

Effect of resilience training in improving the ability to cope with stress and hope of mothers with cancer children

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Abstract

Background: The present study investigates the effect of resilience training in improving the ability to cope with stress and hope of mothers with cancer children.

Methods: In this interventional study, 70 mothers parenting children with cancer were selected as available and randomly classified into the control and experimental groups. The mothers of the two groups completed the parenting stress and hope questionnaire. In the test group, nine sessions of resilience training were held by the researcher for 60 min. One month after the intervention, they were again asked to complete the parenting stress and hope questionnaires. Moreover, in the control group, the mothers completed the parenting stress and hope questionnaires again 2 months later without any intervention.

Result: The difference between the average scores of hope and parental stress showed that the mean score of hope in the intervention and control groups increased by about 5.45 and 2.74 units, and the hope variable was improved in both groups. The mean score of parental stress in the intervention group decreased by 39.62 units. However, in the control group, it increased by 2.45 units, and parental stress in this group declined.

Conclusion: Resilience training significantly reduced the level of parental stress and increased the level of hope in the mothers of the test group. Therefore, it is recommended to use resilience in reducing the level of parental stress and increasing the hope level of mothers with children with cancer.

Keywords

Cancer, stress, mother, resilience, hope

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Introduction

Despite an increase in survival rate, cancer remains a life-threatening factor.¹ It has been reported that more than 80% of children with cancer can survive and have healthy lives if they have access to appropriate care.² Meanwhile, many children in low- and middle-income countries (e.g., Iran) do not receive adequate care. More than 90% of childhood cancer deaths occur in low-support countries.³ In recent years, children have been among the victims of the cancer epidemic, and cancer is the third leading cause of death among Iranian children. This health disorder kills 4% of Iranian children under 5 years of age and 13% of children aged 5–15 years old.^{2,4–6} Many studies have reported that the presence of sick children as a stressor in the family has a significant impact on the level of stress, depression, and frustration

of parents. Because children have more contact with their mothers than with other family members, mothers are at the

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highest risk of stress, long-term hopelessness, and eventually depression.⁷

Cancer is one of the most stressful events in a person's life, and the associated changes affect both patients and their parents.⁸ In addition, psychological problems during treatment are common among parents of children with cancer as they report various psychological problems (e.g., hopelessness, depression, and posttraumatic stress) more than the population norm.⁹ Overall, different levels of stress, anxiety, frustration, fatigue, and depression are the major problems these parents suffer from.^{10–12} Therefore, improving the health status of children with cancer and reducing the psychological risks for their families should be considered major goals in nursing. In this regard, nurse communication and support affect parents' ability to care for their child during hospitalization and after discharge, improve the promote the recovery of the child, and reduce the specific tensions of the parents such as stress, depression, and hopelessness.¹³

Resilience is one of the appropriate strategies to improve the mental health of mothers of children with cancer. Resilience is about a person's ability to improve social performance and overcome problems despite exposure to severe stresses and risk factors. In general, resilience refers to positive outcomes despite the experience of adversity, positive and effective performance under adverse conditions, and recovery from a serious accident.¹⁴ In this context, Juvakka et al. recommended examining and focusing on the success of families rather than on how families fail.¹⁵ In addition, previous studies have shown that resilience increases a person's ability to cope in difficult and clinical situations such that there is a significant relationship between resilience and quality of life.¹⁶ Steinhardt et al. showed that social support, hope, and resilience change the quality of life and influence it significantly.¹⁷ Hence, it is necessary to investigate further the resilience between interventions and the control of stress, frustration, and fatigue and to help improve the activity and performance levels of parents of children with cancer as much as possible. Therefore, the present study sought to determine the effects of resilience training on improving the ability and hope of mothers of children with cancer to cope with stress.

Materials and methods

This pre-test and post-test semi-experimental study was conducted from May to November 2023. The research participants included 70 mothers chosen through accessible sampling and then assigned into one of two intervention and control groups by random block allocation. The results of Kaboudi et al.¹⁸ were used to calculate the sample size. The type-I error level was 0.05 and the test power was 90%. As a result, the sample size in each group was 31 people, while it was 35 people with a 10% dropout rate.

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}}^2 + Z_{1-\beta} \right)^2 \times [\sigma_1^2 + \sigma_2^2]}{(\mu_1 - \mu_2)^2} = \frac{(1.96 + 0.842)^2 \times [11.34^2 + 16.50^2]}{(10)^2} = 31$$

Inclusion criteria were the age of the mother of children with cancer being in the range 20–50 years, having a minimum education level of the fifth elementary school, age of children with cancer being in the range 7–14 years, and 3 months after the definitive diagnosis of cancer. Exclusion criteria included unwillingness to participate in the study, incomplete questionnaire completion, and non-attendance in the training classes (more than two sessions).

Data collection

Demographic questionnaire included age of parents and child, education of parents, occupation of parents, economic status of family, gender of child, and number of children. The short version of the parental stress scale consists of 36 questions and contains questions. The scoring was based on a Likert scale, with a score range of 1 (strongly agree) to 5 (strongly disagree).¹⁸ Consequently, the overall score range of the tool is 36–180. A higher score on this questionnaire means higher stress for the parent. This questionnaire has been validated in past studies^{18,19} and used as a standard questionnaire. Sarhangi et al.¹⁹ calculated a Cronbach's alpha of 0.7 for the reliability of this questionnaire. In the present study, Cronbach's alpha results for the reliability of this questionnaire were 0.88.

"The hope questionnaire," developed by Snyder et al.,²⁰ consists of 12 items designed to assess the level of hope in individuals aged 15 years and older. The questionnaire was administered as a written self-report, where participants responded to each item using a 5-point Likert scale. The scoring options are as follows: 5 (I completely agree), 4 (I agree), 3 (I have no opinion), 2 (I disagree), and 1 (I completely disagree). For questions 3, 7, and 11, the scoring is reversed: 1 (I completely agree), 2 (I agree), 3 (I have no opinion), 4 (I disagree), and 5 (I completely disagree).²¹ The total score is calculated by summing the scores of all 12 items, with higher scores indicating greater levels of hope. Specifically, a score between 12 and 24 indicates a low level of hope, a score between 24 and 36 represents an average level of hope, and a score above 36 signifies a high level of hope.²⁰ Tara et al.²² determined the reliability of the hope scale by Cronbach's alpha, bisection, and retesting as 0.77, 0.80, and 0.82, respectively.²² In the present study, Cronbach's alpha results for the reliability of this questionnaire were 0.79.

Table 1. Resilience skill training protocol in the present study.¹⁸

Session number	Session content
First session	Pre-intervention—providing guidance for the participation of members and explaining how to do the work: the researcher introduces himself, introduces the members, explains the general direction of the meetings to the members
Second session	An introduction to the general framework of the discussion: 1. Define resilience 2. Introducing the characteristics of resilient people: 1. Joy 2. Wisdom and insight 3. Humor 4. Sympathy 5. Rational adequacy 6. Purposefulness in life, and 7. Stability
Third session	Solution: Understanding the unpleasant situations in life and increasing coping and tolerance in personal life. Objective: Familiarity with internal support factors. 1. The concept of optimism, 2. Self-esteem, 3. Source of control. Solution: Recognizing talents and interests and emphasizing them, and wanting to use them
Fourth session	Purpose: Familiarity with external support factors. 1. Social support system, 2. Individual responsibility and acceptance of important roles, Solution: a sense of belonging and value and willingness to participate
Fifth meeting	Purpose: Familiarity with the methods of providing resilience. Establishing and maintaining relationships with others, a framework for parental stress and problem acceptance
Sixth session	Purpose: To continue the ways of providing resilience. Purposefulness and hope for the future, acting
Seventh session	Purpose: To continue the ways of providing resilience. Self-awareness, self-confidence development
Eighth session	Purpose: To continue the ways of providing resilience, self-care
Ninth session	Purpose: Conclusion and implementation of the post-intervention

Procedure

After obtaining the necessary permits and receiving permission to start the study, the researcher went to the pediatric hematology department of Besat educational-remedial center. This facility is the only educational and therapeutic center for children in Hamadan, in the west of Iran. After referring to the head of the department and the physician in charge of the ward and identifying mothers who met the inclusion criteria, the purpose of the study was explained to them. Next, oral and informed written consent was obtained from all the mothers who participated in the present study. Mothers were selected according to available methods and then divided into control and test groups by random block allocation. First, all mothers participating in the study completed the parenting stress and hope questionnaire. Next, in the intervention group, nine resilience training sessions (one session per week for about 2 months, each lasting 60 min) were held by the researcher in the conference hall of the hematology ward (Table 1). The content of resilience training used in this study was based on the resilience training content of Kaveh et al.,²³ which was set for nine sessions of 60 min. This content was also used by Kaboudi et al.¹⁸ In this research, resilience was presented in three parts: (1) “the concept of resilience for families and the characteristics of people with high resilience,” (2) “internal and external factors affecting resilience,” and (3) “ways to increase family resilience.”^{18,23} The participants in the intervention group were asked to complete the post-test questionnaire on parenting stress and hope 1 month after the intervention. In the control group, the mothers completed the post-test questionnaire on parenting stress and hope 2 months later without any intervention.

Statistical analysis

The collected data were analyzed using descriptive statistics. Chi-square, Kruskal–Wallis, Fisher’s exact, and *t*-tests were applied to analyze the data using SPSS software (Version 23) at a significance level of 0.05.

Results

Most participating mothers in the intervention and control groups were in the age range of 31–40 years. In both groups, most children participating in the study were under 10 years old, and the number of family members in the intervention group was ≥ 5 . Meanwhile, the number of family members in the control group was 4. In general, the Kruskal–Wallis test did not show any difference between the groups, and both groups were almost the same (Table 2).

The highest level of mother’s education in the resilience training group was at the primary level (34.3). By contrast, in the control group, the highest level of education was at the secondary level (34.3). In terms of mother’s occupation, more than 91% of both groups were housewives. Regarding economic status, both groups had average economic status (more than 54% in both groups). Moreover, 42.9% of parents participating in the test group had one child, and 40% in the control group had two children. The Chi-square test results showed that both groups were similar concerning all demographic variables (Table 3).

This intervention was conducted for mothers whose children had been diagnosed with cancer about 3 months ago. The research had nine sessions, and all the mothers who participated finished them. No mothers dropped out because they missed any sessions. The mothers maintained that the

Table 2. Comparison of quantitative demographic variables between two groups of resilience training and control.

Variable	Variable levels	Group				F statistic or χ^2 *	p-Value
		Resilience		Control			
		Number	Percent	Number	Percent		
Mother's age	20–30	5	14/3	12	34/3	0/347	0/368
	31–40	23	65/7	19	54/3		
	41–50	6	17/1	4	11/4		
	>50	1	2/9	0	0		
Child age	1–10	19	54/3	21	60	0/535	0/500
	11–19	16	45/7	14	40		
Number of families	3	5	14/3	12	34/3	0/635	0/648
	4	12	34/3	13	37/1		
	≥5	18	51/4	10	28/6		

*The Kruskal–Wallis test was performed and the reported statistic is χ^2 .

Table 3. Comparison of qualitative demographic variables between two test and control groups.

Variable	Variable levels	Group				F statistic or χ^2 *	p-Value
		Resilience		Control			
		Number	Percent	Number	Percent		
Mother's education	Elementary	12	34/3	10	28/6	0/808	0/626
	Guidance	8	22/9	12	34/3		
	Diploma	9	25/7	10	28/6		
	Bachelor's degree and higher	6	17/1	3	8/6		
Mother's occupation	Housewife	32	91/4	34	97/1	0/614	0/303
	Employed	3	8/6	1	2/9		
Economic status	Weak	13	37/1	8	22/9	0/297	0/102
	Medium	19	54/3	24	68/6		
	Good	3	8/6	3	8/6		
Number of children	A child	15	42/9	12	34/3	0/624	0/421
	2 children	8	22/9	14	40		
	3 children	6	17/1	4	11/4		
	4 children and more	6	17/1	5	14/3		

Performed test: Chi-square with Fisher's exact test.

*The statistic is the result of Fisher's exact test.

sessions were very enjoyable, calming, and helpful. They felt that this training was what they needed right now.

Table 4 presents the intergroup comparison of parenting stress before and after the intervention in the intervention and control groups. As can be seen here, this difference was not statistically significant before the intervention (0.114). However, after the intervention, this difference was significant (0.000). Regarding the intergroup comparison of hope before and after the intervention in the intervention and control groups, the results showed that this difference was not significant before the intervention (0.959). However, it was significant after the intervention (0.005).

Table 5 presents the difference in the average scores of hope and parental stress before and after the intervention between the intervention and control groups. According to the results, the average value of hope in the intervention group ranged from -5 to 17 , and the average was 5.45 . In the control group, the value ranged from -10 to 21 , and the average was 2.74 . These results indicate that hope increased by 5.45 in the point average and 2.74 in the control group, and both groups experienced an improving trend in the variable of hope. The minimum value of educational stress in the intervention group was -101 and the maximum was 3 , with the average was -39.62 . In the control group, the minimum

Table 4. Intergroup comparison of parenting stress and hope before and after the intervention between the intervention and control groups.

Group	Intervention group		Control group		t	df	p-Value
	Mean	SD	Mean	SD			
Parental stress							
Before intervention	113.14	18.41	106.88	13.95	1.60	68	0.114
After intervention	73.51	17.13	109.34	19.73	-8.10	68	0.000
Hope							
Before intervention	41.4	4.69	41.34	4.52	0.52	68	0.959
After intervention	46.85	3.35	44.08	4.61	2.78	68	0.005

Table 5. Difference between average scores of hope and parental stress before and after the intervention between the intervention and control groups.

Group	Hope				Parental stress			
	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum	Mean	Standard deviation
Intervention	-5	17	5.45	5.73	101-	3	-39.62	21.35
Control	-10	21	2.74	6.56	-81	54	2.45	26.32

was -81 and the maximum score was 54, with an average of 2.45. As can be seen, in the intervention group that received resilience training, parental stress was reduced by 39.62 units. In comparison, in the control group (without any intervention), this level raised by an average of 2.45 units. Hence, parental stress was increased in this group.

Discussion

Neither group had a statistically significant difference in parental stress scores before the intervention. However, this difference was significant after the intervention, which is consistent with the results of Heydari et al.,²⁴ Sharifian et al.,²⁵ Chung et al.,²⁶ Chu et al.,²⁷ Tobe et al.,²⁸ and Mezgebu et al.²⁹ Certainly, having a child with cancer is a big stress. In this respect, the process of the disease, the future condition of the child with cancer, and the challenges ahead intensify the stress. For instance, Heydari et al.²⁴ reported that psychological treatments such as resilience training in hospitals and clinics can lower the symptoms of anxiety, stress, and depression in women with breast cancer and increase their life expectancy. Sharifian et al.²⁵ reported that resilience training reduced parental stress and increased hope and tenacity in mothers of the test group. Therefore, resilience training is recommended to reduce parental stress and increase the hope and psychological toughness of mothers of mentally and physically disabled children. Chung et al.²⁶ reported that resilience is an important factor associated with quality of life in parents of children with cancer. Assessing resilience in parents is an important prerequisite for designing appropriate interventions to increase their resilience and enhance their quality of life. In another study, Chu et al.²⁷ reported

that improving the level of resilience, hope, optimism, and perceived social support and reducing the level of perceived stress are important strategies for anxiety reduction.

Tobe et al.²⁸ also found that resilience training improved mothers' resilience, emotion regulation, and cognition toward children and themselves. Mezgebu et al.²⁹ concluded that the resilience level among parents of children with cancer was low compared to other studies. Besides, support from friends, participation in recreational activities, and receiving health information from healthcare professionals were positively associated with resilience. In addition, in the mentioned study, parental depression and stress had a negative relationship with resilience. Thus, the results of the above studies have shown that resilience training can be useful in reducing stress in mothers with children with cancer. Hence, it is recommended that resilience training be implemented in these mothers.

The mean difference in hope scores before and after the intervention was significant in the test group, and resilience training could increase hope in mothers of children with cancer. This result is consistent with those reported by Sanayeh et al.,³⁰ Koliai et al.,³¹ Khosrobeigi et al.,³² Rafiepoor et al.,³³ Momeni et al.,³⁴ and Rezaei Sharif et al.³⁵ Sanayeh et al.³⁰ reported that comprehensive care and provision of resilience training programs can be effective in promoting resilience in mothers of children with congenital heart disease. Koliai et al.³¹ identified learning life skills as an effective way to reduce anger and increase hope. In a similar study, Khosrobeigi et al.³² concluded that teaching self-compassion had a significant effect on resilience and reducing the frustration of parents of children with cancer. Thus, it can be said that resilience training effectively strengthens the hope of

mothers with children suffering from cancer. Accordingly, it is recommended to apply resilience training to these mothers.

Moreover, the present study showed that the mean difference in parental stress scores decreased in the test group and increased in the control group. Parental stress worsened in the control group during the study period. Also, the mean difference of hope scores increased in both groups. They both experienced an improvement trend in the hope variable, which is consistent with the findings of Rezaeifar et al.,³⁶ Mustafa et al.,³⁷ Rezaei Sharif et al.,³⁵ Khosrobeigi et al.,³² and Salehian and Sarvari.³⁸ Rezaeifar et al.³⁶ reported that family resilience training impacts the mental health of mothers and can improve their mental health. Mustafa et al.³⁷ reported a positive significant correlation between resilience and psychological well-being among parents of children with leukemia. Elsewhere, Rafiepoor et al.³³ reported that hope therapy can improve the quality of life of mothers of disabled children and acts as an effective step in improving their mental state and the parent-child relationship. The results of these studies highlighted the fact that the parents of children with cancer experience cognitive problems during the child's growth and development, such as despair. Hence, resilience training may play an effective role in enhancing the life expectancy and psychological well-being of mothers with children with cancer.

Rezaei Sharif et al.³⁵ concluded that strength-based family therapy produced a significant change in terms of increasing hope and decreasing stress and depression in the trained group. Kaboudi et al.¹⁸ also found that mothers who received resilience training improved coping styles and reduced parenting stress compared to mothers in the control group. Therefore, resilience training can be used as an effective tool to strengthen mothers against psychological problems and challenges presented by children with cancer. These results are also consistent with those of Salehian and Sarvari.³⁸ These authors concluded that resilience training acts as a shield to cope with stressful situations and lower anxiety and depression levels.

Limitation

To minimize confounding factors, the researcher selected all participants for the test and control groups from mothers with children diagnosed with acute lymphoblastic leukemia under consistent medical supervision and a standardized treatment regimen. However, the researcher could not control other potential confounding variables, such as the mother's mental health, the level of support from her spouse, the presence of other children, the child's age, and similar factors. These unaccounted-for variables could have influenced the study's outcomes and should be considered when interpreting the results. In addition, the study's findings may not be fully generalizable to mothers in different regions of Iran or other parts of the world. The

explanation is that cultural, religious, and socio-economic differences might affect the intervention's efficacy. Furthermore, a significant proportion of the mothers in this study were housewives. Therefore, it might have influenced their relationship with their children differently from that of working mothers. This variable was beyond the researcher's control.

Conclusion

Resilience training reduced the level of parental stress and increased the level of hope in the mothers of the intervention group. Hence, resilience training increases the level of hope in parents and helps them go ahead with more motivation and optimism for a better future. This hope can also reduce the level of stress they face. Therefore, resilience can be used as a simple and effective tool to empower parents to face such challenges, reduce stress, and increase hope in the treatment process for their child with cancer. Overall, it is recommended to use resilience in reducing the level of parental stress and increasing the hope level of mothers of children with cancer.

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Author contribution statements

The first person is the author of the article and project manager, the second person is the scientific advisor, the third person is the data collection partner, the fourth person is the responsible author and supervisor.

Data availability statement

At any time, the corresponding author can provide an additional resource on request.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical approval

This study is a part of the research project conducted at the Hamadan University of Medical Sciences (with project Co. 1401011679) and the procedure of the research was approved by Ethics Committee of Hamadan University of Medical Sciences with code of ethics IR.UMSHA.REC.1400.890.

Informed consent

Informed written consent was obtained from all subjects prior to the initiation of the study. Participation was completely voluntary, and participants were free to withdraw from the study at any time without any consequence. Confidentiality of all information has been maintained. This form of obtaining consent was approved by the Research ethic committee of Hamadan university of Medical Sciences.

Trial registration

Not applicable.

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