

The Effects of Sandplay Therapy on Anxiety and Sleep Habits of Children with Cancer Undergoing Chemotherapy: A Quasi-Experimental Study

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Abstract

Background: Chemotherapy, as one of the most important treatments for cancer, may lead to complications such as anxiety and changes in children's sleeping habits. The present study aimed to evaluate the effectiveness of sand play therapy in improving anxiety and sleep habits of children with leukemia undergoing chemotherapy.

Methods: This quasi-experimental study was conducted on 80 children with leukemia undergoing chemotherapy. The participants were randomly assigned into a control group and an intervention group admitted to Abi Talib (AS) Hospital in Zahedan, southeast Iran, in 2020. Data collection tools included a demographic information questionnaire and the Revised Children's Manifest Anxiety Scale (RCMAS), and Children's Sleep Habits Questionnaire (CSHQ). The questionnaires were completed by the primary caregivers of the children, before and one week after the end of the intervention. Data analyses were performed through SPSS26 software, using independent-t, paired-t, and chi-square tests. The significance level in this study was set at (0.05).

Results: Mean age of the children was 9.35 ± 1.44 years in the intervention group and 9.48 ± 1.57 years in the control group. Based on the results, sandplay therapy significantly reduced anxiety and poor sleep habits in the intervention group ($P < 0.001$).

Conclusion: The findings showed that sandplay therapy can be used as a non-pharmacological and effective treatment method to reduce the complications caused by chemotherapy in children with cancer.

Key Words: Anxiety, Children with Cancer, Sandplay Therapy, Sleep Habits.

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1- INTRODUCTION

One of the diseases that can seriously endanger children's physical and mental health is cancer (1). Pediatric cancer refers to cancers that occur in children under 15 years of age (2). Studies have shown that cancer is the main cause of death in children in many regions of the world; and the number of children with cancer is currently increasing (3). In Europe and America, cancer is the main cause of death in children aged 5-14, affecting about 129 children per million (4). Besides, 4% of Iranian children aged less than 5 years and 13% of the children aged 5-15 years die due to cancer (5). The overall incidence of cancer in Iran is approximately 91 per 100,000 people (6). According to a study conducted on a group of teenagers with cancer, 59% of the patients believed that the side effects of chemotherapy are more painful and worse than cancer itself (7). Chemotherapy is an important treatment method for cancer, but it causes various side effects such as nausea and vomiting, fatigue, alopecia, infection, stomatitis, nutritional disorders, and mental and psychological problems including anxiety and depression, increasing the patient's hospitalization costs (8). Cancer is a stressful experience which, together with side effects caused by chemotherapy, can lead to treatment abandonment in children. All of these problems steadily reduce the patient's quality of life and may even endanger their life (9). Long-term, aggressive, and painful treatment for cancer can worsen the severity of the child's problems (10). Studies have shown that about 50 to 80% of children with cancer also suffer from a psychiatric and mental disorder (10). If cancer patients perceive this disease as a serious threat to their life, they become very anxious, and anxiety gradually becomes a serious clinical problem because the meaning behind events is a vital factor in making people anxious (11). Research has shown

that although the psychological distress in patient's decreases over time, 20 to 30% of them always go through elevated levels of anxiety during the follow-up treatment period (12). Thus, paying attention to anxiety reduction techniques can significantly affect the quality and quantity of life in patients with cancer.

Moreover, studies have shown that physical diseases can disrupt sleep habits and disrupt alertness. Sleep can also co-occur with physical diseases. It can be argued that almost any physical disease that has significant pain and discomfort or is caused by a metabolic disorder can negatively affect both the quality and quantity of sleep (13). Since more than half of cancer patients have sleep disorders, it is essential to pay serious attention to sleep habits in controlling cancer complications. There are two pharmacological and non-pharmacological methods to reduce the psychological problems of children with cancer (13). Non-pharmacological treatments are currently applied and tested along with pharmacological treatments (14). Play therapy is one of the important non-pharmacological approaches in improving children's behavioral disorders (15). Among various therapeutic games, sandplay therapy was used as the treatment method in this study. Sandplay is a special form of play therapy, first introduced in the 1920s and revived at the end of this decade (14). The term sandplay was first coined by Dora Kalff, who chose the term to distinguish her method from that of Margaret Lowenfeld. Her method, which is derived from Jung's theory, includes dolls and small toys placed in a small sandbox (15) Sandplay therapy is a type of psychotherapy technique in which children can create their sand world following their mental and social realities by arranging miniature shapes in a sandbox (16). Since anxiety and sleep disorders, as serious side effects of chemotherapy, considerably

reduce the life quality of children with cancer, it seems essential that effective interventions with minimum side effects and maximum efficiency be conducted by nurses and other healthcare workers.

As stated earlier, sandplay therapy has been used as one of the effective methods to reduce children's behavioral disorders in many countries. However, few studies have investigated the effects of sandplay therapy on psychological and behavioral disorders of children with cancer undergoing chemotherapy. To this end, the present study was the first research attempting to address the effects of sandplay therapy on behavioral disorders and sleep habits of children with cancer undergoing chemotherapy at Ali Ibn Abi Talib (AS) Hospital, in Zahedan. Thus, the main contribution of this study is that it explores the impact of sandplay therapy for the first time on the anxiety and sleep habits of Iranian children with cancer. The findings of this study can be used to improve the complications of cancer in children.

2- METHODS

2-1. design and population

This quasi-experimental study was conducted with a pretest-posttest design on 80 children with cancer undergoing chemotherapy in the outpatient oncology department of Ali Ibn Abi Talib (AS) Hospital in Zahedan in 2020. The sample size was estimated as 40 persons per group (80 persons in total) based on the mean scores of the post-traumatic stress symptoms in a similar study (Shamsipour et al., 2018) with a 95% confidence interval and 95% statistical test power (19). The participants were selected; using convenience sampling, based on the inclusion criteria, from among children aged 8-12 with leukemia undergoing chemotherapy at the hematology department of Ali Ibn Abi Talib Hospital of Zahedan in 2020. The selected children

were randomly assigned into control and intervention groups through red and green cards.

2-1-1. Inclusion and Exclusion Criteria

The inclusion criteria were having an 8-12-year-old child with leukemia, receiving at least two rounds of chemotherapy, not suffering from mental disability, hearing or vision impairment, or any other chronic disease, having good physical conditions, not taking anti-anxiety and antidepressant medications or any other drugs that disrupted the child's normal functioning, and not having a history of sand allergy. The exclusion criteria were the absence of more than one sandplay therapy session and the death or poor health condition of the patient. The children's demographic data were collected through a child's demographic information questionnaire including age, sex, number of siblings, duration of cancer, number of chemotherapy sessions, history of cancer in the family, history of surgery, and caregiver information including age, marital status, education, religion, and ethnicity.

2-2. Data collection

Data of the study was collected using a demographic information questionnaire, Revised Children's Manifest Anxiety Scale (RCMAS), and Children's Sleep Habits Questionnaire (CSHQ). After identifying the primary caregiver of the child (at least one of the parents), the objectives of the study were explained to them. Caregivers also signed an informed consent form to indicate their willingness to participate in the study. The questionnaires were completed for all children by parents in the two groups, before and one week after the intervention. The sandplay intervention was individually conducted by the researcher for children in the intervention group. Questionnaires were completed for each child by the child's parents. Patients in the control group did not participate in

the educational intervention and only received routine training in the clinic.

2.3. Procedure

Dora Kalff's (1980) described individual sandplay therapy in a Step-by-step Manual for Psychotherapists of Diverse Orientations (Boik & Goodwin, 2000). In this protocol, also used as the intervention of the present study, the therapy sessions are held based on 6 main steps. The sandplay therapy intervention was conducted in ten 45-minute sessions held twice a week individually for each participant. To this end, a small 70x60x10 cm box containing granular and sterilized sand was used. The wall and the floor of the box were painted in blue and filled with sand to a depth of 5 cm. Various toys such as human dolls, fantasy dolls (such as Superman), domestic and wild animals, plants, vehicles, houses, trees, traffic signs, and other small objects were used to build the child's world. After getting to know the researcher, the children entered the playroom to play with the sandbox and dolls. The researcher described the sandplay as follows:

“Here we have a sandbox and several different toys. I want you to look carefully at the toys and use them to create the scenery for me in this box. You can use all the toys; for example, you can use animals in your scenery (the therapist placed one or two animals into the box and took them out again) or you can make your scenery with houses (the therapist put the houses in the sand tray and took them out again). You can make any scenery you like and use any of these toys you want. If you remove the sand you will see that the bottom of the box is blue, this could represent water or a lake (the researcher removed the sand by hand), and if you don't like it, you are allowed not to do it (the therapist returned the sand to its original state). Well, you can start now. You have 45 minutes to create your scenery, and when it's finished, you must

choose a name for your scenery and describe it to me. I'm doing my work here. If you have any questions, you can ask me. If not, let me know when you've finished making your scenery”.

At the end of the session, a picture was taken of the scenery made by the child. The therapist handled the session indirectly by creating an emotional connection with the child, and the child acted as the leader. The step-by-step instructions for Kalff's sandplay therapy program are displayed in **Table 1**.

2-4. Data analysis

The data collected in this study were codified and analyzed by SPSS software (version 26). First, the data were summarized using descriptive statistics including frequency, mean, percentage, and standard deviation. Kolmogorov-Smirnov and Shapiro-Wilk tests were used to test the assumption of data normality. To compare the pre-intervention and post-intervention scores of the participants in each group, paired samples t-test was used. Moreover, the mean scores of the participants in the intervention and control groups were compared using the independent samples t-test. Chi-square test was also used to compare the qualitative variables between the two groups. Analysis of covariance (ANCOVA) was run to investigate the effect of sandplay therapy on the dependent variables of anxiety and sleep habits of children with cancer (in the intervention group compared to the control group). Data analysis was performed at the significance level of 0.05 ($P = 0.05$).

3- RESULT

As shown in **Table 2**, no significant difference was observed between the groups in terms of demographic and clinical indicators. It should be noted that in terms of the history of cancer in the family of individuals and in terms of surgery, no case was seen in the groups.

Table-1: The six steps of Kalfff's sand play therapy

step	Title	Instructions
1	Creation of a world	Introducing sandplay (creating a safe and protected space, introducing the sandbox and its instructions) & Creating a world (building any scene the child likes without any intervention by the therapist, building the world with objects and dolls)
2	Experiencing and rearranging the created world	Experiencing the created world with all one's being (making changes in the created world, leaving the changed world, and the opportunity to deeply experience the world)
3	Therapy	Traveling in the world (telling the story to the child about what he/she has made, encouraging the child to express his/her inner feelings and reactions, paying attention to non-verbal cues) & Intervention therapy (creating a sightseeing tour, playing and expressing what is done by the child, entering a character by the child to help people in the world, etc.)
4	Documentation	The therapist takes a picture of the world constructed by the child from the angles of interest and gives the picture to the child in the next session
5	Transition	Creating meaning of the created world and relating it to real life by the child
6	Dismantling the world	Examining and understanding the world and then dismantling it

Table-2: Independent samples t-test, ** Chi-square test

Variables		Intervention Group Frequency %	Control Group Frequency %	P-Value
Age		9.35±1.44	9.48±1.57	0.71
father's age		36 (43)	35 (42.94)	0.96
mother's age		40 (36.80)	40 (37.03)	0.83
marital status	married	37 (92.5)	33 (82.5)	0.17
	divorced	0 (0)	0 (0)	
Number of Children		3.25±1.82	3.33±1.79	0.85
Disease duration		18.70±13.049	18.80±13.99	0.97
Number of chemotherapy sessions		13.08±7.32	12.70±7.44	0.82
Gender	Male	15 (62.5)	25 (62.5)	1.00
	Female	15 (37.5)	15 (37.5)	
Place of residence	City	20 (50%)	19 (47.5)	0.82
	Rural area	20 (50%)	21 (52.5)	
The Child's education	School drop-out	3 (7.5)	5 (12.5)	0.43
	Preschool	7 (17.5)	3 (7.5)	
	Primary school	28 (70)	28 (70)	
	Junior high school	2 (5)	4 (10)	
Ethnicity	Baloch	22 (55)	23 (57.5)	0.82
	Sistani and others	18 (45)	17 (42.5)	

Data in **Table 3** indicates that the average anxiety score for children in the intervention group was 24.45 ± 5.09 before the intervention, which changed to 15.58 ± 3.80 after the intervention. Moreover, the average anxiety scores for the children in the control group before and after the intervention were 25.25 ± 5.53

and 25.15 ± 5.44 , respectively. The data also revealed that the two groups reported no significant differences in anxiety and its subscales before the intervention. However, after the intervention, the mean scores for anxiety and its subscales decreased significantly for the children in the intervention group.

Table-3: Descriptive statistics for the level of anxiety reported by the participants in the two groups

Groups	Pre-intervention scores	Post-intervention scores	Mean difference	P-value**
Intervention	24.45 ± 5.09	15.58 ± 3.80	-8.87 ± 1.29	<0.001
Control	25.25 ± 5.53	25.15 ± 5.44	-0.1 ± 0.09	0.29
P-value*	0.50	<0.001	<0.001	-

* Independent samples t-test, ** Paired samples t-test

As can be seen in **Table 4**, the pre-intervention and post-intervention mean scores for sleep habits in children with cancer in the intervention group were 61.78 ± 8.35 and 46.40 ± 4.91 , respectively. Furthermore, the pre-intervention and post-intervention mean scores for sleep habits in the control group were 60.58 ± 8.75 and 60.65 ± 7.78 , respectively.

In addition, the two groups showed no significant difference in terms of sleep habits and their subscales before the intervention. However, after the intervention, the mean scores for sleep habits and their subscales decreased significantly among the children in the intervention group.

Table-4: Descriptive statistics for sleep habits of the participants in the two groups

Groups	Pre-intervention scores	Post-intervention scores	Mean difference	P-value**
Intervention	61.78 ± 8.35	46.40 ± 4.91	-15.38 ± 3.44	<0.001
Control	60.58 ± 8.75	60.65 ± 7.78	0.07 ± 0.02	0.62
P-value*	0.53	<0.001	<0.001	

* Independent samples t-test, ** Paired samples t-test

4- DISCUSSION

Findings of the present study revealed that children with cancer in the intervention and control group did not show any significant difference in terms of sleep habits and their subscales before the sandplay therapy intervention. However, after the intervention, the mean score of

sleep habits and their subscales decreased significantly among children in the intervention group. In other words, sandplay therapy could significantly reduce poor sleep habits and improve the sleep quality of children with cancer undergoing chemotherapy. Ajorloo et al. (2016) examined the effectiveness of story therapy in decreasing anxiety and

enhancing sleep habits of Iranian children undergoing chemotherapy due to cancer in a Pediatric Medical Center, and showed that story therapy reduces anxiety symptoms and improves sleep habits in children with cancer undergoing chemotherapy (17). However, a review of the literature showed no study on the impact of sandplay therapy on improving the sleep habits of Iranian children with cancer. As shown in the results of this study, the two groups did not have a significant difference in terms of anxiety and its subscales before the intervention, but after the intervention, the average score of anxiety and its subscales in the intervention group decreased significantly. Also, the results of covariance analysis showed that sandplay therapy had a significant effect on children's anxiety and its subscales. Sharifi et al. (2019), conducted a research entitled "Investigation of the effectiveness of play therapy using sand on challenging behaviors and anxiety of children with high-functioning autism disorder" on boys aged 7 to 11, in 2017, in Tehran, Iran. They showed that sand play reduces challenging behaviors and anxiety of children with high functioning autism disorder (18). These findings are consistent with those of the present study confirming the effects of sand play on reducing children's anxiety. However, in that study, the target population was autistic children, while in the present study, children with leukemia were examined.

4-1. Limitations

As one of its limitations, this study was conducted in a small ward of the hospital on a small sample of children. In addition, the use of random convenience sampling can limit the generalizability of the findings of the study. Thus, more studies can be performed using sandplay therapy intervention in different geographical places and areas and for longer periods.

5- CONCLUSION

This study revealed that sandplay therapy can reduce anxiety and improve sleep habits in 8-12-year-old children with cancer undergoing chemotherapy. Consequently, nurses as a member of the health care team who have long and close contact with these children can use play therapy methods such as sandplay therapy as a non-pharmacological and free method preferred by children. Thus, playrooms in hematology and oncology departments of hospitals can be used as children's sandplay rooms.

6- ACKNOWLEDGEMENT

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7- FOOTNOTES

All authors discussed the results and contributed to the final manuscript.

8- CONFLICT OF INTERESTS

None.

9- ETHICAL CONSIDERATIONS

This paper is an excerpt from a master thesis in pediatric nursing approved by the ethics committee of Zahedan University of Medical Sciences with the code IR.ZAUMS.REC.1399.076. All patients signed an informed consent form.

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