensive quality of nursing staff, we must go out of hospital for further study in a planned way, mainly for purpose of developing special training in "nursing blood tumor patients"; Timely deliver latest nursing knowledge, which is taught by an experienced head nurse or an authoritative expert. Help nurses to get familiar with nursing routine, precautions, nursing details, characteristics and adverse reactions of chemotherapy drugs, prevention of phlebitis, and treatment of extravasation of chemotherapy drugs for medical patients with blood tumors as soon as possible. Regularly assess results, establish safety awareness and responsibility awareness, and improve professional skills.

3) Refinement of chemotherapy preparation: Before chemotherapy, patient's pathological report and other blood related examinations must be sorted out to master drug allergy, drug exosmosis, phlebitis, venous thrombosis, and other related conditions. According to patient's physical condition, formulate a targeted nursing plan and establish a one-to-one patrol card, including adverse reactions, infusion, inspection, etc.

4) Fine and scientific selection of venipuncture during chemotherapy: scientific

selection of venipuncture should first follow type and nature of therapeutic drugs. Accurate and rapid puncture is required. Repeated puncture of same vein is prohibited within 24 h. During chemotherapy, patients shall be inspected frequently to master their urine (color, urine volume, etc.) and strengthen inspection. Drink more water to promote urination and reduce nephrotoxicity.

5) Elaboration of emotional management: communication between nurses and patients and their family's needs to be normalized to establish a good nurse patient relationship. In process of communication with patients, we should master emotional state of patients and their families. When patients have depression, we need to give effective measures to comfort them on premise of respect and understanding. Patients with suicidal tendencies should be given special care, and psychological departments and doctors should be invited for consultation and psychological treatment. Normal nursing work should pay attention to details, improve physiological comfort, improve quality of life of patients, establish treatment beliefs, and extend life cycle.

6) Refined risk management: frequently organize general nursing staff to learn about common risk factors in internal medicine ward of blood tumors, including medication errors, catheter related infections, suicide, etc., so that nursing staff can establish a high level of risk awareness, and find and eliminate potential risks as soon as possible.

The role of fine treatment: 1) prevent hospital infection. All punctures must undergo aseptic operation, and transparent film and sterile infusion positive pressure connector must be replaced regularly to ensure smooth flow of infusion pipeline. Observe and ask patient if puncture position is painful, if there is redness, swelling and fever, and deal with it in time. Make patient know about pipe retention and enhance cooperation. 2) Prevent drug allergy. Before medication, understand blood routine, liver function and urine routine of patient, and prepare rescue drugs and treatment instruments for drug allergy. Follow doctor's instructions, accurately master infusion speed of patient, and observe drug reaction. Prevent venous thrombosis, use anticoagulants during treatment, prevent long-term bed rest from compressing side limb of tube, allow patients to exercise properly, speed up blood circulation, prevent thrombosis, etc. 3) Other refined management. We should do a good job in fine management of children's blood diseases, strengthen communication with children, eliminate their sense of tension and strangeness, prevent crying, and appease children by playing cartoons, playing toys, etc. Do a good job of environmental sanitation treatment, and regularly clean, ventilate and disinfect windows. Do a good job in nursing station management, treatment room management, shift management, etc. Strengthen training, supervision, and assessment of health education ability of all nurses, establish a positive and correct concept of disease treatment for patients and their families, improve their cooperation, and enhance their ability to manage their own diseases.

3. Results

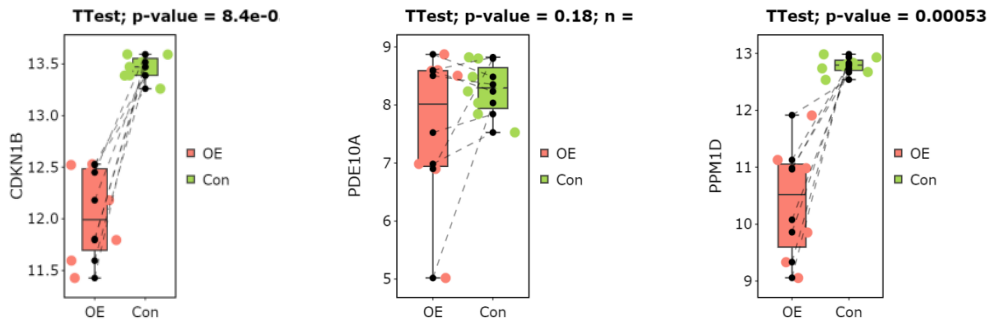
The demographic and clinical characteristics of the participants are summarized in **Table 1** and **Figure 1**. The study included 50 males (59.9%) and 34 females

(40.3%). A majority of the participants (54.9%) were from rural areas, and 62.2% had a junior high school education or below. Almost all participants (97.6%) had medical insurance. Regarding body mass index (BMI), 67.2% of the participants had a normal BMI. The majority (68.3%) had undergone chemotherapy 1–3 times, while 20.7% had received chemotherapy 4–6 times. In terms of disease classification, 56.1% of the participants were diagnosed with leukemia, 36.6% with lymphoma, and 7.3% with myeloma.

Table 1. General information of research objects (n = 82).

variable	project	Number of cases	Percentage (%)
Gender	Male	50	59.9
	female	34	40.3
nation	Han nationality	70	82.9
	ethnic minority	14	17.2
Home location	countryside	46	54.9
	Town	16	18.4
	City	18	16.9
With or without medical insurance	Have	81	97.7
	nothing		2.5
MBI	Emaciation	12	13.5
	normal	56	67.2
	overweight	16	19.6
Chemotherapy course	1–3	57	68.4
	4–6	18	20.8
	> 6	9	11.1
Classification of diseases	leukemia	47	56.2
	lymphoma	30	36.7
	Myeloma	7	7.4

The presentation of the data in this format aims to enhance readability and clarity while maintaining a focus on the most relevant findings. The concise summary provides a clear overview of the participants' characteristics without overwhelming the reader with excessive details.



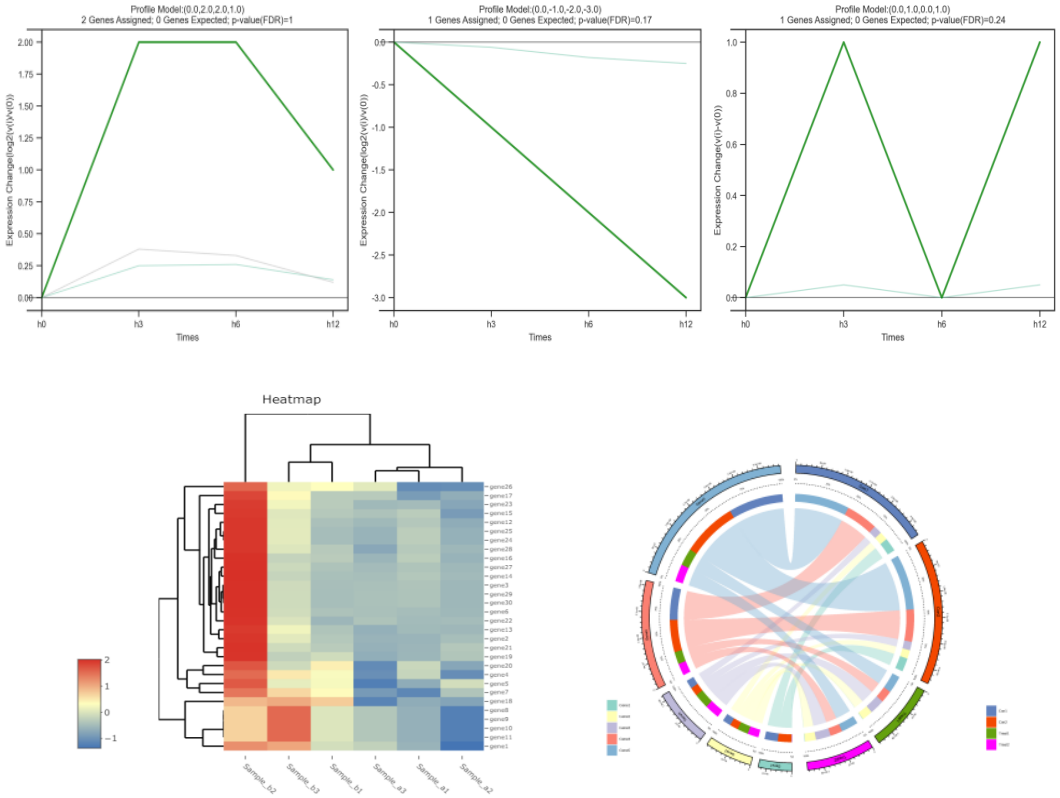


Figure 1. General information of research objects.

The patients' general statistics are included in the data count. The chi square test is employed when the outcome variable is a disorder variable; a nonparametric rank sum test should be used to compare patient general data in an equitable manner when the outcome variable is an ordered variable (education level, family per capita monthly income, BMI, course of therapy). The results showed that there was no significance in terms of gender, nationality, family location, education level, medical insurance, smoking, drinking, BMI, chemotherapy course, disease classification and other general data ($P > 0.05$). The general data are comparable. See **Table 2** and **Figure 2** for details.

Table 2. Comparison of general data of patients ($n = 84$).

Project	category	experience		control		x^2/Z	P
		N = 44	%	N = 40	%		
Gender	Male	27	59.53	24	60.01	0.003	0.966
	female	17	40.49	16	40.01		
nation	Han nationality	35	83.34	33	82.51	0.011	0.921
	ethnic minority	7	16.68	7	17.51		
Home location	countryside	34	21.44	35	87.51	3.566	0.182
	Town	9	26.19	3	7.51		
	City	1	76.19	2	5.01		
With or without medical insurance	Have	42	64.29	39	97.51	-	1.001
	nothing	2	16.68	1	2.51		

Table 2. (*Continued*).

Project	category	experience		control		x^2/Z	P
		N = 44	%	N = 40	%		
MBI	Emaciation	7	4.77	6	15.01	−0.241	0.811
	normal	30	95.24	25	62.51		
	overweight	7	11.91	9	22.51		
Chemotherapy course	1–3	34	71.44	24	60.01	−0.109	0.109
	4–6	7	16.68	10	60.01		
	> 6	3	7.15	6	25.01		
Classification of diseases	leukemia	28	66.68	18	45.01	4.303	0.119
	lymphoma	11	26.19	19	47.51		
	Myeloma	5	7.15	3	7.51		

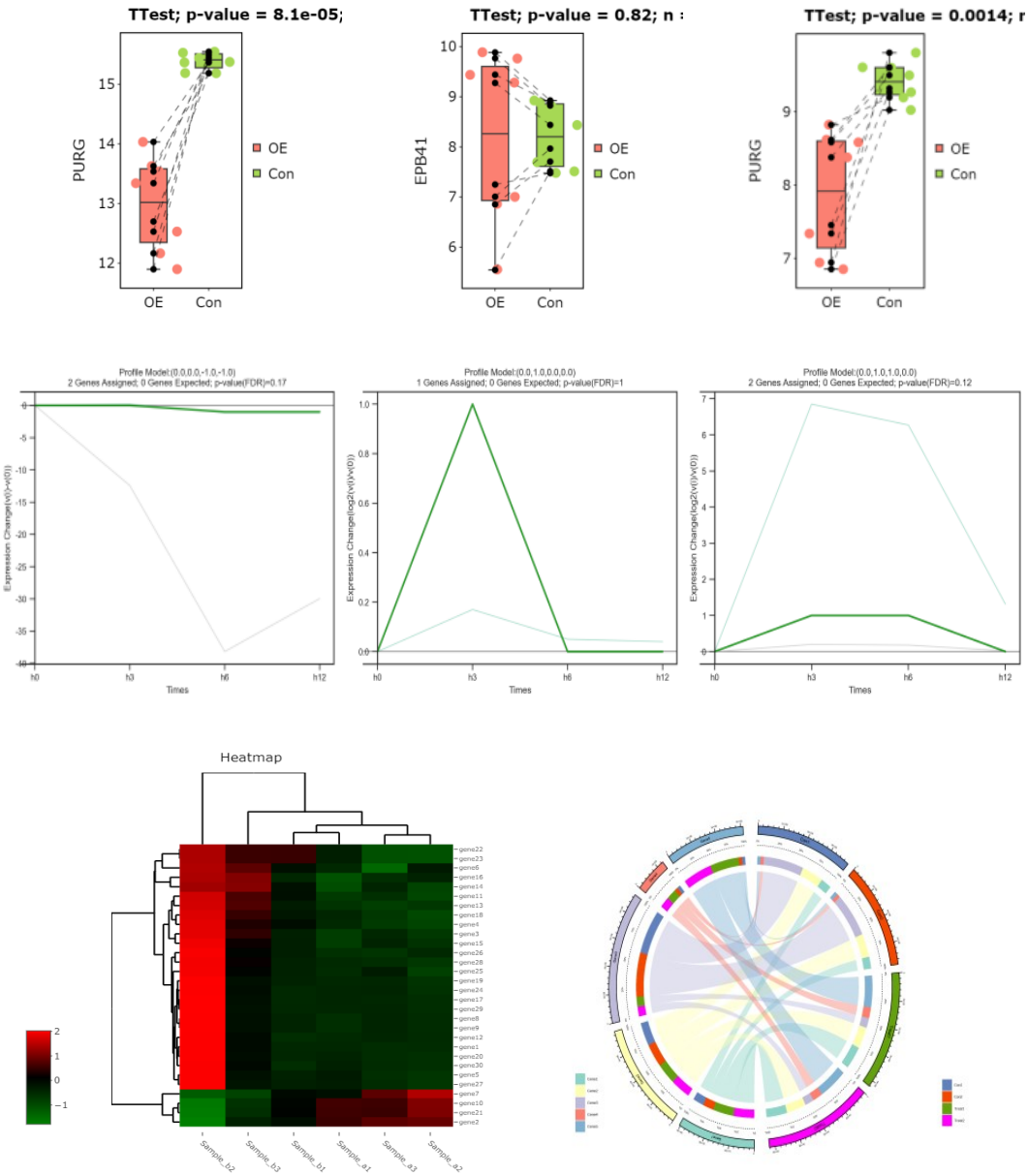
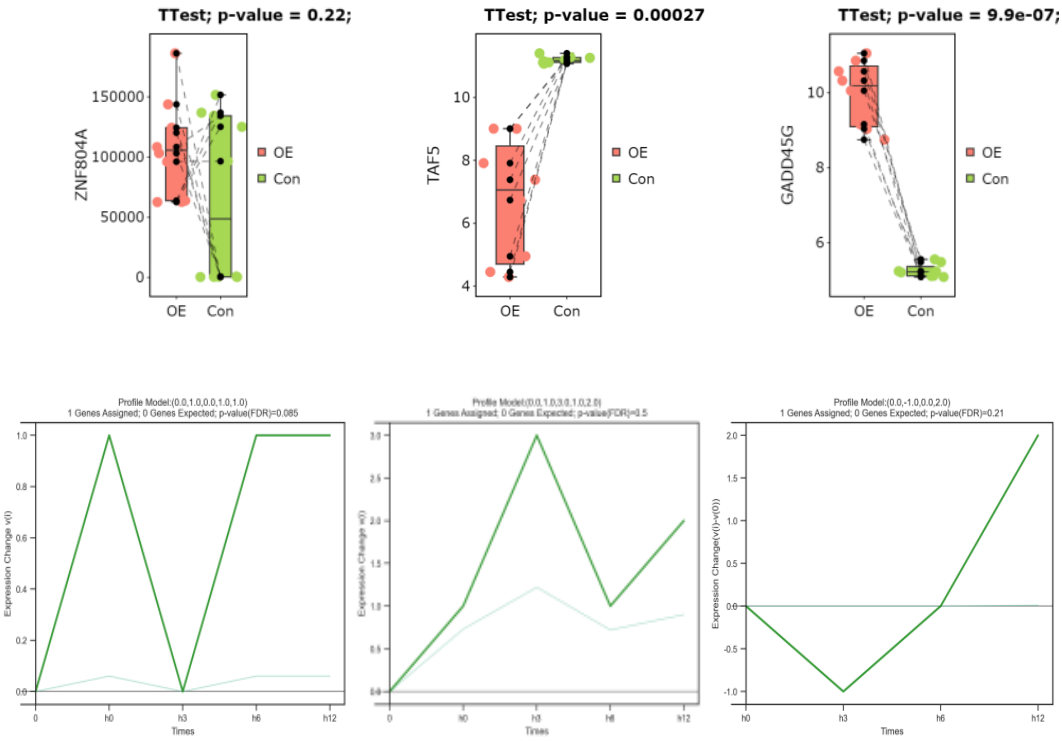


Figure 2. Comparison of general data of patients

Baseline comparison: body fatigue, cognitive fatigue, emotional fatigue and CRF total scores did not obey normal distribution. The median and interquartile intervals were used for description. Nonparametric test (Mann Whitney U) was used for comparison. The results showed that before intervention, total CRF score of experimental was 31.5 (27.0,36.3) for M (P25, P7s), 17.5 (14.0,20.0) for M (P25, P7s), 6.0 (4.8,8.0) for M (P25, P7s), and 9.0 (8.0,11.0) for M (P25, P7s); Before intervention, total CRF score of control was 31.0 (27.0,33.0) for M (P25, P7s), 14.5 (14.0,18.0) for M (P25, P7s), 7.0 (5.0,8.0) for M (P25, P75), and 8.0 (8.0,10.0) for M (P25, P7s), respectively. Before intervention, no difference in terms of CRF total score, physical fatigue, cognitive fatigue and emotional fatigue (P > 0.05), which was comparable, as shown in **Table 3** and **Figure 3**.

Table 3. Comparison of CRF scores before intervention $[M(P_{25}, P_{75})]$.

Project	**experience** $n = 44$	**control** $n = 40$	**Z**	**P**
CRF total score	31.5(27.1,36.4)	31.1(27.1,33.1)	−0.369	0.716
Physical fatigue	17.5(14.1,20.1)	14.5(14.1,18.1)	−1.717	0.087
Cognitive fatigue	6.1(4.8,8.1)	7.1(5.1,8.1)	−1.649	0.099
Emotional fatigue	9.1(8.1,11.1)	8.1(8.1,10.1)	−1.108	0.269



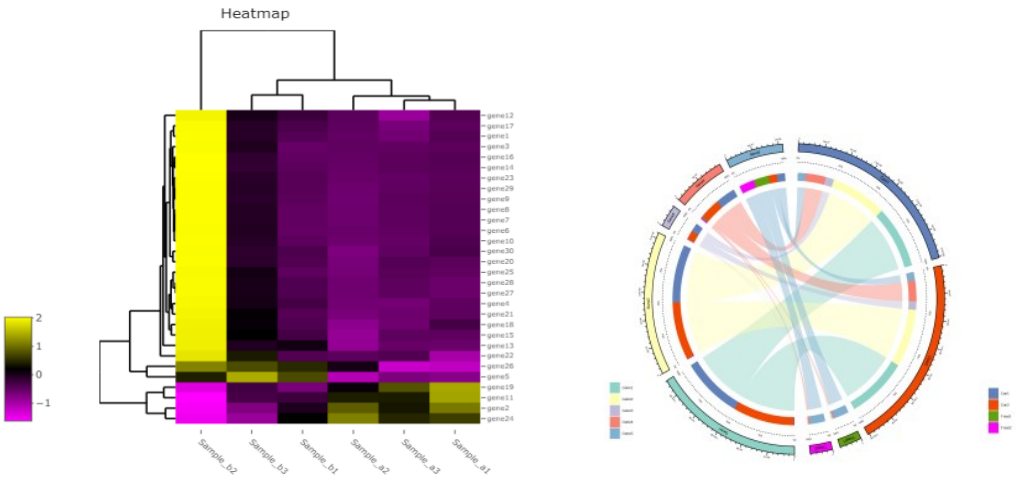
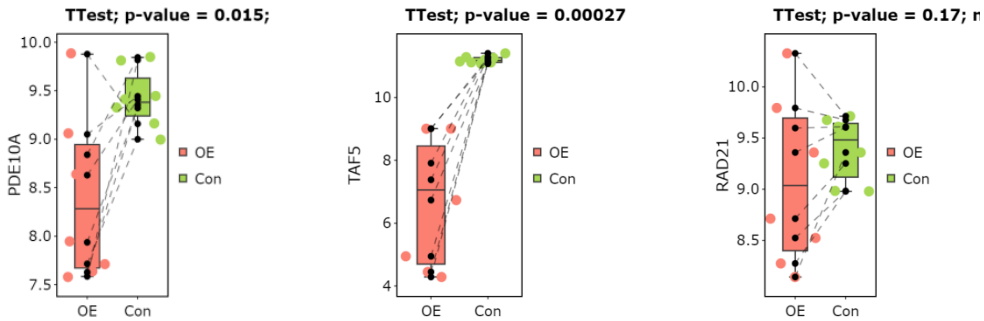


Figure 3. Comparison of CRF scores before intervention.

Through exploratory analysis, anxiety and depression scores of patients follow normal distribution and variance is homogeneous, but to better reflect characteristics and changing trend of data, and to facilitate comparison of data, median and interquartile interval are used for description. The balance was compared by independent sample t-test. The results showed that anxiety score of experimental before intervention, M (P25, P7s) was 9.0 (6.0,10.0), and depression score, M (P25, P75) was 9.0 (7.0,10.0); The anxiety score of control, M (P25, P75) is 8.0 (6.0,9.0), and depression score, M (P25, P7s) is 8.0 (5.3,10.0). In addition, scores of anxieties and depression were not significant and were comparable, as shown in **Table 4** and **Figure 4**.

Table 4. Comparison of anxiety and depression scores before intervention $[M(P_{25}, P_{75})]$.

Project	**experience** $n = 44$	**control** $n = 40$	t	P
CRF total score	9.0(6.1,10.1)	8.1(6.0,9.0)	1.818	0.095
Physical fatigue	9.1(7.1,10.1)	8.1(5.3,10.0)	1.264	0.214



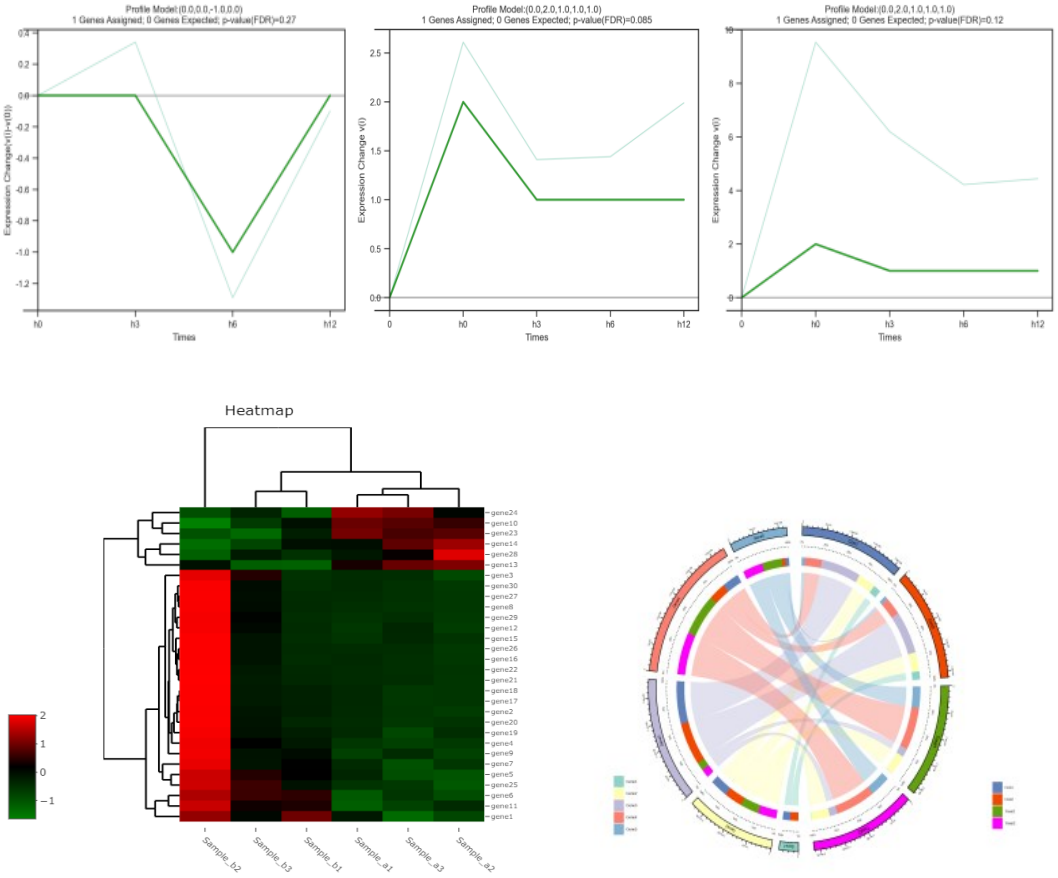


Figure 4. Comparison of anxiety and depression scores.

After intervention, intra comparison of total score of CRF and each dimension score of patients: exploratory analysis was used to test difference of three dimensions of physical fatigue, cognitive fatigue, emotional fatigue, and total score of CRF in experimental before and after intervention. It was found that difference did not conform to normal distribution. Wilcoxon paired rank sum test was used for intra comparison. The physical fatigue, cognitive fatigue and CRF total score difference of control before and after intervention did not conform to normal distribution. Wilcoxon paired rank sum test was used to compare them within. The difference value of control before and after intervention of emotional fatigue obeyed normal distribution, and paired t-test was used for intra comparison. The results showed that a difference in total score of CRF and scores of each dimension in experimental before and after intervention ($P < 0.05$), and no difference in physical fatigue and emotional fatigue in control before and after intervention ($P > 0.05$), as shown in **Table 5** and **Figure 5**.

Table 5. Intra comparison of CRF scores of patients before and after 1000 pre training $[M(P_{25}, P_{75})]$.

project	grouping	Before intervention	After intervention	Z/t	P
CRF total score	experience	31.5(27.0,36.4)	23.1(19.9,27.1)	−5.169	< 0.001
	control	31.1(27.0,33.1)	58.6(24.4,31.1)	−2.384	0.018

Table 5. (*Continued*).

project	grouping	Before intervention	After intervention	Z/t	P
Physical fatigue	experience	17.6(14.0,20.1)	12.1(10.1,14.1)	−5.002	< 0.001
	control	14.6(14.0,18.1)	14.1(13.1,18.1)	−0.532	0.596
Cognitive fatigue	experience	6.1(4.8,8.1)	4.0(1.0,6.1)	−3.076	0.003
	control	7.1(5.0,8.1)	4.6(3.0,7.1)	−3.139	0.003
Emotional fatigue	experience	9.1(8.0,11.1)	7.1(5.0,8.1)	−3.744	< 0.001
	control	8.1(8.0,10.1)	8.1(7.25,9.9)	−0.613	0.545

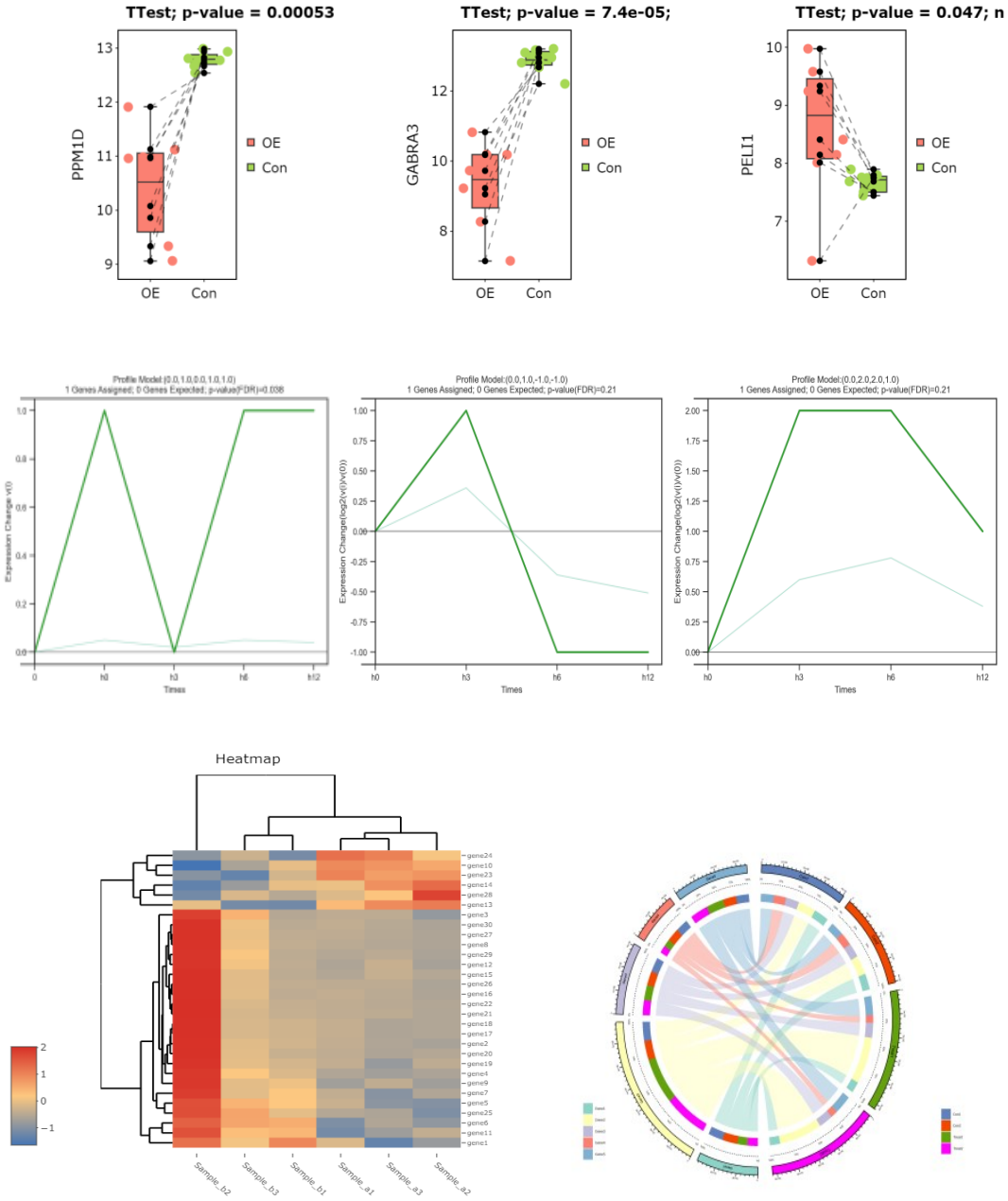


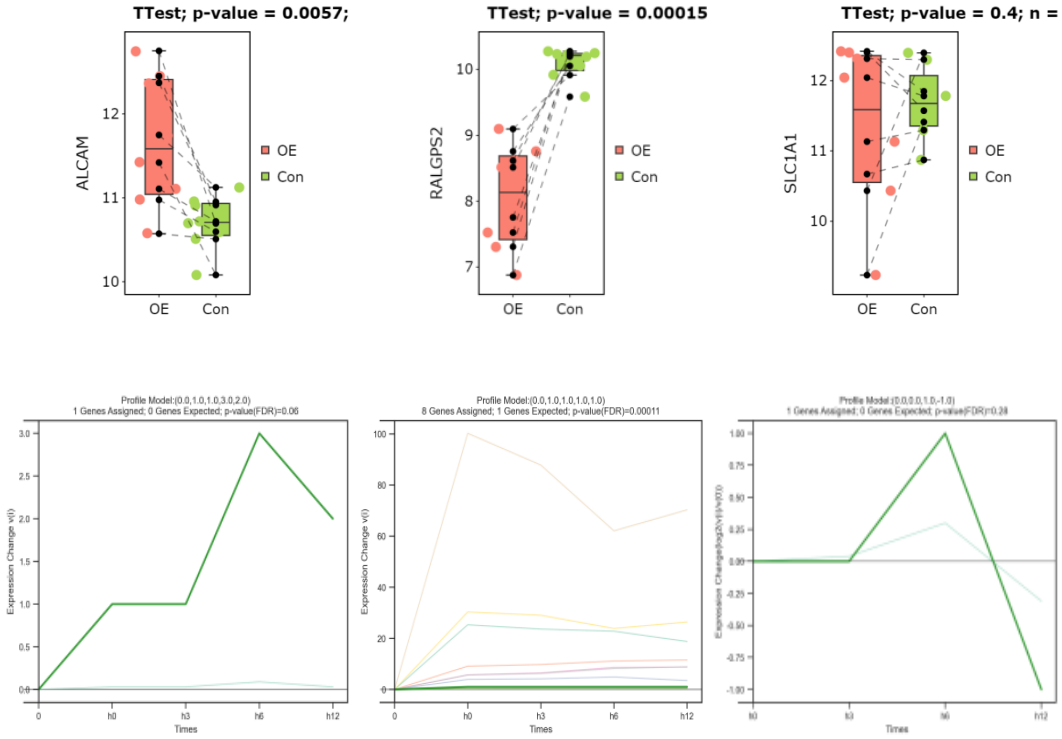
Figure 5. Intra comparison of CRF scores of patients.

After intervention, total score of CRF and comparison of each dimension: physical fatigue, cognitive fatigue and emotional fatigue did not obey normal

distribution, and median and interquartile interval were used for description, and comparison was conducted using non-parametric test (Mann Whitney U). Through exploratory analysis, total CRF scores of patients were in line with normal distribution and homogeneous variance. However, to better reflect characteristics and trends of data, and to facilitate comparison of data, median and interquartile intervals were used for description, two independent sample t-tests were used for interring comparison. The results showed that a difference in CRF total score, physical fatigue, and emotional fatigue after intervention ($P < 0.05$), while no difference in cognitive fatigue dimension ($P > 0.05$), as shown in **Table 6** and **Figure 6**.

Table 6. Comparison of CRF scores of patients with 1000 prognosis $[M(P_{25}, P_{75})]$.

Project	**experience** ***n*** **= 44**	**control** ***n*** **= 40**	**Z/t**	**P**
CRF total score	23.0(27.1,36.4)	28.1(27.1,33.1)	−4.069	< 0.001
Physical fatigue	12.5(14.1,20.1)	14.5(14.1,18.1)	−3.717	0.087
Cognitive fatigue	6.1(4.8,8.1)	4.1(5.1,8.1)	−1.649	0.099
Emotional fatigue	7.1(8.1,11.1)	8.1(8.1,10.1)	−3.108	0.003



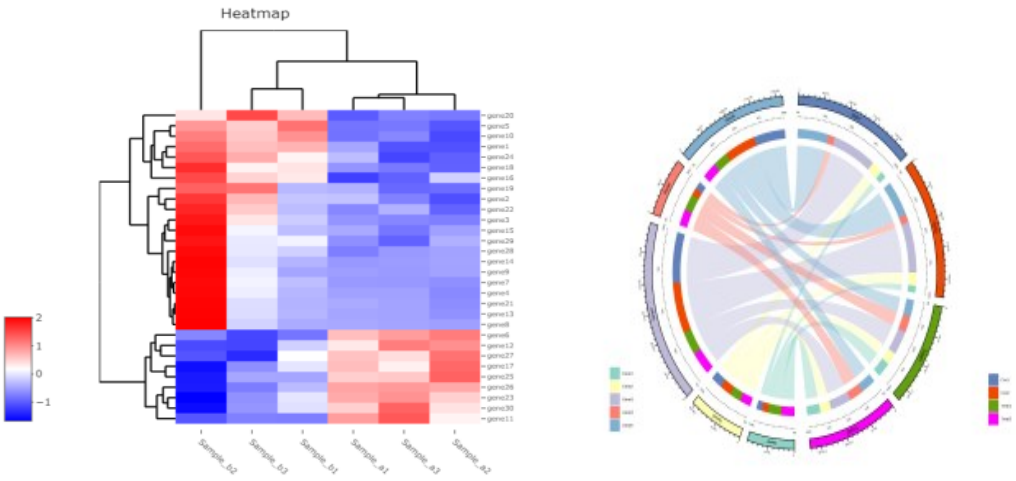


Figure 6. Comparison of CRF scores of patients with 1000 prognosis.

The difference between anxiety and depression of patients in experimental and patients in control before and after anxiety intervention did not conform to normal distribution. Wilcoxon paired rank sum test was used for intra comparison. The difference of depression scores in control before and after intervention followed a normal distribution, and paired t test was used for intra comparison. The results showed that difference in anxiety and depression in experimental before and after intervention ($P < 0.05$), while no difference in anxiety and depression in control ($P > 0.05$). See **Table 7** and **Figure 7**.

Table 7. Intra comparison of anxiety and depression scores before and after intervention $[M(P_{25}, P_{75})]$.

project	grouping	Before intervention	After intervention	Z/t	P
anxious	experience	9.0(6.0,10.1)	5.0(4.0,6.1)	−4.848	< 0.0001
	control	8.0(6.0,9.1)	8.5(6.0,10.1)	−0.452	0.653
depressed	experience	9.0(7.0,10.1)	4.0(3.1,6.0)	−5.087	< 0.001
	control	8.0(5.3,10.1)	7.5(5.3,10.1)	0.407	0.688

After intervention, anxiety and depression of patients did not conform to normal distribution, and median and interquartile intervals were used for description. The comparison was conducted using non-parametric test (Mann Whitney U). The results showed that a difference in anxiety and depression after intervention ($P < 0.05$), as shown in **Table 8** and **Figure 8**.

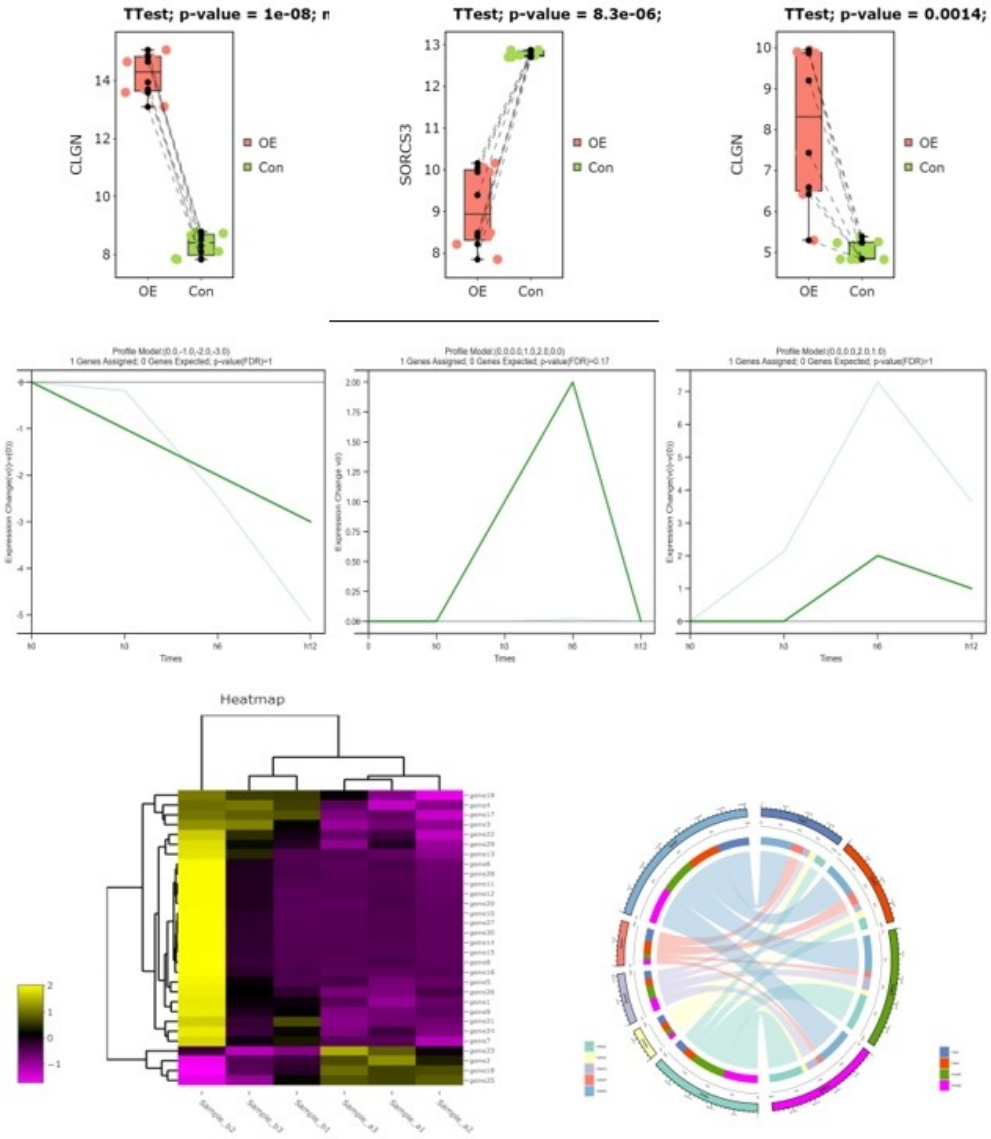


Figure 7. Intra comparison of anxiety and depression scores.

Table 8. Comparison of anxiety and depression scores between experimental and control after intervention $\left[M\left(P_{25}, P_{75}\right)\right]$

Project	**experience n=44**	**control n=40**	**Z**	**P**
anxious	5.0(4.0,6.1)	8.5(6.0,10.1)	−5.145	< 0.001
depressed	4.0(3.0,6.1)	7.5(5.3,10.1)	−4.455	< 0.001

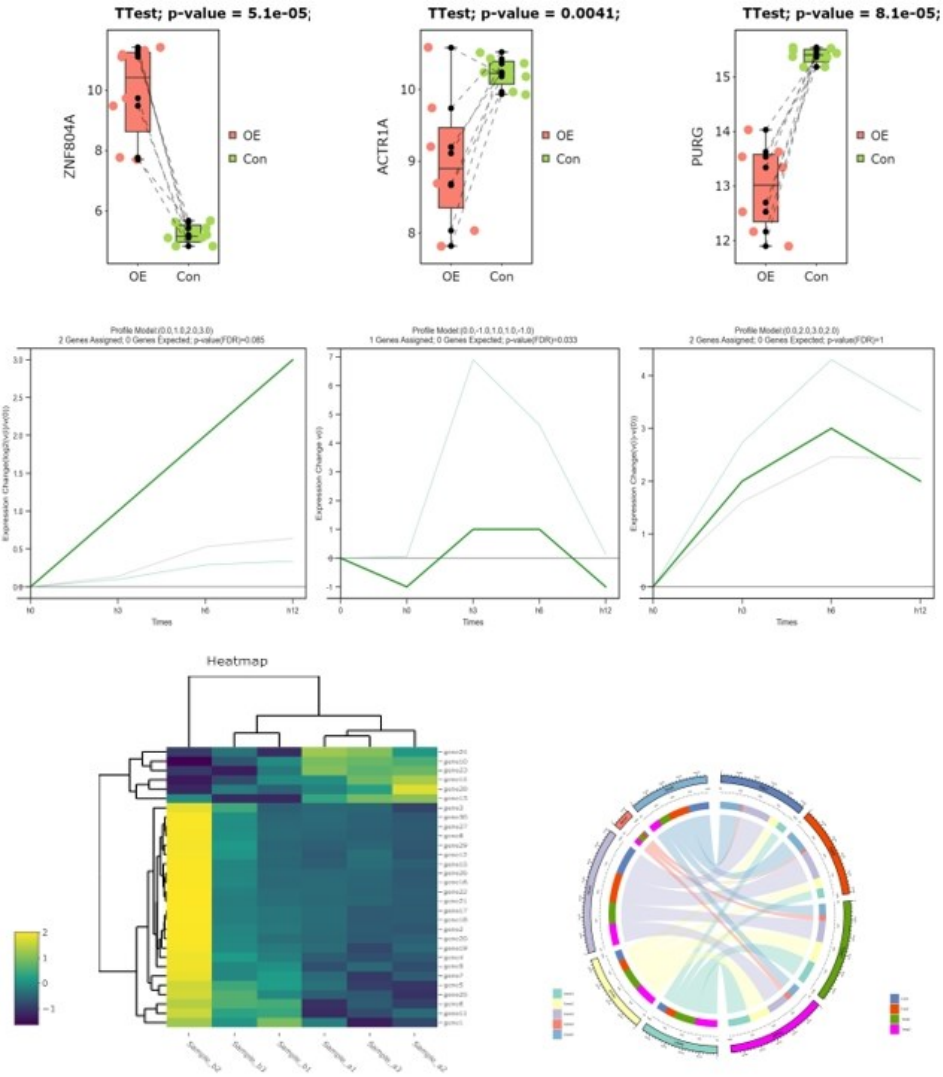


Figure 8. Comparison of anxiety and depression scores.

The difference between anxiety and depression of patients in experimental and patients in control before and after anxiety intervention did not conform to normal distribution. Wilcoxon paired rank sum test was used for intra comparison. The difference of depression scores in control before and after intervention followed a normal distribution, and paired t test was used for intra comparison. The results showed that difference in anxiety and depression in experimental before and after intervention ($P < 0.05$), while no difference in anxiety and depression in control ($P > 0.05$). See **Table 9** and **Figure 9**.

Table 9. Intra comparison of anxiety and depression scores before and after intervention $[M(P_{25}, P_{75})]$.

project	grouping	Before intervention	After intervention	Z/t	P
anxious	experience	9.0(6.0,10.1)	5.0(4.0,6.1)	−4.848	< 0.0001
	control	8.0(6.0,9.1)	8.5(6.0,10.1)	−0.452	0.653
depressed	experience	9.0(7.0,10.1)	4.0(3.1,6.0)	−5.087	< 0.001
	control	8.0(5.3,10.1)	7.5(5.3,10.1)	0.407	0.688

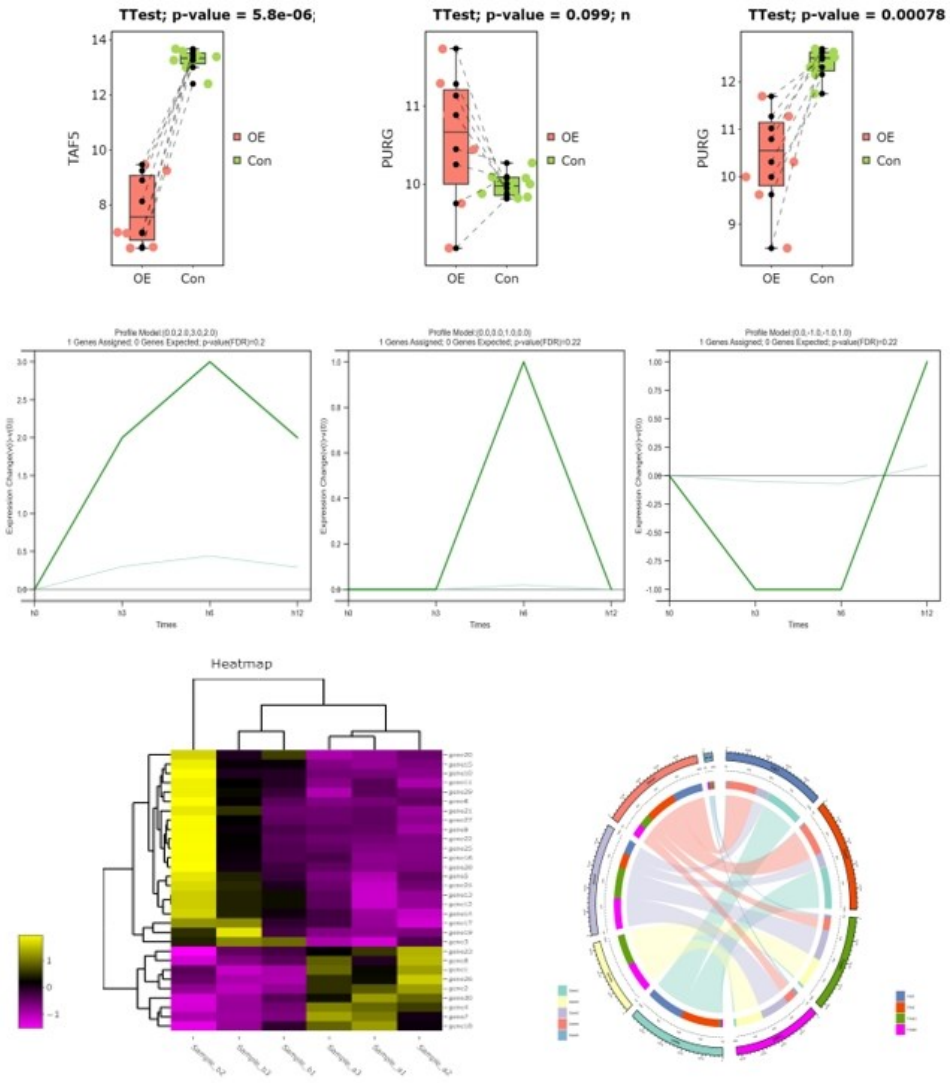


Figure 9. Intra comparison of anxiety and depression scores.

4. Discussion

Hematologic malignancies (HM) are a subset of lymphohematopoietic system disorders that are characterized by high malignancy, challenging treatment, and frequent recurrence. These diseases mostly include leukemia, multiple myeloma, myelodysplastic syndrome, and malignant lymphoma. Malignant lymphoma and leukemia are more common among them. The incidence rate of leukemia is 2.4% of the total incidence rate of cancers, the incidence rate of multiple myeloma is 0.9%, and the incidence rate of non-Hodgkin's lymphoma is 2.8%, according to 2018 worldwide cancer data. Leukemia ranks 10th among malignant tumors in terms of mortality, contributing 3.2% of the total. According to China's cancer data, the incidence rate of lymphoma in men is 6.75/100,000, or 2.24%, which places them ninth. With a mortality rate of 3.78% among malignant tumors, leukemia came in ninth place, and lymphoma came in tenth place with a mortality rate of 3.47%. The total incidence rate of malignant hematological tumors has increased in tandem with the rising rates of leukemia and malignant lymphoma in recent years. Patients with blood cancers now have longer disease-free survival times thanks to advancements

in modern medical diagnosis and treatment technologies. However, patients with blood tumors experience significant physiological and psychological stress due to the tumors' quick start, quick changes in condition, higher rate of comorbidities, high mortality, and costly therapy. According to both domestic and international research, individuals with blood cancers typically experience anxiety and depression, among other psychological issues, to varied degrees.

Low quality of life is the result of chronic illness. Patients frequently utilize immature coping mechanisms, such running away or giving in, to handle the different issues brought on by their illnesses. As the illness worsens, patients become less independent and able to take care of themselves during the course of their treatment and recovery. This can exacerbate psychological issues like poor self-esteem, hopelessness, and loneliness. Hematopoietic stem cell transplantation and targeted medication therapy are added to the current standard of care for hematological malignancy treatment in order to increase the patient's length of life. Chemical medication use frequently results in negative side effects for patients, including nausea, vomiting, anorexia, sleeplessness, baldness, and suppression of the bone marrow. It also somewhat raises patients' psychological load and blood pressure. In addition, most patients will have role maladjustment as a result of the fast shift in their social roles brought on by their illnesses. This will partially demolish the patients' spirits and psychology and negatively impact their overall quality of life. The conventional nursing model is similar to a disjointed one. The negative emotions of the patients cannot be effectively managed, and the promptness and efficacy of nursing care cannot be ensured. This type of nursing frequently has an impact on nursing effect, which significantly lowers the impact of patient care. As a result, incorporating excellent nursing into operating room patient care can effectively avoid and control the incidence of problems, enhance patient and family satisfaction with a variety of services, and improve clinical indicators and patient quality of life. Our previous traditional nursing paradigm did not address a broad range of topics. The nursing effect was not optimal, and there were various limits in the clinical nursing services. As a result, the advancement of quality nursing has corrected the shortcomings of conventional nursing. When fine nursing is implemented, patients come first at all times. Patients' needs are given more consideration, nursing details are improved, and the nursing process as a whole is encouraged to be more thorough, organized, and smooth.

In terms of BMI value, emaciated accounted for 13.4%, overweight accounted for 19.5%, and normal accounted for 67.1%. The main reason is that with improvement of living standards, patients' basic condition is good, their families attach importance to nutrition, and patients' appetite recovers and eat properly during interval of chemotherapy. In terms of disease classification, 56.1% of patients in this study had leukemia, 36.6% had lymphoma, and 7.3% had myeloma. There was no significance and comparability between two patients in terms of disease types. After intervention, CRF scores in experimental were different from those in control. In this study, patients with blood tumor undergoing chemotherapy were guided to receive intensive care based on KAP theory for 4 weeks. In this study, anxiety score of experimental after intervention, M (P25, P7s) is 5.0 (4.0,6.0), and depression score, M (P25, P7s) is 4.0 (3.0,6.0), which is compared with control. After taking part in

intensive care for 4 consecutive weeks, compared with control, anxiety and depression of patients in experimental were relieved, like research at home and abroad. With increase of cancer prevalence in recent years, in addition to managing patients' bodies, there is an urgent need to solve psychological and fatigue problems faced by cancer patients, so that they can improve their quality of life and adapt to disease progress and treatment process. As a means that can be used clinically to improve anxiety, depression and CRF status of cancer patients, fine nursing has brought great benefits to patients' lives. Therefore, this study demonstrated possibility of using fine nursing as a non-invasive intervention program for tumor patients in clinical environment. The limitations of this study only select our hospital, and representative limitations of sample. In future, we can expand sample size, and select sample size to consider local and municipal hospitals. The intervention time is short and there is no long-term effect evaluation. In future, intervention time can be extended to track continuous effect. Subjective measurement tools are used to evaluate effect. The patients have a certain degree of subjectivity. In future, objective indicators can be used for evaluation.

Author contributions: Conceptualization, DL; methodology, DL; software, DF; validation, DF; formal analysis, HX; investigation, HX; resources, YT; data curation, YT; writing—original draft preparation, XR; writing—review and editing, MZ; visualization, XY; supervision, XY; project administration, XY; funding acquisition, XY. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Study on the efficacy and safety of Huaiqihuang granules in the classic treatment of persistent thrombocytopenia in children, grant number 2041ZF274.

Acknowledgments: The authors would like to show sincere thanks to those techniques who have contributed to this research.

Data availability: The experimental data used to support the findings of this study are available from the corresponding author upon request.

Ethical approval: This study was approved by the Ethics Committee of our university (approval number: HH202408765S; approval date: 11/05/2024), Patients were consented by an informed consent process that was reviewed by the Ethics Committee of our university and certify that the study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki.

Conflicts of interest: The authors declare t no conflicts of interest.

References

1. Gage-Bouchard EA, LaValley S, Mollica M, et al. Cancer Communication on Social Media. Cancer Nursing. 2017; 40(4): 332-338. doi: 10.1097/ncc.0000000000000418
2. Howell D, Powis M, Kirkby R, et al. Improving the quality of self-management support in ambulatory cancer care: a mixed-method study of organisational and clinician readiness, barriers and enablers for tailoring of implementation strategies to multisites. BMJ Quality & Safety. 2021; 31(1): 12-22. doi: 10.1136/bmjqs-2020-012051
3. Ferguson J, Aning J. Prostate cancer survivorship: a nurse-led service model. British Journal of Nursing. 2015; 24(Sup18): S14-S21. doi: 10.12968/bjon.2015.24.sup18.s14

4. Wang X, Zhang Z. Data Division Scheme Based on Homomorphic Encryption in WSNs for Health Care. Journal of Medical Systems. 2015; 39(12). doi: 10.1007/s10916-015-0340-1
5. AbdAlGalil FM., Zambare SP. Effect of temperature on the development of calliphorid fly of forensic importance, Chrysomya rufifacies (Macquart, 1842). International Journal of Advanced Research (IJAR). 2015; 3: 1099-1103.
6. Stifter J, Sermersheim E, Ellsworth M, et al. COVID-19 and Nurse-Sensitive Indicators. Journal of Nursing Care Quality. 2020; 36(1): 1-6. doi: 10.1097/ncq.0000000000000523
7. McCullough A, Ruehrdanz A, Jenkins MA, et al. Measuring the Effects of an Animal-Assisted Intervention for Pediatric Oncology Patients and Their Parents: A Multisite Randomized Controlled Trial. Journal of Pediatric Oncology Nursing. 2017; 35(3): 159-177. doi: 10.1177/1043454217748586
8. Mohrmann C, Armer J, Hayashi RJ. Challenges Evaluating Chemotherapy-Induced Peripheral Neuropathy in Childhood Cancer Survivors. Journal of Pediatric Oncology Nursing. 2016; 34(2): 106-114. doi: 10.1177/1043454216651016
9. Alhag SK, Al-Mekhlafi FA, Abutaha N, et al. Larvicidal potential of gold and silver nanoparticles synthesized using Acalypha fruticosa leaf extracts against Culex pipiens (Culicidae: Diptera). Journal of Asia-Pacific Entomology. 2021; 24(1): 184-189. doi: 10.1016/j.aspen.2020.12.007
10. Martel ML, Imdieke BH, Holm KM, et al. Developing a Medical Scribe Program at an Academic Hospital: The Hennepin County Medical Center Experience. The Joint Commission Journal on Quality and Patient Safety. 2018; 44(5): 238-249. doi: 10.1016/j.jcjq.2018.01.001
11. Cook O, McIntyre M, Recoche K, et al. Experiences of gynecological cancer patients receiving care from specialist nurses: a qualitative systematic review. JBI Database of Systematic Reviews and Implementation Reports. 2017; 15(8): 2087-2112. doi: 10.11124/jbisrir-2016-003126
12. Abd Al Galil FM, Al-Keridis LA, AL-Mekhlafi FA, et al. Growth and development of Chrysomya saffranea (Diptera: Calliphoridae) in response to different food substrates. Entomological Research. 2021; 51(10): 528-532. doi: 10.1111/1748-5967.12545
13. Ruddy KJ, Ganz PA. Treatment of Nonmetastatic Breast Cancer. JAMA. 2019; 321(17): 1716. doi: 10.1001/jama.2019.3927
14. Jibb LA, Cafazzo JA, Nathan PC, et al. Development of a mHealth Real-Time Pain Self-Management App for Adolescents With Cancer: An Iterative Usability Testing Study. Journal of Pediatric Oncology Nursing. 2017; 34(4): 283-294. doi: 10.1177/1043454217697022
15. Meacham LR, Burns K, Orwig KE, et al. Standardizing Risk Assessment for Treatment-Related Gonadal Insufficiency and Infertility in Childhood Adolescent and Young Adult Cancer: The Pediatric Initiative Network Risk Stratification System. Journal of Adolescent and Young Adult Oncology. 2020; 9(6): 662-666. doi: 10.1089/jayao.2020.0012
16. Telfer P, Kaya B. Optimizing the care model for an uncomplicated acute pain episode in sickle cell disease. Hematology. 2017; 2017(1): 525-533. doi: 10.1182/asheducation-2017.1.525
17. Vidaurre T, Santos C, Gómez H, et al. The implementation of the Plan Esperanza and response to the imPACT Review. The Lancet Oncology. 2017; 18(10), e595-e606.
18. Salamanca-Balen N, Seymour J, Caswell G, et al. The costs, resource use and cost-effectiveness of Clinical Nurse Specialist–led interventions for patients with palliative care needs: A systematic review of international evidence. Palliative Medicine. 2017; 32(2): 447-465. doi: 10.1177/0269216317711570
19. Catlin A, Ford M, Maloney C. Determining Family Needs on an Oncology Hospital Unit Using Interview, Art, and Survey. Clinical Nursing Research. 2015; 25(2): 209-231. doi: 10.1177/1054773815578806
20. Williamson S, Chalmers K, Beaver K. Patient experiences of nurse-led telephone follow-up following treatment for colorectal cancer. European Journal of Oncology Nursing. 2015; 19(3): 237-243. doi: 10.1016/j.ejon.2014.11.006
21. Frieden M, Zamba B, Mukumbi N, et al. Setting up a nurse-led model of care for management of hypertension and diabetes mellitus in a high HIV prevalence context in rural Zimbabwe: a descriptive study. BMC Health Services Research. 2020; 20(1). doi: 10.1186/s12913-020-05351-x
22. Chen PM, Lai TS, Chen PY, et al. Multidisciplinary Care Program for Advanced Chronic Kidney Disease: Reduces Renal Replacement and Medical Costs. The American Journal of Medicine. 2015; 128(1): 68-76. doi: 10.1016/j.amjmed.2014.07.042
23. Finley J. Caregiver Café: Providing Education and Support to Family Caregivers of Patients With Cancer. Clinical Journal of Oncology Nursing. 2018; 22(1): 91-96. doi: 10.1188/18.cjon.91-96
24. Springer SP, Mor MK, Sileanu F, et al. Incidence and Predictors of Aspirin Discontinuation in Older Adult Veteran Nursing

Home Residents at End of Life. Journal of the American Geriatrics Society. 2020; 68(4): 725-735. doi: 10.1111/jgs.16346

25. Gensheimer MF, Aggarwal S, Benson KRK, et al. Automated model versus treating physician for predicting survival time of patients with metastatic cancer. Journal of the American Medical Informatics Association. 2020; 28(6): 1108-1116. doi: 10.1093/jamia/ocaa290