

Original Article

Evaluation of the effect of tumor case management combined with whole-process management on the nursing quality and medical compliance of lymphoma patients

Jin Luo, Fen Cheng

Department of Ward 3 of Hematology Department, The Second Xiangya Hospital of Central South University, Changsha City 410011, Hunan Province, China

Received April 8, 2022; Accepted July 18, 2022; Epub April 15, 2023; Published April 30, 2023

Abstract: Objective: To analyze and evaluate the effect of a tumor case management model combined with the total management model on the quality of care and behavior compliance of lymphoma patients. Methods: A total of 130 patients with lymphoma diagnosed and treated in our hospital between January 2020 and June 2021 were selected and the study subjects and they randomized by the random number table method and divided into a basic group (65 cases) and a joint group (65 cases). The quality of care of the two groups was evaluated using the Functional Assessment Cancer Therapy-Lymphoma (FACT-Lym), the General Quality of Life Inventory (GQOLI-74), and the Self-Care Ability Scale (ESCA). The rates of consultation, implementation of established treatment plan and first follow-up were evaluated, and the compliance behaviors such as medication compliance, emotion control, reasonable diet, regular follow-up and rehabilitation exercise were assessed during the intervention period. Results: The rates of seeking medical advice, implementation of the established treatment plan, and first follow-up consultation, as well as behavioral compliance rates of medication compliance, mood control, reasonable diet, regular follow-up consultation, and rehabilitation exercise were all higher in the combined group than in the basic group ($P < 0.05$). After 6 months of intervention, the scores of each dimension of the FACT-Lym, GQOLI-74 and ESCA scales were higher in the combined group than in the basic group ($P < 0.05$). Conclusion: A holistic process of case management intervention immediately after the initial diagnosis of lymphoma can effectively improve the rate of seeking medical advice, implementation of established treatment plans, first follow-up, compliance and quality of care, as well as help improve patient prognosis.

Keywords: Lymphoma, tumor case management, whole-process management, quality of life, compliance behavior

Introduction

Lymphoma is a malignant tumor characterized by painless, progressive lymph node enlargement that originates in lymph nodes and lymphoid tissue and it can involve various tissues and organs throughout the body [1, 2]. In addition to painless lymph node enlargement, patients with lymphoma may also present with hepatosplenomegaly, fever, night sweats, emaciation, pruritus, as well as anemia and cachexia in advanced stages [3]. With the rapid socio-economic development and deterioration of the environment in China, the number of lymphoma cases has increased and the remission rate, survival rate and long-term prognosis of

lymphoma patients in China are significantly worse compared to other developed countries such as the United Kingdom and the United States [4, 5]. Currently, with the development of integrated treatments such as chemotherapy, radiotherapy, and biologic therapy, the effectiveness of lymphoma treatment has improved year by year, and the recent mortality rate has shown a decreasing trend. However, the implementation rate of the established treatment plan for patients is not high due to the biospecificity of lymphoma, the long duration of treatment, the importance of follow-up and the lack of patient compliance behavior [6]. In addition, current medical care procedures do not meet the needs of patients for full and continuous

Effect of combined management models on nursing of lymphoma patients

care, and the physiological discomfort caused by various side effects of long-term treatment seriously affects patients' quality of life [7, 8]. How to carry out timely and standardized treatment of lymphoma patients and receive treatment according to the established plan, so as to effectively protect patients' life and health and reduce their symptoms, is a problem worthy of consideration, exploration and urgent solution by modern medical workers.

Whole-process management is a new concept and healthcare strategy for malignant cancer patients, which is used throughout the whole process of diagnosis, treatment, rehabilitation and prognosis, with the aim of giving patients the most effective, systematic and comprehensive treatment and management supervision to enhance and improve their quality of life and prognosis [9]. Case Management is a model for providing systematic care to patients by combining various hospital specialties. It provides integrated care to patients in a team approach by assessing, defining, planning, implementing, and evaluating the individual patient's disease characteristics and individual needs through communication, coordination, and allocation of resources [10, 11]. The current tumor case management model has achieved good results in the treatment and care management of malignant tumors such as breast cancer [12] and nasopharyngeal carcinoma [13], and research results show that this management model can effectively improve patient outcomes, reduce the average hospital stay and improve the quality of life of patients. Our department adopts oncology case management combined with whole-process management model, in which professional case managers provide holistic, personalized and total care for lymphoma patients, as well as supervise and coordinate all aspects of patient treatment, to ensure that treatment and care achieve the expected effect, and solve any problems encountered by patients in a timely manner. In this study, we analyzed the effect of combined oncology case management and total management on the nursing treatment and compliance behavior of lymphoma patients, which is reported as follows.

Materials and methods

General information

A total of 130 patients with lymphoma diagnosed and treated in our hospital between

January 2020 and June 2021 were selected and were randomized by random number table method into a basic group (65 cases) and a joint group (65 cases). Inclusion criteria: those who met the diagnostic criteria of lymphoma and were diagnosed by pathology and other examinations; those who were 18-75 years old; those who had basic understanding, reading or communication skills; those who could take care of themselves in daily life and had no limb disabilities; patients and families who were willing to actively cooperate with the treatment and care; and those who voluntarily participated in this survey. Exclusion criteria: patients with other primary malignancies; patients with cognitive dysfunction, visual and auditory speech disorders, etc.; and patients with serious medical and surgical diseases. The patients in the basic group received the conventional care model for oncology patients, and the patients in the combined group received the tumor case management model combined with the whole-process management model on the basis of the conventional model. General data such as gender, age, body mass index, disease stage, education level, marital status, and work status were collected retrospectively and compared between the two groups ($P > 0.05$), see in **Table 1**. Ethics approval No. 2020654.

Management intervention methods

Basic group: Traditional outpatient admission, re-examination and follow up were given as follows. After the pathological diagnosis of the patients in the basic group was confirmed, they were admitted to the hospital in the traditional outpatient mode. After admission, the doctor in charge formulated the treatment plan in collaboration with the relevant specialties, and the nurses in charge performed health education according to the nursing routine for lymphoma, informing patients of daily precautions, providing appropriate psychological interventions, and guiding medication, diet and exercise, etc. After the patient was discharged from the hospital, the supervising physician formulated a follow-up treatment plan and a follow-up appointment, and the nursing staff followed up regularly according to the plan, with a telephone follow-up visit 1 week before each treatment to provide relevant guidance and remind the re-examination appointment.

Joint group: Patients in the joint group were diagnosed by pathology and then a case manager took the initiative to join the patients and

Effect of combined management models on nursing of lymphoma patients

Table 1. Comparison of general information between the two groups [(Mean, SD); n, %]

Items		Basic group (n=65)	Joint group (n=65)	t or χ^2 value	P value
Gender	Male	35 (53.85)	38 (58.46)	0.281	0.596
	Female	30 (46.15)	27 (41.54)		
Average age		47.52±13.87	49.13±16.14	0.678	0.499
BMI		21.56±3.13	20.87±2.59	1.369	0.173
Diagnosis	Hodgkin's lymphoma	17 (26.15)	14 (21.54)	0.381	0.537
	Non-Hodgkin's lymphoma	48 (73.85)	51 (78.46)		
Educational level	Primary school and below	15 (23.08)	13 (20.00)	1.676	0.642
	Junior high school	12 (18.46)	12 (18.46)		
	High school or junior college	26 (40.00)	22 (33.85)		
	College and above	12 (18.46)	18 (27.69)		
Marital status	Unmarried	10 (15.38)	11 (16.92)	0.871	0.832
	Married	45 (69.23)	43 (66.15)		
	Widowed	6 (9.23)	8 (12.31)		
	Divorced	5 (7.69)	3 (4.62)		
Work Status	Working	21 (32.31)	26 (40.00)	1.606	0.658
	Separated	4 (6.15)	6 (9.23)		
	Retired	16 (24.62)	13 (20.00)		
	Other	24 (52.31)	20 (30.77)		

provide guidance on discharge instructions, admission, treatment plans and related tests. After admission, the oncology case management information system and the lymphoma case management manual were established simultaneously on the basis of the work of the charge nurse and were used for the whole seamless service, and the ratio of the case manager to the patients on the case at the same time was 1:100. The service path and contents of the whole case management model for lymphoma were as follows.

(i) On the day of pathology confirmation: once the oncology case management information system received the patient's pathology results, the patient's pathology results, case manager's name and contact information were sent to the patient's (or family's) cell phone in the form of SMS. The case manager then contacted the patient, and introduced himself/herself and informed the patient of the pathology results and the purpose of the call, determined whether the patient was admitted to the hospital and the specific time of admission, and briefly explained the importance of timely treatment.

(ii) After admission: The case manager introduced himself/herself to the patient again, assessed and collected clinical information from the patient and uploaded important infor-

mation to the treatment management information system. Distributed lymphoma case management manuals, as well as educated patients and their families about the disease and discussed with them how to properly face their condition. An agreement was made on the patient's consultation and treatment plan with the attending physician and coordinate all tests, etc. after the treatment plan was determined, the case manager assisted the attending physician in communicating with the patient and family, and provided detailed information about the dosage of medications used in the treatment plan, the duration of treatment, and other relevant information, patiently listening to their doubts and answering questions.

(iii) Day 1 before treatment: The case manager assessed the patient's physical and mental status at the bedside, explained the specific procedure of treatment to the patient and showed it in video format, and provided health education on precautions to be taken during treatment. On the basis of the charge nurse, the patient and family members were again given an explanation in detail about the route of administration of drugs in the treatment plan and the possible adverse reactions and ways to cope with them.

(iv) During treatment: Ward visits were conducted by case managers 1 to 3 days after the first

Effect of combined management models on nursing of lymphoma patients

treatment to assess the patient's status after the first treatment and entered it into the case management information system, they listened patiently to the patient's doubts and answered them. Patients' physiological reactions were assessed by means of questioning, observation, and blood tests. Patients' emotional reactions were assessed using the Inpatient Anxiety and Depression Scale (HADS), and psychological intervention and health education were provided in a timely manner if patients experienced adverse emotions, and the results were recorded. Nurses dynamically evaluated patients' physical and mental status in the middle and late stages of the treatment, as well as followed up on the progress of treatment, organized and coordinated communication to adjust the treatment plan in response to problems that arose during treatment, and assisted patients in solving their problems.

(v) Post-discharge: The case manager assessed the patient's treatment results on the day of discharge, instructed the patient to take precautions such as diet, follow-up and exercise after discharge, and instructed the patient to fill in the discomfort symptoms that occurred on the lymphoma case management handwriting after discharge, and encouraged the patient to take the initiative to contact the case manager by phone if he/she was troubled. After discharge from the hospital, patients were regularly reminded in advance through the case management system or by phone in accordance with the established follow up and time, outpatient visits or phone calls to assess the patient's recovery and psychological status, as well as intensive dietary and exercise guidance, and referral to professional psychological counselors and nutritional counselors when necessary. Telephone, outpatient or home follow-up visits were conducted every 6 months after discharge to assess the patient's recovery and follow-up.

Evaluation indicators

General data: including data on gender, age, body mass index (BMI), diagnostic typing, education level, marital status, and work status of patients in both groups.

The seeking medical advice rate, implementation rate of the established treatment plan, and

the first re-examination rate were recorded and compared between the two groups of patients.

Quality of care: It was represented by quality of vitality, quality of life, and self-care ability. Quality of life was assessed using the Functional Assessment Cancer Therapy-Lymphoma (FACT-Lym) scale [14], which has a total score of 128 points and is proportional to the patient's quality of vitality. Quality of life was assessed using the General Quality of Life Inventory (GQOLI-74) [15], which has a total score of 100 on each dimension and is proportional to the patient's quality of life. Self-care ability was assessed using the Self-Care Ability Assessment Scale (ESCA) [16], which has a total score of 172 and a score proportional to the patient's self-care ability.

Compliance behavior: including compliance with medication, emotional control, reasonable diet, regular re-examination and rehabilitation exercise, etc., were recorded and assessed by nurses or family members, and those with more than 5 occurrences of non-compliance were included in the scope of non-compliance.

Statistical processing

The data were double-checked and entered, and statistical analysis was performed using SPSS 21.0 software. Means, standard difference (Mean, SD) were used for statistical description of measurement information, and frequency, percentage (n, %) were used for statistical description of count information. For general demographic data, the chi-square test was used for qualitative data, and the rank sum test was used for rank data; the t-test for two independent samples was used for quantitative data. $P < 0.05$ indicated that the difference was statistically significant.

Results

Comparison of general information between the two groups

As shown in **Table 1**, there were no statistically significant differences between the basic and combined groups in terms of gender, age, BMI, diagnostic subtype, education level, marital status, and work status ($P > 0.05$). As such follow-up comparisons could be made.

Table 2. Comparison of the rates of seek medical advice, implementation rate of the established treatment plan, and first re-examination rate between the two groups (n, %)

Group	Rates of seek medical advice	Established treatment plan implementation rate	First re-examination rate
Basic group (n=65)	78.46 (51/65)	88.24 (45/51)	82.35 (42/51)
Joint group (n=65)	92.31 (60/65)	98.33 (59/65)	98.33 (59/60)
χ^2 value	4.993	4.758	8.588
P value	0.025	0.029	0.003

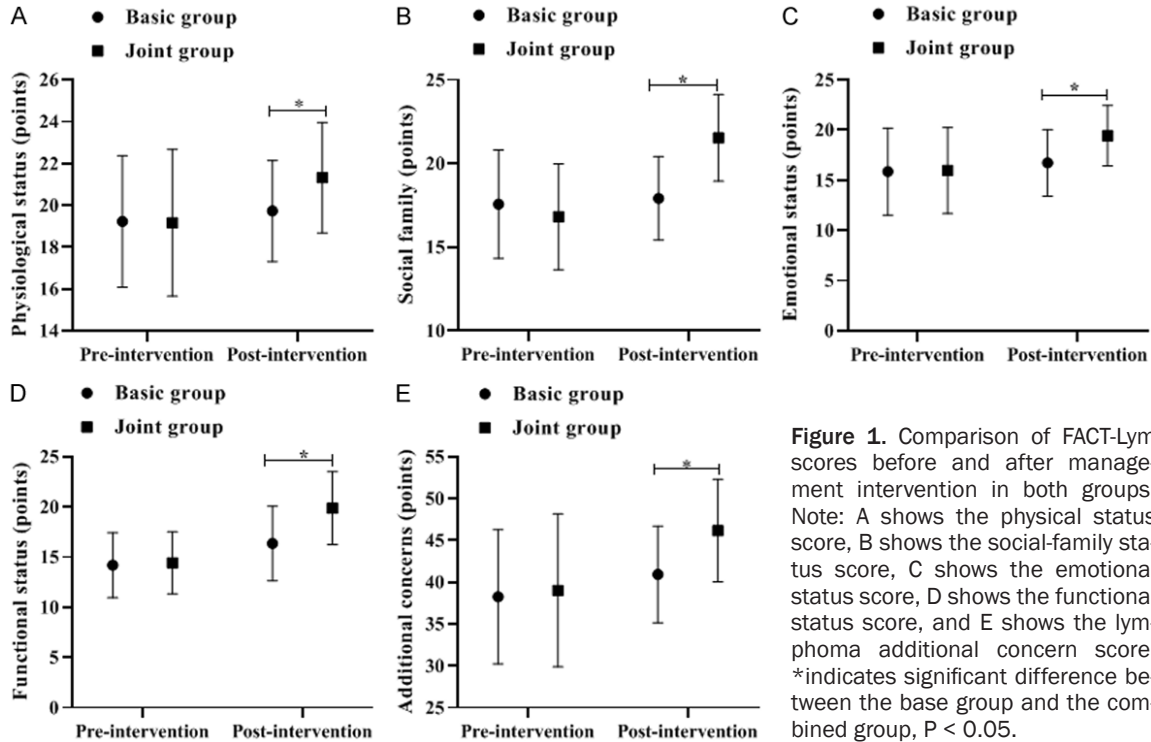


Figure 1. Comparison of FACT-Lym scores before and after management intervention in both groups. Note: A shows the physical status score, B shows the social-family status score, C shows the emotional status score, D shows the functional status score, and E shows the lymphoma additional concern score. *indicates significant difference between the base group and the combined group, $P < 0.05$.

Comparison of seeking medical advice rate, implementation rate of established treatment plan and first re-examination rate between the two groups

As shown in **Table 2**, the rates of seeking medical advice, the implementation rate of the established treatment plan and the first re-examination rate were significantly higher in the combined group than in the basic group ($P < 0.05$).

Comparison of FACT-Lym scores before and after the management intervention in both groups

As shown in **Figure 1**, the FACT-Lym scores for each dimension (physical status, social and family status, emotional status, functional status, and lymphoma additional concern, respectively) were significantly higher in the combined

group when compared with the base group after 6 months of intervention ($P < 0.05$).

Comparison of GQOLI-74 before and after intervention between the two groups

As shown in **Figure 2**, the GQOLI-74 scores for each dimensions (psychological functioning, somatic functioning, physical life, and social functioning, respectively) were significantly higher in the combined group when compared with the base group after 6 months of intervention ($P < 0.05$).

Comparison of ESCA scores between the two groups before and after the intervention

As shown in **Figure 3**, the ESCA scores for each dimension (self-care skills, self-responsibility, self-concept, and health knowledge level, respectively) were significantly higher in the

Effect of combined management models on nursing of lymphoma patients

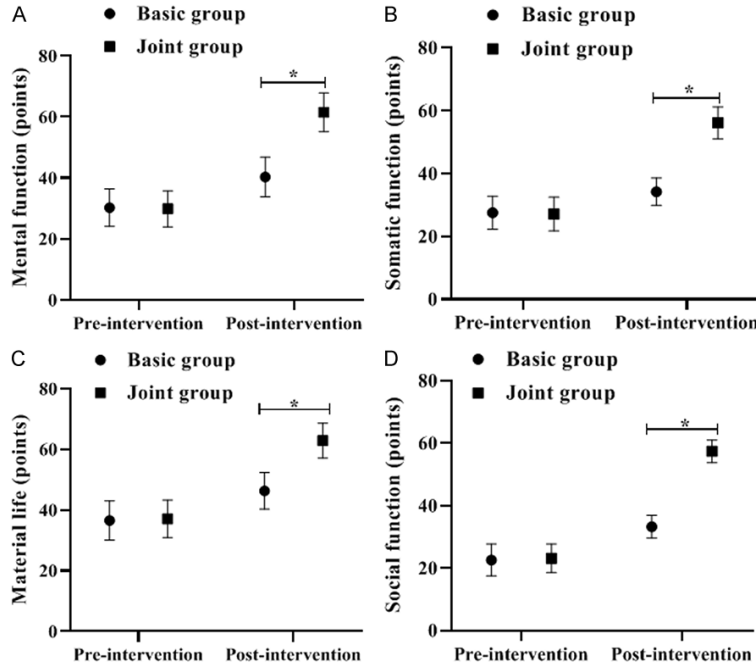


Figure 2. Comparison of QOL-74 before and after intervention in two groups. Note: A shows the psychological functioning score, B shows the somatic functioning score, C shows the physical life score, and D shows the social functioning score. *indicates significant differences between the basic and combined groups, $P < 0.05$.

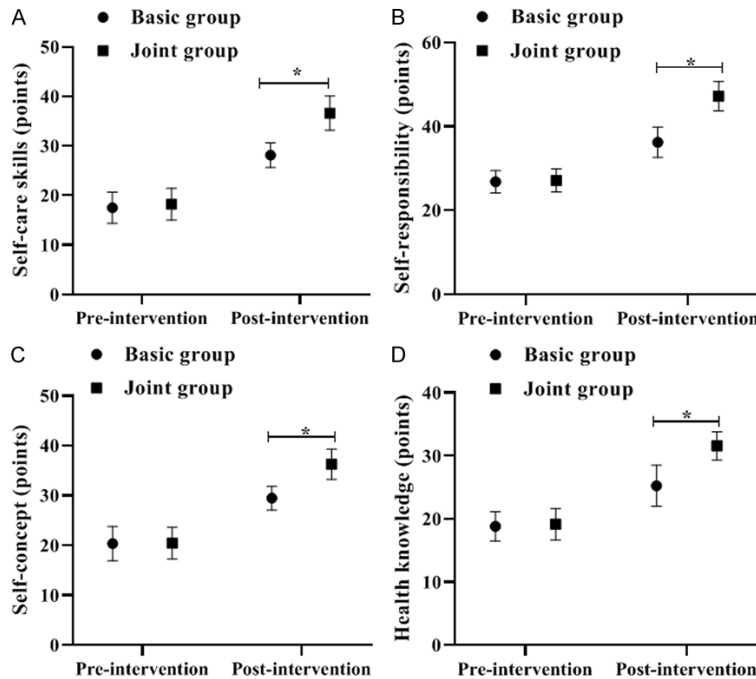


Figure 3. Comparison of ESCA scores before and after intervention between the two groups. Note: A shows self-care skill scores, B shows self-responsibility scores, C shows self-concept scores, and D shows health knowledge level scores. *indicates significant differences between the basic and combined groups, $P < 0.05$.

combined group when compared with the base group after 6 months of intervention ($P < 0.05$).

Comparison of compliance behaviors between the two groups

As shown in **Table 3**, the compliance rates of medication compliance, emotion control, reasonable diet and healthy exercise in the combined group were significantly higher when compared with the base group ($P < 0.05$).

Comparison of short-term prognosis between the two groups

In the basic group, 14 patients who were not admitted to our hospital for treatment after diagnosis, 50 patients in the basic group completed all treatment and follow-up, 1 patient was lost after withdrawing from treatment, and there was no death, and the short-term survival rate was 100%. In the joint group, 5 patients were not admitted to our hospital for treatment after diagnosis, and 58 patients in the joint group finally completed all treatment and follow-up, 1 patient died during the follow-up period, and 1 case was lost, for a short-term survival rate of 98.29%. Patients in both groups experienced adverse reactions (including nausea, vomiting, diarrhea, and decreased white blood cells) during treatment and administration, which was resolved on their own or after symptomatic treatment, and no patient withdrew from the study due to serious adverse reactions, and the adverse reactions did not affect the course of the trial.

Effect of combined management models on nursing of lymphoma patients

Table 3. Comparison of compliance behavior between two groups (n, %)

Group	Medication compliance	Mood control	Reasonable diet	Healthy exercise
Basic group (n=50)	38 (76.00)	32 (64.00)	32 (64.00)	30 (60.00)
Joint group (n=58)	54 (93.10)	51 (87.93)	50 (86.21)	48 (82.76)
χ^2 value	6.224	8.644	7.245	3.933
P value	0.013	0.003	0.007	0.008

Discussion

Lymphoma, as a malignant tumor originating from the lymph nodes and lymphoid tissues, it develops as a complex pathological process resulting from a combination of multiple factors, multiple genes involved and multiple stages [17]. With the rapid development of new molecular targeted drugs, bioimmunotherapy and continuous improvement of chemotherapy regimens, the remission rate and survival rate of lymphoma patients have improved. However, the quality of survival and psychosocial adjustment of lymphoma patients are still greatly affected by the cancer itself, as well as the various side effects brought by the treatment to patients, which should not be ignored and optimistic [18-20]. Therefore, how to effectively improve the quality of survival and enhance the psychosocial adjustment of lymphoma patients needs to be more deeply and extensively explored. In this study, we applied the combination of oncology case management and whole-process management model to the care management of patients with primary lymphoma, and made the following summary of the results obtained.

The whole course of oncology case management can effectively promote patients' timely consultation and follow-up, and their adherence to standardized treatment

The results of this study showed that the visit rate, the implementation rate of the established treatment plan, and the first follow-up rate were significantly higher in the combined group than in the basic group ($P < 0.05$). Patients with lymphoma have high survival remission and survival rates after early standardized treatment, but in clinical practice, consultation is delayed for reasons such as lack of disease-related knowledge in most patients [21]. In addition, the long duration of lymphoma treatment, the number of specialties involved, and the large number of toxic side effects that

become more pronounced with the prolongation of treatment may influence patients to receive treatment according to the established treatment plan; in addition, some patients do not return to the hospital on time between treatments and do not follow up after treatment, which may lead to poor treatment outcomes [22, 23]. In this study, the joint group was managed by an experienced and fully qualified case manager according to a developed lymphoma oncology case management manual to follow up patients' treatment intentions when their pathological results were determined and at the beginning, reducing the delay in consultation and delay in treatment caused by patients' lack of awareness of the disease. In addition, we evaluate patients' adverse reactions during treatment and organized a multidisciplinary program adjustment when necessary to ensure the smooth implementation of treatment; during the inter-treatment period of patients, we reminded and supervised patients' follow-up through management system, SMS and telephone, which effectively assisted patients to receive treatment according to the established plan and improved their follow-up rate.

The whole course of oncology case management can effectively improve the quality of patient care and patient compliance behavior

The quality of patient care is mostly reflected by the patients' quality of vitality and quality of life after receiving nursing interventions, and in this study, the scores on each dimension of the FACT-Lym, GQOLI-74, and ESCA scales were higher in the combined group than in the basic group after 6 months of intervention, the compliance rates of medication, emotion control, diet and healthy exercise were significantly higher in the combined group than in the basic group. ($P < 0.05$). The intervention of a seamless service model of whole course of oncology case management, in which the patient's physical and mental status is assessed at key

points of the patient's treatment therapy in conjunction with the attending physician and the charge nurse, with advance intervention for possible adverse reactions and adverse emotions and referral to a psychiatrist if necessary, can effectively reduce psychological problems such as low interpersonal self-esteem, depression, and anxiety, reduce the patient's symptom distress, and improve the quality of life [24, 25]. On the other hand, case managers help patients to answer various questions in a timely manner during the management process, help patients to establish confidence in disease treatment, promote patients' sense of self-efficacy, and also allow patients to continuously learn, master and adhere to the relevant disease behavior management, and promote the improvement of patients' self-care ability. Through the above-mentioned interventions in all aspects, we try to meet the patients' physical, psychological, social and family care needs on the basis of fully respecting their individual characteristics, which can effectively improve their health cognition and psychological status. It helps to improve their treatment motivation and reduce the occurrence of noncompliance with applied behavioral interventions.

In summary, a whole process of case management intervention immediately after the initial diagnosis of lymphoma can effectively improve the rate of seek medical advice, implementation of established treatment plans, first follow-up, compliance and quality of care, and help improve patient prognosis. Due to the limited time and funding, the intervention period was short, only 6 months, and only 130 lymphoma patients who met the inclusion criteria in our hospital were selected for this study. Future multicenter randomized controlled studies in tertiary hospitals in the province are needed to extend the duration of whole-process case management and the number of follow-up visits to observe the long-term effects of this model.

Disclosure of conflict of interest

None.

Address correspondence to: Fen Cheng, Department of Ward 3 of Hematology Department, The Second Xiangya Hospital of Central South University, Changsha City 410011, Hunan Province, China. Tel: +86-18569400313; E-mail: juanj1229@163.com

References

- [1] Barrington SF and Trotman J. The role of PET in the first-line treatment of the most common subtypes of non-Hodgkin lymphoma. *Lancet Haematol* 2021; 8: e80-e93.
- [2] Attarbaschi A, Abila O, Arias Padilla L, Beishuizen A, Burke GAA, Brugières L, Bruneau J, Burkhardt B, d'Amore ESG, Klapper W, Kontry U, Pillon M, Taj M, Turner SD, Uyttebroeck A, Woessmann W and Mellgren K. Rare non-Hodgkin lymphoma of childhood and adolescence: a consensus diagnostic and therapeutic approach to pediatric-type follicular lymphoma, marginal zone lymphoma, and nonanaplastic peripheral T-cell lymphoma. *Pediatr Blood Cancer* 2020; 67: e28416.
- [3] Ferry JA. Scientific advances and the evolution of diagnosis, subclassification and treatment of lymphoma. *Arch Med Res* 2020; 51: 749-764.
- [4] Liu W, Liu J, Song Y, Zeng X, Wang X, Mi L, Cai C, Wang L, Ma J and Zhu J; Union for China Leukemia Investigators of the Chinese Society of Clinical Oncology; Union for China Lymphoma Investigators of the Chinese Society of Clinical Oncology. Burden of lymphoma in China, 2006-2016: an analysis of the Global Burden of Disease Study 2016. *J Hematol Oncol* 2019; 12: 115.
- [5] Zhang P and Zhang M. Epigenetic alterations and advancement of treatment in peripheral T-cell lymphoma. *Clin Epigenetics* 2020; 12: 169.
- [6] Taylor K, Chivers P, Bulsara C, Joske D, Bulsara M and Monterosso L. Care After Lymphoma (CALy) trial: a phase II pilot pragmatic randomised controlled trial of a nurse-led model of survivorship care. *Eur J Oncol Nurs* 2019; 40: 53-62.
- [7] Chan RJ, Buhagiar S, Teleni L, Simonsen C, Turner J, Rawson C, Hart NH, Jones L, Gordon L, Joseph R, Agbejule OA, Henderson F, Rhee J, Ryan M, Carrington C and Mapp S. Partnering with general practitioners to optimize survivorship for patients with lymphoma: a phase II randomized controlled trial (the GOSPEL I trial). *Trials* 2021; 22: 12.
- [8] Hu B, Boselli D, Pye LM, Chen T, Bose R, Symanowski JT, Blackley K, Moyo TK, Jacobs R, Park SI, Soni A, Avalos BR, Copelan EA, Raghavan D and Ghosh N. Equal access to care and nurse navigation leads to equitable outcomes for minorities with aggressive large B-cell lymphoma. *Cancer* 2021; 127: 3991-3997.
- [9] Ma C and Wen L. Discussion on standardization management mode of medical equipment based on whole process quality control. *Zhongguo Yi Liao Qi Xie Za Zhi* 2020; 44: 270-275.

Effect of combined management models on nursing of lymphoma patients

- [10] Zhu ZG. Key points of perioperative whole-process management for patients with advanced gastric cancer. *Zhonghua Wei Chang Wai Ke Za Zhi* 2020; 23: 115-122.
- [11] Fraser K. Case management. *Prof Case Manag* 2020; 25: 350.
- [12] Mattei da Silva ÂT, de Fátima Mantovani M, Castanho Moreira R, Perez Arthur J and Molina de Souza R. Nursing case management for people with hypertension in primary health care: a randomized controlled trial. *Res Nurs Health* 2020; 43: 68-78.
- [13] Lai HW, Chen ST, Mok CW, Lin YJ, Wu HK, Lin SL, Chen DR and Kuo SJ. Robotic versus conventional nipple sparing mastectomy and immediate gel implant breast reconstruction in the management of breast cancer- a case control comparison study with analysis of clinical outcome, medical cost, and patient-reported cosmetic results. *J Plast Reconstr Aesthet Surg* 2020; 73: 1514-1525.
- [14] Hlubocky FJ, Webster K, Beaumont J, Cashy J, Paul D, Abernethy A, Syrjala KL, Von Roenn J and Cella D. A preliminary study of a health related quality of life assessment of priority symptoms in advanced lymphoma: the National Comprehensive Cancer Network-Functional Assessment of Cancer Therapy-Lymphoma Symptom Index. *Leuk Lymphoma* 2013; 54: 1942-6.
- [15] Stevanović D, Lakić A and Damnjanović M. Some psychometric properties of the pediatric quality of life inventory™ version 4.0 generic core scales (PedsQL™) in the general Serbian population. *Qual Life Res* 2011; 20: 945-9.
- [16] Raffaele B, Biagioli V, Cirillo L, De Marinis MG and Matarese M. Cross-validation of the Self-care Ability Scale for Elderly (SASE) in a sample of Italian older adults. *Scand J Caring Sci* 2018; 32: 1398-1408.
- [17] Wang HW, Balakrishna JP, Pittaluga S and Jaffe ES. Diagnosis of Hodgkin lymphoma in the modern era. *Br J Haematol* 2019; 184: 45-59.
- [18] Jaffe ES. Diagnosis and classification of lymphoma: impact of technical advances. *Semin Hematol* 2019; 56: 30-36.
- [19] Sindel A, Al-Juhaishi T and Yazbeck V. Marginal zone lymphoma: state-of-the-art treatment. *Curr Treat Options Oncol* 2019; 20: 90.
- [20] McCarten KM, Nadel HR, Shulkin BL and Cho SY. Imaging for diagnosis, staging and response assessment of Hodgkin lymphoma and non-Hodgkin lymphoma. *Pediatr Radiol* 2019; 49: 1545-1564.
- [21] David K and Davis ME. Primary central nervous system lymphoma: treatment and nursing management of immunocompetent patients. *Clin J Oncol Nurs* 2021; 25: 439-448.
- [22] Ansell SM. Hodgkin lymphoma: a 2020 update on diagnosis, risk-stratification, and management. *Am J Hematol* 2020; 95: 978-989.
- [23] Kline J, Godfrey J and Ansell SM. The immune landscape and response to immune checkpoint blockade therapy in lymphoma. *Blood* 2020; 135: 523-533.
- [24] Lv X, Wang Q, Ge X, Xue C and Liu X. Application of high-throughput gene sequencing in lymphoma. *Exp Mol Pathol* 2021; 119: 104606.
- [25] Lee AWM, Ng WT, Chan JYW, Corry J, Mäkitie A, Mendenhall WM, Rinaldo A, Rodrigo JP, Saba NF, Strojjan P, Suárez C, Vermorken JB, Yom SS and Ferlito A. Management of locally recurrent nasopharyngeal carcinoma. *Cancer Treat Rev* 2019; 79: 101890.