

## The Effect of Rhythmic Movements on Mild Anxiety in Children of 7 to 12 Years Old with Cancer

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### Abstract

**Introduction:** Cancer can be a chronic childhood disease with many unpleasant psychological consequences such as anxiety. This study was conducted to assess the effect of rhythmic movements on mild anxiety in children with cancer.

**Methods:** This was a quasi-experimental study. The study population included all children aged 7 to 12 years old diagnosed with cancer who were hospitalized in oncology ward of a pediatrics hospital affiliated with Shahid Beheshti University of Medical Sciences in Tehran, Iran. Sampling was done through convenient sampling method and was based on the inclusion criteria. Thirty one children with mild anxiety according to "Spielberger Anxiety Inventory" were recruited. The children participated in rhythmic movements with hip-hop style along with playing music, performed in a playing room for 45 minutes during six sessions. Questionnaires were recompleted in the final day of intervention (sixth day) as well as three weeks later through reading the items for children and filling by the researcher. Data was analyzed using SPSS V.18 by repeated analysis of variance (ANOVA).

**Results:** The results showed significant differences between the mean values of anxiety ( $P < 0.05$ ) before the intervention, at the end of day six, and three weeks after the intervention.

**Conclusions:** Rhythmic movements as a non-pharmacologic intervention reduced mild anxiety in children with cancer. It is recommended that nurses use non-pharmacological approaches such as rhythmic movements to reduce the psychological effects of cancer instead of using drugs.

## INTRODUCTION

Cancer is one of the most common chronic and non-communicable diseases, which is responsible for 9% of deaths throughout the world [1, 2]. In the United States 8300 children are affected by cancer annually and this statistics are on the rise [3]. In 2014, 15780 new cases of cancer occurred in the US children and adolescents. It is predicted that in 2020 the number of children with cancer will increase from 10 to 15 million [4]. Cancer is a leading cause of death among chil-

dren. In the US, it is the second cause of death among children aged 0-14 years, after unintentional events [5]. In Iran, the mortality rate because of cancer is more than other diseases in children aged 3 to 14 years [6] and statistics show that 4% of children under 5 and 13% of children aged 5 to 15 died because of cancer [2]. In addition to the body, cancer affects other aspects such as psychological, social and emotional dimensions in children [7-9]. Cancer, by creating tension and

fear, affects the quality of patients' lives [10]. Anxiety and depression are the most important psychological symptoms in children with cancer [11-13]. One of each two patients with cancer has a mental disorder, especially anxiety, as the most common psychological symptom [13-16]. Depression and anxiety can reduce the quality of life and lead to hopelessness, fatigue, poor social interactions, failure to comply with medical prescriptions, frequent hospitalization and failure in treatment programs [13].

For the management of anxiety and depression, there are different pharmacological and non-pharmacological strategies and one of the non-drug strategies is rhythmic movements. [17, 18]. Rhythmic movements are the way to express feelings and one of the oldest forms of healing [19], which are in the form of a combination of music, moderate exercise and sensory stimulation, providing good therapeutic settings for managing anxiety [20]. Rhythmic movements are a good way to promote health, functioning and sense of well-being [21]. According to the American Cancer Society, rhythmic movement is one method of psychotherapy which involves both mental and physical aspects of people [17, 20, 22, 23]. Rhythmic movements create a positive mood, reduce the effects of cancer [24], and increase both energy and enthusiasms [25]. Although music and rhythmic movements are considered as parts of nursing care and their usage is recommended in medical researches [18], little researches have been done in this area [26]. Given that no study has already been conducted in this field in Iran, this researchers came up with a study entitled "the effect of rhythmic movements on mild anxiety in children with cancer".

## METHODS

This was a quasi-experimental study. The study population included all children aged 7 to 12 years diagnosed with cancer who were hospitalized in the Oncology Ward of a pediatrics hospital affiliated with Shahid Beheshti University of Medical Sciences in Tehran, Iran, from June to September 2014. Thirty one children with cancer were selected according to the inclusion criteria and were randomly assigned into four groups of six patients each and one group of seven patients. The inclusion criteria was children with tendency for participating in the study, school age (7-12), not taking medication for anxiety, and not having faced any other stressful event such as parents' divorce or death of someone close during the past year. These children were not in the final stage of cancer and according to Spielberger Anxiety Inventory were mildly anxious. The exclusion criteria were discharge or transfer to another hospital during the intervention. Individual Characteristics, Disease Questionnaire and translated Spielberger Anxiety inventory were used to collect data. Individual Characteristics and Disease Questionnaire included some information such as age, gender, type of cancer, age at diagnosis, level of education, number of siblings, number of hospitalizations, history of rhythmic movements and living with parents. Spielberger Anxiety Inventory is a self-administered questionnaire which includes two items for each state anxiety or trait anxiety. In the present study, the state anxiety was considered and the score of 20 to 33 indicated mild anxiety, 33 to 47 moderate anxiety and more than 47 severe anxiety [27]. The reliability of this questionnaire in Iran has been calculated as ICC = 0.89 [28]. In the present study, the

Cronbach's alpha coefficient for "Spielberger Anxiety Inventory" and the internal consistency were X and ICC = 0.86, respectively.

Before the meetings, the researcher met the children and explained aims of the study for them and their parents. After obtaining informed consents from parents, the questionnaire items were read by researchers one by one and filled for each child separately. The children who got a score of 20 to 33 from Spielberger Anxiety Inventory were selected. Related music with hip-hop style was used. The intervention consisted of six 45-minute sessions, performed individually in the afternoon from October to mid-December 2014 in the oncology ward of the mentioned hospital.

### The First Session

At the beginning and after the introduction, friendly dialogues with children were performed; then, the children were asked to say their full names, ages and any experiences of doing rhythmic movements. Afterwards, they were asked to perform it if the answer was positive. In order to prepare for the first practice, a four-minute warm-up exercise was performed. The first practice was in the following way: children opened their feet shoulder-wide and put their hands on waist like number 8, and then the shoulders moved slowly upward and downward; the children then turned right by moving the shoulders up and down and repeated this exercise when they turned left.

### The Second Session

In this session, children took their steps slowly back and forth then moved one hand to the right and the other hand to the left; then, hands were raised and dropped.

### The Third Session

In the first five minutes of this session, the movements of the second session were repeated; then, the children raised their hands and turn them to the right and left.

### The Forth Session

Children put two hands on both sides and their feet were next to each other, then one foot came out from the claws while in the half-sitting position. The same motion was repeated for the other foot.

### The Fifth Session

Children clenched fists, put the right hand on the right and the left hand on the left foot; then right foot came out from the claws and the same motion was repeated for the left foot.

### The sixth Session

This was the final session. In this session, all the movements of the previous sessions were repeated during 45 minutes. Spielberger Anxiety Questionnaire was recompleted in the same way at the end of session six as well as three weeks after the intervention.

The collected data were analyzed with descriptive statistics and analytical tests using SPSS V.18. Data analysis was car-

ried out with longitudinal analysis and analysis of variance with repeated measures. P values of less than 0.05 were considered significant.

## RESULTS

Demographic and disease-related characteristics of the subjects are shown in table 1. Mean and standard deviation of the sample anxiety scores before the intervention, at the end of session six and three weeks later are shown in table 2.

## DISCUSSION

The study was performed to assess the effect of rhythmic movements on mild anxiety in children with cancer. The results showed that rhythmic movements decreased the anxiety scores both at the final day of intervention and end of week three. Rhythmic movements, while reducing stress in patients with cancer, increase self-esteem. Ho et al. (2005) showed that rhythmic movements reduced psychological effects of cancer [24]. Geong et al. (2005) showed that rhythmic movements not only reduced stress and mental disorders but also increased self-esteem and can affect the brain neurohormones such as serotonin and dopamine, so finally reduce depression [17]. Akandere et al. (2011) also showed that rhythmic movements had positive effects on depressed girls [29]. The results of the studies showed that using complementary methods besides pharmacological treatment is very important in order to improve patients' quality of life and their compatibility with the disease. Many people turn to art therapy practice to reduce anxiety caused by the disease [24]. The results showed that there were significant differences between the mean score of anxiety in children with cancer before the intervention and both at the final day and end of week three. Findings reflected the positive effects of rhythmic movements on reducing anxiety in children with cancer and are good confirmation on this claim that rhythmic movements can be used as therapeutic methods [30-33]. Erfer et al. (2006) in a study demonstrated that using rhythmic movements in treatment protocol of children with mental disorders is beneficial [34]. Garcia et al. (2012) in a review study entitled "Dancing as a psychosocial intervention in care homes" showed that rhythmic movements improved the patients' interaction with other people and also led to mood improvement and life expectancy [35]. Aktas et al. (2005) also showed the beneficial effects of rhythmic movements on mental health problems [23]. All these studies are consistent with the present study and refer to the importance of rhythmic movements.

Rhythmic movements are used as a tool to express emotions and thoughts. For the first time, they were used in western countries in 1950. Rhythmic movements coordinate the neuro hormones, hands and legs. In Iran, at the time when there was no medical treatment for mental illness, Persian philo-

sophers used non-pharmaceutical methods such as music, exercise, massage or changing diet for treating mental illnesses [36]. Therefore, we can conclude that rhythmic movements have a long history in Iran. The limitations of the study were using non-random methods for sampling and the lack of a control group of children with cancer due to the limited number of hospitalized children; so, generalizing the results should be taken with caution. The authors suggest a longer term longitudinal studies.

Rhythmic movements can be utilized as an effective factor to reduce the physical and mental effects of chronic diseases. Due to the positive influence of these movements on anxiety in children with cancer, they should be taken into account in the nursing care of these patients. Cancer in children and its different treatment protocols such as surgery, chemotherapy, radiotherapy and their side-effects reduce the quality of patients' lives, and take them into depression and anxiety. Therefore, these kinds of exercises can be helpful.

**Table 1:** Demographic and Disease-related Characteristics of the Subjects

Variable	No (%)	P
<b>Gender</b>		*0.42
Male	17 (54.8)	
Female	14 (45.2)	
<b>Education</b>		0.12*
Primary School	30 (96.77)	
Secondary School	1 (2.23)	
<b>Type of Cancer</b>		***0.24
Leukemia	17 (54.8)	
Lymphoma	6 (19.35)	
Others	8 (25.8)	
<b>Number of Siblings</b>		**0.12
0	7 (22.58)	
1	20 (64.51)	
2	4 (12.9)	
<b>Number of Hospitalizations</b>		***0.12
1	6 (19.35)	
2-5	4 (12.9)	
5-10	8 (25.8)	
>10	13 (41.93)	
<b>Age (Mean ± SD)</b>	8.4 ± 49.1	**0.12
<b>Age of Diagnosis (Mean ± SD)</b>	7.32 ± 1.69	**0.57

\*Independent- T Test \*\* Pearson's Coefficient \*\*\* ANOVA

The mean and standard deviation of age of children with cancer and age of diagnosis was 8.4 ± 49.1 and 7.32 ± 1.69, respectively. Leukemia was the most common cancer in children.

**Table 2:** Mean and Standard Deviation of the Samples' Anxiety Scores

Variable	Before Intervention	Final Day of Intervention	Three weeks After Intervention
<b>Anxiety</b>	22 ± 3.11	21.04 ± 5.62	20.57 ± 5.81

According to the table, the mean score of anxiety was 22 ± 3.11 before the intervention and 20.57 ± 5.81 at the end of week three (P < 0.005).

**CONFLICT OF INTEREST**

The authors declare that there is no conflict of interest

**AUTHORS' CONTRIBUTIONS**

The paper is part of a M.Sc. thesis in 2014 and registered in the Shahid Beheshti University of Medical Sciences. The authors would like to thank the research deputy of Shahid Beheshti University of Medical Sciences and all participants without whom this study would not have been possible.

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