Original Research

Evaluating The Effectiveness of Painting Therapy and Music Therapy on Sleep Quality, Pain Severity and Behavioral Disorders of Children with Cancer

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Abstract:

Background: This study aims at investigating the effect of music therapy and painting therapy on pain severity, sleep quality and behavioral disorders of children with cancer.

Method: The research method is experimental and quasi-experimental with two experimental groups A and B and control group and was performed in two time periods of pre-test and post-test. The statistical population consisted of all children aged 5-12 years suffered from cancer and the sample included 30 children with cancer in Omid Hospital in Isfahan selected by convenience sampling method and were randomly separated in three groups. Data collection tools in this study included Wong-Baker faces pain rating scale, Owens children's sleep habit questionnaire (2000) and Quay and Peterson's revised Behavior Problem Checklist (RBPC). The data obtained from the questionnaires were analyzed in two pre-test and post-test intervals using SPSS-24 software. The results of Wilcoxon test showed that art therapy by two methods of music therapy and painting therapy has a negative effect on pain severity in children with cancer.

Results: The results of the paired sample t-test showed that art therapy by two methods of painting therapy and music therapy is effective on sleep quality of children with cancer. The results of the paired sample t-test showed that art therapy by two methods of music therapy and painting therapy is effective on behavioral disorders in children with cancer.

Conclusion:

As a result, since the complications of diagnosis and invasive drug treatments for children with cancer are very stressful, applying *non-pharmacological* approaches appropriate to the capacity of children, including music therapy and art therapy are useful in reducing their physical and psychological problems.

Keywords: Cancer, Painting Therapy, Music Therapy, Pain Severity, Sleep Quality, Behavioral Disorders, Children With Cancer

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Introduction

Humans have involved in various diseases, including cancer, since the time of written history (1). Cancer is a disease through which cells lose their ability to divide and grow normally and this leads to destroy healthy tissues (2). After accidents and unintentional deaths, cancer is the second cause of death of children aged 1 to 14 in the United States (3) and in developed and developing countries. This disease is the second leading cause of death of children under 14 years-old in Iran and accounts for about 40% of deaths of children under 5 years-old and 13% of children aged 5 to 10 years (4).

Experiencing cancer and related therapies causes serious psychological problems and affected children experience physical and emotional distress during encountering with the disease (5). These children face many problems, including decreased self-esteem and self-confidence and increased negative emotions (6). Several studies have shown that even children with relatively good situation are well aware of the deterioration of the disease and may expect early death. This encountering with death, in turn, can arouse inevitable anxiety responses in the individual (7).

Theoretical foundations of research

Cancer

Cancer is characterized by multiple and chronic stressors such as: diagnosis, severity of disease, prognosis, invasive treatment, physical abnormalities, side effects of treatment, delayed medical and psychological effects, and the risk of recurrence of cancer (8). Lack of controlling these complications intensifies the negative effects on the quality of life of these patients. The life quality of the sick child is endangered as a result of the pain caused by the disease itself and invasive methods as well as reduced energy to enjoy normal daily activities, and treatment methods cause the child to be constantly exhausted and sick (9).

Sleep problems are one of the most important factors that negatively affect the quality of life and even the survival of cancer patients (10). Sleep can preserve the activity of some immune system cells that are important in fighting cancer. Evidence shows that the activity of natural killer cells decreases with sleep deprivation. Sleep is probably important for the immune system to fight tumor cells (11). Sleep disorders in these children start with a variety of causes, mostly as a direct result of brain complications from brain radiotherapy or indirectly as a result of chemotherapy. Stress caused by cancer itself is one of the reasons of sleep disorders in children with cancer. (11).

Pain as one of the most worrying experiences of cancer patients and their families can cause sadness, frustration and feelings of loss of control, emotional distress and reduced quality of life. This pain is highly prevalent in these patients so that 33% after treatment, 59% during treatment, 64% with advanced and metastatic disease, and 53% was reported for all patients (1).

Pain and chronic fatigue in these patients is one of the results of cancer and also the side effects of *pharmacological* treatments that can affect sleep. Therefore, rapid and timely examination, determination and diagnosis of sleep problems during cancer treatment methods, including chemotherapy, is very important and necessary because these problems directly affect the ability of patients to continue treatment programs, complete treatment, recovery and ultimately maintain a good quality of life (12).

Pain is one of the most important symptoms in terms of frequency and a discomfort factor in cancer patients. Controlling and reducing pain in these patients is one of the most important aspects of palliative care, which is important both clinically and morally (13), because pain is always associated with negative emotional states such as depression, anxiety, anger, aggression (14).

Pain caused by cancer is psychologically important from two dimensions. First, chronic

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pain causes new mental distress and exacerbates previous illnesses. On the other hand, methods such as hypnotherapy, relaxation and attention restoration are part of a comprehensive approach to pain management in cancer patients (ibid.).

The results of a review of studies on the prevalence of chronic pain indicate that the most prevalent chronic pain in children are: Headache 8-83%, abdominal pain 4-53%, backache14-24%, musculoskeletal pain 4-40%, multiple pain 4-49% and other chronic pain 5-88% (15). When children experience pain, the stress hormones released in their bodies increase their heart rate and blood pressure, weaken their immune system, delay their recovery (16), disrupt sleep cycle and the high energy required for growth and recovery is spent on coping with pain (17).

Other consequences of diagnosing this disease can include anger, rage, depression, loneliness, emptiness, meaninglessness, jealousy, malice, and the like (18). Cancers change the course of a person's life, cause many problems in all physical, psychological, social, economic and family dimensions (19) and increase dependence, decrease self-confidence, increase vulnerability, confusion, pain, physical symptoms and disturbed thoughts in patients and disrupt daily functionalities, social activities and mental serenity (20). Children with cancer are very vulnerable in terms of mental health and behavioral problems. These children are more likely than other children to suffer from depression and anxiety, social isolation, peer conflict and antisocial behaviors (11). The prevalence of behavioral disorders in children with cancer differs from the claimed proportion in children. According to the results of the Rutter child behavioral disorder questionnaire and child mental health checklist, it can be said that a group of behavioral disorders such as anxiety and depression are more prevalent in children with cancer. This means that the prevalence of behavioral disorders in children with cancer is higher than in children without cancer.

Pain is the most common cause in cancer patients, which affects their function and quality of life. Cancer pain may be due to pathology, disease progression, cancerous growth, or diagnostic and therapeutic methods. The severity of the pain increases as the disease progresses. Chronic cancer pain is considered as one of the major problems for this group of patients and so far various methods have been introduced to reduce and relieve pain caused by malignancies. Despite progresses in pain relief techniques, many cancer patients are experiencing severe pain. It has been reported that one in two cancer patients face with difficulty in relieving pain (21). On average, 70% of the time, cancer pain is not relieved enough. Real pain is stressful and affects the patient's lifestyle, satisfaction and comfort and causes suffering and discomfort, loss of control, fatigue and disrupted quality of life, sexual activity, personal relationships, meaning of life, person’s function, sleep and daily activities. Therefore, identification and relieving the cancer pain in early stages is necessary. In this vein, it is important that the barriers to effective pain relief are identified and addressed with appropriate measures. The results of research by Amy, Madson, Michael, Emanuel (2010) showed that music therapy in the elderly with chronic pain reduces their perception of pain (22).

Given that stress as an adaptive reaction to external factors can have many physical, behavioral, cognitive and psychological consequences for each person and increase the risk and progression of cancer cells and reduce the survival of cancer patients, therefore, reducing stress should be a priority in the treatment of these patients. Suffering cancer in childhood can endanger the mental health of an affected child. Children face with painful side effects of cancer treatment and due to their desease, they cannot participate in school or friendly and family gatherings as before; so

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their lives change a lot. Cancer treatments methods cause the child to be constantly fatigue. These children are also prone to infections and are constantly hospitalized, leading to the child's isolation from family and community. Accordingly, the level of happiness that is a prominent feature of childhood decreases in these children; this is while happiness and vitality makes the treatment conditions more successful and increases the life expectancy in these people. Therefore, it is necessary to increase the quality of life in adolescents with leukemia by creating vitality and happiness. Research has shown that music is one of the favorite entertainments of teenagers and can improve their mood. Also, the results of research by Siegel et al. (2011) showed that music therapy increases the quality of life of people with irritable bowel syndrome. Music improves physical, mental and cognitive problems in patients and is introduced and used as a suitable and effective intervention in various wards, especially in public and psychiatric hospitals (17).

In general, depending on the type of activity of the client, there are two types of music therapy: active and passive. Active music therapy involves singing, playing or composing and passive music therapy involves listening to music (23). The central nervous system (brain) is designed in such a way to respond positively and appropriately to musical stimuli and facilitate the use of this treatment method. Given that pain is one of the most common phenomena that forces people to seek help from care, health and treatment systems and affects various aspects of one's life not only through the stress and discomfort it has caused but also due to other stressful consequences for the person in pain, such as medical costs and occupational and family consequences (24). Numerous studies in other communities have shown that music therapy can be effective in stabilizing the patient's vital signs and reducing perceived stress.

Based on the abovementioned, after saving the patient's life, pain relief is considered as one of the most important medical priorities and many efforts have been made to control pain; therefore, one of the methods to reduce the pain severity and promote mental health and psychological characteristics in adolescents can be music therapy.

Given that adolescents with leukemia suffer from emotional stress, severe pain from chemotherapy, treatment methods and stress, it is important to find ways to reduce the pain. Most medical care focuses on treatment care related to the disease and sometimes the patient's pain and mental stress are forgotten. The main purpose of this study was to evaluate the effectiveness of music therapy on reducing pain severity, perceived stress and increasing happiness in adolescents with leukemia; therefore, the present study seeks to answer the question of whether music therapy has an effect on reducing pain severity, perceived stress and increasing happiness in adolescents with leukemia in Ahvaz.

Methods and material

The present study is an applied and semi-experimental research in terms of purpose and method, respectively, which was conducted with three experimental group a, experimental group B, and control group. The statistical population included all children aged 5-12 years with cancer in 2018-2019 whose cancer was confirmed by a physician and were treated at Omid Hospital in Isfahan. The sample size of the study for the experimental and control group were 30 children with cancer who were selected from the children under treatment by convenience sampling method and then were separated as follows: 10 people in experimental group A, 10 people in experimental group B and 10 people in the control group. One experimental group participated in music therapy sessions, and the other experimental group participated in painting therapy sessions. The control group did not participate in any of

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the sessions until the end of the study, and after the end of the study, in order to prevent feelings of discrimination, they participated in their favorite sessions.

Research tools:

The research tools included: Wang-Baker faces pain rating scale, Owens children's sleep habit questionnaire (2000) and Quay and Peterson's revised Behavior Problem Checklist (RBPC) which were performed on experimental and control groups in pre-test and post-test stages.

Wong-Baker faces pain rating scale

For children, pain measurement scales using faces are commonly used. A child describes the amount of his pain by describing different faces with different expressions. The child chooses a face that feels most compatible with their current level of pain.



Owens children's sleep habit questionnaire (2000)

This questionnaire was developed by Owens, Spirito et al. (2000) in 45 items to assess the quality and sleep habits of children, which is completed by parents. This questionnaire was designed for children 4 to 12 years old by Owens et al. (2000). Owens et al. (2000) conceptually grouped items into eight subscales: 1) bedtime resistance, 2) sleep onset delay of, 3) sleep duration, 4) sleep anxiety, and 5) night waking, 6) parasomnia, 7) Sleep disordered breathing, 8) daytime sleepiness. The questionnaire is scored in the form of a five-point Likert scale. This questionnaire consists of 45 questions, some of which have only diagnostic and therapeutic value and not research value. Therefore, in its scoring, only 33 questions are considered. Each item has a value between1-3 (rarely to usually) and with the exception of items (24, 11, 10, 3, 2, 1) which are scored conversely, the score range is between33-99. The score of each subscale is obtained from the sum of the mentioned questions. The minimum and maximum score of bedtime resistance component (1, 3, 4, 5, 6, 8) is respectively 6 and 8. The minimum and maximum score of sleep onset delay component (2) is respectively 1 and 3. The minimum and maximum score of sleep duration component (9, 10, 11) is respectively 3 and 9. The minimum and maximum score of sleep anxiety component (5, 7, 8, 21) is respectively 4 and 12. The minimum and maximum score of night waking component (16,25,23) is respectively 3 an 9. The minimum and maximum score of parasomnia component (12, 13, 14, 15, 17, 22, 26) is respectively 7 and 21. The minimum and maximum score of Sleep disordered breathing component (18, 19, 20) is respectively 3 and 9. The minimum and maximum score of daytime sleepiness (24, 27, 28, 29, 30, 31, 32, 33) is respectively 8 and 24. The total score of sleep problems is the sum of the scores of all subscales and the score of each subscale is the sum of the scores of the items related to that component. Higher scores on the sleep habits questionnaire mean more sleep problems. The internal consistency (Cronbach's alpha) estimation for the subscales was 0.70 in a (non-clinical) sample of children aged 4 to 10 years. Validity estimation through test-retest method at two-weeks interval was in the range of 0.62 to 0.79. In Iran, the validity of the instrument was assessed in terms of content validity method in the research of Shoghi, Khanjari, Farmani and Hosseini (2005) and its validity by a two-week test-retest method for 10 children aged 11-11 years was determined 0.97. Cronbach's alpha coefficient of the questionnaire was obtained 0.77 and 0.79 in two studies (Atrifard M, Zahiredin A, Dibaei Sh, Zahed Gh, 2014) (31).

Quay and Peterson's revised Behavior Problem Checklist (RBPC)

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This checklist was prepared by Quay and Peterson (1987) to rate the behavioral problems of children and adolescents aged five to 18 years, with six subscales of conduct disorder (22 items), socialized aggression (17 items), attention problems-immaturity (16 items), Anxiety-withdrawal (11 items), psychotic behavior (6 items) and motor excess (5 items) and include 89 items. To score this questionnaire, three scores of zero, one and two are used. The score of 2 is given to behavioral problems that are seen as acute, 1 is given to problems that are not seen as acute, and zero is given to the absence of behavioral problems. The highest score obtained for each subtest is twice the number of items of that subtest and the lowest score for each subtest is zero. The amplitude of individual problems varies from zero to 178 (26). In Iran, this questionnaire has been translated and standardized by Shahim, Yousefi and Ghanbari Mazidi (2007). The validity of the checklist by correlating the items with the total score, factor analysis and correlating the scores of the checklist with the Rutter Child Behavior Questionnaire was 88%. Factor analysis with principal components and then varimax rotation resulted in extraction of four factors with eigenvalue more than one, which are: conduct disorder, attention problems -immaturity, socialized aggression and anxiety-withdrawal. Reliability coefficients in a four-week test-retest interval were obtained as follows: conduct disorder (90% items), attention problems -immaturity (85%), socialized aggression (78%) and anxiety-withdrawal (85%).

Result

Patients ranged in age from 5 to 12 years, and by gender, the number of boys was 6 and the number of girls was 4 in the music therapy group. In the painting therapy group, the number of boys was 4 and the number of girls was 6. In the control group, the number of boys was 7 and the number of girls was 3. Information on gender and age is given in Tables 1 and 2.

Table 3 provides the descriptive information on pain severity variable. Since the pain severity variable is measured with ordinal indicator, so the mode and median is used to describe it. The mode and median of pain severity in the pre-test group of music therapy and painting therapy are 7, 7, 6 and 6, respectively, and in the post-test group are 2, 3, 2 and 2, which shows after music therapy and painting therapy intervention, pain severity has decreased. But the mode and median of the control group did not change during the pre-test and post-test.

Table 4 provides descriptive information on sleep quality variable. The mean of sleep disorders in the pre-test group of music therapy and painting therapy were 2.13 and 2.07, respectively, and in the post-test group they were 1.77 and 1.83, and the mean of sleep disorders decreased after music therapy and painting therapy interventions. But the mean sleep disorders of the control group at post-test were higher than pre-test.

Table 5 provides descriptive information on the behavioral disorders variable. The mean behavioral disorders in the pre-test group of music therapy and painting therapy were 2.27 and 2.36, respectively, and in the post-test group they were 1.28 and 1.65, and the mean behavioral disorders decreased after music therapy and painting therapy interventions. However, the mean of these disorders in the control group at post-test is approximately equal to the pre-test.

According to Table 6, determination of the direction of difference in the Wilcoxon test is determined from the subtitles of the table. In both experimental art therapy groups, the negative rating is higher than the positive rating, so the difference direction will be diagnosed based on subtitle a, and in both experimental groups, the intensity of pain in pre-test is greater than the intensity of pain in post-test. It is also observed that the mean rating in the experimental group of music

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Table 1: Frequency distribution of subjects in experimental and control groups by gender

group	music therapy experimental group		Painting therapy experimental group		Control group		total	
gender	Frequency	Percentage frequency	Frequency	Percentage frequency	Frequency	Percentage frequency	Frequency	Percentage frequency
boy	6	20.0	4	13.33	7	23.33	17	56.66
girl	4	13.33	6	20.0	3	10.0	13	43.33
total	10	33.33	10	33.33	10	33.33	30	100.0

Table 2: Frequency distribution of subjects in experimental and control groups by age

group	music therapy experimental group		Painting therapy experimental group		Control group		total	
age	Frequency	Percentage frequency	Frequency	Percentage frequency	Frequency	Percentage frequency	Frequency	Percentage frequency
5-8 years old	4	13.33	2	6.67	2	6.67	8	26.65
8-12 years old	4	13.33	4	13.33	5	16.67	13	43.33
10-12 year old	2	6.67	4	13.33	3	10.0	9	30.0
total	10	33.33	10	33.33	10	33.33	30	100.0

therapy (5.90) is higher than the experimental group of painting therapy (5.00). In other words, music therapy has been able to reduce the severity of pain in children with cancer to a greater extent than painting therapy.

According to Table 7, the mean variable in the experimental groups in the post-test is less than the pre-test, which means that sleep disorders have decreased after the intervention, and this decrease is greater in the music-therapy group than the painting therapy group. In the control group, it can be observed that the mean sleep quality did not change much in the pre-test and post-test.

According to Table 8, the mean variable in the experimental groups in the post-test is less than the pre-test, which means that behavioral disorders have decreased after the intervention, and this decrease is greater in the music-therapy group than the painting therapy group. In the control group, it can be observed that the mean behavioral disorders did not change much in the pre-test and post-test.

Discussion

The results of this study showed that there was a significant difference in pain severity in pre-test and post-test in the experimental groups of music therapy and painting therapy. It was also observed that the average rate in the experimental group of music therapy (5.90) is higher than the experimental group of painting therapy (5.00). In other words, music therapy has been able to reduce the severity of pain in children with cancer to a greater extent than painting therapy.

Conclusion of tagharrob (2010)(28) entitled "Analytical study on the role of art therapy in the process of cancer treatment in children" that painting therapy, theater therapy and music

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Table 3: Descriptive statistics of pain severity variable

pain severity variable	music therapy experimental group		Painting therapy experimental group		Control group	
	mode	median	mode	median	mode	median
Pre test	7	7	6	6	2	4
Post test	2	3	2	2	2	4

Table 4: Descriptive statistics of sleep quality variable

sleep quality variable	music therapy experimental group		Painting therapy experimental group		Control group	
	Mean [a]	Standard deviation	Mean [a]	Standard deviation	Mean [a]	Standard deviation
Pre test	2.13	0.38	2.07	0.39	1.66	0.18
Post test	1.77	0.27	1.83	0.25	1.71	0.29

Mean cutoff point= 1.5[a]

Table 5: Descriptive statistics of behavioral disorders variable

behavioral disorders variable	music therapy experimental group		Painting therapy experimental group		Control group	
	Mean [a]	Standard deviation	Mean [a]	Standard deviation	Mean [a]	Standard deviation
Pre test	2.27	0.22	2.36	0.33	2.30	0.18
Post test	1.28	0.13	1.65	0.11	2.29	0.18

Mean cutoff point= 1.5[a]

therapy reduce pain in children with cancer aged 4 to 12 years is consistent with the results of the present study.

Many studies have been done on the effect of music. A quasi-experimental study by Larsen Beck at the University of Utah, the United States on people of different ages showed that music reduces pain. In a qualitative grounded theory study conducted by McCaffrey and Jane (2011) (23), the effects of using music in cancer wards were observed. Patients presented different reasons and results for using music and its effects, which were related to age, gender and frequency of music use, but all of them described it as a pleasant and satisfying experience.

Also, the researches of Yousefi Nejad et al. (2005)(25) on the effect of music on chronic cancer pain and Hosseini (2009)(29) on the effect of music on reducing nausea and vomiting caused by chemotherapy in children with malignant tumor are in line with the present results.

In explaining this result, it can be said that one of the behavioral methods is music therapy, which increases both the stimulation threshold and the pain threshold. Listening to favorite music causes muscle relaxation, distraction from pain and reduces pain severity by reducing the sending of pain messages to the central nervous system. Music reduces the need for medicine in patients and has positive effects on anxiety, depression and pain severity. Therefore, the presence of sound may reduce pain due to the distraction of thought, which is caused by focusing on music. Using art therapy to relieve pain is one of the non-invasive, low-cost and safe measures that can be applied in any age group and those who have more experience listening to music or drawing paint more benefit from it (25).

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Table 6: Wilcoxon test to compare means of pretest-posttest pain severity in experimental and control groups

groups	Negative rating	Positive rating	Mean score	Z test	sig
music therapy	10a	0b	5.90	2.816-	0.005
painting therapy	9a	0b	5.00	2.724-	0.006
control	6a	1b	3.50	1.228-	0.219

a. Post-test pain severity >Pre-test pain severity
b. Post-test pain severity <Pre-test pain severity

Table 7: Descriptive statistics of sleep quality variable in pre-test and post-test time periods

group	Time period	mean	frequency	Standard deviation
music therapy	pre-test	2.13	10	0.384
	post-test	1.77	10	0.271
painting therapy	pre-test	2.11	10	0.367
	post-test	1.83	10	0.249
control	pre-test	1.89	10	0.203
	post-test	1.78	10	0.286

Table 8: Descriptive statistics of behavioral disorders variable in two time periods of pre-test and post-test

group	Time period	mean	frequency	Standard deviation
music therapy	pre-test	2.268	10	0.218
	post-test	1.275	10	0.127
painting therapy	pre-test	2.356	10	0.328
	post-test	1.650	10	0.110
control	pre-test	2.297	10	0.183
	post-test	2.293	10	0.178

The results also showed that sleep disorders in the pre-test group of music therapy were more than the post-test. So music therapy has improved the quality of sleep in children with cancer. In the painting therapy group, sleep disorders in the pre-test were more the post-test. So painting therapy has improved the quality of sleep in children with cancer. But in the sleep quality control group, there is no significant difference between pre-test and post-test.

The present results are in line with the findings of Frie (2007)(7), Siegel, (2010)(20) on the effect of painting therapy on sleep quality. Shapiro et al (2006)(21). Also examined the effect of music on improving sleep quality and relaxation of 28 cancer patients and described the results as follows: Listening to relaxing music before going to bed regulates the heart rate and increases the parasympathetic cycle, thereby relieving muscle tension and ensuring quality sleep. This study is consistent with the result of the above hypothesis. Another research by Zeidan et al (2010)(19) entitled "Music Improves Students' Sleep Quality" yielded consistent results. Sleep quality is an important factor in quality of life. Sleep is a window into each person's social, family and emotional functioning. Nervous mental problems can cause sleep disorders and disrupt sleep and waking regulation. Sleep disorders can also be the result of fatigue, depression, or

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problems with daily activities. Treatment of sleep problems eliminates many of the cognitive and behavioral problems caused by sleep deprivation.

The results of the sample paired t-test showed that behavioral disorders in the music therapy group in pre-test were more than the post-test. So music therapy has reduced behavioral disorders in children with cancer. In the painting therapy group, behavioral disorders in painting therapy group in pre-test were more than the post-test. So painting therapy has reduced behavioral disorders in children with cancer. But in the control group, behavioral disorders in the pre-test and post-test in the control group are not significantly different. According to the explanations provided, the research hypothesis on the effectiveness of art therapy with two methods of painting therapy and music therapy on behavioral disorders in children with cancer was confirmed.

McCaffrey, Triona nda Edwards (2011)(23) and Breitbart et al (2006)(8) in their research aimed at investigating the effect of music therapy on conduct disorders in children and Siegel, R. D. (2011)(3) in their research aimed at investigating painting therapy on improvement of conduct disorder achieved similar results to the present study.

Most interventions related to children with behavioral disorders are aimed at developing communication skills, appropriate social interaction with parents and peers, developing social skills, and giving responses appropriate to the developmental level. In general, programs for children with behavioral disorders emphasize the development of educational skills, increased self-awareness, growth of self-esteem, and sense of control on the environment, self-control, strengthening self-confidence, psychological refinement and increased impulse control. In this regard, group art therapy provides the opportunity to be in a friendly group, which leads to the experience of emotional growth. Also, children who are afraid that their hostile feelings will be unacceptable will find the group in a better position than two-person treatment situations. In this way, art therapy reduces conflicts and increases social skills. Also, since music therapy and painting therapy are flexible and different groups of children with different talents and abilities use and enjoy it, they strengthen their self-confidence and causes expression of more appropriate social behaviors.

Shapiro, S. L., et al (2006)(21) and Tagharrob (2010)(28) studies on the effectiveness of music therapy on improving children's attention problems, and Siegel, R, et al (2011)(20) on the effect of painting therapy on improving attention problems of children are in line with the results of the present study.

Music nurtures the ability to understand the beauties of the environment and life and the ability to communicate and collaborate with others, and these abilities can reduce students' depression by transferring to everyday life. On the other hand, music has always played a calming, cheerful, vital, sympathy and captivation role in human life. It reduces heart rate and deepens breathing and has positive effects on anxiety. In the present study, active participation of children in learning and performing music pieces, rhythmic games and improvisational musical activities affected children in a different ways including arousing their emotions and feelings in pleasant and imaginative situation and created the appropriate conditions for the projecting emotions, including children's anxiety. Also, a positive and safe relationship with musical environment and atmosphere and the pleasure that children get from their activities were indirectly effective in reducing their concerns and anxieties.

On the other hand, painting, which has a refining action, helps to act out the tensions that exist in the child for various reasons. In this way, children can represent themselves creatively and reduce their feelings of anger, fear and other negative emotions.

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Children's behavioral problems have undesirable effects on interpersonal behaviors and unfavorable effects on internal and mental states of people. There are different methods for treating it including art therapy which is performed in various ways such painting therapy and music therapy. The basic premise is that expressing emotion through art has a healing effect. Painting is an attractive and privileged means of expressing emotion that can have a significant impact on the intelligence development, increase capabilities and the growth of creative vigor.

Since musical communication is a form of non-verbal communication, music can be an effective means of making initial contact with children who are emotionally damaged or have behavioral problems. Activities related to playing the instrument, moving with the music and composing the song allow them to express their feelings and turn undesirable motivations into socially acceptable behaviors. The mild desire and propensity for group activities that is inherent in music can motivate shy and dissociable people to communicate with others. Musical group activities and dance and painting therapy are effective for developing non-verbal collaborations and communication. Group singing, talking about music and composing songs, as well as exchanging drawing materials and talking about the drawn paint are used to facilitate the means of expression and verbal relations. Strengthening imitation skills and increasing behavioral tasks are often the result of group playing instrument, motor-activity, and reading activities. Successful participation in music groups and acquisition of instrument playing skills also boosts self-esteem motivation and leads to strong self-confidence.

Conclusion

The present study showed that music and painting as a non-pharmacological and non-invasive method can be used to reduce the complications of cancer diagnosis and treatment, including sleep problems, pain and behavioral problems. Therefore, due to the effectiveness of this method, it is recommended to adopt a therapeutic approach that is a combination of pharmaceutical and art therapy methods for children with cancer.

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