

Effect of Play-based Occupational Therapy on Symptoms of Hospitalized Children with Cancer: A Single-subject Study

Ahmad Mohammadi¹, Afsoon Hassani Mehraban¹, Shahla A. Damavandi²

¹Department of Occupational Therapy, Iran University of Medical Sciences, ²Department of Pediatric Oncology, Ali-Asghar Hospital, Iran University of Medical Sciences, Tehran, Iran



Corresponding author: Afsoon Hassani Mehraban, PhD

Associate Professor, Occupational Therapy Department, Rehabilitation Research Center

School of Rehabilitation Sciences, Iran University of Medical Sciences, Tehran, Iran

Tel: 0098 021 22228051 ext. 389; Fax: 0098 021 22220946

E-mail: mehraban.a@iums.ac.ir

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ABSTRACT

Objective: Cancer is one of the four leading causes of death in children. Its courses of diagnosis and treatment can cause physiologic symptoms and psychological distress that secondarily affect children's quality of life and participation in daily activities. The aim of this study was to investigate the effect of play-based occupational therapy on pain, anxiety, and fatigue in hospitalized children with cancer who were receiving chemotherapy. **Methods:** Two hospitalized children with acute lymphoblastic leukemia at least 4 months after diagnoses who received two courses of chemotherapy participated in this pilot study. Takata Play History and Iranian Children Participation Assessment Scale were used to develop intervention protocol.

Nine, 30–45 min play-based occupational therapy sessions took place for each child. Children filled out the Faces Pain Scale, Visual Fatigue Scale, and Faces Anxiety Scale before and after each intervention session. **Results:** Pain, anxiety, and fatigue levels decreased in both participants. Furthermore, the results showed a relationship between pain, anxiety, and fatigue variables in these children. **Conclusions:** Play-based occupational therapy can be effective in improving pain, anxiety, and fatigue levels in hospitalized children with cancer receiving chemotherapy.

Key words: Chemotherapy, childhood cancer, hospitalization, play-based occupational therapy

Introduction

Cancer is a rare condition in children <15 years old, which despite medical advances still one of the four leading causes of death in children.^[1] The most common symptoms associated with pediatric cancer are pain, fatigue, lethargy,

cough, anorexia, nervousness, irritability, and anxiety.^[2,3] The incidence of childhood cancer in Iran is 48–112 and 51–144/million among girls and boys in multi-geographical

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settings, respectively. The most common childhood cancers consist of leukemia, brain, lymphoma, and bone tumors.^[4]

The invasive, painful, stressful, and prolonged processes of diagnosis, hospitalization, and treatment of cancer as well as drug's side effects such as pain, fatigue, nausea, vomiting, and hair loss can negatively influence on the different aspects of children's physical, emotional, and psychosocial abilities.^[5,6] These processes may lead to emotional distress, functional limitations, participation restrictions, and confined adaptive skills and responses in these children.^[7,8] Children hospitalized in pediatric oncology wards may experience negative sign and symptoms such as developmental delay, sleep disorders, eating disorders, aggression, anxiety, depression, dependency on caregivers, disruption of daily activities, diminished quality of life, and limited participation in social functions.^[9,10]

Play is the children's world. Playing is the basic need of the children; they satisfy their internal desire for participation in the surrounding environment through playing, so, it is a critical part of their lives, which facilitates the development of sensory, motor, and cognitive processes.^[11] As a result, children with a life-threatening disease need playing too, maybe even more than normal children.^[12] Play therapy is a purposeful collection of structured activities based on children's situation to improve their mental health.^[13] Classic play therapy was introduced in 1970s, but its application in hospital settings was initiated since 1975 with formation of the National Association of Hospital Play Staff.^[14] Importance of playing in childhood is highly emphasized in occupational therapy in two forms: play as means (i.e., classic play therapy for improving mental health issues) and play as end (i.e., play-based occupational therapy). Play-based occupational therapy refers to the use of play to accomplish treatment goals (facilitating playful activities) and to develop skills and abilities required for performing daily life activities.^[15] Although the majority of nurses (and other health-care professionals) have knowledge about therapeutic play and value its use in practice, it is not routinely used in daily practice.^[16]

Since the core occupational therapy intervention is meaningful and purposeful activity, the main occupational therapy intervention in children is playing.^[17] Diagnosis of a disease with an uncertain prognosis, anxiety of hospitalization, and side effects of drugs may disturb functional performance and especially playing in children with cancer. Different studies have investigated play therapy on various populations such as hospitalized children with cancer^[13,18-20] which were usually related to psychological symptoms. Furthermore, play-based intervention is applied in children with attention deficit hyperactivity disorder, Down syndrome, and children with poor self-care skills to improve behaviors such as eating

and tooth brushing.^[21-23] To the best of our knowledge, there is no study on play-based occupational therapy in children with cancer. Therefore, the purpose of this pilot study was to investigate the effects of play-based occupational therapy on pain, anxiety, and fatigue in hospitalized children with cancer who were receiving chemotherapy.

Methods

Two children with acute lymphoblastic leukemia, including a boy (9 years old) and a girl (7 years old) participated in this study. They were diagnosed with cancer at least 4 months ago, and they have been experienced at least two courses of chemotherapy during hospitalization. Pattern of hospitalization and chemotherapy (Berlin–Frankfort–Munster protocol) during the past 4 months was stable in the children and during the course of the study.^[24,25] We used a random sampling to select the included participants from children with cancer in pediatric cancer ward in a governmental hospital. Both the parents and children signed the consent form for participating in the study.

Evaluation process included assessment of pain (Faces Pain Scale), fatigue (Visual Fatigue Scale), and anxiety (Faces Anxiety Scale) at the beginning and at the end of each play-based occupational therapy session, which were completed by own children. Their parents completed the Children's Takata Play History (TPH) and Iranian Children Participation Assessment Scale (ICPAS). Information provided by parents was used to develop therapeutic intervention protocol.

TPH is a semi-structured interview with parents or caregivers. It is used to determine play experiences, opportunities, and interests of the child for guiding therapeutic intervention. This tool can be used for 0–16-year-old children and examines five play development phases (sensorimotor, symbolic, simple structure, dramatic and complex structure, competitive games, and recreational games) through four classes of items regarding playing tools, applied games, playmates, and play time and place. Reliability of TPH was reported 0.91 in the total interview and 0.85 in the classes. Test-retest reliability of the total interview is 0.77 and it is 0.78 for four classes of items.^[26]

The ICPAS scale is a 69-item questionnaire in eight subscales (activities of daily living, instrumental activities of daily living, play, leisure, social participation, education, work, and sleep/rest), reported by children and their parents. This tool is designed for 6–12 year-old children, and Cronbach's alpha values for children and parent versions are 0.84 and 0.90, respectively. Its test-retest reliability in children version is 0.92 and 0.95 for the parent version.^[27]

Wong and Becker (1998) designed Faces Pain Scale, including two parts: figures and numbers. The numerical

part consists of a 10 cm horizontal line with higher scores indicating severe pain. The figures' part contains six images with children's face indicating different degrees of pain. The figures' part is used for children who do not know the meaning of the numbers or are unable to count 0–10. Persian version of this scale with a good reliability ($\alpha = 0.82$) has been used in various studies.^[28,29]

Visual Fatigue Scale contains five cartoon images showing different levels of fatigue. It is leveled as the absence of fatigue (0), mild fatigue (1–3), moderate fatigue (4–6), severe fatigue (7–9), and too severe fatigue (10). Reliability and validity of this tool have been shown in various studies.^[30,31]

Anxiety Faces Scale includes a visual part with five cartoon faces and scores of 1–5. The final score is interpreted as lack of anxiety (1), low anxiety (2), moderate anxiety (3), high anxiety (4), and severe anxiety (5). The psychometric properties of Persian version have been reported by Borhani *et al.*^[32]

A child-oriented approach based on play was used for designing the intervention program according to the history and interests of each child. An occupational therapist selected plays according to the children's interests to control symptoms and facilitate daily activities using playing.

Finally, nine playful activities were formulated for each child, and he/she was allowed to choose one or more activities during the nine play-based occupational therapy sessions. Due to higher flexibility among direct and indirect approaches in our program, the therapist could implement necessary changes according to child's conditions and treatment progress.

This study was designed as a single-subject study using A-B-A-B-A-B method. This method is a withdrawal design and consists of three phases: A - baseline (admission), B - intervention (first hospitalization), A - baseline (first recovery), and B - intervention (second hospitalization), A (second recovery), and B - intervention (third hospitalization). Any phase of intervention protocol for children included phase of hospitalization (3–5 days) and then hospital discharge phase for recovery and rest (2 weeks). Assessments were done before (as baseline phases) and after (as intervention phases) each treatment session, and the results of baseline and intervention phases were compared. Implementation of intervention protocol was also formulated accordingly and considering minimum hospitalization days (3 days). Finally, given three periods of hospitalization and chemotherapy, nine 30–45 min treatment sessions were conducted over 7 weeks.

The play-based occupational therapy session was as follows:

- a. Filling out the forms for pain, fatigue, and anxiety assessments (5 min)

- b. Choosing the play among formulated plays and its implementation (30 min)
- c. Planning for the next session based on the feedback provided by the therapist and children (5 min)
- d. Filling out the forms by children at the end of the session (5 min).

Results

Table 1 shows demographic data about two participants in our study. We used visual analysis and celeration line chart for evaluating deviation of pain, fatigue, and anxiety scores from midline. Baseline phase comprised the pretest values (beginning of each treatment session) and intervention phase comprised the posttest values (end of each treatment session).

Discussion

The results of the present study suggest the reduction of pain, anxiety, and fatigue scores in hospitalized children with cancer following play-based occupational therapy. Using the children's play history, we facilitated participation of children in choosing and manipulating plays for reducing symptoms (play as means) and increasing their participation in playful activities (play as end). Occupational therapy using both play as means and play as end in pediatric oncology ward could help children to overcome some discomfort situations in the hospital.

Trend of pain severity in both participants showed a greater reduction in the intervention phase compared to the baseline phase [Figures 1 and 2]. Greater reduction of pain during the intervention phase showed that play-based occupational therapy could facilitate compatibility with pain during chemotherapy. Pain reduction trend was also observed within 3-session periods. The only exception was for participant 1 in the third session, who reported pain more than normal because of displacing the needle in the hand. Other studies on pain in children with cancer were mostly related to impact of play in distracting children during painful medical procedures.^[28,33,34]

As shown in Figure 3, decreasing trend of fatigue observed in this study was incremental for participant 1 in baseline phase. That is, fatigue was increased with progress of chemotherapy and increasing days of hospitalization. Comparison of fatigue trend in baseline with intervention phase indicates fatigue reduction with average decrease of fatigue severity. In participant 2, fatigue in baseline phase

Table 1: Participant demographics

Participants	Sex	Age (year)	Onset (month)	Hospitalization
Participant 1	Girl	7	6	3
Participant 2	Boy	9	9	4

showed a reductive trend with treatment progress and increasing hospitalization days [Figure 4]. This condition, with preserving its reductive trend during intervention phase, indicates fatigue severity reduction. Similar to pain results, fatigue reduction trend is observed during 3-session periods. Relationship between pain and fatigue can be mentioned about participant 1 who experienced more pain in the third session and reported more fatigue in this session. Participant 2 also reported fatigue more than normal in the fourth session, which was related to the child's expectation for receiving blood test results and early discharge.^[35]

Reductive trend of anxiety in baseline phase for both children is well observed [Figures 5 and 6]. Interesting point is that anxiety was higher in the first intervention session in both participants, possibly due to unfamiliarity with therapist and treatment environment. Figures show the reducing trend of anxiety during the intervention period in both participants. In participant 2, anxiety in session 4 was reported more than other sessions, which was possibly because of waiting for early discharge. According to the fatigue results in session 4, it can be referred to the relationship between anxiety and fatigue. Comparison of anxiety severity between two children in baseline phase indicated lower anxiety level for participant 2, which can

be possibly associated with their gender, age, knowledge, and culture. Despite older age of participant 2, he had less information about his disease and lived in a rural area. Our results are consistent with the findings of Bazmi and Nersi and Aliloo *et al.*, who studied the impact of play therapy on reduction of anxiety in children with leukemia, suggesting the effectiveness of this intervention on reduction of anxiety and feeling insecurity and increasing positive emotions.^[36,37]

Conclusion

The results of this study showed that play-based occupational therapy can be helpful in reducing the symptoms of hospitalized children with cancer. It seems that presence of playroom and higher participation of an occupational therapist or a trained nurse in oncology and palliative care are necessary to achieve the desired goals (reducing the unwanted symptoms and improvement of participation in daily life activities and finally quality of life). Further studies need to be done with a larger sample size and in different types of childhood cancer.

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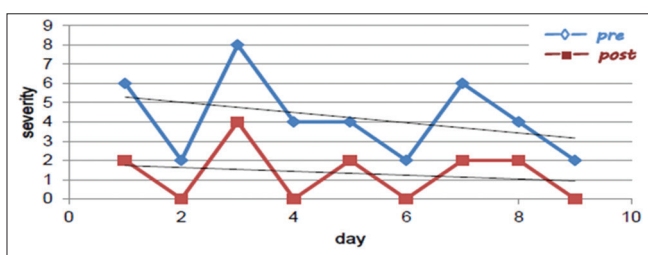


Figure 1: Participant 1 pain

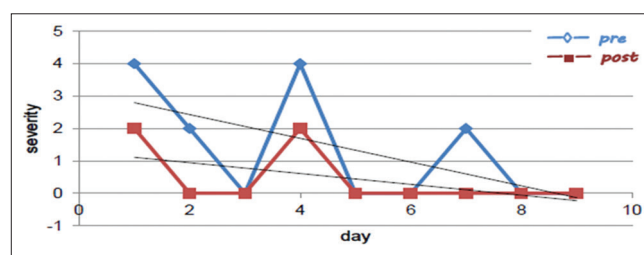


Figure 2: Participant 2 pain

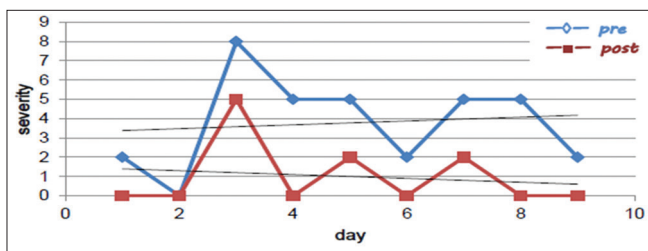


Figure 3: Participant 1 fatigue

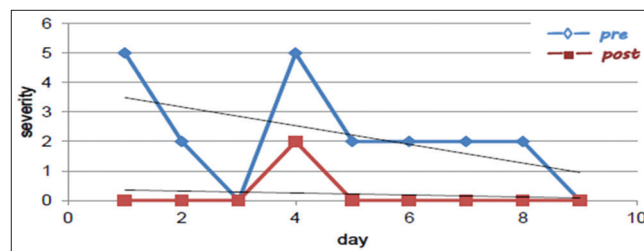


Figure 4: Participant 2 fatigue

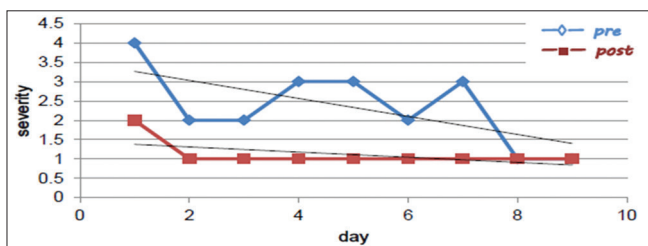


Figure 5: Participant 1 anxiety

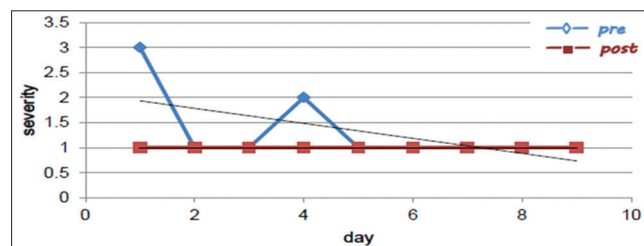


Figure 6: Participant 2 anxiety

Conflicts of interest

There are no conflicts of interest.

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