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INVESTIGATING THE RELATIONSHIP BETWEEN PAIN SELF-EFFICACY AND EMOTIONAL INTELLIGENCE WITH RESILIENCE IN LEUKEMIA PATIENTS

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ABSTRACT

This research is a descriptive-correlational study aimed at investigating the relationship between pain self-efficacy and emotional intelligence with resilience in patients with leukemia. The statistical population consisted of all the patients suffering from leukemia in Neyshabour. The statistical sample comprised all the leukemia patients with a treatment file in the chemotherapy center of 22 Bahman Hospital in Neyshabour during March to May (Farvardin to Khordad) of 2016, who were selected through full enumeration. In this study, Nicholas Pain Self-Efficacy Questionnaire (1989), Goleman Emotional Intelligence Questionnaire (1995) and Connor-Davidson Resilience Scale (2003) were used for data collection. To analyze the data, Pearson correlation coefficient test and multivariate regression were applied. The obtained results demonstrated that pain self-efficacy and emotional intelligence can predict resilience in leukemia patients. Further, the findings suggested that there is a significant relationship between pain self-efficacy and emotional intelligence with resilience in patients with leukemia.

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Introduction

Past studies have shown the importance of the role of cognitive-behavioral variables in pain and physical disabilities and their associated depression [8]. Besides, these studies have referred to the interventions based on this approach in individuals with chronic pain [36]. Cancer, while creating physical problems for the sufferers, causes the incidence of multiple social and mental difficulties for them among which reactions such as denial, anger and feeling of guilt can be observed in such patients. Leukemia is characterized by symptoms such as bleeding problems, bruising, severe fatigue, fever and increased risk of infection [30]. Deep bone pain is one of the obvious symptoms of leukemia. Pain occurs when the bone marrow expands because of the abnormal accumulation of white blood cells existing in the bone marrow [31]. These symptoms are developed due to the lack of normal blood cells [41].

Despite remarkable advances in medical science, cancer is still raised as one of the most important diseases of the century and the second cause of death after cardiovascular diseases. Currently, more than 7 million people worldwide lose their lives due to cancer [27].On the other hand, leukemia forms 8% of all types of cancer in human population and is recognized as the fifth most common cancer in the world which leads to eliminating the body's ability to fight diseases [35]. Cancer as a crippling and incurable disease involves the patient in anxiety and depression arising from unrealistic fear of death and loss

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of social energy [10]. Thus, conducting studies of this kind to identify the disease scope and understand the factors affecting this disorder seems essential.

As previously mentioned, cancer causes the incidence of numerous social and mental difficulties in addition to physical problems. A group of researchers found that the most important factor associated with mental health which has influenced the life quality of these patients is anxiety and if their age is over 50, low educational levels and lack of employment lead to unfavorable quality of life in these patients [21]. Additionally, it has been determined that high levels of their mental tension are related to dysfunction in physical, psychological and social performance [47]. Hence, with respect to the increased incidence of cancer in society and considering the negative impacts of this disease on different aspects of the sufferer's life and creation of interpersonal relationship problems, anxiety, depression, decreased quality of interpersonal relationships, loss of energy and so on, identifying and evaluating the role of pain self-efficacy and also emotional intelligence in resilience of these people seem necessary.

One of the important psychological factors in patients with leukemia is their level of self-efficacy in pain tolerance. Self-efficacy as perceived competence, attributional style and control beliefs [49], in addition to reducing fears and expected inhibitions, affect the level of motivation and attempt to cope with pain through the expectation of possible success [49].

Bandura's social cognitive theory (1986) emphasizes self-reflection from among internal processes to explain human behavior since it is through this type of self-focused thinking that analysis of personal experiences, thinking about thinking and thus modification of personal reflection become possible; it is through this ability that beliefs about one's own capabilities or self-efficacy are formed [34]. Among the mental factors underlying pain, the role of psychological and personal processes should not be ignored[50] reported that psychological variables such as pain-associated thoughts and their coping methods are related to psychological intensity and performance of the individual.

Therefore, among the psychological factors underlying cancer, the role of self-related internal processes should not be ignored. [46] examined the psychological factors in patients with multiple sclerosis and pain. The results indicated that psychological variables such as social support, catastrophising, positive or negative beliefs about pain and pain coping strategies are related to psychological intensity and performance. These results suggest that psychological factors can play a crucial role in reducing the severity of pain in these patients.

Given the role of biological factors in the experience of pain among cancer patients, evidence shows that psychological context and content of pain can have a significant role in determining perception, intense experience of pain, effects of pain on performance, emotional well-being and response to treatment .

Studies have demonstrated that self-efficacy is an effective and important predictor of performance and pain control [32].People with high self-efficacy have an inherent interest in activities, tend to increase their efforts and work harder in the face of obstacles [55]. [31] found that personality traits such as pain self-efficacy are among the effective factors in enhancing resilience. Lei et al. (2015) revealed that low pain self-efficacy, self-blame, acceptance and catastrophising have a positive correlation with the symptoms of cancer patients[15] showed in a study that people accustomed to using the reappraisal strategy to regulate their emotions in everyday life show more resilience in the face of stress[12]. carried out a study and stated that a significant relationship exists between depression and suicidal thoughts in patients with chronic pain. In a study, [7] observed that pain self-efficacy is effective in the level of resilience in the face of chronic pain. [28] concluded in their study that individuals with the ability of resilience have more endurance in the face of life adversity and problems.

Today, emotional intelligence is seen as an important issue for compatibility. [24] has provided a theory about the performance of individuals indicating that we can increase our awareness about feelings, emotions and their effects. This model is a combination of mental abilities and some personality traits and is different from ability-based models. According to Goleman, emotional intelligence includes the learned ability that leads to impressive performance in jobs. This model is based on twenty competencies which can distinguish individual differences in people's performance. These twenty competencies in Goleman's model have been expressed in the form of four types of general abilities which consist of self-awareness, self-management, social awareness and social skills. Numerous studies have assessed the effect of these factors on difficult situations.

[29] demonstrated that training these factors is effective in stress coping styles. Moreover, the study by Dirksen, suggested that training these components (especially self-management and empathy) plays a determining role in reducing stress and increasing compatibility in cancer patients. [18] performed a study and came to the conclusion that the desire for emotional expansion, intensity and regulation depends on building oneself based on situational demands and cultural factors. Emotional intelligence refers to the psychological process that involves in the control and management of emotions and is associated with internalized and externalized disorders [39-40] and causes to decrease emotional biases in individuals [54]. Indeed, emotional intelligence is the central point of the effective functioning in the fields of impulse control, coping with stress and time management which does not always act voluntarily but also includes involuntary and unconscious levels 37-38-. Emotional intelligence is regarded as the ability to modify or enhance the emotional arousals. This regulation comprises strategies such as deep breathing and use of external utilities like the knowledge of emotions [63].

Emotional intelligence can be used in the situations of interpersonal conflict, interpersonal interactions, organization of refreshment and dealing with social pressures [59-60]. Emotional intelligence is a multi-dimensional process that covers a

wide range of categories. This process occurs with the purpose of changing the attitudes and behaviors towards benefiting from peace and is essential from this perspective ([26] All people inevitably experience stressful events and disturbing experiences throughout their life, but they are different in how to show reaction to these experiences and manage the events and this issue is dependent on the management style and emotional intelligence [17], [21] found that habits usually play the role of constant reactions to the environment; a structured and predictable role. But in dynamic and unpredictable environments, people need to coordinate their emotional intelligence with any particular situation.

The studies by [2] and [32] indicate that emotional intelligence is related to the individuals' resilience. In recent years, the ultimate goal of positive psychology approach has been to identify the structures and methods that bring well-being and happiness for humans. So, factors that promote human adjustment with life needs and threats are the most fundamental structures studied in this approach. Meanwhile, resilience has gained a special place in the fields of developmental psychology, family psychology and mental health [42].

Psychological resilience is a process that leads to positive adjustment with bitter and unpleasant experiences or successful performance when faced with stressful situations [1]. Further, it can be considered as an uncertain protective factor in the face of daily tensions and pressures and can lead to the individual's adjustment in such conditions [44-45].

Resilience is a set of adjustment and stress coping skills which can be acquired by individuals [23]. This construct is based on the strengths-based approach and suggests the individuals' capability in dealing with problems and dangers and it can be said that resilience is the opposite of vulnerability and people with higher resilience are less affected by psychological injuries [22].

Although the success of resilient individuals in relationships with others is determined through autonomy and self-reliance_ that is, they do not only rely on others to meet their needs and solve their problems_ poor self-determination is related to personality disorders according to the holistic biosocial personality theory [16]. Hence, a person with high self-determination should be resilient. These individuals enjoy the characteristics such as the sense of self, self-efficacy, positive orientation towards the future, control of negative emotions and behaviors, interpersonal skills, optimism, a source of internal control, purposefulness, support, emotion management and appropriate coping skills [58].

Various studies indicate the relationship between resilience and emotional intelligence. [19] believe that resilience is not only resistance to injuries or threatening conditions, but also it is the active and constructive participation of the individual in his surrounding environment and the ability to establish biomental balance in family circumstances. [57]. conducted a study and observed that resilient people have the ability to develop a set of coping skills which support them in challenging situations. Researchers [11]; [13-14]; [25] showed that personal characteristics such as proper emotional intelligence, positive self-concept, sociability, high intelligence, competence in educational work, autonomy, high self-esteem, good communication, problem solving skills and mental and physical health are among the effective factors in increasing the individual's resilience.

[51] in their study investigated the relationship between emotional intelligence and emotional problems in students. They found that two social-emotional strategies (catastrophising and mental rumination) can predict emotional problems. [4] conducted a study entitled "The role of nine cognitive emotion regulation strategies in the prediction of resilience" and came to the conclusion that out of the adaptive strategies of cognitive emotion regulation, positive reappraisal and refocusing strategies positively predict resilience and out of the maladaptive strategies of cognitive emotion regulation, catastrophizing and blaming others negatively predict resilience[52-53] performed a study and revealed that resilience has no significant direct impact on life satisfaction but makes a significant indirect effect on it. Therefore, in the present study, the main question is whether pain self-efficacy and emotional intelligence are related to resilience in patients with leukemia.

Methodology

This research is a descriptive-correlational study in which the relationship between pain self-efficacy and emotional intelligence with resilience in patients with leukemia has been investigated. The statistical population of this study comprises all the leukemia patients in Neyshabour. The statistical sample consists of the leukemia patients with a treatment file in the chemotherapy center of 22 Bahman Hospital in Neyshabour during March to May (Farvardin to Khordad) of 2016, who were selected through full enumeration. Data collection tools included Nicholas Pain Self-Efficacy Questionnaire, Goleman Emotional Intelligence Questionnaire and Connor-Davidson Resilience Scale.

Pain Self-Efficacy Questionnaire (PSE): This questionnaire has been developed by Nicholas (1989) based on Bandura's concept of self-efficacy. It consists of two articles and evaluates the patient's power and belief in his ability to do some affairs despite the existence of pain, using a 7-point Likert scale (0 to 6). Cronbach's alpha coefficient of this scale has been reported by [6] to be 0.92. Reliability of this scale has been estimated by [6] to be 0.81 through Cronbach's alpha coefficient method and 0.78 through the split-half method [5]. Validity of this questionnaire has been examined with the scores of the scale of pain-associated disabilities and coping strategies of the self-efficacy scale. In this study, the test reliability was obtained to be 0.735 using Cronbach's alpha [7].

Goleman Emotional Intelligence Questionnaire: Siberia Schering Emotional Intelligence Test consists of 70 questions and is scored based on a Likert scale. This scale is composed of two parts. The first part includes 40 questions and the second part consists of 30 questions. In the first part, each question suggests a life situation. The subject should put himself in that

situation and choose one of the options that is more compatible with his mental states. In the second part, an emotional fabricated story has been presented at the beginning of each question and the subject is asked to choose his answer with regard to the story. This test includes components such as self-awareness, self-regulation, motivation, empathy and social skills. Each subject receives six separate scores, five of which are related to each component and one is the total score. The range of the questionnaire scores is between 33 and 165. The consistency rate of the test was obtained to be 0.85 through Cronbach's alpha method [43-52]. In this study, the test reliability was reported to be 0.72 using Cronbach's alpha method.

Connor-Davidson Resilience Scale (C-DRS): This questionnaire has been developed by Connor and Davidson (2003). It comprises 25 items and is scored based on a Likert scale. Although the results of exploratory factor analysis have confirmed the existence of the seven factors (feeling of individual ability, resistance to negative effects, positive acceptance, change, confidence in personal instincts, sense of social support, faith and pragmatic approach to problem-solving methods) for the resilience scale, only the total score of resilience is currently considered as valid for the research purpose since the reliability and validity of the subscales have not been certainly confirmed yet [9]. The reported validity coefficient is equal to 0.87. In order to determine the reliability of the scale, Cronbach's alpha method was employed. The obtained reliability coefficient was equal to 0.89. [36] in a study reported its validity to be 0.73 using Cronbach's alpha method. The achieved alpha coefficient was equal to 0.86 in the study by [64]. In this study, the test reliability was obtained to be 0.761 through Cronbach's alpha method.

In this research, statistical indicators such as inferential statistics including Pearson correlation coefficient and multivariate regression were used to analyze the data. The analyses have been made based on SPSS-22 software.

Findings

Table 1: Mean and SD of the scores of subjects in pain self-efficacy, emotional intelligence and resilience questionnaires

Research variables		Mean	SD	Lowest score	Highest score	Number
Pain self-efficacy		25.87	17.14	7	58	32
Emotional intelligence components	Self-awareness	22.75	8.32	7	37	32
	Self-regulation	18.18	6.70	6	32	32
	Motivation	18.31	6.25	5	28	32
	Empathy	16.21	5.76	7	27	32
	Social skills	13.34	4.74	6	23	32
Emotional intelligence (total scale)		89.81	28.39	34	139	32
Resilience		46.62	29.08	10	96	32

In (Table 1) The main research hypothesis indicated that "pain self-efficacy and emotional intelligence can predict resilience in leukemia patients". To predict resilience in patients with leukemia based on the variable of pain self-efficacy and emotional intelligence and its components, multivariate regression and step by step variable entry method were employed. In this hypothesis, the variable of resilience is considered as the criterion variable and pain self-efficacy and emotional intelligence and its components (including self-awareness, self-regulation, motivation, empathy and socially skills) are defined as predictor variables.

Table 2: Multiple correlation coefficient and coefficient of determination for the main research hypothesis

Model	Correlation coefficient	Coefficient of determination	Adjusted coefficient of determination	Durbin Watson
1	[a]0.765	0.586	0.572	1.873
2	[b]0.800	0.640	0.615	

a predictor: (constant), emotional intelligence

b predictor: (constant), emotional intelligence and pain self-efficacy

Dependent variable: resilience

The **(**Table 2) shows correlation coefficient, coefficient of determination, adjusted coefficient of determination and Durbin-Watson test statistic for each of the models according to the predictor variable. With respect to the coefficient of determination (R^2), it can be said that around 64% of the changes in the variable of resilience in leukemia patients are explained by the changes in the predictor variables of emotional intelligence and pain self-efficacy.

Table 3: Analysis of variance related to the regression model of the predictor variables of emotional intelligence and pain self-efficacy with the criterion variable (resilience)

Model		Total square	Degree of freedom	Mean Square	Fisher statistic	Significance level
1	Regression	15357.16	1	15357.16	42.43	[a]0.001
	Remaining	10858.33	30	361.94		
	Total	26215.50	31			
2	Regression	16784.07	2	8392.037	25.80	[b]0.001
	Remaining	9431.42	29	325.22		
	Total	26215.50	31			

a predictor: (constant), emotional intelligence
b predictor: (constant), emotional intelligence and pain self-efficacy
Criterion variable: resilience

In (Table 3) Given the significance of F test value at the error level of less than 0.05, it can be concluded that the research regression model consisting of two predictor variables and one criterion variable is a good model and the predictor variables are able to explain the changes in resilience as a criterion variable.

Table 4: Standardized coefficients, unstandardized coefficients, test statistic and significance level related to predicting resilience based on pain self-efficacy and emotional intelligence

Model		Unstandardized coefficients		Standardized coefficients	T statistic	Significance level
		B	Std. Error			
1	Emotional intelligence	0.784	0.120	0.765	6.514	0.001
2	Emotional intelligence	0.580	0.150	0.566	3.86	0.001
	Pain self-efficacy	0.521	0.249	0.307	2.095	0.045

[a]criterion variable: resilience

In (Table 4)Findings of multivariate regression analysis regarding the main research hypothesis demonstrate that in the first model, emotional intelligence can significantly and positively predict resilience in leukemia patients (P<0.05). Similarly, in the second model, pain self-efficacy as a second order variable has been added to the model and can significantly and positively predict resilience in these patients (P<0.05). If emotional intelligence of a standard deviation increases, we can predict that resilience of leukemia patients will increase by 0.566 standard deviation. Additionally, if the variable of pain self-efficacy increases by one standard deviation, it can be predicted that resilience of leukemia patients will increase by 0.393 standard deviation.

The first secondary hypothesis suggested that "there is a relationship between emotional intelligence and its components with resilience in patients with leukemia". To examine the relationship between emotional intelligence and its components with resilience, correlation coefficient has been used.

Table 5: Correlation coefficient between emotional intelligence and its components with resilience

		Emotional intelligence (total scale)	Self-awareness	Self-regulation	Motivation	Empathy	Social skills
Resilience	Correlation coefficient	0.665	0.696	0.724	0.577	0.644	0.791
	Sig(2-tail)	0.001	0.001	0.001	0.001	0.001	0.001
	Number	32	32	32	32	32	32

As can be observed in (Table 5), the amount of Pearson correlation coefficient and its significance level in the variable of emotional intelligence and its components (self-awareness, self-regulation, motivation, empathy and social skills) with resilience have been provided. With regard to the significance level of Pearson correlation coefficient which is lower than 0.05, it can be inferred that the research hypothesis indicating the existence of a significant relationship between emotional intelligence and its components with resilience in leukemia patients is accepted.

The second secondary hypothesis suggested that "there is a relationship between pain self-efficacy and resilience in leukemia patients". To evaluate the relationship between pain self-efficacy and resilience, correlation coefficient has been used.

Table 6: Correlation coefficient between pain self-efficacy and resilience

Variable	Coefficient value	Significance level	Number
Pain self-efficacy	0.675	0.001	32

As can be seen in (Table 6), considering the significance level of Pearson correlation coefficient which is less than 0.05, it can be inferred that the research hypothesis indicating the existence of a significant relationship between pain self-efficacy and resilience in leukemia patients is accepted.

Discussion and conclusion

This study aimed to investigate the relationship between pain self-efficacy and emotional intelligence with resilience in patients with leukemia. To achieve this goal, Nicholas Pain Self-Efficacy Questionnaire, Goleman Emotional Intelligence Questionnaire and Connor-Davidson Resilience Scale were applied. The research results reveal that among the sample of 32 subjects under investigation, their average scores in pain self-efficacy, emotional intelligence and resilience questionnaires are respectively equal to 25.87, 89.81 and 46.62. This indicator is equal to 22.75 for the component of self-awareness, 18.18 for self-regulation, 18.31 for motivation, 16.21 for empathy and 13.34 for social skills.

The main research hypothesis indicated that "pain self-efficacy and emotional intelligence are predictors of resilience in leukemia patients". Results of the regression table show that pain self-efficacy and emotional intelligence can predict resilience in patients with leukemia and this prediction is equivalent to 0.442 of the changes in resilience, meaning that it is predicted that the greater the pain self-efficacy and emotional intelligence, the higher the resilience in leukemia patients will be.

Results of this research are consistent with the findings of other studies [46],[31],; [61]; [39]; [24][18]; [39-40], 2015; [37-38]; [63]., 2013; [12]; [55]; [29]; [34]; [51], 2011 and [5].

Since pain self-efficacy and emotional intelligence promote the individual's capability and resilience to maintain mental balance in risky conditions (Connor & Davidson, 2003), resilience, flexibility and adaptation to environmental changes also increase. People with very low resilience have less pain self-efficacy and emotional intelligence, slightly adapt themselves to new situations and are slowly improved from stressful situations to the normal state [57].

The studies conducted by Garmezy, Masten and Tellegen (1984), Rutter (1979) and Masten, Best and Garmezy (1990) demonstrate that some people have good condition despite unfavorable situations and show no difficulty. These studies indicate that resilient individuals enjoy characteristics such as the ability to grow and progress despite adverse and high risk conditions, providing positive consequences after experiencing the stress, constant ability in performance under stress and tension, the ability to return after trauma resulting from experiencing adverse situations in life and the ability to create self-regulation or self-control. Besides, personality traits such as high self-efficacy, positive self-concept, sociability, high intelligence, competence in educational work, autonomy, high self-esteem, good communication, problem solving skills and mental and physical health are considered among the factors effective in increasing emotional intelligence and resilience in individuals [61].

Another explanation for this issue is based on the cognitive theory. In the cognitive theory, among the factors underlying resilience, self-related internal processes are emphasized. Bandura's social cognitive theory (2000) refers to the self-reflection ability. The study by Seligman (2000) suggests the role of attributional style in resilience. He believes that people with internal attribution style enjoy higher resilience.

Nelson and Lowe have described emotional intelligence as the intersection of advanced abilities and skills in accurate identification of self and personal strengths and weaknesses, creating healthy, effective and continuous relationships, spending time and working productively and fruitfully with others and effectively dealing with the demands and pressures of life. These features pave the way for higher resilience in people.

Another explanation is associated with psychological factors related to the pain intensity and psychological functioning of patients. The research results suggest that psychological variables including pain related beliefs and pain coping strategies are associated with the pain intensity and psychological functioning of cancer patients [31]. Hence, psychological factors (like self-efficacy and resilience) can play an important role in reducing pain severity in such patients.

The first secondary hypothesis indicated that "there is a relationship between pain self-efficacy and resilience in leukemia patients". The statistical results suggest the existence of this relationship, meaning that the greater the pain self-efficacy, the higher the resilience in leukemia patients will be.

Results of this research are congruent with the findings of other studies [46];; [49]; [32]; [61]; [39]; [22-23]; [55] and [52].

In explaining these results, it can be mentioned that the perceived self-efficacy, in addition to reducing fears and expected inhibitions, affects the rate of motivation and attempt to cope with pain through the expectation of possible success [47-48]. Therefore, individuals with high self-efficacy adapt themselves to difficult conditions such as incurable diseases like cancer and their consequences and cope with them.

On the other hand, resilience enhances the individual's capability in maintaining biomental balance in risky situations (Connor & Davidson, 2003). As stated by [57], a resilient person is flexible and looks for remedial measures and adapts himself to the environmental changes. The studies by Garmezy, Masten and Tellegen (1984) and Masten, Best and Garmezy (1990) also indicate high self-efficacy and the ability to adapt to risky and adverse conditions, high capability in performance under stress and tension and the ability to create self-regulation or self-control in people with high resilience.

The second secondary hypothesis indicated that "there is a relationship between emotional intelligence and its components with resilience in leukemia patients". The obtained results demonstrate that emotional intelligence and its components (self-awareness, self-regulation, motivation, empathy and social skills) have a significant relationship with resilience among patients with leukemia ($P<0.05$).

Results of the present research are consistent with the findings of other studies [1]
; [44-45]; [23]; [22],[58]; [56]and [53]

In explaining the results of this hypothesis, it can be stated that according to studies, chronic pain which characterizes cancer gradually and negatively affects general and mental health, physical and social functions and also psychological roles of the individual in life and leads to reduced level of well-being and life quality [53]. In fact, resilience is a kind of self-repair with positive emotional, affective and cognitive consequences and enhances social competence (e.g. understanding, flexibility, empathy and compassion, communication skills and sense of humor), problem solving skills (such as planning, help seeking, critical and creative thinking), autonomy (identity, self-efficacy, self-awareness and mastery of tasks) and purposefulness and optimism about future. On the other hand, increased level of emotional intelligence leads to the maintenance of positive mood and thus prevention of depression .

The study .revealed that there is a significant relationship between empathy, self-awareness and so on with psycho-emotional functions. By the same token, the research conducted on depression, eating disorders, delinquency and aggression in adolescents indicates the important role of emotional intelligence in the treatment of these disorders [24].

In similar vein, [24] stresses the role of self-awareness (which is the characteristic of resilient people) as one of the components of emotional intelligence in mental health. Empathy as another component of emotional intelligence can also predict the changes in mental health because when the individual's awareness of his own and others' emotions and feelings increases, it can lead to the regulation of the individual's psychological states and thus improvement of resilience through involvement in the course of coping with crisis. Access to the social support network allows for emotional disclosure. Emotional disclosure causes to improve the action of the immune system and subsequently leads to higher resilience

Difficult conditions resulting from the chemotherapy process in answering the questionnaires, dishonesty and lack of interest and motivation on the part of many of the subjects to complete the questionnaires were among the research limitations.

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