Effect of a self-help educational program with peer group on anxiety of mothers of children with cancer: A clinical trial study

Akram Gholamian, Masoud Bahrami¹, Mohammad Reza Sherbafchi², Mahboobeh Namnabati³

Abstract:
BACKGROUND: The mental health of the mothers of the children with cancer is strongly influenced by the child's illness and treatment process. This study aimed to investigate the effect of a self-help educational program with peer group on anxiety of the mothers of the children with cancer.

MATERIALS AND METHODS: This clinical trial study was conducted on 44 mothers of the children with cancer in an educational Hospital of Isfahan University of Medical Sciences, Iran. Convenience sampling method was performed on the eligible mothers, and using random allocation, they were divided into two groups of the intervention (n = 22) and the control (n = 22). Both groups completed the Hamilton Anxiety Questionnaire before and after the intervention. The intervention of the study was a self-help educational program with peer group that was performed in collaboration with the mothers of the children with cancer, a psychiatrist, and cancer nurses in the hospital within 3 months.

RESULTS: The results showed that 55% of the mothers of the intervention group had severe and very severe anxiety before the intervention, but the intensity of their anxiety was reported to be moderate after the intervention. The analysis of covariance with adjusted anxiety score in the two groups showed that the mean score of anxiety in the intervention group decreased from 22.3 to 12.3 after the intervention, showing a significant difference (P < 0.05).

CONCLUSION: The program, designed to support the mothers and guide the specialists and psychiatrists to counsel the mothers, can enhance their self-help and reduce their anxiety level.

Keywords: Anxiety, cancer, children, educational, mother, peer groups, self-help group

Introduction

Today, cancer is the leading cause of mortality in countries. Although childhood cancers are not prevalent, every year about 16,400 cancers are diagnosed in children and adolescents under 20 years old.¹² This rate is estimated to be 18.1% in low-income countries among the 5–14-year-old children.¹⁰ Acute lymphoblastic leukemia, non-Hodgkin lymphoma, and central nervous system are the most prevalent childhood cancers referred to hospitals for treatment and care.¹¹

The incidence of cancer and hospitalization in children may cause many problems for their families. These children need to undergo intensive care diagnostic and treatment procedures. Because of unawareness about the cause and manner of treatment and care and the suffering imposed on the child during the illness, the parents of these children often get anxious.
and pass their anxiety on the child. Studies around the world have also shown that parents, especially mothers of children with cancer, have many mental and psychological problems including anxiety and depression.\cite{4,6} The level of depression, anxiety, and stress in the mothers of the children with cancer is also alarming in Iran. According to a recent study conducted by Asghari-Nekah et al. in Iran, 68.7% of the mothers of children with cancer suffered from stress, 56.2% had anxiety, and 53.1% of them were depressed. Owing to these mood changes, the mothers had a low level of resilience, and this maternal resilience was negatively and significantly correlated with stress, anxiety, and depression.\cite{6}

Although there are various supportive programs for the parents, especially for the mothers of the children with cancer, at health centers,\cite{7,8} a lot of stress and anxiety is imposed on these parents at different stages of their child’s treatment and diagnostic procedures. Therefore, it is necessary to think about an appropriate strategy for reducing the anxiety of these parents, especially mothers. Being in peer group is one of the strategies that can help to cope with anxiety and reduce it. A study found that peer groups were effective in self-efficacy of the diabetic patients.\cite{9} Other studies have shown that these mothers have a heavy burden of caring for their children and consequently develop the feelings of fatigue, exhaustion, and anxiety and thus do not have competency to help other mothers, as they themselves are anxious and unable to help other members of the peer group.\cite{4,8}

Based on above, researchers have found it necessary to conduct more research in this regard. On the other hand, researchers’ experiences and their long-term presence in cancer wards suggest that nurses or physicians cannot lonely help to calm mothers, because they have not experienced living with such children and cannot truly understand the situation and feelings of a suffering mother. Moreover, another major motivation for this study was the leukemia of one of the researchers’ child. Based on her experiences during the process of her child’s illness and also presence in the pediatric ward, she concluded that stress and anxiety are the most prevalent problems among the mothers of these children and the strategy of peer group, which can lead to self-help, should be used to reduce anxiety and stress in these mothers. Accordingly, the aim of this study was to investigate the effect of a self-help educational program with peer group on the anxiety of the mothers of the children with cancer.

**Materials and Methods**

This is a clinical trial study conducted with the registration code of IRCT20190616043902N1. Using the formula of \( n = \frac{(Z_1 + Z_2)^2 \cdot S^2}{d^2} \) the sample size was calculated to be twenty participants in each group. Considering the probability of 10% loss in samples, the sample size of each group was considered to be 22 participants. \( Z \) is the 95% confidence level that is equal to 1.96, \( z \) is the test power factor of 80% that is equal to 0.84, \( S \) is an estimation of the standard deviation of the mothers’ anxiety score in both groups. \( d \) is the minimum difference of the mean anxiety score between the two groups, indicating that the difference is significant and is equal to 0.9.

Initially, the convenience sampling method was used and 44 eligible mothers of the children with cancer were selected. Then, the mothers were divided into two groups of control (\( n = 22 \)) and intervention (\( n = 22 \)) by the random allocation, using drawing cards. Inclusion criteria were having no neuropsychiatric disorder based on their medical record, no major stress in the recent 6 months reported by the mothers themselves, no stressful events such as financial crisis, divorce, and death of the first-degree members of the family, and having an ill child (from 1 week to 2 years). The criteria of the consort checklist were completed [Figure 1].

Pre- and post-intervention data were collected using the Hamilton Anxiety Questionnaire in both groups. The questionnaire consisted of two parts: the first part contained the mother’s demographic information (age, education level, employment status, type of child cancer, etc.) and the second part contained 14 questions...
about anxiety symptoms. The mothers’ responses to
each question were assessed based on a five-point
Hamilton scale ranging from 0 to 4 (0 = absence,
1 = mild, 2 = moderate, 3 = severe, and 4 = very severe).
The scores ranged from 0 to 56. The mean score, then,
was calculated for each person. Content validity and
scientific reliability of this questionnaire were confirmed
by studies.[10-12]

The intervention consisted of a group educational
self-help program that was conducted in eight sessions
over 3 months. The mothers were excluded if they
lost more than two sessions or if they attended other
anxiety-reducing classes such as yoga. The participating
mothers were ensured about the confidentiality of
their information, and then informed written consent
was obtained from all of them. The intervention
consisted of a self-help educational program with peer
group held in eight sessions (each session was about
45–60 min) for 3 months in the teaching classroom of
the Seyed-al-Shohada (Omid) Hospital affiliated to the
Isfahan University of Medical Sciences in summer and
autumn 2018.

The content of the sessions is shown in Table 1. After the
sessions, the mothers were asked to practice and repeat
the strategies offered to them. During the first 24 h after
the first training session, the mothers were telephoned
to ensure that they understood and applied verbal and
written instructions correctly. Moreover, this telephone
contact provided them with the opportunity to ask
possible questions or express their feelings, concerns,
fears, difficulties, problems, and successes with regard to
taking care of their child. Doing so, they were provided
with appropriate solutions as well as emotional and
informational support and were retrained if needed. To
assess the provided training and supports, how to cope with
anxiety, and to facilitate the adaptability of them, follow-up
measures were performed using telephone, telegram, or the
presence of the mothers themselves. The telephone contacts,
lasted from 20 to 40 min, were coordinated with mothers in
the afternoon. At the end of the study, to meet the ethical
principles and raise the awareness of the mothers of the
control group, an educational booklet and other related
materials were given to them.

The data were analyzed using descriptive and
inferential statistics. Descriptive statistics such as
mean, standard deviation, frequency, and percent
was done for demographic variables. Chi-square and
Mann-Whitney tests were used to compare groups for
the nominal demographic variables. Independent t-test
and analysis of covariance were used to compare the
mean score of the two groups. Statistical significance
was considered at \( P < 0.05 \). All statistical analyses were
performed using SPSS version 22 (SPSS Inc., Chicago,
IL, USA).

Results

According to the results of the study, the mean (Standard
Devotion) of the mothers’ age was 37.25 (6.85) and
37.41 (6.31) in the intervention and control groups,
respectively. Other demographic characteristics
are shown in Table 2. Independent t-test showed
that the mean score of anxiety was not significantly
different between the two groups before the
intervention \( (P > 0.05) \). The analysis of covariance with
adjusted anxiety score in the two groups showed that,
after the intervention, the mean score of anxiety in the
intervention group was significantly lower than the
control group \( (F = 80.02, P < 0.001) \) [Table 3]. In addition,

| Table 1: Self-help educational program for the mothers of the children with cancer |
|---------------------------------|---------------------------------|
| Session                        | Subjects                                      |
|--------------------------------|---------------------------------|
| First session                   | Introducing the researcher and the psychiatrist to the mothers and acquainting the mothers with each other  
Describing the aims of the research  
Precipitation of group thoughts based on the acceptance of the children cancer  
Expressing the problems and challenges |
| Second session                 | The 45 min lecture of the psychiatrist about cancer and its impact on family  
Expression of the mothers’ experiences with cancer and the articulation of problems  
The psychiatrist’s counseling with mothers to help reduce their anxiety |
| Third session                  | Treatment and care challenges for children with cancer  
Expressing the experiences of the mothers of the children rescued from cancer  
Peer support of the mothers regarding treatment and diagnostic procedures |
| Fourth session                 | Discussing the recognition of the thoughts leading to anxiety, and recognizing the triangle of (a) depression; (b) fear and anxiety; and (c) anger and violence, with destruction at the center |
| Fifth session                  | Control and management of emotions in the form of role modeling |
| Sixth session                  | Management of the ways of treating children and caring for them |
| Seventh session                | The mothers’ consultation with a psychiatrist |
| Eighth session                 | Feedback of managing anxious thoughts  
Summarizing and providing a feedback from the past sessions and addressing some of the unresolved issues and how mothers and researchers deal with them |
the results showed that the greatest problem (50%) was severe and very severe anxiety among the mothers, but after the intervention, the mood was not severe and only 55% of the mothers had an experience of moderate anxiety.

The result was shown no significant difference in the intervention group in terms of the stress intensity with muscle contraction, fear, insomnia, and cardiovascular symptoms before and after the intervention \((P > 0.001)\). However, the intensity of other anxiety items in the intervention group, after the intervention, was significantly lower than before the intervention \((P < 0.001)\) [Table 4].

**Discussion**

The aim of the study was to investigate the effect of a self-help educational program with peer group on anxiety of the mothers of the children with cancer. The results of the study revealed that this program can reduce the anxiety of the mothers.

### Table 2: Comparison of the demographic characteristics of the participants of the study

| Type of the disease | Control group, \(n\) (%) | Intervention group, \(n\) (%) | Chi-squared test |
|--------------------|---------------------------|-------------------------------|----------------|
|                    |                           |                               | \(\chi^2\)  | df  | \(P\)  |
| Leukemia           | 11 (55)                   | 10 (45.5)                     | 1.32         | 4   | 0.86   |
| Brain tumor        | 2 (15)                    | 4 (18.2)                      |              |     |        |
| Neck mass          | 1 (5)                     | 2 (9.1)                       |              |     |        |
| Hemolytic anemia   | 3 (15)                    | 4 (18.2)                      |              |     |        |
| Sarcoma            | 3 (15)                    | 2 (9.1)                       |              |     |        |

### Table 3: Comparison of the mean score of anxiety between the two groups before and after the intervention

| Time                  | Mean (SD) Intervention group | Mean (SD) Control group | Independent \(t\)-test | Analysis of covariance |
|-----------------------|------------------------------|-------------------------|-----------------------|------------------------|
|                       |                              |                         | \(t\)  | df  | \(P\)  | \(F\)  | df  | \(P\)  |
| Before the intervention| 22.3 (12.3)                  | 20.6 (10.2)             | 0.51                  | 40                     | 0.61               | -    | -    | -    |
| After the intervention | 12.5 (7.2)                   | 21.4 (8.5)              | -                     | -                      | -                  | 80.02 | 1    | <0.001 |

SD=Standard deviation

### Table 4: The frequency percent of responses to each item before and after the intervention

| Trait or behavior                  | Before the intervention | After the intervention | Test |
|------------------------------------|-------------------------|------------------------|------|
|                                    | No response | Mild | Moderate | Severe | Very | No response | Mild | Moderate | Severe | Very | Z    | P   |
| Anxious                            |             |     |          |        |      |             |     |          |        |      |      |     |
| Stress with muscle contraction     |             |     |          |        |      |             |     |          |        |      |      |     |
| Fear                               |             |     |          |        |      |             |     |          |        |      |      |     |
| Insomnia                           |             |     |          |        |      |             |     |          |        |      |      |     |
| Mental or cognitive                |             |     |          |        |      |             |     |          |        |      |      |     |
| Depressed                          |             |     |          |        |      |             |     |          |        |      |      |     |
| Physical and muscular              |             |     |          |        |      |             |     |          |        |      |      |     |
| Physical and sensory               |             |     |          |        |      |             |     |          |        |      |      |     |
| Cardiovascular symptoms            |             |     |          |        |      |             |     |          |        |      |      |     |
| Respiratory symptoms               |             |     |          |        |      |             |     |          |        |      |      |     |
| Digestive symptoms                 |             |     |          |        |      |             |     |          |        |      |      |     |
| Genital and urinary system symptoms|             |     |          |        |      |             |     |          |        |      |      |     |
| Symptoms of autonomic nervous system|           |     |          |        |      |             |     |          |        |      |      |     |
| Behavior during the interview      |             |     |          |        |      |             |     |          |        |      |      |     |
The mood of the mothers changed from severe and very severe to mild and moderate anxiety following the intervention. This indicates that, while such an intervention is beneficial for mothers, they are still experiencing a significant proportion of anxiety. Similarly, another study in Iran showed that 56% of mothers had anxiety, 53% had depression, and 68% of them had stress. Studies indicated that the mothers of the children with leukemia experienced a lot of depression and anxiety. Reviewing 58 articles, van Warmerdam et al. found out the diagnosis and treatment of cancer is a traumatic experience for parents. He also found that 5%-65% of mothers’ experience anxiety, and 7%-91% have an experience of depression.

One of the major causes of sudden anxiety in cancer is the treatment of and other related procedures. A qualitative research in Iran identified the needs of mothers. The results indicated that what mothers needed strongly was medical awareness, physical health awareness, psychoeducational health information, and information about family lifestyle. Therefore, a regular assessment of the informational needs of the parents can help health-care providers to reduce stress and anxiety in families by providing them with the information they need. As such, a group educational self-help program can meet the needs of these parents. Group educational self-help program can reduce the mothers’ mean score of anxiety. Using a group of peer mothers, together with a group of specialists (psychiatrist and nurse), we were able in this study to set up a supportive training program to help mothers minimize their anxiety with their own help. When the mothers’ anxiety is reduced, they are more prepared to accept and deal with existing challenges and thus are better able to care for their children during the diagnostic and treatment procedures.

Given the importance of mothers’ problems, it is necessary for the health team to plan effective and appropriate measures for mothers. The results of the present study indicated that a self-help-educational program with peer group is an effective, affordable, and safe method that can be adapted to different sociocultural conditions and be welcomed by mothers. Accordingly, we found that these mothers themselves, as real sufferers in this regard, can help each other to reduce their anxiety effectively. Although other strategies such as relaxation therapy, prayer, spirituality, or writing the events of daily life can reduce the anxiety of these mothers, self-help can play a significant role in the reduction of anxiety.

Other studies have also shown the effect of peer group. In this regard, Rashidi’s study investigated the effect of peer support on self-efficacy of diabetic patients. After preparing the peer group, he held ten training-support sessions for the peer group members for 3 months, and the results showed the effectiveness of the program. In addition, the peer group can reduce anxiety by improving communication skills and support. In this regard, a study showed that the reinforcement of coping skills, the enhancement of the dimensions of the supporters and family communication network, the improvement of interpersonal communication skills, and the strengthening of self-care behaviors can reduce mothers’ anxiety. Cancer and its process of treatment can lead to the exhaustion of caregivers and affect the quality of their life severely. Moreover, the parents of children with cancer feel strongly guilty at all stages of the disease, at the time of death, and after the death of their children. Although, mothers always have some challenges in take care of infants and children in the hospital and home. Therefore, applying different strategies, including the results of the present study, may be useful for them.

The present study was faced with different challenges and limitations. For example, it was difficult to get mothers together because they had to take care of their children and did not feel well to participate in the sessions. For this reason, 72 mothers were invited to participate in the study, but 28 of them were unable to enter the study from the outset. However, after sampling and attending the sessions, getting to know each other, and exchanging emotions and empathy, they were able to help one another and the program was held perfectly. The most important point was that they accomplished this supportive program with the guidance and help of the nurses and a psychiatrist. Sample size was determined to show the minimum difference between the two groups. It is suggested to investigate the effect of this intervention on larger samples of mothers to obtain more generalizable results.

**Conclusion**

The results of this study showed that the mothers of the children with cancer experience a great deal of anxiety. Although many measures have already been taken by the health team to address these problems and there are standards to support these mothers, it seems that using self-help by parents, especially mothers of these children, can help them better through understanding sociocultural conditions. Using a self-help educational program with peer group had a significant impact on reducing the anxiety of the mothers of the children with cancer. Therefore, it is recommended to use this program in the support system with the help and patience of the nurses and hospital officials.
Ethics Approval and Consent to Participate
This paper was extracted from a master’s thesis in pediatric nursing, approved by Ethics Committee of Isfahan University of Medical Sciences (the registration code of IRCT20190616043902N1). All participants provided written informed consent for participation. Anonymity and confidentiality were assured, and participants were allowed to withdraw from the study at any time and for any reason. All data were stored securely in the principal researcher’s office and were accessible only to the researcher.

Acknowledgments
The authors would like to thank the authorities of Isfahan University of Medical Sciences, and the mothers who eager to attend and conduct the present study.

Financial support and sponsorship
Thus study was financially supported by Isfahan University of Medical Sciences, Isfahan, Iran.

Conflicts of interest
There are no conflicts of interest.

References
1. Hockenberry MJ, Wilson D and Cheryl CC. Rogers. Wong’s Nursing Care of Infants and Children: Elsevier; St. Louis, Missouri 2019.
2. Scheurer ME, Lupo PJ, Schúz J, Spector LG, Wiemels JL, Aplenc R, et al. An overview of disparities in childhood cancer: Report on the Inaugural Symposium on Childhood Cancer Health Disparities, Houston, Texas, 2016. Pediatr Hematol Oncol 2018;35:95-110.
3. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2018;68:394-424.
4. van Warmerdam J, Zabih V, Kurdyak P, Sutradhar R, Nathan PC, Gupta S. Prevalence of anxiety, depression, and posttraumatic stress disorder in parents of children with cancer: A meta-analysis. Pediatr Blood Cancer 2019;66:e27677.
5. Namnabati M. The correlation between meetings physical needs of children during chemotherapy and the mother’s knowledge. In: Tumor Biology. Basel, Switzerland: Karger; 2017.
6. Asghari-Nekah M, Jansouz F, Kamali F, Taherinia A. The resiliency status and emotional distress in mothers of children with cancer. J Clin Psychol 2006; 3: 17-21.
7. Keyvanfar S, Sadeghniah AR, Namnabati M. The effects of a neonatal critical care nurse companionship with parents during hospital–home transfer of preterm infants on mothers’ mood status. NMS 2020; 9:16.
8. Bahrami M, Namnabati M, Mokarian F, Oujian P, Arbon P. Information-sharing challenges between adolescents with cancer, their parents and health care providers: A qualitative study. Support Care Cancer 2017;25:1587-96.
9. Rashidi K, Safavi M, Yahyavi SH, Farahani H. The effect of the peers’ support on self efficacy level type II diabetic patients. Avicenna J Nurs Mid Care 2015;23:15-26.
10. Maier W, Buller R, Philipp M, Heuser I. The Hamilton Anxiety Scale: Reliability, validity and sensitivity to change in anxiety and depressive disorders. J Affect Disord 1988;14:61-68.
11. Brody AC, Simmons LA. Family resiliency during childhood cancer: The father’s perspective. J Pediatr Oncol Nurs 2007;24:152-65.
12. Kayyani H, Mossavi AS, Mohit A. A Psychological Scales and Interviews. Tehran, Iran: Sana Publications; 2001. p. 179-205.
13. Tan WS, Beatty L, Koczvara B. Do cancer patients use the term resilience? Systematic review of qualitative studies. Support Care Cancer 2019;27:43-56.
14. Esmaeili Douki H, Elyasi F, Hasanazadeh R. Effectiveness of positive thinking training on anxiety, depression and quality of life of mothers of children with leukemia. Nurs Midwifery Sci 2020;6:21-6.
15. Borjalilu S, Sharif Z, Afzali M, Sabbagh Bani A, Koochakzadeh L. Information needs of parents of children with cancer: A qualitative study. Qual Res Health 2017;6:228-37.
16. Pourfallahi M, Gholami M, Tarrahi MJ, Touabi T, Kordestani Moghadam P. The effect of informational-emotional support program on illness perceptions and emotional coping of cancer patients undergoing chemotherapy. Support Care Cancer 2020;28:485-95.
17. Chaar EA, Hallit S, Haji A, Aaraj R, Kattan J, Jabbour H, et al. Evaluating the impact of spirituality on the quality of life, anxiety, and depression among patients with cancer: an observational transversal study. Support Care Cancer 2018;26:2581-90.
18. Borjalilu S, Shahidi S, Mazaheri MA, Emami AH. Spiritual care training for mothers of children with cancer: Effects on quality of care and mental health of caregivers. Asian Pac J Cancer Prev 2016;17:545-52.
19. Nikfarid L, Rassouli M, Borimnejad L, Alavimajd H. Religious coping in Iranian mothers of children with cancer: A qualitative content analysis. J Pediatr Oncol Nurs 2018;35:188-98.
20. Biabanakigoortani A, Namnabati M, Abdeyazdan Z, Badiz F. Effect of peer education on the noise management in Iranian neonatal intensive care unit. IJNMR 2016;21:317-21.
21. Rodriguez EM, Murphy L, Vannatta K, Gerhardt CA, Young-Saleme T, Saylor M, et al. Maternal coping and depressive symptoms as predictors of mother-child communication about a child’s cancer. J Pediatr Psychol 2016;41:329-39.
22. Snaman JM, Kaye EC, Torres C, Gibson D, Baker JN. Parental grief following the death of a child from cancer: The ongoing odyssey. Pediatr Blood Cancer 2016;63:1594-602.
23. Morris S, Fletcher K, Goldstein R. The grief of parents after the death of a young child. J Clin Psychol Med Settings 2019;26:321-38.
24. Hemati Z, Namnabati M, Taleghani F, Sadeghniah A. Mothers’ challenges after infants’ discharge from neonatal intensive care unit: A qualitative study. Iran J Neonatol 2017;8:31-6.
25. Namnabati M, Taleghani F, Sadeghniah A. Home-based care needs of preterm infants discharged early from the neonatal intensive care unit: A descriptive qualitative study. Iranian Journal of Neonatology 2017;8:74-82.