The effect of training on self-efficacy of patients with leukemia after hematopoietic stem cell transplantation

El efecto del entrenamiento sobre la autoeficacia de los pacientes con leucemia después del trasplante de células madre hematopoyéticas

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Abstract

Introduction: Cancer is considered the second leading cause of death around the world. Health-promoting behaviors are the major determinants of health. Also, the association of self-efficacy with the theory of planned behavior is an important factor in predicting the intention and behavior. The objective of this study was to evaluate the effect of training based on the theory of planned behavior on the self-efficacy of patients with leukemia after hematopoietic stem cell transplantation.

Methods: This quasi-experimental study was conducted on cancer patients after hematopoietic stem cell transplantation in 2019. Using the random sampling method, we selected 66 patients who met the inclusion criteria and divided them randomly into intervention and control groups (each group including 33 patients). The research data were collected using a demographic information questionnaire and generalized self-efficacy scale (GSES). The intervention group received two face-to-face self-efficacy training sessions. Then, the levels of self-efficacy were compared in the two groups before, one week, and one month after the intervention. The data were analyzed using descriptive and analytical statistics through SPSS version 23 software.

Results: The results showed that self-efficacy in the intervention group increased after the intervention ($p<0.001$). The differences between self-efficacy scores in the experimental group at all dimensions were statistically significant ($p<0.05$). There was no statistically significant relationship between demographic variables and the mean score of self-efficacy.

Conclusion: Self-care training based on the theory of planned behavior can be effective in enhancing self-efficacy and its dimensions. With increasing these dimensions and self-confidence of the patients, self-care training improves their quality of life.

Keywords: Self-efficacy, Cancer, Hematopoietic Stem Cell Transplantation.

Resumen

Introducción: el cáncer se considera la segunda causa de muerte en todo el mundo. Los comportamientos que promueven la salud son los principales determinantes de la salud. Además, la asociación de la autoeficacia con la teoría de la conducta planificada es un factor importante para predecir la intención y la conducta. El objetivo de este estudio fue evaluar el efecto del entrenamiento basado en la teoría del comportamiento planificado sobre la autoeficacia de los pacientes con leucemia tras un trasplante de células madre hematopoyéticas.

Métodos: Este estudio cuasiexperimental se realizó en pacientes con cáncer después de un trasplante de células madre hematopoyéticas en 2019. Utilizando el método de muestreo aleatorio, seleccionamos 66 pacientes que cumplían con los criterios de inclusión y los dividimos aleatoriamente en grupos de intervención y control (cada grupo incluía 33 pacientes). Los datos de la investigación se recopilaron mediante un cuestionario de información demográfica y una escala de autoeficacia generalizada (GSES). El grupo de intervención recibió dos sesiones de entrenamiento de autoeficacia cara a cara. Luego, se compararon los niveles de autoeficacia en los dos grupos antes, una semana y un mes después de la intervención. Los datos fueron analizados mediante estadística descriptiva y analítica mediante el software SPSS versión 23.

Resultados: Los resultados mostraron que la autoeficacia en el grupo de intervención aumentó después de la intervención ($p <0,001$). Las diferencias entre las puntuaciones de autoeficacia en el grupo experimental en todas las dimensiones fueron estadísticamente significativas ($p<0,05$). No hubo relación estadísticamente significativa entre las variables demográficas y la puntuación media de autoeficacia.

Conclusión: El entrenamiento del autocuidado basado en la teoría del comportamiento planificado puede ser efectivo para mejorar la autoeficacia y sus dimensiones. Al aumentar

estas dimensiones y la autoconfianza de los pacientes, la formación en autocuidado mejora su calidad de vida.

Palabras clave: Autoeficacia, cáncer, trasplante de células madre hematopoyéticas.

Introduction

Cancer is among the most important health problems around the world. According to the International Congress on Early Cancer Prevention and Diagnosis, the cancer rate increased from 10 million in 2006 to 14 million in 2012 and is predicted to reach 25 million by 2030. Also, cancer-related deaths in 2006 were estimated at 6 million, while this rate was 8 million in 2012 and it is predicted to reach 13 million by 2030[1].

Recent global assessments of the cancers caused by infection, obesity, ultraviolet radiation make us remember its importance around the world and the need for taking cancer control measures in accordance with localized models[2].

More than 70,000 hematopoietic stem cell transplantations occur annually around the world and its rate is still growing. The goal of transplantation surgery is enhancing the quality of life, cutting the cost, and providing a better future for the patient and his or her family[3]. Hematopoietic stem cell transplantation is among the modern and selective methods in the treatment of congenital blood disorders, such as thalassemia, types of leukemia (acute and chronic leukemia), multiple myeloma, and Hodgkin and non-Hodgkin lymphoma. The use of this method has increased dramatically in recent years[4]. Stem cell transplantation is performed, using allogeneic, autologous, and syngeneic methods. Stem cells are harvested from three sources of bone marrow, peripheral blood, and umbilical cord. The source of transplantation is selected by an oncologist and hematologist[5]. Blood stem cell transplantation from stem cells of the patient or donor is a potential treatment for many life-threatening cancers and non-malignant disorders, and umbilical cord blood is currently being used around the world for stem cell transplantation[6]. Leukemia and its treatment have many side effects, including sexual dysfunction, decreased life satisfaction, lower self-esteem and adjustment, increased emotional stress, and mental and psychological disorders such as anxiety and depression. These complications reduce self-care behaviors and affect the self-efficacy in these patients[7,8].

In this regard, the results of a study conducted by Broers et al. have shown that the patients undergoing blood stem cell transplantation face several problems that have a negative effect on their self-efficacy in self-caring [9]. Self-efficacy is one's judgment of his or her ability to organize and perform the required activities and to fulfill the role that has always been associated with one's desired behaviors [10]. The concept of self-efficacy has been derived from Bandura theory. It refers to an ability to perform a specific activity and an expectation to be able to perform a given behavior successfully. According to this theory, human success depends on the interaction among individual behaviors, personal factors, and environmental conditions. It should be noted that self-efficacy is an essential concept in nursing training and it is one's confidence in achieving specific goals and changing the behavior in a desirable way[11,12].

The studies conducted by White et al. have shown that self-efficacy has been identified as an effective factor in the development of healthy behaviors and quality of life in cancer patients. It plays a key role in symptom management, so self-efficacy beliefs affect many aspects of the personal performance of these patients. People who have higher self-efficacy have better physical and mental health compared to others[13].

A low level of self-efficacy before transplantation is associated with a lower quality of life in all domains, and with increasing the self-efficacy after transplantation, the physical and functional ability of these patients in life will increase[14]. Given what was stated and the limited number of studies conducted in this area, the present study was conducted to evaluate the effect of training on self-efficacy in cancer patients after stem cell transplantation.

Materials and methods

This is a quasi-experimental study. The statistical population of this study consisted of all cancer patients referred to Shiraz Clinic affiliated to the University of Medical Sciences after stem cell transplantation in 2018. Considering the confidence level of 95% and the test power of 80%, 66 patients were selected by the random sampling method. The research inclusion criteria included having Iranian nationality and age over 18 years, having the skill of speaking Persian language and its comprehension, not working in the health care system, not participating in similar training classes, being willing to participate in research, and attending all training sessions. Two questionnaires were used in this study to collect the data. The first questionnaire consisted of demographic data such as the age of the patient, age of the spouse, marital status, sex, occupation, housing, frequency of hospitalization, length of hospitalization, education level, type of transplantation, and monthly income level. The second questionnaire was the generalized self-efficacy scale (GSES) used to assess self-efficacy[15]. This scale consists of 17 items scored on a 5-point Likert scale ranging from one for "strongly disagree" to five for "strongly agree". The scores between 17 and 34 represent low self-efficacy; those between 34 and 51 represent moderate self-efficacy, and those higher than 51 represent very high elf-efficacy. Sherer and Maddox reported Cronbach's alpha for this scale at 86%. The validity and reliability of this tool have been also assessed in Iran and its Cronbach's alpha coefficient has been reported to be 80%. To obtain the construct validity of this tool, Barati tested it among 199 people and reported its construct validity at 0.61 by correlating it with a self-esteem scale, which was significant at the level of 0.05[16].

In the present study, to complete the questionnaires, the researcher considered the ethical considerations and explained the research objectives to the patients and after obtaining their written consent to participate in the research, the re-

searcher collected the data by filling out the questionnaire. Then, block randomization based on a random number table was used to randomly allocate the samples in the control and intervention groups. After collecting the data, the questionnaire was first provided as a pre-test for all participants. Then, two 60-minute training sessions along with question and answer sessions on self-efficacy were held for the intervention group. The control group received routine care. At the end of the training sessions, a booklet containing educational materials was provided for the patients. The questionnaires were re-completed one week and one month after the training. One month later, the training booklet was also provided to the control group to observe the codes of ethics. Descriptive statistics and paired t-test, independent t-test, chi-square test, one-way ANOVA, and Pearson correlation coefficient tests were used for data analysis. The data were analyzed through SPSS version 23 software and a value of p<0,05 was considered significant.

Results

The research results showed that the mean age of the patients was 39.3 ± 13.85 years in the intervention group and 37 ± 13.04 in the control group. Their minimum age was 18 years and their maximum age was 66 years. The majority of the participants (66.7%) were male and 45.5% of them were female. Also, 72.7% were married, 24% had a diploma level of education, and 31.3% were employed. Patients in both groups had equally 48.5% allogeneic transplantation and 51.5% had autologous transplantation. In general, there was not a significant difference between the two groups in terms of quantitative and qualitative variables and the two groups were homogeneous in terms of demographic characteristics (p<0.05).

To investigate the trend of changes in self-efficacy scores of two groups over time, we used repeated measures ANOVA and independent t-test. (Figure 1) shows the mean score of self-efficacy before the intervention (46.7±7.35), one week later (67.09±8.37), and one month later (62.18±6.90). Based on this Figure, the trend of changes in the self-efficacy scores over time between the two groups is statistically significant (p<0.001). No significant difference was observed in the control group at all three times, while the mean score of self-efficacy in the experimental group increased after the intervention Therefore, it can be concluded that self-efficacy levels varied in the two groups at different times. Also, according to the p-value, it can be concluded that the self-efficacy levels were significantly different between the experimental and control groups before the intervention, one week, and one month after the intervention (p<0.05).

Figure 1. Comparison of mean self-efficacy scores over time in the two groups

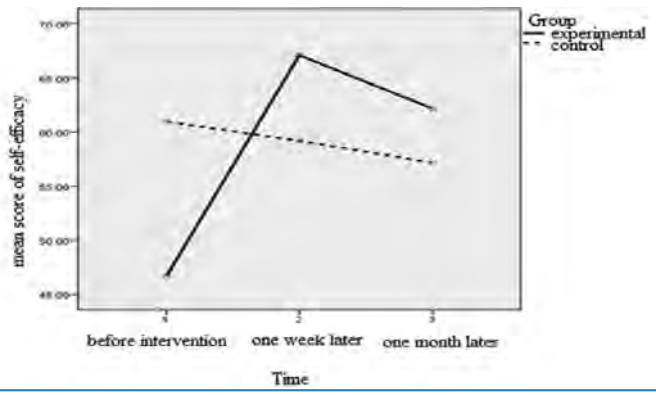

Figure 1 shows the mean score of self-efficacy before the intervention (46.7±7.35), one week later (67.09±8.37), and one month later (62.18±6.90).

(Figure 1) illustrates the difference in the trend of changes over time between the two groups. It shows that the total score of self-efficacy in the experimental group increased significantly after the intervention, but it decreased one month later. Its level after the intervention was significantly different from that before the intervention. However, in the control group, this trend three times was decreasing with a gentle slope. The independent t-test was used for inter-group comparison at each time separately. The results showed that the intervention was effective and increased the self-efficacy compared to before the intervention and the two groups showed a significant difference in terms of self-efficacy score before the intervention, one week and one month after the intervention (p <0.001).

In the present study, there was a significant relationship between the monthly income and type of housing and self-efficacy score. The independent t-test and one-way ANOVA tests were used to examine the relationship between the mean overall self-efficacy score and demographic characteristics. The results of (Table 1) showed that there was no significant relationship between gender, marital status, education, job status, frequency of hospitalization, the patients and spouse's age, and type of transplantation and self-efficacy (p<0.05), but there was a significant relationship between the type of housing (p=0.005) and household monthly income and self-efficacy score (p=0.033).

Table 1. Comparison of demographic characteristics and overall self-efficacy score

Variable		N	Mean	SD	Statistical results		
					p	df	Statistic
Income level (Rials)	Less than 10 million Rials	39	57.56	5.53	0.033	2	3.611=f
	20-50 million Rials	24	60.81	4.35			
	Over 50 million Rials	2	63.16	8.24			
Housing status	Private house	49	57.93	4.72	0.005	64	2.891-=t
	Rental/ organizational house	17	62.07	6.08			

Discussion

The present study was conducted to evaluate the effectiveness of training based on the theory of planned behavior on the self-efficacy of cancer patients after hematopoietic stem cell transplantation. The results of this study showed that there was no significant difference between the experimental and control groups in terms of demographic characteristics. According to the results of this study, the mean score of self-efficacy after one week increased significantly after the intervention in the intervention group and decreased one month after the intervention, but it increased compared to before the intervention. The results of this study showed that training enhanced self-efficacy. They are in line with the results of the study conducted by Razi et al., in which the self-efficacy score increased one month and three months after the intervention [17]. In the present study, the interval between the training and the next investigation was one month. The prolonged interval reduced the effect of the training. The emergence of transplantation complications and their negative effects on the patients' lives may be another factor that has reduced the effect of training.

We show that people with better economic status had a better quality of life and higher self-efficacy. On the contrary, in the studies conducted by Mirzai et al[18] and Mularcik[19], the mean score of self-efficacy was not significantly different between the groups at the different economic status. Having material independence and appropriate economic status is an important factor in the quality of life of individuals and as it plays a major role in maintaining their living conditions despite the medical and hospitalization costs, the negative impact of low-income level on self-efficacy, and subsequently self-care behaviors related to the health of cancer patients indicate that people with low income need more support, especially in the areas of chemotherapy and other related costs. The results of the present study showed that training had a significant effect on the self-efficacy of patients undergoing stem cell surgery, increased self-efficacy, and improved the patients' performance, similarly to those findings of the study conducted by Azizi Fini[20]. In line with the results of our study, Hagland et al. revealed that the effect of training on self-efficacy and social support, and on reducing fear and improving the quality of life[21]. Also, Liang et al. showed that self-efficacy training can reduce the symptoms of stress in cancer patients and affect their quality of life, confirming the results of the present study[22]. Barandeh et al. found that training did not affect self-care and self-efficacy, which is in disagreement with the present study[23].

In addition, and accordance with the present results, Zhang et al. evaluated the effect of the self-efficacy-enhancing intervention on colorectal cancer patients and showed that after four months of intervention through face-to-face training, educational booklet, audiotape, and telephone counseling, statistically significant differences were found between the mean scores of self-efficacy in the experimental and control groups three and four months after the intervention[24]. According to the findings of the present study, one month after the intervention, the mean score of self-efficacy in the intervention group increased compared to the control group, so that the difference between the mean scores of self-efficacy between the two groups one month after training was significant [25]. Similarly, Baljani et al. showed that the mean scores of self-efficacy were significantly increased immediately and one month after the intervention[26]. In the current study, a significant relationship was found between self-efficacy and housing status. Housing, as a primary human need, plays a key role in improving the quality of life, enhancing self-efficacy, and reducing stress. As a facilitator and supporter, it has a positive effect on the patients' self-efficacy.

Conclusion

Self-care training based on the theory of planned behavior can be effective in enhancing self-efficacy and its dimensions. By increasing these dimensions in patients, it improves their quality of life. Self-efficacy training based on the theory of planned behavior can enhance self-confidence and self-care in patients, leading to a better quality of life in patients. Given the high prevalence of cancer and its adverse side effects such as physical and psychological complications, increased hospitalization rate and imposing heavy costs on the patient, family, and community, and the importance of enhancing self-efficacy in cancer patients, training programs can be held to reduce these consequences. Training is among the important areas of nursing, but due to the shortage of nursing staff in every shift and the high workload of nurses, most patients are not fully trained in health care centers. Therefore, holding training classes for these patients at admission time, during the treatment, and after discharge seems to be essential.

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