Evaluation of the Effect of Education based on Pender Health Promotion Model on Self-efficacy and Quality of Life in Patients with Leukemia Referred to the Clinics of Shiraz University of Medical Sciences

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Abstract -Introduction & Objective: Leukemia as a disease can reduce the quality of life and self-efficacy of patients. Educational program as a part of the care program leads to health-promoting behaviors. Thus, this research was conducted with the aim of evaluating the effect of education based on Pender Health Promotion Model on self-efficacy and quality of life in patients with Leukemia.

Methods: This is a quasi-experimental interventional study conducted on 54 patients with Leukemia. Data were collected using four questionnaires, Demographic Information Questionnaire, Pender Health Promotion Model Components Questionnaire, Self-efficacy Questionnaire, and Quality of Life Questionnaire. After collecting the data, they were analyzed in SPSS24 software using descriptive statistics, mean, standard deviation, frequency and paired t-test, Pearson correlation coefficient, repeated measure, chi-square, and ANOVA tests.

Results: The research results revealed that the score of self-efficacy and quality of life increased significantly (p <0.001) immediately after and one month after education compared to before intervention (p <0.001). In addition, in the intervention group, there was a direct and significant relationship between quality of life and self-efficacy scores immediately and one month after the intervention and Pender health promotion scores immediately and one month after the intervention (P <0.05).

Conclusion: The research results suggested that the use of educational intervention based on Pender health promotion model can improve the self-efficacy of patients with regard to self-care behaviors and improve the quality of life in patients with Leukemia.

Keywords: Education, Pender Model, Self-efficacy, Quality of Life, Leukemia

I. Introduction

Our current communities are facing an ominous enemy called chronic diseases [1]. Like other chronic diseases, cancer is considered as a major health care issue. At the present time, more than 25 million people around the world suffer from cancer. More than 11 million people are annually affected by this disease and 7 million people die from

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cancer, that has made cancer the second leading cause of death in human communities after cardiovascular disease. It is estimated that the incidence of this disease worldwide will reach 24 million annually by 2035 and it will be the first leading cause of death in developed and developing countries in the near future [2,3]. In Iran, more than thirty thousand people die annually due to cancer. Approximately 80,000 people are infected with this disease in Iran every year [4]. Among all cancers, Leukemia is the fifth most common cancer in the world, accounting for about 8% of cancers [5]. Given the consequences of cancer, such as anorexia, nausea, vomiting, sensory-motor changes, hair loss, fatigue and stress caused by the disease, job dysfunction, etc., it can be stated that cancer influences the quality of life and performance of the patient, his or her family, and other family-related systems [6]. Hence, one of the issues that should be considered in cancer patients is the quality of life. With regard to the quality of life of cancer patients, it is clear that the complications of cancer and its various treatments have significant negative effects on their quality of life [7]. Quality of life is one of the most important components of the general concept of health. It represents one's understanding of life, values, goals, standards, and interests [8]. Quality of life or the level of people perception of their abilities in performing physical, emotional, and social functions has been investigated for more than a decade in studies of chronic diseases such as cancer [9]. One of the ways to improve the quality of life in cancer patients is to increase their self-efficacy, as patients with low self-efficacy experience significantly higher degrees of pain, fatigue, symptoms of anxiety, and depression [10]. The term "self-efficacy" refers to people believing in their abilities to mobilize motivations, cognitive resources, and control over a given event, which this belief is one of the essential aspects of self-efficacy [11]. Thus, it is possible to enhance one's self-efficacy and capability by creating the right context to acquire skills and knowledge needed and success in it. Patients who have a sense of confidence in their ability to take care of themselves actively participate in health-promoting programs and this partnership improves their quality of life [12]. Given the high prevalence of Leukemia in Iran and in the world and despite many advances in the treatment of cancer in recent years, the diagnosis of this disease still causes high stress in patients, which in turn reduces their self-efficacy and quality of life. One of the essential tools in changing a patient's lifestyle is an educational program as a part of the care that promotes health behaviors [13]. Health promotion is recognized as one of the most important principles of public health and includes all efforts to bring people closer to their best status of wellbeing and to the highest level of health [14]. One of the most comprehensive and predictive models used to help study the health-promoting behaviors and self-care is the Pender Health Promotion Model, which is a conceptual framework for describing a wide range of health behaviors rooted in social cognition, nursing, and public health theories [15]. The components of this model include health behaviors, personal experiences and characteristics, behavior-specific feelings and cognition (perceived benefits of the practice, barriers perceived from practice, perceived self-efficacy, situational effects, interpersonal effects, and activity-related effects), and behavioral outcomes [16]. Given what was stated above and as Leukemia can decrease the quality of life and self-efficacy of patients and the benefits of using education, the present study was conducted to evaluate the effect of educational intervention based on Pender health promotion model on self-efficacy and quality of life of patients with Leukemia referred to clinics affiliated to Shiraz University of Medical Sciences.

II. Methods

This research is a quasi-experimental interventional study designed to evaluate the effect of educational intervention based on Pender Health Promotion Model on self-efficacy and quality of life in patients with Leukemia referred to clinics affiliated to Shiraz University of Medical Sciences in 2018. Inclusion criteria of the research included willingness to participate in the study, age over 18 years, and passing at least 6 months after the definitive diagnosis of the disease. Exclusion criteria of the research also included participating in educational sessions on self-efficacy and quality of life, absence in more than one session, and withdrawing from the study. Samples were randomly divided into intervention and control groups. The sample size was determined 25 people in each group (a total of 50 people) using the sample size calculation formula based on the study conducted by Mohammadi Pour et al. [17] and using assumptions including 5% error, 80% power, and 40% effect size. Finally, with considering a 20% dropout, the sample size was determined 27 people in each of the intervention and control groups (a total of 54 people).

$$n = \frac{s^2(t_{\alpha,v} + t_{\beta(1),v})^2}{(\partial)^2}$$

Data were collected using four questionnaires. The demographic information questionnaire was a researcher-made questionnaire, including questions about demographic characteristics such as age, marital status, patient's education level, job status, and income level. The second questionnaire was the Pender Health Promotion Model Components Questionnaire. It is a researcher-made questionnaire that includes sections on individual knowledge, perceived benefits and barriers, perceived capability, planning, alternative behaviors, commitment to do controlling behaviors, and support of others. The first section of the Pender Health Promotion Model Component Questionnaire was individual knowledge that included 20 questions with a score range of 20 to 40. The second section included the benefits and barriers, scored on the Likert scale from "strongly agree" to "strongly disagree"; and the score for each question ranged from one to four. In this scale, score 1 was assigned to option "strongly agree" and score 4 was assigned for the option "strongly disagree". This section consisted of 10 questions, ranged from 10 to 40. The third section of the questionnaire was perceived capability questionnaire, scored on the Likert scale from "quite sure", "not very sure" and "not at all". The score 3 was assigned to option "quite sure" and score 1 was assigned to option "not at all". This section consisted of 6 questions and the range of scores obtained for this section was a minimum of 6 and a maximum of 18. The fourth section of the Pender Health Promotion Model Component Questionnaire was planning for self-efficacy. It was designed on a Likert scale ranging from "often", "sometimes", and "never". Accordingly, score 3 was assigned to option "often" and score 1 was assigned to option "never". This section consisted of 5 questions and the range of scores was between 5 and 15. The fifth section of the questionnaire was alternative behaviors. It was designed with 4 questions with group A and group B and the scores were in the range of a minimum of 4 and a maximum of 8. The last section of the questionnaire was related to the support of others for the control of Leukemia complications. It was designed on a Likert scale as "often", "sometimes", and "never"; in which score 1 was assigned to option "never" and score 3 was assigned to option "often". This section consisted of 5 questions and the range of scores obtained for this section was a minimum of 5 and a maximum of 15.

The face and content validity of the first and second questionnaires were calculated based on the opinion of 10 faculty members of Shiraz University of Medical Sciences. The face validity of the questionnaire was quantitatively obtained 2 on average for all items. Content validity for the questions was also 0.5-1. To confirm the reliability of the questionnaire, it was provided to 40 patients with Leukemia (who will not be included in the study) and it was confirmed with a coefficient of 0.78%. Accordingly, the validity and reliability of the researcher-made questionnaires were confirmed. The third questionnaire was related to self-efficacy questionnaire based on the Sherer and Maddux questionnaire.

This questionnaire assesses individual beliefs and ability to overcome different situations. This questionnaire is answered on a Likert scale, ranging from "strongly disagree", "disagree", and "strongly agree". Score 1 to 5 is assigned to each item. Items 1, 3, 8, 9, 13, 15 are scored from low to high and the rest are scored reversely from high to low. Thus, the maximum score in this questionnaire was 85, which was considered "high self-efficacy", and the minimum score was 17, which was considered as "low self-efficacy". This scale has been translated and validated in Iran. Its Cronbach's alpha coefficient has been reported 0.79 by Asgharnejad et al. [18]. The fourth questionnaire is related to the quality of life based on the EORTC QLQ_C30 Quality of Life Questionnaire with 30 questions. The range of scores that can be acquired in this questionnaire is between 30 and 120. Validation studies of this questionnaire have confirmed it as a valid and reliable scale for evaluating the quality of life of cancer patients in multicultural research situations with a reliability coefficient of 0.95 [19, 20]. The data were collected after obtaining the necessary permission to conduct the research and relevant coordination with the samples selected purposefully by using randomized sampling method among the patients with Leukemia and with considering inclusion and exclusion criteria. After assigning them into intervention and control groups, they were invited to participate in the study.

Educational classes on Leukemia and ways to increase self-efficacy and quality of life in patients with Leukemia were held in 4 sessions of 2 hours (one session per week) for the experimental group. They were implemented by the researcher through lecture, questioning, group discussions, and presenting educational booklets on Leukemia and ways to increase self-efficacy and quality of life in patients with Leukemia based on the components of the Pender Health Promotion Model. Moreover, the content of each educational session was given to the intervention group on the same day and the lesson of the previous session was briefly reviewed at the beginning of the class. After completing the educational interventions, the samples in both experimental and control groups completed the research questionnaires. Additionally, one month after the intervention, the questionnaires were re-completed to evaluate educational durability. After collecting the data, they were analyzed by using SPSS24 software 24 and using descriptive statistics such as mean, standard deviation, frequency, percentage, and paired t-test, independent t-test, Pearson correlation coefficient, repeated measures, chi-square, and ANOVA tests.

III. Results

Based on Table 1, showing the demographic characteristics of the participants in both groups, majority of patients in the intervention group (55.6%) and control group (44.4%) were in the age range of 31-55 years. The number of males and females in the two groups was equal (27 males and 27 females). 18 of the patients (33.33%) were single and 36 of them (66.66%) were married. Most of them (n=32) were employed (59.26%) and most of them (44

people, 44.44%) had income between 20 and 40 million Rials. Based on the results of this study, there was no significant relationship between demographic variables and quality of life and self-efficacy (P> 0.05). There was no significant difference between the two control and experimental groups in terms of demographic variables (P> 0.05). Based on the results of Table 2, self-efficacy score significantly increased immediately after intervention (P <0.001) compared to before intervention (P <0.001). One month after the intervention, this score decreased immediately after the intervention but there was still a significant difference compared to before intervention (p <0.001).

However, in the control group, there was no significant difference between the self-efficacy score before the intervention, immediately after the intervention, and one month after the intervention (p> 0.05). In addition, there was no significant difference between the two groups before and after intervention in terms of self-efficacy score (p> 0.05), but there was a significant difference between two groups in terms of self-efficacy score immediately after the intervention and one month after the intervention. Therefore, education significantly increased self-efficacy scores at different times (p <0.001). According to Table 3, there was no statistically significant difference between the quality of life scores of the intervention and control groups before the intervention (P> 0.05). There was a significant difference between the quality of life scores of the two intervention and control groups immediately after the intervention (P <0.001). Although the quality of life score in the intervention group slightly decreased one month after the intervention, there was still a statistically significant difference between the quality of life scores of the intervention and control groups (P <0.001). According to Tables 4 and 5, immediately and one month after the intervention, there was a statistically significant difference between the scores of all components of the Pender Health Promotion Model (except for the alternative behaviors one month after the intervention) in the intervention and control groups (P <0.001).

Based on the results of Table 6, there was a direct and significant relationship between the quality of life scores immediately after the intervention and one month after the intervention and Pender health promotion score immediately after and one month after the intervention in the intervention group (P <0.05). Moreover, there was a direct and significant relationship between self-efficacy score immediately after the intervention and one month after the intervention and Pender health promotion score immediately after and one month after the intervention (P <0.05). Hence, it is concluded that education improves the quality of life and self-efficacy in patients with Leukemia.

Table 1. Frequency distribution of demographic variables of the subjects in two groups of experimental and control

variable	time	Before intervention		Immediately after intervention		one month after intervention		p-value		
	group	mean	SD	group	mean	SD	group	time	group	Time/group
self-efficacy	experimental	96.48	56.6	25.62	52.5	44.61	25.5	007.0	08.0	007.0

	control	62.43	42.7	29.43	43.7	22.43	49.7			

Table 2. Mean self-efficacy score (before, immediately and one month after intervention) in experimental and control groups

ROW	Group	experimental		control		P-value
	Frequency variable	n	%	n	%	
age	18-30	9	3.33	7	9.25	24.0
	31-55	15	6.55	12	4.44	
	<55	3	1.11	8	6.29	
gender	Male	14	9.51	13	1.48	78.0
	Female	13	1.48	14	9.51	
Marital status	Single	8	6.2	10	37	56.0
	Married	19	4.70	17	63	
job	Housewives	8	6.29	5	5.18	16.0
	Employed	17	63	15	55/6	
	Retired	2	4.7	7	9.25	
Education level	Under diploma	4	8.14	4	8.14	65.0
	Diploma	7	9.25	10	37	
	Over diploma	16	59/3	13	1.48	
income	Below20 million Rials	12	4.44	5	5.18	12.0
	20-40million Rials	10	37	14	9.51	
	Over 40 million Rials	5	5.18	8	6.29	

Table 3. Comparison of the mean score of quality of life (before, immediately and one month after intervention) between experimental and control groups

variable	time	intervention		control		P-value
		mean	SD	mean	SD	
Quality of life	before intervention	74.74	10.7	85.75	57.9	63.0
	Immediatelyafter intervention	81.101	99.7	14.76	28.7	001.<0

	one month after intervention	81.95	56.6	03.76	47.7	001.<0

Table 4. Comparison of mean scores of components of Pender Health Promotion Model immediately after intervention between experimental and control groups

variable	intervention		control		P-value
	mean	SD	mean	SD	
individual knowledge	44.35	6.0	03.31	7.3	<0.001
perceived benefits and barriers	07.34	68.0	74.22	4.5	<0.001
perceived capability	5.16	97.0	6.12	1.2	<0.001
planning	8.12	4.1	5.9	9.1	<0.001
alternative behaviors	4.7	69.0	4.6	84.0	<0.001
commitment to do controlling behaviors	7.12	23.1	44.10	04.2	<0.001
support of others	22.13	08.1	29.9	72.1	<0.001
Self-efficacy	25.62	5.5	45	24.8	<0.001

Table 5. Comparison of mean scores of components of Pender Health Promotion Model one month after intervention between experimental and control groups

variable	intervention		control		P-value
	mean	SD	mean	SD	
individual knowledge	85.32	81.1	92.30	98.2	0.006
perceived benefits and barriers	03.32	26.2	29.23	52.3	<0.001
perceived capability	81.14	43.1	12	28.2	<0.001
planning	44.11	18.1	85.9	51.1	<0.001
alternative behaviors	7	96.0	74.6	85.0	0.3
commitment to do controlling behaviors	07.11	17.1	96.9	25.1	0.001
support of others	60.11	14.1	25.9	50.1	0.003
Self-efficacy	59.58	25.5	29.46	42.7	<0.001

Table 6. Relationship between Pender health promotion and quality of life and self-efficacy in patients with Leukemia before, immediately and one month after educational intervention in intervention group

variable		Pender health promotion					
		Before intervention		Immediately after intervention		One month after intervention	
		Correlation coefficient (r)	P-value	Correlation coefficient (r)	P-value	Correlation coefficient (r)	P-value
Quality of life	Before intervention	29.0	14.0	19.0	92.0	74.0	15.0
	Immediately after intervention	15.0	43.0	12.0	02.0	70.0	018.0
	One month after intervention	32.0	10.0	18.0	01.0	26.0	021.0
Self-efficacy	Before intervention	49.0	19.0	52.0	5.0	25.0	1.0
	Immediately after intervention	12.0	54.0	91.0	04.0	13.0	04.0
	One month after intervention	65.0	9.0	15.0	03.0	22.0	007.0

IV.   Discussion

The present study was conducted to evaluate the effect of educational intervention based on Pender Health Promotion Model on self-efficacy and quality of life in patients with Leukemia referred to clinics affiliated to Shiraz University of Medical Sciences. Based on the results of this study, there was no significant relationship between variables of age, gender, job status, marital status, education, income level in control and intervention groups and quality of life and self-efficacy (P> 0.05). In the study conducted by Ahmadi et al, there was no statistically significant relationship between demographic information and quality of life dimensions, which is in line with the result of the present study [21]. In their study, Rezaei et al reported that there was no significant relationship between education level, job status, economic status, marital status, and quality of life, but in another part of their study, they showed that patients' age is inversely associated with the general quality of life. It means that as age goes up, quality of life decreases [22], which is inconsistent with the results of the present study. It might be due to the fact that this study was conducted in Iran, where one's perception of health and diseases changes greatly by increasing the age. However, some studies did not reveal a significant correlation between age and quality of life (P> 0.05) [23, 24].

The results of the study conducted by Jacobs et al in 2019 revealed a significant decrease in the general quality of life score in patients with secondary level of education [25], as low education is associated with reduced social support, lack of knowledge about treatment and health and poor health [26], which is inconsistent with the results

of the present study. Evaluation of quality of life in the study groups showed that the subjects had a moderate quality of life before the start of the study (75.295± 8.33). There was a significant difference between the intervention and control groups (P <0.05). This result is in line with that of the study conducted by Coleman et al, in which they evaluated the effect of self-care program on quality of life in 70 acute leukemia patients undergoing chemotherapy and found that the implementation of this program significantly improved quality of life in the experimental group, compared to the control group [27].

Salehi et al (2016) and Rahimi et al (2012) in their studies showed that the quality of life of patients with breast cancer improved after implementing nursing supportive and educational care compared to the control group [28, 29]. In another study conducted by Noushirvani et al in 2018, it was found that education based on the Pender Health Promotion Model had an impact on the quality of life in diabetic patients and improved the quality of life after the intervention, compared to before intervention [30]. Chehri et al (2018) also reported that education based on Pender model in patients with heart failure was effective in enhancing their quality of life [31]. These reports are in line with the results of the present study. Similarly, the results of the research conducted by Pool to evaluate the effect of the implementation of a self-care education program on improving the quality of life of patients with esophageal cancer are consistent with those of the present study [32]. As cancer patients are among the most vulnerable groups in the community, finding a strategy to improve their health and improve their quality of life seems necessary. Self-care programs and enhanced knowledge on the disease lead to reduced anxiety, improved perception of life goals, reduced mood disorders, improved adaptive behaviors of patients, resulting in improved quality of life [33]. The results of the present research showed that self-efficacy was increased after the educational intervention. This result is in line with the results of Tamimi et al., which showed that applying the Pender model enhances the self-efficacy [34]. In the research conducted by Mohsenipouya et al. in 2017, the educational intervention based on the Pender Health Promoter Model promoted self-efficacy of the patients underwent heart surgery regarding self-care behaviors [35]. Moreover, the results of our study were consistent with the results of the research conducted by Sanaei and Baljani [37] on the effect of intervention and education on the self-efficacy of the subjects. Dehdari et al. reported that the use of Pender model was effective in enhancing perception, modifying health culture, and nutritional patterns and as result, increasing self-efficacy [38], which was consistent with the result of the present study and this self-efficacy increasing can be due to the knowledge of barriers and strategies, and as a result, increased motivation and perception of social supports [34].

Self-efficacy is considered as a key source of adaptation to chronic diseases [39], which can be increased by providing the appropriate context for acquiring skill and knowledge needed to increase one's self-efficacy and ability. Patients who are feeling confident in their ability to care for themselves actively participate in health-promoting programs and this partnership improves their quality of life [40]. Hence, change in attitude in lifestyle should be considered along with other treatments as an essential factor in building individual beliefs to reduce complications and improve the symptoms. In this regard, using this model and in frequent contact with individuals, community health nurses can help them modify their health-promoting behaviors or use of health services [41]. The results suggest that self-efficacy as one of the dimensions of mental health will improve the quality of life [42]. Therefore, using Pender model-based education enhances self-efficacy and improves the quality of life of patients with Leukemia.

V.   Conclusion

The results of this study showed that the use of educational intervention based on Pender health promotion model can improve the self-efficacy of patients regarding self-care behaviors, and thus, enhance the quality of life in patients with Leukemia. It can be concluded from the results that self-efficacy as one of the dimensions of mental health will improve the quality of life in patients with Leukemia. Hence, applying this model by health education and health promotion professionals, nurses, planners, and health care policymakers is a new perspective in providing education on self-care behaviors for patients.

Conflicts of interest: There are no conflicts of interest

VI.   Ethical Approval

Approval was received from Shiraz University of Medical Sciences of Iran, Department nursing ethic committee with code: SUMS.RES.1397.647

VII.   References

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