

Effectiveness of Individual Play therapy on Hope, Adjustment and Pain Response of Children with Leukemia Hospitalized in Shahrivar Hospital, Rasht, Iran

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Abstract

Background: Childhood cancer is a grueling event that can affect the lives of patients and their parents both psychologically and physically. Playing is a way to reduce this problem in children with cancer.

Objectives: The aim of this study was to evaluate the effectiveness of individual play therapy on hope, adjustment and pain response of hospitalized children with cancer.

Methods: This quasi-experimental study was performed among 30 children with cancer aged 8 to 12 years. Subjects were randomly divided into experimental and control groups. In the experimental group, individual play therapy intervention was performed for two months (10 sessions). The study instruments included: Snyder's Hope Scale, Pediatric Pain Response Questionnaire (Walker et al.), and Dokhanchi's Adjustment Questionnaire (1998). In order to analyze the data, repeated measures analysis and Bonferroni post hoc test were performed in SPSS, version 16.

Results: In this study, the mean age of participants in the experimental and control groups was 9.36 ± 1.68 and 10.1 ± 1.98 years, respectively. The results of this study showed that the difference between the three evaluation stages in all variables, except the post-test with the follow-up of hope variable, was significant in the experimental group ($p \leq 0.001$). But no significant difference was observed between the three evaluation stages in the control group ($p \geq 0.001$).

Conclusion: It seems that play therapy intervention has an effect on the research variables. Given that the research was conducted on a small sample in a hospital, it is suggested that similar research be conducted to increase the external validity of the present study.

Keywords: *play therapy, hope, pain response, child, cancer*

Introduction

Cancer is one of the major problems of the Iranian health system, and after cardiovascular diseases and accidents, it is the third leading cause of mortality in Iran [1]. Cancer is less common in children under the age of 15 and accounts for less than 1% of known cases of malignancy in the developed countries. Cancer is still a major cause of death in children, but there has a significant increase in survival and recovery in children [2]. Cancer has a profound effect on the mental, social

and physical conditions of children. Children and adolescents may experience the fear of relapse and death along with the stressors of treatment and loss of control due to the hospital environment [3].

During cancer treatment, children experience a range of side effects such as anorexia, nausea and vomiting [4]. Cognitive impairment in childhood cancer has been reported repeatedly, and behavioral and psychological disorders have often been seen in children who have survived cancer.

In addition, pediatric tumors are often associated with sleep disorders. Despite the relationship between sleep disorders, neurodevelopmental disorders, and childhood cancer [5], variables such as hope, adjustment, and pain response in children still need further investigation. Children with cancer, in addition to medical treatment, need psychological treatment to overcome their disease and its consequences [6].

The experience of pain in children with cancer, both before and after the diagnosis, is often present [7], and this pain caused by the disease affects the daily activities of children and their families, and consequently, their quality of life and health are overshadowed [8]. Apart from pain, in many cases after the definitive diagnosis of cancer and in the treatment process, one of the first constructs to be affected by this disease is hope for life in children and their families [9]. Due to the role of pain and hope in the quality of life of children with cancer and their families, a variety of psychological interventions and treatments have been used for both children and their families [10]. The results of Pai et al.'s research showed that psychological interventions have more effect on distress, anxiety and adjustment of families and parents than children [11]. This is while the treatment and return of health in children with cancer is extremely important along with their families' health [12].

Among the range of different treatments, the ones that are more appropriate for the age conditions of children are plays [6]. Play can involve working with objects and occur individually or in groups [13]. A play, which is based on the intention of entertainment and psychosocial development, creates new emotions, creativity, and everyday life situations and helps children discover the world. It also supports confrontation with reality and alters reality to the wishes of children [14]. However, some conditions can prevent playing, and one of these conditions is hospitalization [15]. In this respect, illness and hospitalization of children indicate a break from their daily lives [14].

As games and plays are appropriate for childhood, they can well help children to gain more knowledge of their disease, become more compatible with it, and psychologically deal with this disease more effectively by engaging children and even adults in entertaining and joyful

activities [16-18]. When children engage in games in the medical treatment of their illness, they have the opportunity to continue to enjoy their childhood despite illness, pain, and all the problems associated with cancer and its treatment [16,17]. Also, based on the available evidence, it can be stated that play therapy reduces the level of pain perception in children with cancer and increases the level of hope for the future and life in these children [19]. As a result, play becomes a strategy that can alleviate the discomfort of being hospitalized and helps fight the disease. It can also facilitate nursing interventions and should be included as an interface for caring for children with cancer [20].

For nurses, play can be considered as the most appropriate way to create empathy and a way to understand the world from the perspective of children [21]. Unstructured or structured play involves activities that children specifically perform, such as board and card games, puzzles, and handicrafts. Unstructured play is of particular importance for the natural, cognitive, physical, social and emotional development of children [22].

Play therapy can be considered a powerful tool for developing these issues. Play therapy is defined as a framework of structural activities, which is designed to improve the emotional and physical levels of hospitalized children and adolescents based on psychological and cognitive development and their specific needs [23]. Play therapy seems to be effective in reducing negative emotions such as children's anxiety and fears related to illness and treatment and helps children and adolescents maintain self-esteem and self-confidence. When dealing with problems in plays, children create creative solutions and communicate more easily with peers, families, nurses [24-27].

Through play, children and adolescents may become familiar with the unfamiliar environment of the hospital and become acquainted with health care professionals and medical procedures [25]. In various studies, play has been reported as a treatment to reduce anxiety, depression, and stress and improve the quality of life [19,28,29]. Scarponi [19] also points to the prominent role of play therapy in helping children with cancer to overcome problems and pain. Satapati et al. have shown the effect of music therapy and play

therapy on children's psychological well-being indicators [10]. Asghari Nekah et al. also investigated the effect of structured group play therapy on reducing anxiety and depression in children with cancer under 10 years of age and showed that group games have an effect on these variables [30].

Shojaei et al. exhibited that cognitive-behavioral play therapy was effective in increasing hope and reducing pain [6]. Few studies have been done on the adjustment variable and most of the studies have been only in the form of pre-test and post-test, and the follow-up stage has not been considered due to the fact that coordination with parents and patients has been challenging. The need for this study was both consolidation of previous research and deficiency in relation to the adjustment variable and follow-up stage. According to the above, the aim of this study was to evaluate the effectiveness of individual play therapy on hope, adjustment and pain response of children with leukemia hospitalized in 17 Shahrivar Hospital in Rasht.

Methods

This is a quasi-experimental study. The statistical population in this study at the time of the researcher's visit to the hospital included 51 children with cancer at the Mahak Institute in Rasht, located in Shahrivar Hospital, who underwent chemotherapy and pharmacotherapy in 2019. The sample size was determined using Cochran's formula to be 30 people. The participants were chosen by the convenience sampling method due to the unpredictable problems of children with cancer. Among these children, 30 were selected and randomly assigned to the two groups of experimental and control (n=15). The experimental group received individual cognitive-behavioral play therapy and the control group did not receive any intervention. The inclusion criteria were as follows: being 8 to 12 years old, having leukemia, living with both parents, willingness to cooperate, no acute psychological illness, and no psychological treatment (based on medical files). The exclusion criteria were: divorce of parents in the course of the study, non-cooperation in completing the questionnaire and participation in the research, and absence of more than two sessions in play therapy sessions. The research instruments

included Snyder's Hope Scale, Pain Response Inventory and Dokhanchi Children Adjustment Questionnaire (1998).

Snyder's Hope Scale: This scale has six items and assesses children's causal and strategic thinking and hope. Each of the subscales has three items. This scale can be used for children and adolescents aged 8 to 16 years. Snyder et al. [31] administered it among six different groups in order to standardize the Children's Hope Scale. Significant positive correlation of children's hope scale scores with the parent-specific version (in which parents answered the same questions about their child), self-profile test, children's perception, children's attribution style questionnaire and self-esteem scale and the significant negative correlation of children's hope scale scores with the scores of children's depression test indicate the convergent validity of the children's hope scale. In Iran, Nejati, Ismailian and Amani [32] standardized this scale among 8 to 15-year-old students in Tehran. The reliability of this scale in their research was established by Cronbach's alpha coefficient and internal consistency with the total score of 0.69.

Dokhanchi's Children's Adjustment Questionnaire (1998): This questionnaire has 37 four-choice questions of 'never', 'rarely', 'sometimes' and 'most often', from which mothers choose the option that best suits their child's behavior. The reliability of this scale was confirmed using the split-half method (equal to 0.79) and its validity was equal to 0.81% in Dokhanchi's study as quoted by Ghadampour, Amirian, and Radpour [33].

Pain Response Inventory: This scale has 60 items designed to measure children's adaptive responses to recurrent pain. To evaluate, the three dimensions are active, passive, and adaptive, each of which includes subscales that indicate specific strategies for coping with pain. This scale has good internal consistency in the subscales with alpha 0.66 to 0.91. Alpha in adjustment factors has a range of 0.64 to 0.82, which has a correlation in one week of retesting among the school sample and its range is from 0.46 to 0.71 and has an average of 0.59 in subscales. It showed good construct validity by correlating scores in abdominal pain index and scales of somatization symptoms, functional disability and depressive symptoms [34].

In the Iranian sample, the strategy of passive coping was associated with negative consequences of higher levels of pain. The subscales of this strategy have also been related to a number of other scales with a variety of methods, including pain and pain states. Several subscales and passive strategies and all adaptive coping strategies all provide statistically significant predictors of pain changes and physical symptoms. There are also several statistically significant differences between untreated, cured, and treated patients in several subscales and in the three adjustment strategies. This indicates good credibility in group differentiation.

The protocol of cognitive-behavioral play therapy was taken from the study of Asghari Nekah et al. [30], which included 10 sessions lasting for 2 hours. In the first stage, after reviewing the patients' files and based on the inclusion and

exclusion criteria, 30 subjects were selected and in the second stage, they were randomly assigned to the two groups of experimental and control (n=15). With the cooperation of the hospital psychologist, a meeting was held with the children's parents and the purpose of the research was explained. After obtaining written consent from parents, the questionnaires were completed. The questionnaires were completed by the subjects with the help of a psychologist and after selecting the option by the researcher, the desired option was marked with a cross. Ten sessions were held for the experimental group in coordination with the hospital and parents during two months. After the 10 sessions, the questionnaire was completed again for both experimental and control groups. Follow-up steps were performed two months after the post-test and the questionnaires were completed again by the subjects with the help of a psychologist.

Table 1: Summary of the Cognitive-behavioral Play Therapy Protocol (Asghari Nekah et al. 2013)

Session	The goal pursued	Content and activity
First session	Build a relationship, build trust, get to know the therapist better	Introduction and acquaintance, preparing children and performing artistic activities with optional subject.
Second session	Expressing emotions with the aim of discovering children's issues.	Artistic activity entitled Abbas Ali, a sick child using scraps of paper.
Third session	Increasing hope, overcoming loneliness and despair, cognitive reconstruction with the aim of avoiding negative self-talk and examining their role in creating despair.	Storytelling (sad lion story) and making smileys from it and performing creative plays.
Fourth session	Overcoming despair, replacing negative thoughts with positive ones, reducing isolation and reducing sadness, using positive self-talk when sad.	Artistic and fictional activities of sick fish in the form of stories and paintings.
Fifth session	Hope for the future, happiness, the ability to deal with negative emotions, a sense of worth.	Using the artistic activity of the Happiness Tree by using artistic tools with a focus on positive feedback.
Sixth session	Uncovering conflicts, expressing negative emotions and feelings, gaining adjustment and improving strategies for children to deal with problems and worries.	Doing puzzles, color and develop and complete it.
Seventh session	Facing anxiety caused by medical devices, expressing fears and anxieties, reducing anxiety and unpleasant emotional states.	Making handicrafts using medical tools and artistic techniques.
Eighth session	Reducing anxiety, adapting children to medical equipment in the hospital, increasing control and experiencing positive emotions.	Drawing a painting using gouache and ampoules.
Ninth session	Externalization and objectification of the disease, overcoming anxiety caused by the unknowns of the disease, reducing anxiety and psychological relaxation.	Letters and paintings to the disease giant and doing ugly ball activity.
Tenth session	Integrating perceptions and cognitions and generalizing them to real life	Summarizing previous sessions, preparing children to finish the sessions

In order to analyze the data, the normal distribution of the quantitative variables was first determined by Shapiro-Wilk test. Then, data was

analyzed using repeated measures analysis of variance (ANOVA) and Bonferroni post hoc test in SPSS, version 16.

Results

The results of descriptive statistics showed that the mean age in the experimental group was 9.36 ± 1.68 years, and in the control group it was 10.11 ± 1.98 years. The mean duration of the disease in the experimental group was 4.02 ± 0.78 years, and in the control group it was 3.0 ± 12.97 years. The sex distribution of the subjects in the control group was 11 boys and 4 girls, and in the experimental group it was eight boys and seven girls. All subjects had leukemia.

Table 2 shows the scores of the research variables in the three stages of the test in the control and experimental groups.

The value of Shapiro-Wilk test in all the groups and in all the evaluation stages for the distribution of age and duration of disease variables was not

significant ($p < 0.05$), this indicates that the distribution of data among the groups was normal. Also, according to the Box's M test, the significance level of all the variables was higher than 0.05, which shows that the assumption of homogeneity of covariance matrices in all the three variables has been observed. Levene's test index was not statistically significant for the research variables in all the three stages of evaluation ($p > 0.05$). Therefore, it can be concluded that the assumption of error variance homogeneity was observed. Based on the results of Mauchly statistics, the assumption of equality of covariance scores was established in different statistical stages for research data, because the significance level for Mauchly statistics was greater than 0.05.

Table 2: Mean and standard deviation of pre-test and post-test and follow-up of the research variables in the control and experimental groups

	Variable	No.	Control		Experimental	
			Mean	Standard deviation	Mean	Standard deviation
Pre-test	Hope	15	19.00	3.00	18.03	2.99
	Adjustment	15	47.53	2.38	49.06	2.52
	Active pain response	15	51.33	3.43	48.06	3.21
	Passive pain response	15	31.00	6.69	39.73	6.70
	Adaptive pain response	15	42.00	4.75	37.93	5.88
Post-test	Hope	15	18.06	2.49	19.73	2.91
	Adjustment	15	47.00	2.36	51.80	2.21
	Active pain response	15	51.46	3.18	46.06	3.36
	Passive pain response	15	31.13	6.57	37.26	6.15
	Adaptive pain response	15	41.66	4.45	35.33	5.45
Follow-up	Hope	15	18.13	2.23	20.12	2.81
	Adjustment	15	47.38	3.15	53.45	3.35
	Active pain response	15	51.20	3.02	44.17	2.15
	Passive pain response	15	31.23	6.12	35.57	5.13
	Adaptive pain response	15	41.55	4.17	33.17	3.18

Table 3 displays the results of repeated measures ANOVA to examine the main effects of group and time on the variables of hope, adjustment, and active, passive and adaptive response to pain.

The results of the repeated measures ANOVA for the pain variable show the modification of degrees of freedom. It is clear from the table content that the main effect of time and group is significant on all the variables ($p < 0.001$).

The effect of time shows that 61% of changes in the variable of hope are due to time changes. The effect size in the main effect of group shows that

74% of the changes in the variable of hope in the subjects are due to group membership.

The effect of time shows that 81% of the changes in the adjustment variable are due to time changes. The effect size in the main effect of group shows that 73% of the changes in the adjustment variable of the subjects are due to group membership.

The effect of time shows that 67% of the changes in the active pain response variable are due to time changes. The effect size in the main effect of group shows that 56% of the variable changes in

the subjects' active pain response are due to group membership.

The effect of time shows that 76% of the changes in passive response to pain variable are due to time changes. The effect size in the main effect of group shows that 68% of the changes in the subjects' passive pain response variable are due to group membership.

The effect of time shows that 69% of the changes in adaptive pain response variable are due to time changes. The effect size in the main effect of group shows that 54% of the changes in the subjects' adaptive pain response variable are due to group membership.

Table 3: Results of repeated measures analysis of variance test for the main and interactive effects of research variables

Variable	Source of changes	Mean squares	F	Degree of freedom	Significance level	Size	Test power
Hope	Group effect	29.40	36.61	1	0.001	0.74	1.00
	Time effect	53.217	54.111	1.045	0.022	0.61	1.00
Adjustment	Group effect	55.053	59.91	1	0.04	0.73	0.998
	Time effect	84.146	88.145	1.0317	0.001	0.81	1.00
Active pain response	Group effect	44.40	29.96	1	0.003	0.56	0.921
	Time effect	19.871	45.13	1.0564	0.001	0.67	1.00
Passive pain response	Group effect	23.23	14.385	1	0.001	0.68	1.00
	Time effect	48.951	37.935	1.0345	0.001	0.76	1.00
Adaptive pain response	Group effect	30.73	44.05	1	0.031	0.54	0.915
	Time effect	58.435	68.212	1.0557	0.001	0.69	1.00

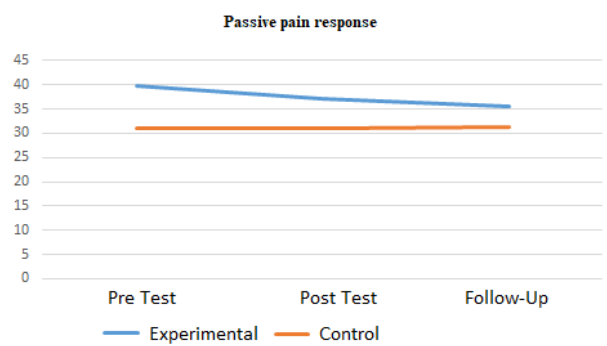
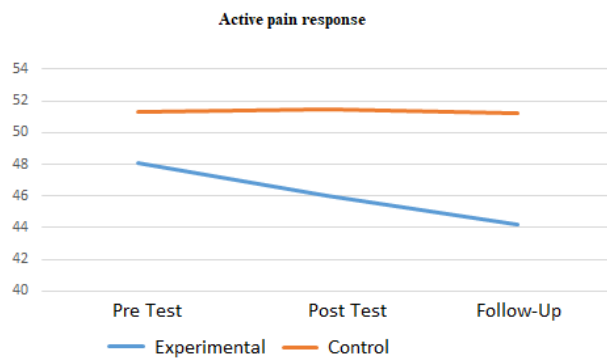
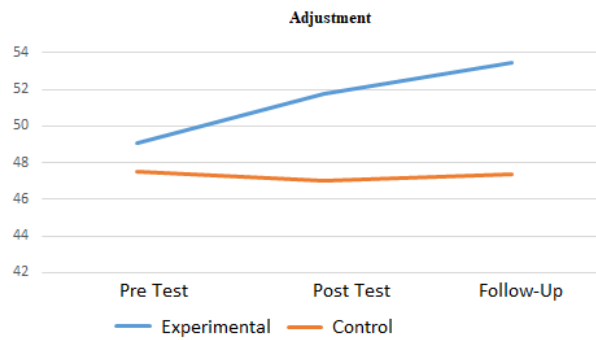
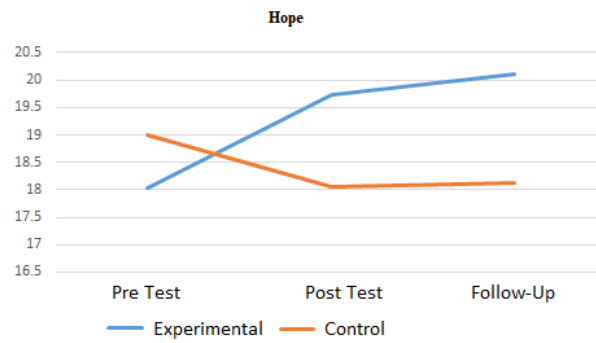
To evaluate the difference between the means of the research variables in the three evaluation stages, Bonferroni post hoc test was run, the results of which are presented in Table 4. The difference between the three stages of the test in all the stages, except the post-test, is significant regarding the variable of hope ($p < 0.001$).

However, for more accuracy and confidence in the results, since the Bonferroni test calculates the sum of the average of the two groups, it is

necessary to pay attention to the main effects diagram of group and time. Figure 1 shows the main effects of group and time geometrically. As shown in Figure 1, the changes in all the variables from the pre-test stage to the post-test stage and follow-up, except for the post-test, have changed with the follow-up of the variable of hope, and this change in all the three evaluation stages of the experimental group shows its superiority.

Table 4: Bonferroni test results for the variables of hope, adjustment, and active, passive and adaptive pain response

Variable	test stages (mean)		Mean difference	Standard error	Significance level
Hope	Pre-test (18.03)	Post-test (19.73)	-1.7	0.169	<0.001
		Follow-up (20.12)	-2.09	0.187	<0.001
	Post-test (19.73)	Follow-up (20.12)	-0.39	0.114	0.180
Adjustment	Pre-test (49.06)	Post-test (51.80)	-2.74	0.174	<0.001
		Follow-up (53.45)	-4.39	0.155	<0.001
	Post-test (51.80)	Follow-up (53.45)	-1.65	0.132	<0.001
Active pain response	Pre-test Post-test (48.06)	Post-test (46.06)	2	0.156	<0.001
		Follow-up (44.17)	3.89	0.112	<0.001
	Post-test (46.06)	Follow-up (44.17)	1.89	0.98	<0.001
Passive pain response	Pre-test (39.73)	Post-test (37.26)	2.47	0.148	<0.001
		Follow-up (35.57)	4.16	0.139	<0.001
	Post-test (37.26)	Follow-up (35.57)	1.69	0.124	<0.001
Adaptive pain response	Pre-test (37.93)	Post-test (35.33)	2.36	0.198	<0.001
		Follow-up (33.17)	4.76	0.142	<0.001
	Post-test (35.33)	Follow-up (33.17)	2.16	0.117	<0.001



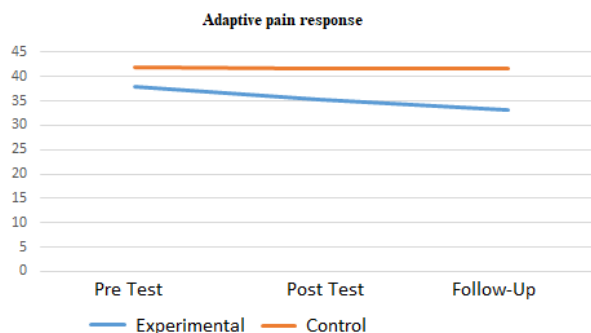


Figure 1: Graphs of the interactive effect of individual play therapy and the variables studied in the three stages of evaluation

Discussion

The results related to hope showed that individual cognitive-behavioral play therapy had an effect on increasing hope in the post-test stage, but this effect was not significant in the follow-up stage. The results of this study were in line with the those of Pearson [35], Scarponi [19] and Shojaei [6]. Regarding the effectiveness of play therapy in relation to hope, it can be stated that when children with cancer play children's games in which there are different imaginative roles during treatments such as chemotherapy and radiation therapy, the expression of negative states associated with the disease and the treatments happen both willingly and unwillingly. This cognitive and emotional expression can increase the level of hope for life and future in these children [6].

The present study also showed that individual cognitive-behavioral play therapy was effective on pain in all the three evaluation stages. The results of this study were in concord with the those of Mehrara et al. [36], Scarponi [19] and Shojaei [6]. The results of Mehrara et al. [36] indicated that cognitive-behavioral therapy games increased pain tolerance and reduced trait anxiety in children with cancer. With respect to the results of this section of the research, it can be said that painful and long-term treatments for cancer cause severe psychological problems such as anxiety and reduce the level of pain tolerance, especially in children [36].

The final result of the study also exhibited that individual cognitive-behavioral play therapy had an effect on adjustment in all the three evaluation

stages. The results of this part of the research were in accordance with the results of Pai et al. [11] and Zhang et al. [37]. The findings of Zhang et al.'s [37] research showed that cognitive play therapy promotes flexibility and reduces negative mood, resulting in a proper ability to adapt psychologically. Increasing positive emotions while playing seems to lead to greater adjustment in children with cancer [38].

Recent studies have shown that optimistic mood affects the immune function of cancer patients through the hypothalamic-pituitary-adrenal axis and the sympathetic neuro-adrenal axis, increasing the number of T lymphocytes and NK cells to promote their immunity [39]; this may be beneficial for immune function and prognosis in cancer patients [40]. In addition, improving negative mood and psychological resilience is beneficial in helping children with cancer cope with the symptoms of cancer with optimism and enhance their quality of life [41]. Therefore, good psychological adjustment helps to improve the physical and mental health of children with cancer after cognitive play therapy [37].

As observed in the present study, individual play therapy intervention was effective in improving pain response because language in these children, due to the lack of development of cognitive and linguistic abilities, is highly limited. To the extent that some believe that the use of verbal tools in therapeutic communication with children is not appropriate and instead of using verbal counseling and psychotherapy, play tools should be used to treat children's behavioral problems [30].

In this study, children performed a play or role-play individually with the equipment provided to them. In this type of play, children take on different types of life roles, occupations and professions, and activities, for example the role of father, mother, baby, nurse, doctor, patient, singer, police, teacher, student, salesman, buyer, driver, passenger, athlete, etc. Theatrical games or role-playing can be performed in silence, alone or with others, which in this study was done individually. Ultimately, play and role play is very effective in the development of children's cognition as it uses imagination, and the child's language skills are developed by talking about their activities. By gaining the ability to see life from the perspective of others, children's emotional development is enhanced. Therefore, it is possible that these targeted activities can improve the response to pain in these children.

Conclusion

Overall, the results of the study showed the effect of play therapy intervention on the research variables, but after two months and in the follow-up stage, there were no significant changes in the hope variable. One of the limitations of the present study is the lack of random selection of subjects in the first stage of the research and the use of a self-report questionnaire. It seems that in order for the research effect to last, there is a need to continue play therapy, and it cannot be expected that the state of hope to continue in the future with only a period of two months of play therapy. Accordingly, it is suggested that play therapy for children with cancer be considered in hospital programs.

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Conflict of interest

None declared.

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References

1. Nouraei Motlagh S, Heidari Orojlo P, Lotfi F, Mohammadshahi M, Shaarbafchi Zadeh N. Investigating the Relationship between Socioeconomic Factors and Incidence of Leukemia. *Payavard Salamat*. 2016; 10(2): 205-19. [In Persian]
2. Gaynor EP, Sullivan PB. Nutritional status and nutritional management in children with cancer. *Arch Dis Child*. 2015; 100(12): 1169-72.
3. McCaffrey CN. Major stressors and their effects on the well-being of children with cancer. *J Pediatr Nurs*. 2006; 21(1): 59-66.
4. Brinksma A, Sulkers E, IJpma I, Burgerhof JG, Tissing WJ. Eating and feeding problems in children with cancer: Prevalence, related factors, and consequences. *Clin Nutr*. 2020; 39(10): 3072-9.
5. Mogavero MP, Bruni O, DelRosso LM, Ferri R. Neurodevelopmental Consequences of Pediatric Cancer and Its Treatment: The Role of Sleep. *Brain Sci*. 2020; 10(7): 411.
6. Shojaei Z, Golparvar M, Bordbar MR, Aghaei A. The effect of cognitive-behavioral art-play therapy and cognitive-behavioral story therapy on pain perception and hope in children with cancer. *J Pediatr Nurs*. 2019; 6(1): 39-47. [In Persian]
7. Chester R, Jerosch-Herold C, Lewis J, Shepstone L. Psychological factors are associated with the outcome of physiotherapy for people with shoulder pain: a multicentre longitudinal cohort study. *Br J Sports Med*. 2018; 52(4): 269-75.
8. Matziou V, Vlachioti E, Megapanou E, Ntoumou A, Dionisakopoulou C, Dimitriou V, et al. Perceptions of children and their parents about the pain experienced during their hospitalization and its impact on parents' quality of life. *Jpn J Clin Oncol*. 2016; 46(9): 862-70.
9. Li P, Guo Y-J, Tang Q, Yang L. Effectiveness of nursing intervention for increasing hope in patients with cancer: a meta-analysis. *Rev Lat Am Enfermagem*. 2018; 26: e2937.
10. Satapathy S, Kaushal T, Bakhshi S, Chadda RK. Non-pharmacological interventions for pediatric cancer patients: A comparative review

and emerging needs in India. *Indian pediatr.* 2018; 55(3): 225-32.

11. Pai AL, Drotar D, Zebracki K, Moore M, Youngstrom E. A meta-analysis of the effects of psychological interventions in pediatric oncology on outcomes of psychological distress and adjustment. *J Pediatr Psychol.* 2006; 31(9): 978-88.

12. Germann JN, Leonard D, Stuenzi TJ, Pop RB, Stewart SM, Leavey PJ. Hoping is coping: A guiding theoretical framework for promoting coping and adjustment following pediatric cancer diagnosis. *J Pediatr Psychol.* 2015; 40(9): 846-55.

13. Lira ACM, Mate CH. Jogos e brincadeiras nas práticas pedagógicas na educação infantil: entre o dito e o escrito. *Currículo sem Fronteiras.* 2013; 13(1): 5-19.

14. Monteiro LS, Correa VAC. Reflexões sobre o brincar, a brinquedoteca e o processo de hospitalização. *Rev para med.* 2012; 26(3).

15. Lima KYNd, Santos VEP. Play as a care strategy for children with cancer. *Rev Gaucha Enferm.* 2015; 36(2): 76-81.

16. Sadruddin MM, Hameed-ur-Rehman M. Understanding the perceptions of children battling cancer about self and others through drawing. *South Asian J Cancer.* 2013; 2(3): 113-8.

17. Farrokhnia M, Shahidi S, Fathabadi J. The impact of cognitive interventions in reducing intensity of pain and distress, and improving situation-related quality of life of children with cancer. *Basic & Clinical Cancer Research.* 2013; 5(3): 16-22.

18. Paice J, Nainis N, Ratner J, Wirth J, Lai J. Relieving symptoms in cancer: Innovative use of expressive art therapy. *J Pain.* 2005; 6(3): S59.

19. Scarponi D. Play therapy to control pain and suffering in paediatric oncology. *Front Pediatr.* 2016; 4: 132.

20. Jansen MF, Santos RMd, Favero L. Benefits from the use of toys during nursing care delivered to hospitalized children. *Rev Gaucha Enferm.* 2010; 31(2): 247-53.

21. Cunha GL, Silva LF. Lúdico como recurso para o cuidado de enfermagem pediátrica na punção venosa. *Rev Rence.* 2012; 13(5):1056-65.

22. Burns-Nader S, Hernandez-Reif M. Facilitating play for hospitalized children through child life services. *Child Health Care.* 2016; 45(1): 1-21.

23. Li WH, Chung JO, Ho EK. The effectiveness of therapeutic play, using virtual reality computer games, in promoting the psychological well-being of children hospitalised with cancer. *J Clin Nurs.* 2011; 20(15-16): 2135-43.

24. Wikström B-M. Communicating via expressive arts: the natural medium of self-expression for hospitalized children. *Pediatr Nurs.* 2005; 31(6):480-485.

25. Koukourikos K, Tzeha L, Pantelidou P, Tsaloglidou A. The importance of play during hospitalization of children. *Mater Sociomed.* 2015; 27(6): 438-41.

26. Li WH, Chung JOK, Ho KY, Kwok BMC. Play interventions to reduce anxiety and negative emotions in hospitalized children. *BMC pediatrics.* 2016; 16(1): 1-9.

27. Silva SGTd, Santos MA, Floriano CMdF, Damião EBC, Campos FVd, Rossato LM. Influence of Therapeutic Play on the anxiety of hospitalized school-age children: Clinical trial. *Rev Bras Enferm.* 2017; 70(6): 1244-9.

28. Schleisman A, Mahon E. Creative play: A nursing intervention for children and adults with cancer. *Clin J Oncol Nurs.* 2018; 22(2): 137-40.

29. Ebrahimi E, Mirzaie H, Borujeni MS, Zahed G, Baghban AA, Mirzakhani N. The Effect of Filial Therapy on Depressive Symptoms of Children with Cancer and Their Mother's Depression, Anxiety, and Stress: A Randomized Controlled Trial. *Asian Pac J Cancer Prev.* 2019; 20(10): 2935-41.

30. Asghari Nekah SM, Kamali F, Jansouz F. The effects of structured cognitive-behavioral group play therapy on anxiety and depression in children with cancer: a pilot study. *Evid Base Care.* 2015; 5(3): 39-50. [In Persian]

31. Snyder CR, Hoza B, Pelham WE, Rapoff M, Ware L, Danovsky M, et al. The development and validation of the Children's Hope Scale. *J Pediatr Psychol.* 1997; 22(3): 399-421.

32. Nejati V, Esmailian N, Amani O. Psychometric properties and factor structure of children and adolescents' hopelessness scale. *Journal of Thought & Behavior in Clinical Psychology.* 2015; 9(34): 67-76. [In Persian]

33. Ghadampour E, Amirian L, Radpour F. The Effect of Group Painting Therapy on Loneliness, Control of Anger, and Social Adjustment of Primary School Students. *J Child Ment Health.* 2019; 6(2): 119-31. [In Persian]

34. Walker LS, Smith CA, Garber J, Van Slyke DA. Development and validation of the pain response inventory for children. *Psychol Assess*. 1997; 9(4): 392-405.
35. Pearson BL. Effects of a cognitive behavioral play intervention on children's hope and school adjustment [dissertation]. Ohio, Cleveland: Case Western Reserve University. 2008.
36. Mehrara M, Ghaffari Z, Ghezelghabr RM, Ghavasi F, Fatemizadeh M. The Effectiveness of Cognitive-Behavioral Play Therapy on Pain Tolerance and Trait-State Anxiety Among Children with leukemia cancer in Isfahan City. *J Appl Behav Sci*. 2018; 5(2): 22-7.
37. Zhang P, Mo L, Torres J, Huang X. Effects of cognitive behavioral therapy on psychological adjustment in Chinese pediatric cancer patients receiving chemotherapy: A randomized trial. *Medicine*. 2019; 98(27): e16319.
38. Chari U, Hirisave U, Appaji L. Exploring play therapy in pediatric oncology: a preliminary endeavour. *Indian J Pediatr*. 2013; 80(4): 303-8.
39. Yan Q. Biological Rhythms and the HPA axis in psychoneuroimmunology. In *Psychoneuroimmunology*. 1st ed. New York: springer international pub; 2016: 19-26.
40. Lutgendorf SK, Andersen BL. Biobehavioral approaches to cancer progression and survival: Mechanisms and interventions. *Am Psychol*. 2015; 70(2): 186-97.
41. Rosenberg AR, Bradford MC, Barton KS, Etsekson N, McCauley E, Curtis JR, et al. Hope and benefit finding: Results from the PRISM randomized controlled trial. *Pediatr blood cancer*. 2019; 66(1): e27485.