

The Effectiveness of Positive Psychology Training on Distress Tolerance and Optimism in Patients with Leukemia

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Quantitative Study

Abstract

Background: Detection of cancer, followed by prolonged treatments, is usually a stressful experience. The purpose of this study was to determine the effectiveness of positive psychology training on distress tolerance and optimism in patients with leukemia.

Methods: This quasi-experimental study was conducted with a pretest-posttest design, follow-up, and a control group. The statistical population of the study included all patients with leukemia who had referred to Valiasr Hospital in Khorramshahr, Iran, in 2020; 30 of them were selected using a purposive sampling method, and randomly assigned to an experimental group and a control group (15 individuals in each group). To collect data, the Distress Tolerance Scale (DTS) (Simmons & Gaher, 2005) and Life Orientation Test (LOT) (Scheier & Carver, 1993) were used. The experimental group underwent positive psychology training (14 weekly 90-minute sessions) based on Rashid's treatment protocol (2008), but the control group received no treatments. Data were analyzed using analysis of covariance (ANCOVA) in SPSS software.

Results: The results showed that positive psychology training was effective in increasing distress tolerance ($F = 34.30$; $P < 0.001$) and optimism ($F = 10.10$; $P < 0.001$) in patients with leukemia.

Conclusion: According to the results, positive psychology can be used to increase distress tolerance and optimism in patients with leukemia.

Keywords: Optimism; Positive psychology; Leukemia; Patients

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Introduction

Cancer refers to a large family of diseases that involve the abnormal growth of cells, and these cells have the ability to spread and invade other parts of the body (Jonker, Plas, de Bock, Buskens, van Leeuwen, & Lahr, 2021). One of the most common types of cancer is blood cancer, which is a group of diseases in which disobedient cells are part of the circulatory system of the human body. Bone marrow and lymph nodes, which are responsible for the production and differentiation of blood cells, are the main centers of initiation of leukemia (Ko & Thornburg, 2017). The main cause of leukemia is still unknown, but it is said that genetics and the environment have significant effects on the development of blood cancer. People with leukemia primarily experience fatigue and lethargy, unusual bleeding, frequent infections, bruising, and swollen lymph nodes (Martincorena & Campbell, 2015). Leukemia is divided into two general types: lymphoma (cancer of lymphoid cells) and leukemia (cancer of bone marrow cells), each of which has other subtypes (Haber & Velculescu, 2014).

Depending on the type of disease and treatment, patients who are treated for leukemia may face challenges such as side effects of the drugs used in the treatment that may disrupt their normal life for a while. Cancer causes patients to have a low distress tolerance. Thus, due to low flexibility, the individual considers stressful situations as uncontrollable situations, thinks less about the application of different options and solutions and treatments, is pessimistic about his efforts in overcoming the disease (Hill & Hamm, 2019), which leads to increased anger, discomfort, worry, depression, and low distress tolerance (Del Vecchio, Pochtar, & Jablonka, 2020). Distress tolerance is defined as a person's ability to experience and tolerate negative emotional states (Ellis, Salgari, Miklowitz, & Loo, 2018). This construct is an individual differences variable that refers to the capacity to experience and resist emotional and physical distress (Van Eck, Warren, & Flory, 2017).

It seems that by increasing distress tolerance in cancer patients, it is possible to increase their optimism about the future and treatment. Optimism, as a positive psychological construct, protects people in the face of difficulties (Aspinwall & Tedeschi, 2010). During the last few decades, the effect of personality factors such as optimism has attracted the interest of researchers. Optimism, as a relatively stable general tendency to have positive expectations in the face of negative life outcomes, is related to various aspects of health and plays an important role in the prevention of the occurrence of physical and mental disorders. Some studies have shown that optimism is an effective resource for dealing with difficulties and challenges (Jobin, Wrosch, & Scheier, 2014). Patients with low coping tolerance have a negative view of recovery and have lower hope of recovery than patients who are more optimistic about their treatment process (Choi, Chan, & Lehto, 2019).

Optimism has been defined as the ability to look better at the world and the events that happen in it, and the ability to deal with the realities of life correctly (Vakada, Bachmann, & Lu, 2018). Scheier and Carver (2018) consider optimism to be an individual difference variable that reflects the domain in which individuals maintain generalized favorable experiences for their future. According to Prasad, Fojo, and Brada (2016), optimism is considered as an effective individual attitude towards life, and optimistic people show more flexibility when facing a problem (even if their progress is difficult or slow). Many researches have shown the relationship between the optimism of cancer patients and the reduction of the duration of treatment and their recovery (Ahmad & Gaber, 2019; Ingersoll, Alexander, Ladwig,

Anderson, Norton, & Gramling, 2019; Ehman, Schepers, & Phipps, 2019).

The most common treatments for cancer are chemotherapy and radiation therapy (Virga, Ehling, & Mazzone, 2019). In addition, it is possible to improve or reduce the problems caused by cancer in patients with different psychological approaches. One of these approaches is positive psychology (Keefer, 2018). In positive group therapy, the group members learn how to be happier, more hopeful, more optimistic, more diligent, and livelier, so that they can enjoy life themselves, and make the people around them benefit from the greatest gift of being (life) (Vojdany, Golzari, & Borjali, 2014). Various researches have been conducted on the effectiveness of positive psychology therapeutic approach on increasing academic optimism and academic enthusiasm of female students (Sadeghi, Abbasi, & Beyranvand, 2020), improving students' optimism and anxiety (Jafar Tabatabaee, Ahadi, Bahrami, & Khamesan, 2018); promoting resilience (distress tolerance), improving the spiritual attitude, distress tolerance, and quality of life (QOL) of women suffering from chronic pain (Ghotbinejad Bahre Asmani, Ahadi, Hatami, & Sarami Froushani, 2019), improving resilience, happiness, and general health of women with drug-addicted spouses (Sohrabi & Jafari Roshan, 2016), improving the psychological well-being, resilience, and happiness of teenage girls (Honarmand Zadeh & Sajjadian, 2016), psychological well-being, distress tolerance, mental well-being, hope, optimism, and happiness (Gurgan & Ulubay, 2020), increasing hope and optimism in students with hemophilia (Ghavidel, Shirazi, & Sanagouyemoharer, 2019), improving happiness, aggressiveness, and optimism in teenagers with leukemia (Shamkhani & Khalafi, 2018), and increasing hope and optimism in cancer patients, and improving their perception of the disease (Casellas-Grau, Vives, Font, & Ochoa, 2016).

The result of this research can be considered as a basic effort to improve the psychological status of cancer patients, so paying more attention to this issue and conducting numerous researches in this field can be an effective step towards decreasing the psychological problems of cancer patients and their families at different levels of personality and society. The purpose of this study was to determine the effectiveness of positive psychology training on distress tolerance and optimism in patients with leukemia.

Methods

The current research was an experimental study with a pretest-posttest design, follow-up, and a control group. The statistical population of the study included all people with leukemia who referred to Valiasr Hospital in Khorramshahr city, Iran, in 2020 (98 people). From among them, 30 patients (2 groups of 15 people) were selected through purposive sampling. The study inclusion criteria included written consent to participation in the research, a lower than mean score on the questionnaires used, age of 20-55 years, and lack of intake of any medication at the same time for another disorder. The exclusion criteria were the unwillingness to continue participating in the research or absence from more than 2 treatment sessions. After the sessions, the experimental and control groups took part in the posttest under the same conditions. One month after the posttest, the follow-up phase was conducted on both groups. Moreover, to comply with the ethical principles, after the completion of the training sessions and the implementation of the follow-up phase on the experimental and control groups, a summary of the positive psychology training sessions was also presented to the control group. The Distress Tolerance Scale (DTS) and Optimism Scale were used to collect data.

Distress Tolerance Scale: The DTS is a self-measurement index of emotional distress tolerance that was created by Simmons and Gaher (2005). The items of this scale measure anxiety tolerance based on a person's emotional anxiety tolerance, mental evaluation of anxiety, attention to negative emotions when they occur, and regulatory measures to relieve anxiety. This scale has 15 items and they are scored based on a 5-point Likert scale ranging from 1 to 5. High scores on this scale indicate high anxiety tolerance. The developers reported an alpha coefficient of 0.82 for all questions. Its internal correlation after 6 months was 0.61. Moreover, it has been determined that this scale has good initial convergent and criterion validity. In the research of Simmons and Gaher (2005), the Cronbach's alpha of the whole scale was 0.82. In the present study, the Cronbach's alpha method was used to determine the reliability of the DTS, which was 0.84 for the entire questionnaire.

Life Orientation Test (LOT) (Optimism): The optimism questionnaire was measured using the Life Orientation Test (LOT) developed by Scheier and Carver (1993). Life Orientation Test was created in order to evaluate optimistic and pessimistic explanatory styles in a reliable and effective way. It is a scale that people respond to according to the consequences of life. The creators of this scale believe that the questionnaire has a high degree of validity and basically evaluates the general expectations of the individual in terms of the desirability of the future consequences of his/her actions. Scheier and Carver (1993) determined the reliability coefficient of their questionnaire using the test-retest method with a time interval of 4 weeks, the coefficient was 0.79. Furthermore, its Cronbach's alpha coefficient was 0.76. Scheier and Carver (1993) studied the psychometric characteristics of this scale, and reported a Cronbach's alpha coefficient of 0.76. Many researches have shown that temperamental optimism and pessimism have a relationship with a wide range of related constructs such as self-esteem, despair (Scheier & Carver, 1993), which indicates the convergent validity of this questionnaire. In addition, the factor analysis of optimism and its related constructs has shown that optimism is an independent and separate factor (Scheier & Carver, 1993), which indicates the differential validity of this construct. In this study, Cronbach's alpha was used to evaluate the internal consistency of the questionnaire, and the Cronbach's alpha coefficient was 0.83.

Positive psychology training: In the present study, 14 weekly 90-minute group positive psychology sessions were held according to group positive psychology techniques based on Rashid's (2008) treatment protocol. A description of the group positive psychology training sessions is presented in table 1.

Table 1. Description of the group positive psychology training sessions

Session	Description of session
First	Discussion session on the framework of group positive psychology
Second	
Third	Introduction of character abilities
Fourth	Discussion session about special abilities and positive emotions
Fifth	
Sixth	Good memories versus bad memories
Seventh	Forgiveness
Eighth	Gratitude
Ninth	Mid-term reviews of the treatment
Tenth	
Eleventh	Contentment
Twelfth	Optimism and hope
Thirteenth	Positive relationships (love and attachment)
Fourteenth	Increasing meaning (discussing the special abilities of other family members)
	The principle of pleasure
	Finding meaning (positive legacy and gift of time)
	A complete life (integration of pleasure, commitment, and meaning)

Table 2. The mean (SD) of the research variables in the experimental and control groups in the pretest, posttest, and follow-up

The dependent variables	Measurement	Positive psychology group (mean $\pm$ SD)	Control group (mean $\pm$ SD)
Distress tolerance	Pretest	31.13 $\pm$ 4.79	31.80 $\pm$ 5.70
	Posttest	46.20 $\pm$ 7.11	30.53 $\pm$ 6.90
	Follow-up	43.46 $\pm$ 7.12	32.66 $\pm$ 10.61
Optimism	Pretest	5.06 $\pm$ 2.15	6.00 $\pm$ 1.77
	Posttest	10.06 $\pm$ 3.21	6.73 $\pm$ 3.05
	Follow-up	9.20 $\pm$ 3.16	5.60 $\pm$ 3.01

SD: Standard deviation

The data obtained in the pretest, posttest, and follow-up stages were analyzed using descriptive statistics (indicators of mean and standard deviation), and inferential statistics (indicators of analysis of covariance). Data were analyzed using analysis of covariance (ANCOVA) in SPSS software (version 22; IBM Corp., Armonk, NY, USA).

Results

In the present study, the average age of the female and male participants was 33.65 ± 4.89 years and 36.19 ± 5.32 years, respectively. The mean and standard deviation of the research variables in the experimental and control groups in the pretest, posttest, and follow-up stages are presented in table 2.

Before analyzing the data related to the hypotheses, to ensure that the data of this research estimated the assumptions of ANCOVA, its assumptions were examined. For this purpose, the normality of the data, due to the non-significance of the Kolmogorov-Smirnov Z, showed that the anxiety tolerance variable ($Z = 0.14$; $P = 0.100$) and the optimism variable ($Z = 0.11$; $P = 0.200$) follow a normal distribution. In addition, to check the assumption of homogeneity of variances (to ensure that the variances of the two experimental and control groups are the same), Levene's test was used for the distress tolerance variable ($F = 0.01$; $P = 0.985$) and the optimism variable ($F = 0.511$; $P = 0.481$). The results of Box's M test ($P = 0.689$; $F = 0.491$; Box's M = 1.595) were also obtained. Moreover, in order to check the assumption of homogeneity of the slope of the regression line, analysis of variance (ANOVA) was used, which was obtained in the distress tolerance variable ($F = 3.025$; $P = 0.067$) and the optimism variable ($F = 1.020$; $P = 0.37$). Came. According to the results, ANCOVA can be used. Multivariate analysis of covariance (MANCOVA) was used to compare experimental and control groups in terms of posttest scores, after controlling the effect of the pretest, to determine the effect of the positive psychology training intervention on distress tolerance and optimism in leukemia patients. The results of the posttest phase are presented in table 3.

As can be seen in table 3, the MANCOVA test in the positive and control psychology training groups show that these groups have significant differences in at least one of the dependent variables. Table 4 shows the results of univariate ANCOVA for the posttest scores of the dependent variables.

As seen in table 4, the F ratio of the univariate ANCOVA for the dependent variables shows that there is a significant difference between the positive psychology training group and the control group in terms of the distress tolerance and optimism variables.

Table 3. The results of multivariate analysis of covariance on the posttest scores of distress tolerance and optimism

Effect	Value	F	Hypothesis df	Error df	P-value	Partial eta squared
Pillai's Trace	0.57	16.90	2	25	0.001	0.57
Wilks' Lambda	0.42	16.90	2	25	0.001	0.57
Hotelling's Trace	1.35	16.90	2	25	0.001	0.57
Roy's Largest Root	1.35	16.90	2	25	0.001	0.57

df: Degree of freedom

Table 4. Results of univariate analysis of covariance on the posttest scores of distress tolerance and optimism

Dependent variable	SS	df	MS	F	P-value	Partial Eta squared
Distress tolerance	1802.70	1	1802.70	34.30	0.001	0.56
Optimism	81.30	1	81.30	10.10	0.001	0.28

SS: Sum of Squares; df: Degree of freedom; MS: Mean Squares

The results of the follow-up stage are presented in table 5.

As shown in table 5, the MANCOVA tests in the positive psychology training and control groups show that these groups have significant differences in at least one of the dependent variables. Table 6 shows the results of univariate ANCOVA for the follow-up scores of the dependent variables.

As seen in table 6, the F ratio of the univariate ANCOVA for the dependent variables shows a significant difference in the distress tolerance and optimism variables between the positive psychology training group and the control group.

Discussion

This research was conducted with the aim of investigating the effectiveness of positive psychology training on distress tolerance and optimism in leukemia patients. The results showed that positive psychology training was effective in increasing distress tolerance and optimism, and these results persisted until the follow-up stage. The first finding showed that positive psychology training is effective in increasing distress tolerance in the posttest and follow-up stages. This finding is in line with the results of the researches by Ghotbinejhad Bahre Asmani et al. (2019), Sohrabi and Jafari Roshan (2016), Honarmand Zadeh and Sajjadian (2016), and Gurgan and Ulubay (2020). For example, Ghotbinejhad Bahre Asmani et al. (2019) showed that group positive psychotherapy was more effective in the posttest than psychotherapy on the spiritual attitude, distress tolerance, and QOL of women with chronic pain. Gurgan and Ulubay (2020) conducted a meta-analysis of 16 studies on the effect of positive psychology intervention on psychological well-being, distress tolerance, mental well-being, hope, optimism, and happiness.

In the explanation of this finding, it can be stated that positive psychology education is done for people in order to strengthen and improve positive relationships with themselves, others, and the world, as well as increase happiness, so that people know themselves better and recognize their positive experiences. Paying attention to positive points and past experiences increases the probability of having more positive perceptions of themselves and others, enabling them to accept more responsibility and achieve a more complete understanding of themselves (Rashid and Anjum 2008).

As a result, teaching positive skills and techniques increases distress tolerance in patients.

The research results also showed that positive psychology training is effective in increasing optimism in patients with leukemia in the posttest and follow-up stages. This finding is consistent with the results of Sadeghi et al. (2020), Jafar Tabatabaee et al. (2018), Ghavidel et al. (2019), Shamkhani and Khalafi (2018), and Casellas-Grau et al. (2016).

Table 5. The results of distress tolerance and optimism in the positive psychology training group and the control group in the follow-up

Effect	Value	F	Hypothesis df	Error df	P-value	Partial Eta squared
Pillai's Trace	0.43	9.54	2	25	0.001	0.43
Wilks' Lambda	0.56	9.54	2	25	0.001	0.43
Hotelling's Trace	0.76	9.54	2	25	0.001	0.43
Roy's Largest Root	0.76	9.54	2	25	0.001	0.43

df: Degree of freedom

Table 6. Results of univariate analysis of covariance on the follow-up scores of distress tolerance and optimism

Dependent variable	SS	df	MS	F	P-value	Partial Eta squared
Distress tolerance	903.70	1	903.70	10.40	0.003	0.28
Optimism	102.90	1	102.90	12.80	0.001	0.33

SS: Sum of Squares; df: Degree of freedom; MS: Mean squares

In explaining this finding, it can be stated that positive psychology training is a beneficial program in increasing life satisfaction, optimism, and positive emotions in patients, and thus, this program can be used to improve their mental health. Therefore, pursuing pleasure, commitment, and meaning in life leads to strengthening happiness and optimism. Positive psychology is not an objective or unitary concept and is characterized by its themes, because in the case of each person, what is considered as optimism depends on the things that are desirable for him/her. People with positive thinking benefit more from their life and work, stay healthier, and have better relationships with others (Jafar Tabatabaee et al., 2018). Such people look at life positively and instead of regretting the past or lack of health, they look at it with satisfaction, and instead of doubting, they look at the future with hope and optimism, and this gives them joy. In this training, patients are helped to identify and deal with their pessimistic thoughts. In positivity, they learn to control their pessimistic beliefs, and negative thoughts and feelings, and to be optimistic about achieving desirable outcomes. Hence, positivity is a well-documented way to create optimism (Casellas-Grau et al., 2016).

Conclusion

Like any research in the field of humanities, the current research had some limitations, such as the fact that the statistical population included all patients with leukemia referred to Valiasr Hospital in Khorramshahr; therefore, it is not possible to generalize the results to other patients and other cities. The necessary caution should be taken in this regard. Considering the effectiveness of positive psychology training, it is suggested that therapists learn the correct implementation of the treatment and use it on people suffering from chronic diseases in order to improve their tolerance of distress and optimism.

Conflict of Interests

Authors have no conflict of interests.

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