Original Article

The impact of a collaborative care model on leukemia patients' quality of life and anxiety

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Abstract

Background and Objective: Leukemia is one of the top five cancers in Iran. Aside from physical issues, the disease causes a variety of social and psychological issues for patients. In this regard, one aspect that cancer may affect is quality of life, which can lead to anxiety. The collaborative care model is a novel nursing model that improves treatment outcomes through collaboration. As a result, the purpose of this study is to look into the impact of a collaborative care model on quality of life and anxiety in leukemia patients.

Methods: The current non-randomized clinical trial, which included a control group, was conducted on 60 leukemia patients at Firoozgar and Rasoul Akram hospitals in Tehran (affiliated to Iran University of Medical Sciences). The hospitals were randomly divided into two groups: control and intervention, and patients were chosen at random from each hospital using a convenience sampling method. The collaborative care model was implemented in the intervention group, while no specific measures were taken in the control group. Patients in both groups' quality of life was measured using the Quality-of-Life Questionnaire in Oncology Patients before, one, and two months after the intervention, and their anxiety was measured using the Beck Anxiety Inventory. Both groups completed their questionnaires using a self-report method.

Results: In terms of demographic characteristics, there was no statistically significant difference between the two groups (p>0.05). Prior to the intervention, no statistically significant difference in mean anxiety, quality of life, and its dimensions was observed between the two groups (p>0.05). Following the intervention, a statistically significant difference in mean anxiety and quality of life scores was observed between the two groups (p<0.05), indicating a decrease in anxiety and an increase in quality of life among patients in the intervention group.

Conclusion: Based on the findings, it appears that the collaborative care model has a positive effect on reducing anxiety and improving quality of life in leukemia patients, and it is preferable to use this model when caring for this group of patients.

Keywords: Collaborative care model, Anxiety, Quality of life, Leukemia

Introduction

Cancer is one of the most common and dangerous chronic diseases, as well as one of the factors that threatens patients, families, and communities, according to all scientific, experimental, and research evidence (1, 2). Cancer is the third leading cause of death in Iran, after cardiovascular disease and unintentional accidents, according to the most recent statistics (3). Leukemia is a type of cancer that is distinguished by the accumulation of malignant white blood cells in the blood or bone marrow (4). Acute leukemia is fatal if not treated within three months. Patients usually die in less than a year after the onset of symptoms because their bone marrow is mostly occupied by primary cells with poor differentiation (5).

Oncology patients face a variety of issues, including anxiety and depression, which can impair their quality of life and its dimensions (6). In this regard, the findings of the Hadi and colleagues study can be mentioned, which revealed that patients with leukemia, like those with other blood cancers, have a low quality of life (7). According to the results of a survey of 398 oncology patients, whenever patients' mental health deteriorates after a cancer diagnosis, their performance in other dimensions of quality of life suffers (8). Quality of life is a multidimensional and complex concept with objective and subjective components that is frequently used to refer to a specific perception of life satisfaction, physical health, social and family health, hope, social etiquette, and mental health (9). One of the primary goals of care in oncology patients, as with other chronic diseases, is to improve their quality of life, and the healthcare team strives to achieve this goal throughout the treatment process by improving patients' job skills as well as performance (10). Depression and anxiety, which occur during the diagnosis and treatment process, are examples of factors that can have a negative impact on quality of life, cause physical and psychological symptoms, and reduce adaptation to treatment (11). Patients with advanced or terminal cancer frequently experience anxiety about the treatment process, progression, unbearable pain, death, and the unknown after death. Anxiety can also have a negative impact on treatment processes and even patients' survival rates (12). For anxiety, not only the cancer diagnosis, but also the type of treatment, contribute to the stressful environment. Patients who receive both chemotherapy and radiotherapy in addition to surgery are more likely to develop mental disorders such as anxiety and depression than patients who only receive one type of treatment (13).

To meet the needs of patients and their families, members of the care and treatment team must fully understand the patients' problems and have a practical strategy. Furthermore, it is recognized that people in different parts of the world have different tendencies and needs based on their economic, social, and cultural circumstances, which must be met with the resources available, and their rights must be respected. Implementing and evaluating local models to control chronic diseases such as leukemia is one of the available strategies (14). The collaborative care model is one of these models. The goals of this model are to create an effective, balanced, and continuous relationship between team members throughout the care and treatment processes, to increase team members' cooperation, motivation, and responsibility throughout the care and treatment processes, to increase patient satisfaction and quality of life, and to reduce disease complications and risk factors (14). The concept and approach of collaboration can be used in the care process to create and improve an effective care relationship. As a result, an effective care relationship is formed between the three main components, namely the patient, the nurse, and other members of the treatment team (15).

The effects of a collaborative model care program on various patients have been evaluated. However, no research into the effectiveness of this model in leukemia patients was found. Given the importance of this group of patients' quality of life and mental health, the current study was designed and carried out to investigate the effect of collaborative model care on quality of life and anxiety in leukemia patients.

Methods

This non-randomized quasi-experimental study with a control group was carried out in Iran in 2018. After approving the proposal, obtaining a code of ethics from the Ethics Committee, receiving a letter of introduction from the university, and coordinating with hospital officials, the researcher referred to the study setting for sampling. He then invited patients who met the inclusion criteria to participate in the study after obtaining permission from blood ward managers and officials, introducing himself, and explaining the study's objectives and methods.

The sample for this study consisted of 60 leukemia patients who met the inclusion criteria, could participate in all collaborative-educational care sessions, and were admitted to Firoozgar and Rasoul Akram hospitals' blood wards. The researcher then used a coin toss to choose one of the hospitals as the intervention group and the other as the control group. Firoozgar Hospital was chosen as the intervention group, and Rasoul Akram Hospital was chosen as the control group. A convenience sampling method was used to select patients in each hospital based on the

inclusion criteria. Both groups were matched in terms of the main and potential confounding variables. It is worth noting that all patients signed a written consent form. Patients were asked to complete the data collection tool for the first time after sampling and before the intervention, which included a checklist for demographic characteristics, the Quality-of-Life Questionnaire in Oncology Patients (QLQ-C30), and the Beck Anxiety Inventory (BAI). The collaborative care model was then implemented for 30 patients in the intervention group who were admitted to Firoozgar Hospital's blood wards A and B.

Intervention Group

The intervention in this group was designed and implemented using the collaborative care model. The focus of this model, in general, is on providing active and continuous collaboration of the main and effective elements of care, namely the patient, nurse, and physician. Collaborative groups were formed with a maximum of 15 leukemia patients (patients were divided into two groups based on educational priorities, which were extracted separately for each patient using the nursing process, and care needs), one of their family members, a nurse (researcher), and other members of the treatment team for this purpose (hematologist, nutritionist, psychologist etc.). The intervention program was then carried out in four stages, according to the steps of the collaborative care model (1: motivation (At this point, the client was encouraged to be more involved in the care process by providing awareness of the existing situation (explaining the extracted care problems) and the risks and benefits of collaborative care). 2: preparation (general and specific goals were determined for each patient based on the problems and care needs diagnosed in the previous stage; then, collaborative educational and follow-up visits by a doctor, nurse (researcher), psychologist, and nutritionist were planned with the clients' opinions based on their care problems), 3: engagement (this stage is one of the most important and sensitive strategic goals of the collaborative care model. The main responsible and coordinator of program implementation was first appointed for program implementation. The nurse (researcher) was chosen as the program's coordinator with the group's approval. After the visit sessions, the nurse (researcher) specified and announced how the clients would access themselves and other members of the treatment team. The programs designed in the previous stage were then implemented on time. Executive programs are distinct from traditional and ongoing programs in the collaborative care model. The collaborative care model formulates and implements executive programs to ensure patients' participation

and compliance in the treatment and care process) and 4: evaluation (evaluation is the collaborative care model's final step. The evaluation was done in two stages in this model: 1) staged and 2) final. The evaluation criteria were as follows: a) improving the patient's quality of life by at least 10 reduction units in each quality-of-life domain; and b) reducing patients' anxiety by at least 10 points on the Beck's anxiety questionnaire. c) Reduction of risk factors in the progression of blood cancer and its complications d) Improvement of chemotherapy-induced symptoms and side effects)).

Control Group

The researcher made no interventions in this group. This group, on the other hand, received routine education and care from hospital nurses and physicians. During the study, there was no ethical relationship between the control and intervention groups. The control group was treated according to the hematologist's current protocol, with no intervention from the researcher. At the end of the study, all of the items taught to the intervention group were presented to the control group in the form of an educational package.

Data Collection Tool

A demographic checklist, the Quality-of-Life Questionnaire in Oncology Patients (QLQ-C30), and the Beck Anxiety Inventory (BAI) were used to collect data. Data was collected three times: before the intervention, one month later, and two months later. The demographic characteristics checklist collected the following information from patients: age, gender, marital status, number of children, level of education, employment status, income adequacy, having high-risk behaviors, body mass index, personality type, comorbidity, number of hospitalizations, history of chemotherapy and the number of its sessions, history of radiotherapy and the number of its sessions, history of bone marrow transplant and the number of its sessions, history of bone marrow transplant and the number of its sessions, history of leukemia.

Beck Anxiety Inventory (BAI)

This questionnaire contains 21 items, each of which assesses a different cognitive, physical, or panic symptom. Each item is answered on a 4-point Likert scale. The total score is the sum of all the item scores, and a higher score indicates a higher level of anxiety. Scores can range from 0 to 63, with the lowest level of anxiety (0-7), the highest level of anxiety (16-25), and the lowest level of anxiety (0-7). (26–63). Previous

studies in Iran found this questionnaire's validity and reliability to be desirable (16).

Quality of Life Questionnaire in oncology patients (QLQ-C30)

This questionnaire includes global health status, five functional scales, and three symptom scales to assess quality of life. It is designed specifically for cancer patients. Previous studies in Iran found the validity and reliability of the Persian version of this questionnaire to be desirable (17).

Ethical Considerations

In this study, researchers attempted to consider all ethical principles in research, such as obtaining informed consent, confidentiality, participant independence, and the right to withdraw from the study. This study is also registered in IRCT as IRCT20181019041381N1. The code of ethics for this study was IR.IUMS.FMD.REC 1396.94116860 from Iran University of Medical Sciences.

Data Analysis

Descriptive statistics such as two-dimensional frequency distribution tables and numerical indices were used for data analysis, as were inferential statistics such as the chi-square test, Fisher's exact test, paired t-test, independent t-test, and analysis of variance. SPSS v16 was used to analyze the collected data.

Table 1. Anxiety in participants before, one and two months after the intervention and homogeneity test of the data

groups / anxiety	intervention		control		Comparison of two groups using Mann-Whitney test
	Mean	SD	Mean	SD	
before the intervention	42.291	4.330	42.100	7.172	p-value: 0.831 Z: -0.215
one month after the intervention	22.535	5.044	42.629	6.439	p-value< 0.001 Z: -6.182
two months after the intervention	14.821	7.707	45.222	4.435	p-value< 0.001 Z: -6.839
Friedman test results	p-value: 0.001 Df: 2 Chi-square: 47.78		p-value: 0.001 Df: 2 Chi-square: 14.264		
Repeated Measures ANOVA results	P Value: 0.001 F : 315.18 DF:1				

Table 2. Mean changes in QoL in control and intervention groups before, one and two months after the intervention

Items	Control group			Intervention group			P value
	Before	One-month	Two-month	Before	One-month	Two-month	
Physical functioning	68.83	70.19	72.89	71.78	65.58	55.54	0.001
Role functioning	62.50	82.90	76.78	70.42	57.14	48.21	0.001
Emotional functioning	58.12	70.60	71.76	59.37	57.59	46.21	0.001
Cognitive functioning	70.41	74.54	73.61	71.67	58.04	42.86	0.001
Social functioning	67.92	68.98	69.59	66.25	53.57	44.64	0.001
Exhaustion	71.11	72.84	73.30	69.72	58.33	49.11	0.001
Vomiting	65.00	70.83	73.61	68.75	59.38	49.11	0.001
Pain	70.83	72.16	74.07	67.92	60.71	44.64	0.001
Dyspnea	71.67	73.15	76.85	70.00	56.25	43.75	0.001
Insomnia	62.83	66.44	69.67	72.50	52.67	39.29	0.001
Appetite loss	73.33	75.93	69.89	75.00	54.46	40.18	0.001
Constipation	63.33	72.22	73.22	68.33	50.89	47.32	0.001
Diarrhea	64.17	72.20	73.15	65.00	50.89	51.79	0.001
Economic problem	65.00	69.44	72.22	71.67	65.00	52.67	0.001
Total QoL	58.99	52.91	51.11	62.50	82.90	76.78	0.001

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Descriptive statistics such as two-dimensional frequency distribution tables and numerical indices were used for data analysis, as were inferential statistics such as the chi-square test, Fisher's exact test, paired t-test, independent t-test, and analysis of

variance. SPSS v16 was used to analyze the collected data.

Results

In terms of demographic characteristics, there was no significant difference between patients in the intervention and control groups in terms of age, gender, marital status, number of children, level of education, employment status, income adequacy, having high-risk behaviors, body mass index, personality type, comorbidity, number of hospitalizations, history of chemotherapy and the number of sessions. The two groups were homogeneous in terms of these characteristics, including history of radiotherapy and the number of sessions, history of bone marrow transplant and the number of transplants, family history of leukemia and other types of cancer, source of information on the disease and method of gathering information.

Anxiety

The Mann-Whitney test results showed that there was no significant difference in the mean anxiety score before the intervention between patients in the intervention and control groups (p>0.05), and the two groups were homogeneous. The Friedman test results revealed that anxiety levels in each group changed before, one, and two months after the study (p0.05). The results of the analysis of variance revealed that the direction of this change in the two groups is not the same (p0.05), and patients in the intervention group had a lower mean anxiety score, whereas patients in the control group had a higher mean anxiety score (Table 1).

Quality of life

According to the Mann-Whitney test results, there was no significant difference in the mean score of quality of life before the intervention between patients in the intervention and control groups (p>0.05). The mean score of quality of life in the intervention group was significantly higher one and two months after the intervention (p0.05). Table 2 provided more information.

Discussion

It is especially important to focus on oncology patients' quality of life and mental health. The current study found that implementing a collaborative care model has a positive effect on quality of life and anxiety in leukemia patients.

Miladinia and colleagues in 2016 found that before the intervention, the quality of life of patients with leukemia was the same in the intervention and control groups (18). However, after the intervention, the intervention group's mean quality of life score increased significantly. It is worth noting that the 36-Item Short Form Health Survey (SF-36) was used in Miladinia and colleagues' study, and an increase in the score of quality of life is considered an improvement (18). Grulke and colleagues conducted a study on patients with leukemia in 2012 using the quality-of-life questionnaire in oncology patients (QLQ-C30), and the results showed that the two groups were the same in terms of quality of life before the intervention, with cognitive function being the most common problem and constipation being the least common disorder. However, after the intervention, the mean score of quality of life was not the same between the two groups, with the most change related to physical functioning and the least change related to constipation. Furthermore, there was no improvement in the intervention group's economic problems or diarrhea (19). This study is consistent with the current research in this area. Furthermore, the mean total score of quality of life in the mentioned study was reported to be 63, which is close to the current study's mean score. These findings corroborate previous findings in leukemia patients. This study is consistent with the current research in this area. There was no improvement in diarrhea in the intervention group in the study. Furthermore, despite the relative decrease in the intervention group's mean score of economic problems and its increase in the control group, the two groups were homogeneous up to one month after the intervention.

In a study conducted by Zareian and Rahmati, the intervention and control groups had the same levels of anxiety and quality of life prior to the intervention. However, after the intervention, the intervention group's anxiety level decreased by 31.6 units, while the control group's anxiety level increased by 0.25. In terms of quality of life, both groups were the same prior to the intervention, with no significant difference reported. However, after the intervention, the intervention group's quality of life increased by 40.65 units, while the control group's quality of life decreased by 0.5 units and remained nearly constant. Given this disparity, the two groups' quality of life were no longer homogeneous after the intervention (20). This study's findings are consistent with those of the current study. In another study on anxiety in breast cancer patients using the Beck Anxiety Inventory conducted by Hajsadeghi and colleagues in 2017, the two intervention and control groups were homogeneous in terms of the mean anxiety score before the intervention. However, after the

intervention, the intervention group reported a lower mean anxiety score (from 35.2 to 28.1) than the control group (21). This study supports the current study. Despite this important finding, the mean anxiety scores in the intervention and control groups were around 35 prior to the study, which is slightly lower than the mean scores reported in the current study. This difference could be due to sample differences.

One of the novel nursing models is the collaborative care model. One of the assumptions of this model is that patients' lack of understanding and insufficient knowledge about the diseases is one of the causes of failure to control chronic diseases and patients' lack of recovery, and it is closely related to patients' failure to comply with the principles and standards of care and treatment. The primary cause of this problem is a lack of an effective care relationship between the main elements of treatment and care process, and the solution is to modify this structure, i.e. improve care relationships (15). The concept and meaning of collaboration, which were welcomed and considered by patients, can be attributed to the significant increase in quality of life and decrease in anxiety in the collaborative care model. Patients who were only given a few minutes in all of their self-referrals to the physician due to leukemia or other diseases were ecstatic when they were given an hour at each educational and prevention visit with several other similar patients, as well as the physician and nurse, and they were able to ask all of their questions and problems and get the right answers during this time. Patients were so enthusiastic about this process that even at the end of the intervention, patients in the intervention group asked to continue their visits. This desire is understandable given the scarcity of physicians in our country's healthcare system and the constant presence of nurses in hospitals and clinics.

Conclusion

The collaborative care model may be an appropriate model for meeting the unique needs of leukemia patients. The model can reduce the workload of nurses, families, and even physicians while increasing their satisfaction and improving their quality of life and anxiety. Using this model and care programs based on it, clinical nurses can help patients with leukemia improve their quality of life and anxiety. Given the high prevalence of leukemia in children and adolescents, a study to determine the effect of collaborative care models on quality of life and anxiety in this group of patients is recommended.

Acknowledgments

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