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World J Clin Cases 2022 February 26; 10(6): 1754-2052



Contents

Thrice Monthly Volume 10 Number 6 February 26, 2022

OPINION REVIEW

- 1754 Gut-brain axis: Focus on gut metabolites short-chain fatty acids
Guo C, Huo YJ, Li Y, Han Y, Zhou D

MINIREVIEWS

- 1764 Association between direct-acting antiviral agents in hepatitis C virus treatment and hepatocellular carcinoma occurrence and recurrence: The endless debate
Kamal A, Elsheaita A, Abdelnabi M

ORIGINAL ARTICLE

Retrospective Cohort Study

- 1775 Effects of bilirubin on perioperative myocardial infarction and its long-term prognosis in patients undergoing percutaneous coronary intervention
Li Y, Li DB, Zhao LD, Lv QB, Wang Y, Ren YF, Zhang WB
- 1787 Disease exacerbation is common in inflammatory bowel disease patients treated with immune checkpoint inhibitors for malignancy
Rubin SJS, Balabanis T, Gubatan J, Habtezion A
- 1795 Multidrug-resistant organisms in intensive care units and logistic analysis of risk factors
Han Y, Zhang J, Zhang HZ, Zhang XY, Wang YM

Retrospective Study

- 1806 Change and impact of left ventricular global longitudinal strain during transcatheter aortic valve implantation
Zhang H, Xie JJ, Li RJ, Wang YL, Niu BR, Song L, Li J, Yang Y

Observational Study

- 1815 Early detection of noise-induced hearing loss
Meng ZL, Chen F, Zhao F, Gu HL, Zheng Y
- 1826 Empathetic nursing with mindful cognitive therapy for fatigue, depression, and negative emotions in leukemia patients undergoing long-term chemotherapy
Lu YY, Lu XM, Shao CY, Wang CC, Xu TT, Zhang BL

Prospective Study

- 1834 Superior pancreatic lymphadenectomy with portal vein priority *via* posterior common hepatic artery approach in laparoscopic radical gastrectomy
Zhang YJ, Xiang RC, Li J, Liu Y, Xie SM, An L, Li HL, Mai G

Randomized Controlled Trial

- 1843** Systematic nursing interventions in gastric cancer: A randomized controlled study
He F, He RX

META-ANALYSIS

- 1852** Impact of adding opioids to paravertebral blocks in breast cancer surgery patients: A systematic review and meta-analysis
Chen MH, Chen Z, Zhao D

CASE REPORT

- 1863** Multiple different remote epidural hematomas after craniotomy: A case report
He Q, Tao CY, Fu RH, You C
- 1869** Tuberculous pericarditis-a silent and challenging disease: A case report
Lucero OD, Bustos MM, Ariza Rodríguez DJ, Perez JC
- 1876** Transileocolic endovascular treatment by a hybrid approach for severe acute portal vein thrombosis with bowel necrosis: Two case reports
Shirai S, Ueda T, Sugihara F, Yasui D, Saito H, Furuki H, Kim S, Yoshida H, Yokobori S, Hayashi H, Kumita SI
- 1883** Efficacy of EGFR-TKI sequential therapy in patients with EGFR exon 19 insertion-positive non-small-cell lung cancer: A case report
Shan BB, Li Y, Zhao C, An XQ, Zhang QM
- 1889** Novel compound heterozygous variants in the TAF6 gene in a patient with Alazami-Yuan syndrome: A case report
Lin SZ, Feng JH, Sun LP, Ma HW, Wang WQ, Li JY
- 1896** Asymmetric limb weakness in Guillain-Barré syndrome: Three case reports
Hu M, Li X, Wong HY, Feng XG, Wang YZ, Zhang GR
- 1903** Modified treatment of knee osteoarthritis complicated with femoral varus deformity: A case report
Xu SM, Li W, Zhang DB, Bi HY, Gu GS
- 1909** Novel HNF1A gene mutation in maturity-onset diabetes of the young: A case report
Xu Q, Kan CX, Hou NN, Sun XD
- 1914** Cerebral corridor creator for resection of trigone ventricular tumors: Two case reports
Liu XW, Lu WR, Zhang TY, Hou XS, Fa ZQ, Zhang SZ
- 1922** Left abdominal wall proliferative myositis resection and patch repair: A case report
Xing RW, Nie HQ, Zhou XF, Zhang FF, Mou YH
- 1929** Concurrent ankylosing spondylitis and myelodysplastic syndrome: A case report
Xu GH, Lin J, Chen WQ

- 1937** Life-threatening subclavian artery bleeding following percutaneous coronary intervention with stent implantation: A case report and review of literature
Shi F, Zhang Y, Sun LX, Long S
- 1946** Cryptogenic organizing pneumonia associated with pregnancy: A case report
Lee YJ, Kim YS
- 1952** Eosinophilia complicated with venous thromboembolism: A case report
Su WQ, Fu YZ, Liu SY, Cao MJ, Xue YB, Suo FF, Liu WC
- 1961** Neck and mediastinal hematoma caused by a foreign body in the esophagus with diagnostic difficulties: A case report
Wang LP, Zhou ZY, Huang XP, Bai YJ, Shi HX, Sheng D
- 1966** Therapeutic endoscopy of a Dieulafoy lesion in a 10-year-old girl: A case report
Chen Y, Sun M, Teng X
- 1973** Cavernous hemangioma of an intrapancreatic accessory spleen mimicking a pancreatic tumor: A case report
Huang JY, Yang R, Li JW, Lu Q, Luo Y
- 1981** Surgery and antibiotics for the treatment of lupus nephritis with cerebral abscesses: A case report
Hu QD, Liao LS, Zhang Y, Zhang Q, Liu J
- 1991** Median arcuate ligamentum syndrome: Four case reports
Kim JE, Rhee PL
- 1998** Novel ABCB4 mutations in an infertile female with progressive familial intrahepatic cholestasis type 3: A case report
Liu TF, He JJ, Wang L, Zhang LY
- 2007** Primary duodenal dedifferentiated liposarcoma: A case report and literature review
Kim NI, Lee JS, Choi C, Nam JH, Choi YD, Kim HJ, Kim SS
- 2015** Implant site development using titanium plate and platelet-rich fibrin for congenitally missed maxillary lateral incisors: A case report
Zhang TS, Mudalal M, Ren SC, Zhou YM
- 2023** Successful embolization of an intrahepatic portosystemic shunt using balloon-occluded retrograde transvenous obliteration: A case report
Saito H, Murata S, Sugihara F, Ueda T, Yasui D, Miki I, Hayashi H, Kumita SI
- 2030** Bilateral pneumothorax and pneumomediastinum during colonoscopy in a patient with intestinal Behcet's disease: A case report
Mu T, Feng H
- 2036** Acute kidney injury due to intravenous detergent poisoning: A case report
Park S, Ryu HS, Lee JK, Park SS, Kwon SJ, Hwang WM, Yun SR, Park MH, Park Y

- 2045** Vaginal enterocele after cystectomy: A case report

Liu SH, Zhang YH, Niu HT, Tian DX, Qin F, Jiao W

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Observational Study

Empathetic nursing with mindful cognitive therapy for fatigue, depression, and negative emotions in leukemia patients undergoing long-term chemotherapy

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Abstract

BACKGROUND

Leukemia is a broad term for blood cell cancer. Leukemia is divided into acute or chronic, depending on cell differentiation. Leukemia patients are prone to adverse reactions during chemotherapy, such as anxiety, depression, and even suicide, affecting prognosis. As a nursing model developed by three well-known cognitive psychologists, empathetic nursing with mindfulness cognitive therapy (ENMCT) can effectively reduce anxiety and depression and improve the quality of life in patients with chronic disease.

AIM

To explore the effect of ENMCT on cancer-induced fatigue, hope level, and negative emotions in patients with long-term leukemia chemotherapy.

METHODS

A total of 103 patients with long-term leukemia chemotherapy diagnosed and treated in our hospital from July 2017 to October 2019 were enrolled and randomly assigned to observation and control groups using the random number table approach. Fifty-one patients in the control group received routine nursing, while 52 patients in the observation group received empathetic nursing with mindfulness cognitive therapy. After three months of nursing care, cancer-induced fatigue was measured with the Piper Fatigue Scale (PFS), hope level with the Herth Hope Index (HHI), and negative emotion with the Hamilton Anxiety Scale (HAMA)/Hamilton Depression Scale (HAMD). Self-management (Chinese Strategies Used by People to Promote Health) was also recorded.

RESULTS

The observation group's total scores in behavior, cognition, emotion, feeling, and

PFS were lower than the control group after the intervention ($P < 0.05$). Keeping close contact with others, the attitude of taking positive actions, the attitude toward reality and future, and the total HHI score were higher in the observation group than the control group ($P < 0.05$). The observation group's HAMA and HAMD scores were lower than the control group ($P < 0.05$). The observation group's positive attitude, self-decision, and self-relief scores were greater than the control group ($P < 0.05$).

CONCLUSION

Empathetic nursing with cognitive mindfulness therapy is beneficial in improving cancer-related fatigue, negative emotions, expectation level, and self-management ability in patients with long-term leukemia chemotherapy.

Key Words: Mindfulness-based cognitive therapy; Empathetic nursing; Leukemia; Chemotherapy; Cancer-induced fatigue; Hope level; Negative emotions

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Core Tip: Leukemia often results in a heavy burden to patients' families and society. A total of 103 patients with long-term leukemia chemotherapy were assessed to explore the effect of empathetic nursing with mindfulness cognitive therapy (ENMCT) on leukemia-induced fatigue, hope level, and negative emotions. After three months of nursing care, various indicators, such as the Piper fatigue scale, and the Herth hope index, provided conclusion. Our results suggest that ENMCT improves cancer-related fatigue, negative emotions, expectation level, and self-management in patients with long-term leukemia chemotherapy.

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INTRODUCTION

Leukemia is a white blood cell cancer characterized by rapid, out-of-control proliferation of aberrant cells in the bone marrow. It is classified as acute or chronic depending on cell differentiation[1]. Leukemia prevalence has been increasing yearly, especially in middle-aged and older populations. Leukemia patients are prone to adverse reactions during chemotherapy, which affects prognosis. Leukemia easily relapses, resulting in a heavy burden to patients' families and society. Therefore, patients are prone to negative emotions, such as anxiety and depression, and even suicide[2,3]. Studies have shown that the incidence of depression in leukemia patients is about 30%[4]. Empathetic nursing with mindfulness cognitive therapy (ENMCT) is a nursing model developed by three well-known cognitive psychologists. ENMCT uses cognitive behavior as the basis of treatment and integrates mindfulness decompression therapy concepts plus trained exercises proposed by Kabajin. The integration of Eastern Zen meditation and Western cognitive insight can effectively reduce anxiety and depression and improve the quality of life of patients with chronic diseases.

ENMCT has had a good clinical effect in other countries[5]. However, these methods have rarely been used in China, especially leukemia patients. Therefore, this study analyzed the clinical data of 103 Leukemia patients undergoing long-term chemotherapy in our hospital and explored the impact of empathic care with mindfulness cognitive therapy on cancer-related fatigue, hope level, and negative emotion in leukemia patients with long-term chemotherapy.

MATERIALS AND METHODS

General information

This study included 103 patients diagnosed with leukemia in our hospital who underwent long-term chemotherapy between July 2017 and October 2019. Inclusion criteria were the patient met the conditions for leukemia therapy[6], had no history of anxiety and depression treatment, had received chemotherapy for three months or more, and had an expected survival time greater than six months. Patients and family members signed a written informed consent form. Exclusion criteria were a history

of an intracranial aneurysm or other malignant tumors, severe heart, liver, kidney, or other important organ damage, asthma, mental illness, and communication disorders. Patients were randomly assigned to the observation and control groups by the random number table approach. The observation group included 52 patients, 32 men and 20 women ranging in age from 18 to 81 years, with a mean age of 54.17 ± 16.48 , chemotherapy of 1 to 3 years, and mean chemotherapy time of 1.23 ± 0.47 years; two cases with religious beliefs and remaining 50 cases without religious beliefs. The control group included 30 men and 21 women, aged 22–92 years, with a mean age of 54.81 ± 16.94 , chemotherapy time of 1 to 3 years, a mean chemotherapy time of 1.27 ± 0.49 years; three cases with religious beliefs, and the others without religious beliefs. The above-mentioned general information was not significantly different between the two groups ($P > 0.05$). This research was reviewed and approved by the Medical Ethics Committee of our hospital.

Methods

A routine nursing method was used for the control group. According to nursing norms, patients were first introduced to the surrounding ward environment, attending physicians, responsible nurses, and related ward rules and regulations for admitted patients. Second, possible adverse effects of chemotherapy were introduced to help patients master the coping methods. Finally, patient health education was conducted to patiently answer questions sent by the patients, strengthen communication with the patients, eliminate patients' doubts, and intervene for three consecutive months. For the observation group, ENMCT was externally added to the control group. The specific methods were: initially establish an empathetic group to conduct empathetic psychological intervention training for nursing staff. The training included concepts, content, communication skills, human-orientated caring theory, cognitive theory, *etc.*, to improve the nursing staff's ability to care for patients and cultivate the cognitive ability to respond to patients' psychological changes. At the end of the training, an assessment was carried out, and the nursing staff with better performance was selected to form an empathetic group. The criteria to be in the empathetic group also included qualifications and intentions, to be able to listen eagerly, to ask the patient about the situation kindly and tell them to express their inner thoughts actively, listen carefully, encourage the patient through eye contact and body movement; pay attention to changes in the patient's facial expression and body language during communication, and further understand the patient's needs. To think for patients while communicating with them, the nursing staff had to intentionally think about the problem from the patient's perspective, their misfortune, and inner pain; to sort out relevant information expressed by patients, summarizing the causes of the patients' negative emotions, and have an in-depth understanding of patients' feelings. To be able to give information feedback, the nursing staff provided positive feedback to the patient's expression through body movements such as a handshake, hug, *etc.*, and guided patients to express their deep inner feelings; to lighten up the patients' minds with different traditional (touching) stories or other proper empathy experiences; for example, joking, laughing, and adjusting expressions to make the patient feel recognized or understand a positive feeling, and instruct family members to actively communicate with their loved one, encourage support, and maximize the satisfaction of patient needs.

Observed indicators

The Piper fatigue scale (PFS)[7], which includes four dimensions, behavior, cognition, emotion, and sensation, was used before and after the intervention. The scale has 22 items with a total score of 0–40 points. The lower the score, the lighter the fatigue caused by cancer observed through behavior. The hope level, or the Herth Hope Index[7] (HHI), includes three dimensions, keeping close contact with others, taking positive actions, and attitude toward reality and future. It was used before and after the intervention and contained items for 12 dimensions, using a 4-level scoring method; the higher the score, the better the patient's hopes. The Hamilton Anxiety Scale (HAMA)[8] was used for anxiety assessment, < 7 points for no anxiety, 7–14 points for existing anxiety, > 14 points for obvious anxiety; depression was assessed with the Hamilton Depression (HAMD) scale[8], < 7 points for no depression, 7–14 points for depression, > 14 points for obvious depression. The higher the score, the more serious the anxiety and depression. Self-management ability was assessed before and after the intervention with the Chinese version of the Cancer Self-Management Efficacy Scale[9], the Chinese version Strategies Used by People to Promote Health (SUPPH), or the C-SUPPH, including positive attitudes, self-decision-making, and self-relief decompression. A total of 28 measurements were made using a 5-point Likert scale. The higher the score, the stronger the self-management ability. Cronbach's α coefficient of the total scale was 0.970, and Cronbach's α coefficient of the subscale was between 0.849–0.959.

Statistical analysis

SPSS 20.0 was used to perform the statistical analysis. Data were expressed as mean \pm SD. An independent sample *t*-test was used between the groups and a paired sample *t*-test within groups. Categorical variables were expressed as a percentage, and the χ^2 test was used to compare the groups. A *P*-value < 0.05 was statistically significant.

RESULTS

PFS score comparison between the two groups

There was no significant difference in the PFS scores of the two groups before the intervention ($P > 0.05$). After the intervention, the two groups' total behavior, cognition, emotion, feeling, and PFS scores decreased. The observation group had a significantly larger decline ($P < 0.05$) than the control group (Table 1).

Comparison of HHI scores of the two groups

As shown in Table 2, there was no significant difference in the PFS scores of the two groups before the intervention ($P > 0.05$). However, after the intervention, the two groups had higher scores in maintaining close contact, taking positive actions, attitudes toward reality and future, and the total HHI score. The observation group had a significantly greater increase than the control group ($P < 0.05$).

Comparison of HAMA and HAMD scores of the two groups

HAMA and HAMD scores showed no significant difference between the two patient groups before the intervention ($P > 0.05$). After the intervention, the HAMA and HAMD scores of the two groups decreased, and the observation group had a significantly greater decline than the control group ($P < 0.05$) (Table 3).

Comparison of C-SUPPH scores of the two groups

As shown in Table 4, there was no statistically significant difference between the C-SUPPH score in the two groups before the intervention ($P > 0.05$). After the intervention, positive attitude, self-decision, and self-relief, the decompression scores of the two groups increased, and the observation group had a significantly greater increase than the control group ($P < 0.05$).

DISCUSSION

With the reform of medical models and improved quality of life, contemporary medicine has higher requirements for clinical nursing, gradually forming a biological-psychological-social model. This model is related to patient prognosis[10]. It is easy for patients diagnosed with malignant tumors to have negative and psychological stress, affecting medication. As a malignant tumor in the blood system, patients with leukemia will have a long drug treatment course, a high recurrence rate, and long-term chemotherapy. This situation makes patients prone to varying degrees of anxiety, depression, other emotions, and worry about the prognosis[11,12]. Therefore, choosing appropriate nursing measures is significant to cure disease with the help of the patient's psychological state, quality of life, and the effect of chemotherapy.

As a kind of psychotherapy, mindfulness cognitive therapy can effectively reduce ruminating thoughts and avoid recurrent negative emotions such as periodic anxiety and depression. Among these, empathetic nursing is clinically effective[13]. Expression of empathy is the recognition of patients and their motivations to touch their inner feelings (and simultaneously avoid personal matters). Through three aspects: understanding the essence of the problem, experiencing the emotion, thinking of the patient's feeling, and conveying empathy to the patient through communication skills, influence the patient to obtain emotional feedback spontaneously[14]. To achieve these goals, nurses must first actively gain the information expressed by the patient, and second, empathize and think about the problem from the patient's perspective. With a computer, information sorting will elucidate the content and hidden information expressed by the patient. The nursing staff can feel the patient's inner world; understand the painful motivation and their attitude and desire. Thus, information feedback can provide timely help.

Research has shown that the degree of cancer-related fatigue determines patients' quality of daily life. Reducing cancer-related fatigue impacts the daily quality of life and even improves the prognosis[15]. ENMCT has been consistently positive since we adopted the method. This study showed that behavior, cognition, emotion, and feeling by the respective PFS total scores, and the HAMA and HAMD scores of the observation group were lower than those of the control group after the ENMCT intervention. It shows that ENMCT improves the emotional rejuvenation of leukemia patients with long-term chemotherapy. It reduces the patient's tension, strengthens their self-regulation ability, reduces stress response, further improves adaptability, and finally, reduces the degree of cancer-related fatigue. As a subjective feeling, hope is a potential force that can continuously produce positive effects and greatly impact people's psychological and physical health[16]. Studies have shown that the hope level of patients with malignant tumors negatively correlates with negative emotions and positively correlates with social support; that is, the lower the negative emotions, the higher the social support[17]. Studies have shown that implementing integrated psychological care for patients with cervical cancer radiotherapy and chemotherapy is conducive to improving their level of expectation[18]. Our results showed that the observation group's attitude toward maintaining close contact with others, taking

Table 1 Comparison of Piper Fatigue Scale scores of the two groups (mean \pm SD, points)

Groups	Time	Behavior	Cognition	Emotion	Feelings	Total PFS scores
Observation group (<i>n</i> = 52)	Before intervention	5.15 \pm 1.49	4.09 \pm 1.38	5.37 \pm 1.48	4.19 \pm 1.35	18.80 \pm 2.74
	After intervention	2.60 \pm 0.82 ¹	2.44 \pm 1.01 ¹	3.46 \pm 1.13 ¹	2.25 \pm 0.77 ¹	18.55 \pm 2.85 ¹
Control group (<i>n</i> = 51)	Before intervention	5.06 \pm 1.42	4.03 \pm 1.24	5.34 \pm 1.41	4.12 \pm 1.38	10.75 \pm 1.76
	After intervention	4.63 \pm 1.37 ¹	3.78 \pm 1.13 ¹	4.47 \pm 1.26 ¹	3.03 \pm 0.95 ¹	15.92 \pm 2.45 ¹
<i>T</i> _{after intervention}	-	9.190	6.348	4.285	4.582	12.304
<i>P</i> _{after intervention}	-	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

¹Group comparison before treatment.

PFS: Piper Fatigue Scale.

Table 2 Comparison of Herth hope Index scores of the two groups (mean \pm SD, points)

Groups	Time	Maintain close contact with others	Take positive attitude	Attitudes toward reality and the future	Total HHI scores
Observation group (<i>n</i> = 52)	Before intervention	9.14 \pm 2.28	9.53 \pm 2.72	10.93 \pm 2.43	29.61 \pm 4.57
	After intervention	14.06 \pm 1.78 ¹	14.28 \pm 1.89 ¹	14.52 \pm 1.76 ¹	42.86 \pm 3.52 ¹
Control group (<i>n</i> = 51)	Before intervention	9.33 \pm 2.64	9.48 \pm 2.66	10.85 \pm 3.16	29.69 \pm 5.24
	After intervention	10.67 \pm 1.69 ¹	11.08 \pm 1.46 ¹	12.03 \pm 1.39 ¹	33.78 \pm 2.58 ¹
<i>T</i> _{after intervention}	-	9.909	9.603	7.958	14.894
<i>P</i> _{after intervention}	-	< 0.001	< 0.001	< 0.001	< 0.001

¹Group comparison before treatment.

HHI: Herth hope Index.

Table 3 Comparison of Hamilton Anxiety Scale and Hamilton Depression Scale scores of the two groups (mean \pm SD, points)

Groups	Time	HAMA	HAMD
Observation group (<i>n</i> = 52)	Before intervention	20.22 \pm 2.55	22.07 \pm 4.57
	After intervention	9.11 \pm 3.12 ¹	9.98 \pm 3.21 ¹
Control group (<i>n</i> = 51)	Before intervention	20.06 \pm 3.12	22.25 \pm 4.22
	After intervention	13.97 \pm 3.32 ¹	16.88 \pm 3.55 ¹
<i>T</i> _{after intervention}	-	7.657	10.351
<i>P</i> _{after intervention}	-	< 0.001	< 0.001

¹Group comparison before treatment.

HAMA: Hamilton Anxiety Scale; HAMD: Hamilton Depression Scale.

positive actions, attitudes toward reality and the future, and the total HHI score were higher than the control group. ENMCT might truly touch the inner needs of leukemia patients with long-term chemotherapy, encourage and support family members and friends, increase the patient's social support level, reduce negative emotions, and finally promote the patient's hope of survival. Studies have shown that empathy care based on mindfulness cognitive therapy can effectively improve patients' unhealthy emotions[19]. Our research findings indicate that the observation group's positive attitude, self-decision-making, and self-decompression scores were greater than those of the control group. Our findings revealed that ENMCT was beneficial to the self-management ability of leukemia patients with long-term chemotherapy.

Table 4 Comparison of Chinese Strategies Used by People to Promote Health scores between the two groups (mean \pm SD, points)

Groups	Time	Positive attitude	Self-determination	Self-relief
Observation group ($n = 52$)	Before intervention	39.48 \pm 9.19	8.33 \pm 2.35	29.57 \pm 6.71
	After intervention	52.87 \pm 7.72 ¹	11.29 \pm 2.49 ¹	35.46 \pm 6.42 ¹
Control group ($n = 51$)	Before intervention	40.40 \pm 9.54	7.82 \pm 1.83	28.78 \pm 5.92
	After intervention	47.80 \pm 9.18 ¹	9.04 \pm 2.65 ¹	31.42 \pm 5.98 ¹
$T_{\text{after intervention}}$	-	3.036	4.442	3.303
$P_{\text{after intervention}}$	-	0.003	< 0.001	0.001

¹Group comparison before treatment.

C-SUPPH: Chinese Strategies Used by People to Promote Health.

This study was conducted in one medical center with a homogeneous group of patients. We did not consider whether the selected sample represented the target population and whether more sites and a more heterogeneous population would produce different results. This fact needs further experimentation. Overall, the need for additional research in the care of leukemia patients related to mindfulness is evident. We hope that the intervention can provide a long-lasting impact on patients' lives and that they will continuously apply the intervention after the study.

CONCLUSION

ENMCT is beneficial to leukemia patients with long-term chemotherapy to improve cancer-related fatigue and negative emotions and improve prognosis by enhancing hope and self-management ability.

ARTICLE HIGHLIGHTS

Research background

Leukemia is a group of blood cancers that usually begin in the bone marrow and result in high numbers of abnormal blood cells. Treatment may involve some combination of chemotherapy, radiation therapy, targeted therapy, and bone marrow transplant. Among these, chemotherapy is a standard treatment and beneficial for most patients. However, patients may experience many different chemotherapy-related side effects, such as discomfort, anxiety, and fatigue, significantly affecting comfort and well-being during and after cancer treatment. Empathetic nursing with mindfulness cognitive therapy (ENMCT) is a mild form of therapy that can reconcile the body and spirit through the mindfulness-based method. Numerous studies have shown that ENMCT enormously empowers patients with chronic pain, hypertension, heart disease, and psychological problems, such as depression and anxiety, and improves the well-being of cancer patients. However, these methods have rarely been used in China. Thus, we performed this randomized controlled trial to explore the effect of ENMCT on cancer-induced fatigue, hope level, and negative emotions in patients with long-term leukemia chemotherapy.

Research motivation

This article aims to explore the effect of ENMCT on cancer-induced fatigue, hope level, and negative emotions in patients with long-term leukemia chemotherapy.

Research objectives

A randomized control study was designed and performed to assess whether ENMCT can improve the health outcomes of Chinese leukemia patients. This research proved that ENMCT is an inexpensive, non-invasive, effective complementary therapy for leukemia associated with relaxation and pain reduction.

Research methods

In this study, a total of 103 patients with long-term leukemia chemotherapy diagnosed and treated were enrolled and randomly assigned to the observation and control groups using the random number table approach. After three months of nursing care, cancer-induced fatigue was measured with the PFS, hope level with the HHI, and negative emotion with the HAMA Scale/HAMD Scale. In addition, self-management ability was also recorded.

Research results

After the intervention, the observation group's total scores in behavior, cognition, emotion, feeling, and Piper Fatigue Scale were lower than the control group. Moreover, keeping close contact with others, the attitude of taking positive actions, the attitude toward reality and the future, and the total Herth Hope Index score were higher in the observation group than the control group. The observation group's Hamilton Anxiety Scale and Hamilton Depression Scale scores were lower than the control group. The observation group's positive attitude, self-decision, and self-relief scores were greater than the control group.

Research conclusions

Empathetic nursing with cognitive mindfulness therapy is beneficial in improving cancer-related fatigue, negative emotions, expectation level, and self-management ability in patients with long-term leukemia chemotherapy.

Research perspectives

This research proved ENMCT is a mild and effective intervention that benefits leukemia patients receiving chemotherapy. It can be carried out in a nursing environment and is easily acceptable by leukemia patients, which might improve leukemia treatment schemes.

FOOTNOTES

Author contributions: Lu YY performed the data analysis and wrote the manuscript; Lu XM designed the study and prepared the figures and tables; Shao CY corrected the manuscript; Wang CC, Xu TT, and Zhang BL participated in data collection; all authors approved the final manuscript.

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REFERENCES

- 1 **Rose-Inman H**, Kuehl D. Acute leukemia. *Emerg Med Clin North Am* 2014; **32**: 579-596 [PMID: 25060251 DOI: 10.1016/j.emc.2014.04.004]
- 2 **Gökbuğet N**, Dombret H, Bonifacio M, Reichle A, Graux C, Faul C, Diedrich H, Topp MS, Brüggemann M, Horst HA, Havelange V, Stieglmaier J, Wessels H, Haddad V, Benjamin JE, Zugmaier G, Nagorsen D, Bargou RC. Blinatumomab for minimal residual disease in adults with B-cell precursor acute lymphoblastic leukemia. *Blood* 2018; **131**: 1522-1531 [PMID: 29358182 DOI: 10.1182/blood-2017-08-798322]
- 3 **Cox RC**, Jessup SC, Olatunji BO. Executive Dysfunction and Emotion Dysregulation Explain the Effects of Insomnia Symptoms on Repetitive Negative Thinking. *Cognit Ther Res* 2019; **6**: 147-149 [DOI: 10.1007/s10608-019-10033-y]
- 4 **Ding T**, Wang X, Fu A, Xu L, Lin J. Anxiety and depression predict unfavorable survival in acute myeloid leukemia

- patients. *Medicine (Baltimore)* 2019; **98**: e17314 [PMID: 31651837 DOI: 10.1097/MD.00000000000017314]
- 5 **Boland M**, Papa A, Del Carlo RE. Trait negative affect moderates the effects of expressive vs experiential emotion suppression. *Pers Individ Dif* 2019; **11**: 4-10 [DOI: 10.1016/j.paid.2018.08.021]
- 6 **Lu DP**, Qiu JY, Jiang B, Wang Q, Liu KY, Liu YR, Chen SS. Tetra-arsenic tetra-sulfide for the treatment of acute promyelocytic leukemia: a pilot report. *Blood* 2002; **99**: 3136-3143 [PMID: 11964275 DOI: 10.1182/blood.v99.9.3136]
- 7 **Wang SY**, Gao M, Zhao Y. [The reliability and validity of the Chinese version of chronic disease treatment function evaluation-fatigue scale in maintenance hemodialysis patients]. *Zhonghua Huli Zazhi* 2014; **5**: 103-107 [DOI: 10.3761/j.issn.0254-1769.2014.05.025]
- 8 **Liu CF**, Yao BR, Xu AM, Xu ZH, Shi HW. [Application of the modified Hamilton Depression Scale to assess the depression status of patients undergoing invasive mechanical ventilation]. *Linchuang Jizhen Zazhi* 2015; **3**: 224-226 [DOI: 10.13201/j.issn.1009-5918.2015.03.017]
- 9 **Qian HJ**, Yuan CR. [Evaluation of the reliability and validity of the Chinese version of cancer self-management efficacy scale]. *Zhonghua Huli Zazhi* 2011; **1**: 87-89 [DOI: 10.3761/j.issn.0254-1769.2011.01.032]
- 10 **Mortensen JA**, Barnett MA. Intrusive parenting, teacher sensitivity, and negative emotionality on the development of emotion regulation in early head start toddlers. *Infant Behav Dev* 2019; **55**: 10-21 [PMID: 30825714 DOI: 10.1016/j.infbeh.2019.01.004]
- 11 **Manczak EM**, Ham PJ, Sinard RN, Chen E. Beyond positive or negative: variability in daily parent-adolescent interaction quality is associated with adolescent emotion dysregulation. *Cogn Emot* 2019; **33**: 840-847 [PMID: 29804508 DOI: 10.1080/02699931.2018.1479243]
- 12 **Shi D**, Li Z, Li Y, Jiang Q. Variables associated with self-reported anxiety and depression symptoms in patients with chronic myeloid leukemia receiving tyrosine kinase inhibitor therapy. *Leuk Lymphoma* 2021; **62**: 640-648 [PMID: 33150806 DOI: 10.1080/10428194.2020.1842397]
- 13 **Robbertz AS**, Weiss DM, Awan FT, Byrd JC, Rogers KA, Woyach JA. Identifying risk factors for depression and anxiety symptoms in patients with chronic lymphocytic leukemia. *Support Care Cancer* 2020; **28**: 1799-1807 [PMID: 31332513 DOI: 10.1007/s00520-019-04991-y]
- 14 **Weiss NH**, Tull MT, Dixon-Gordon K, Gratz KL. Assessing the Negative and Positive Emotion-Dependent Nature of Risky Behaviors Among Substance Dependent Patients. *Assessment* 2018; **25**: 702-715 [PMID: 27581175 DOI: 10.1177/1073191116665906]
- 15 **Arring NM**, Barton DL, Brooks T, Zick SM. Integrative Therapies for Cancer-Related Fatigue. *Cancer J* 2019; **25**: 349-356 [PMID: 31567463 DOI: 10.1097/PPO.0000000000000396]
- 16 **Lazarus G**, Bar-Kalifa E, Rafaeli E. Accurate where it counts: Empathic accuracy on conflict and no-conflict days. *Emotion* 2018; **18**: 212-228 [PMID: 28481575 DOI: 10.1037/emo0000325]
- 17 **Zwingmann J**, Baile WF, Schmier JW, Bernhard J, Keller M. Effects of patient-centered communication on anxiety, negative affect, and trust in the physician in delivering a cancer diagnosis: A randomized, experimental study. *Cancer* 2017; **123**: 3167-3175 [PMID: 28378366 DOI: 10.1002/cncr.30694]
- 18 **Vogel AC**, Jackson JJ, Barch DM, Tillman R, Luby JL. Excitability and irritability in preschoolers predicts later psychopathology: The importance of positive and negative emotion dysregulation. *Dev Psychopathol* 2019; **31**: 1067-1083 [PMID: 31109387 DOI: 10.1017/S0954579419000609]
- 19 **Apolinário-Hagen J**, Drüge M, Fritsche L. Cognitive Behavioral Therapy, Mindfulness-Based Cognitive Therapy and Acceptance Commitment Therapy for Anxiety Disorders: Integrating Traditional with Digital Treatment Approaches. *Adv Exp Med Biol* 2020; **1191**: 291-329 [PMID: 32002935 DOI: 10.1007/978-981-32-9705-0_17]



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