



THE EFFECTIVENESS OF DISTRACTION PLAY INTERVENTION ON REDUCING ANXIETY LEVELS IN CHILDREN UNDERGOING CHEMOTHERAPY

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ABSTRACT

In addition to the unpleasant symptoms of the disease, invasive procedures, pain, and anxiety resulting from prolonged treatment and hospitalization in pediatric cancer. These can affect a child's physical, emotional and psychosocial functioning. Play is an important part of childhood and a basic need. Play therapy, through the playful nature of games, will create distraction from the pain, help children express emotions and adapt to the hospital environment. Objective: Therefore, it is necessary to identify non-pharmacological interventions to reduce anxiety in children undergoing chemotherapy. Methodology: the literature Articles were searched using four databases: Pubmed, Scopus, Science Direct, and Sage journal which were published in 2018-2023. From 4 databases, 9317 articles were obtained and totaled final result are found 8 articles. They were reviewed and all were randomized controlled trial (RCT) studies which were assessed for risk of bias by using the Center for Evidence-Based Medicine (CEBM). Result: Distraction play interventions that can reduce anxiety levels in children undergoing chemotherapy include Art Therapy, Music Therapy, Virtual Reality, Muscle Relaxation, and Play Therapy. Conclusion: distraction play intervention can be applied in daily nursing practice to reduce anxiety in children undergoing chemotherapy treatment.

Keywords: anxiety; children undergoing chemotherapy; distress; non-pharmacology; pediatric cancer

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INTRODUCTION

Cancer remains the second leading cause of death for children after accidental death (American Cancer Society, 2020). It is estimated that globally, there will be 13.7 million new cases of childhood cancer between 2020 and 2050, with 44.9% of these cases not diagnosed at an early stage. Between 2020 and 2050 an estimated 11.1 million children will die from cancer if there are no further interventions to improve access to healthcare and treatment of childhood cancer (Atun et al., 2020). In Indonesia alone, around 7448 children are diagnosed with cancer each year and nearly 6000 children die from this disease. The World Health Organization (WHO), in collaboration with the International Agency for Research on Cancer (IARC), reported that in 2020, there were 8677 cases of cancer among children aged 0-14 years in Indonesia. This figure is the largest number compared to other countries in Southeast Asia (Indonesia's Childhood Cancer Patients are the Most in Southeast Asia, n.d.).

When a child is diagnosed with cancer, the child and his or her family are subjected to a series of highly restrictive treatment regimes that involve a great deal of ongoing uncertainty and the fear that the child will die. This extreme situation will also affect the working environment of

health care professionals (Pergert et al., 2019). Once a child is diagnosed with cancer, the child will receive a series of treatment protocols according to the type of cancer and the extent of the cancer (Lam et al., 2019). According to the National Institutes of Health, the type of cancer will be treated using different methods including chemotherapy, radiotherapy, surgery and bone marrow transplantation. Sometimes the best combination of therapies is suggested based on the individual child's cancer case (Seth & Singh, 2015). The most widely used treatment methods are surgery, chemotherapy and radiotherapy.

One of the treatment therapies provided is chemotherapy which aims to inhibit the growth of cancer cells through cytotoxic drugs that focus on rapidly dividing cancer cells. This type of drug is usually given in cycles consisting of treatment periods every week and or every two weeks and rest periods are usually given between cycles. The rest period is essential to restore healthy non-cancerous cells. The goal of chemotherapy is to inhibit cell proliferation and tumor multiplication so that it can be expected to avoid invasion and metastasis. Chemotherapy can be given in several types such as neoadjuvant, adjuvant, combination and metastatic. Neoadjuvant therapy is chemotherapy treatment given before primary treatment, while adjuvant therapy is given in addition to initial therapy aimed at suppressing or eliminating occult cancer cells (Mokhtari et al., 2017; Nakamura & Maeda, 2023). However, this treatment will produce toxic effects of chemotherapy because it affects normal cells so that it can have a negative impact. The most common side effects of chemotherapy are fatigue, nausea, mucositis, diarrhea, hair loss, and risk of infection (Alam, 2018). Children with a cancer diagnosis will experience not only physical but also psychological disorders as a result of cancer treatment. Physical impacts experienced by children include infections, anemia, headaches, fatigue, digestive problems and sensory deficits (Landier et al., 2016). And psychological impacts include post-traumatic stress disorder (PTSD) and post-traumatic stress symptoms (PTSS), depression and anxiety. To help improve the quality of life of children psychologically affected by cancer, it is necessary to support the need for mental health care (Marusak et al., 2019).

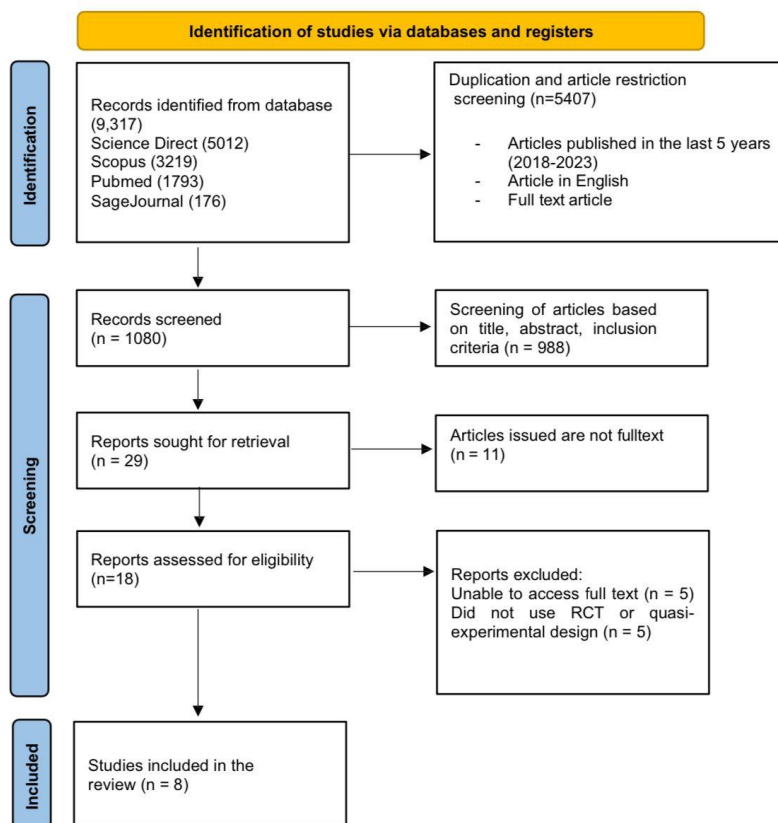
The selection of coping strategies is influenced by the individual characteristics of the child, environmental factors, and the dynamics of mutual interactions over time. Numerous studies have demonstrated that the attitudes displayed by parents in the presence of their children undergoing medical treatment can significantly impact the psychological well-being of the patients. Such distress syndrome found in children undergoing chemotherapy in addition to the pain caused as a side effect of therapy is also partly the impact of direct correlation with that experienced by parents. Research on the quality of life of children with cancer in general uses the PedsQol (Pediatric's Quality Of Life) generic 4.0 instrument and specifically using the PedsQol Cancer Module 3.0. Both instruments have been tested for reliability and validity by various studies and have been translated into 69 languages. The PedsQol Cancer Module questionnaire is an instrument specifically used in the pediatric population with cancer where the instrument consists of eight domains namely pain (pain and hurt), nausea (nausea), procedures that cause anxiety (procedural anxiety), management or treatment that causes anxiety (treatment anxiety), fear (worry), cognitive problems (cognitive problems), perceived physical appearance and communication problems.

In previous studies, it was said that non-pharmacological distraction techniques were effective in reducing distress in children. Some of them are with Virtual Reality methods, Play Therapy, Music Therapy, Occupational Therapy and direct support from parents (Ejiri, et al, 2023). Play is very important for child development because it has many benefits for child development including physical, emotional, cognitive and social (Nijhof et al., 2018). Play

serves as a vehicle through which children can navigate their social and physical surroundings, fostering interaction with their environment and enhancing their social and cognitive skills. Engaging in play while hospitalized benefits sick children by enhancing their physical and emotional wellness.. It can help children to explore issues related to their hospital experience and reduce the intensity of negative feelings or emotions that are often associated with acceptance of illness and hospitalization. (Koukourikos et al., 2015). To improve the quality of care and reduce anxiety in children undergoing chemotherapy, child-focused nursing interventions are needed. Therefore, this systematic review is needed to identify non-pharmacological interventions in reducing anxiety in children undergoing chemotherapy.

METHOD

The method used in this research is a systematic review of Quasi Experiment and Randomized Controlled Trial (RCT) studies. The Articles were searched using four databases: Pubmed, Scopus, Science Direct, and Sage journal which were published in 2018-2023. 9317 articles were obtained and totaled final result found 8 articles and those were reviewed and all were randomized controlled trial (RCT) studies which were assessed for risk of bias by using the Center for Evidence-Based Medicine (CEBM). The first step was to identify the PICO (Population, Intervention, Comparison, and Outcome) questions and obtain the clinical question "Is distraction play intervention more effective in reducing anxiety in children undergoing chemotherapy?". After that, a literature review search was conducted using 4 databases, namely: Pubmed, Scopus, Science Direct, Sage journal and using keywords pediatric cancer OR pediatric malignancy OR pediatric tumors OR pediatric oncology AND guided imagery OR imagery psychotherapy OR virtual reality relaxation OR sand therapy OR sensory play AND distress OR anxious OR anxiety. Articles attached were with the criteria of using a Randomized Controlled Trial (RCT) design that discussed non-pharmacological distraction play therapy in reducing anxiety in children undergoing chemotherapy, articles published no more than 10 years, using English, and full text. Furthermore, a critical review of the literature that has fulfilled inclusion criteria. The selection results will be entered into the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analyses) diagram as follows:



RESULT

Data Collection and Analysis

The authors extracted data in a data collection table based on author name, year of publication, country, title, sample, study characteristics, intervention. Data extraction is attached in table 1. Then the risk of bias assessment was carried out related to the intervention, participants, outcome measurement, statistical analysis and appropriateness of the design used using the CEBM Instrument. The study assessment is attached in table 2. The assessment of article characteristics was categorized by intervention, age, and outcomes. Distraction play interventions categorized as non-pharmacological interventions included play therapy, music therapy, muscle relaxation, audio visual (virtual reality), and art therapy. Studies were conducted at an average age of 6-18 years. Variations in study outcomes included anxiety levels, physiological responses in the form of changes in vital signs, and decreased cortisol levels.

Tabel 1.
Hasil Skringing Artikel

| Author | Article Title | Design | Results |
|--------------------|----------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Altay et al (2017) | The effect of drawing and writing technique on the anxiety level of children undergoing cancer treatment | Quasi Experimental | A sample of 30 hospitalized children with the age criteria of 9-16 years old. Drawing and writing and storytelling techniques were used to reduce anxiety in children. In the application of this intervention, the anxiety rate was lower after intervention (38.63±4.38) than before (42.63±46.4), p < 0.05. |

| Author | Article Title | Design | Results |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hasanah et al (2020) | Effect of music therapy on cortisol as a stress biomarker in children undergoing IV-line insertion: chemotherapy procedure | Quasi Experimental | children with leukemia who underwent chemotherapy procedures with an age range of 6-18 years as many as 30 participants. At this stage the subject was taken the first salive within 20 minutes after the IV line puncture. Then the subject was given music therapy which was played right after the first saliva sampling. The effect of music therapy on salivary cortisol levels was determined by testing the mean difference in salivary cortisol levels by comparing measurements before and after music therapy. The median difference before and after music therapy was 0.67 ng/ml, which confirmed that the value of the difference between the two measurements was 0.05 ng/ml. This shows that clinically music therapy helps to reduce salivary cortisol levels, which as a result of the music therapy, can reduce salivary cortisol levels. anxiety markers. |
| (Kerimoglu Yildiz et al., 2022) | A tablet game or training booklet? Two methods for evaluating symptom management and quality-of- life of children receiving chemotherapy | RCT | The study sample was 50 participants. 25 children in the game group, 25 children in the booklet group Game group: using Samsung galaxy tab 3 tablets given to 25 children and placed at the bedside. This type of KETO game was developed by the researcher which contains instructions application and guide to manage symptoms that caused by chemotherapy. As a result, both the booklet and the game were very useful. In both groups, 88% (n=22) of the children stated that both the booklet and the game provided enough information sufficient information about disease their disease. A total of 92% (n=23) of the children in the gaming group, and 80% (n=20) of the children in the group booklet group, severity anxiety decreased significantly when evaluated on day seven. |
| Lee Wong et al (2022) | Effects of immersive virtual reality for managing anxiety, nausea, and vomiting among pediatric cancer patients receiving their first chemotherapy | RCT | A total of 20 pediatric patients, 20 caregivers and 10 nurses. who were undergoing their first chemotherapy. in the intervention group where participants received 3 IVR sessions 4 hours before chemotherapy administration, 5 minutes before and during the first chemotherapy and 5 minutes before and during chemotherapy. The first session was conducted to establish a relaxation response as counter conditioning before the start of chemotherapy. While session 2 aimed to reduce the anxiety of pediatric patients and CINV, then session 3 aimed to determine whether the IVR intervention had a stable effect and the children had a continued interest in the intervention. As a result, the intervention group showed a much better reduction in anxiety levels than the control group. |
| (Ali Elsabely Mohammed et al., 2022) | Effect of Foot Massage on Physiological indicators, fatigue, and pain among children undergoing chemotherapy | Quasi Experimental | 100 children aged 6-12 years who were undergoing a routine chemotherapy program. 50 children were included in the intervention group, and the remaining 50 children received the standard routine treatment. Study results show there is a difference statistically significant between the intervention and control groups (P<0.001) |

| Author | Article Title | Design | Results |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Abdulah & Abdulla, 2018) | Effectiveness of group art therapy on quality of life in paediatric patients with cancer | RCT | 60 children aged 7-13 years. 30 patients in the experimental group and 30 patients in the control group. Patients in the intervention group were more physically active, energetic, and fit ($P < 0.001$), and had lower levels of depressive moods and emotions and feelings of stress ($P = 0.003$). In addition, They are provided with increased chances to organize and derive pleasure from social and recreational activities, as well as participate in social engagements. ($P = 0.0001$). in social activities ($P=0.016$), creating more social relationships aboard ($P=0.047$), and having better health by overall ($P < 0.001$). |
| Loannou et al, (2022) | Effects of virtual reality VS guided imagery on mood changes in cancer patients receiving chemotherapy treatment | RCT | RCT trial of 50 cancer patients actively undergoing chemotherapy with an age range below 18 years. 27 participants received a 20- minute VR intervention and then switched to a 20-minute GI intervention. The other 23 participants followed the same intervention in the reverse order. Measurements of POMS, 3 signs of symptoms and vital signs were repeated again after the end of intervention period 2 with the overall duration of the procedure being about one hour for each patient. The results obtained were that patients experienced a change in mood or better mood after receiving virtual reality intervention where it was found that the patient had a better mood. P value <0.05 |
| Zhang et al, (2019) | Effects of Cognitive Behavioral Therapy on Psychological adjustment in pediatric cancer patients receiving chemotherapy | Cognitive behavioral therapy Group play therapy | A total of 104 participants aged 8-18 years old. The intervention, which spanned 5 weeks and included cognitive therapy, relaxation training, and outcome assessment, resulted in significant differences in psychological resilience and negative mood scores between the two age groups before and after the intervention.in the 8- to 12-year-old and 13- to 18-year-old age groups in both the pre- and post-intervention groups. CBT group and control group ($P>.05$) |

DISCUSSION

The results of article searches on four database sources Science Direct, Pubmed, Sage, and Scopus obtained 9317 articles. Then filtering with the criteria of articles within five years, scientific journals, research articles, and English, 5407 articles were obtained, but only 988 articles were obtained with abstract suitability. After analyzing and searching for *full text* and accessible, 8 articles were obtained for review with a publication year range of 2018 to 2023. From the results of searching all articles, data collection was carried out with a *Randomized Controlled Trial* (RCT) design in the form of a non-pharmacological intervention *distraction play* as a distraction to reduce anxiety in children undergoing chemotherapy.

Play Therapy is a distraction technique where children will be invited to play according to their age range to reduce anxiety levels before chemotherapy and can be done during child hospitalization. Play is essential for proper child development as it has many developmental benefits including physical, emotional, cognitive and social. The function of catharsis, which means the relief of anxiety and which is the basis for play therapy, can be highlighted. Play therapy also helps children express and communicate their feelings and emotions through toys. It also makes them understand the process (Caleffi et al., 2016). Play for sick children

can improve physical and emotional well-being and reduce the intensity of anxiety due to hospitalization and invasive measures. Role play, puppet play, and puzzle play can reduce children's anxiety levels (Gisele Tobias da Silva et al., 2017). After the play sessions, children had positive behavior (relaxed posture and smile) and decreased behaviors that indicated fear, anxiety, and anger (tension, crying, screaming, beating). Furthermore, children became involved and collaborative in the processes of their disease, increasing their trust in the professionals (Godino-Iáñez et al., 2020).

Muscle Relaxation (Foot Massage) Progressive muscle relaxation in recent years has been practiced as a cognitive behavioral technique used in many therapeutic settings. Progressive muscle relaxation involves the use of imagination to create sensory experiences and achievements with clinical goals, which may specifically reduce heart rate, improve immune function, or reduce pain. (Giannakopoulou, 2015). Progressive muscle relaxation is a non-pharmacological therapy that is inexpensive, easy, and safe. Addressing the side effects of chemotherapy enhances the resilience of children and aids them in managing their illness. Relaxation techniques serve as a supplementary approach to alleviate chemotherapy side effects (Kanitz et al., 2013). It's important to explore how progressive muscle relaxation, a non-pharmacological and cost-effective therapy, relates to both sleep quality and chemotherapy side effects in pediatric cancer patients.

Art therapy encompasses a range of therapeutic approaches that employ creative methods like drawing, painting, and sculpting to delve into emotions. These techniques, employed by art therapists, psychologists, healthcare professionals, and clinical counselors, have been utilized to mitigate symptom severity in children within medical contexts. In addition, art therapy is also known to play a therapeutic role in pediatric populations to address stress and sequelae related to physical illness, injury, or medical procedures such as surgical or pharmaceutical interventions, or hospitalization (Abdulah et al., 2018). The American Art Therapy Association (AATA) (2013) describes art therapy as a method that enhances the overall health and wellness of individuals by engaging them in the creative process of art making, benefiting their physical, mental, and emotional states. This approach has been extensively utilized as supplementary treatment for various conditions, including cancer (Pouraboli et al., 2019). Art therapy utilized as a form of distraction allowed children to cope with painful or stressful situations (Woodgate et al., 2014). Art therapy encompasses various practices, with painting being a prominent aspect. Drawing and painting serve as powerful means for children to convey unspoken emotions, facilitating emotional release and aiding in the treatment of their issues (Tahmasebi et al., 2017). Painting therapy serves as a crucial means of communication with children who may struggle to express their feelings due to factors like fear or embarrassment. Drawing allows these children to articulate their thoughts and frustrations about their hospital environment in a secure setting, facilitating emotional expression. Essentially, drawing aids in the development of anger management and emotional understanding by teaching appropriate coping strategies, techniques, and problem-solving skills, offering a non-intrusive avenue for communication during emotionally challenging situations (Khodabakhshi Koolae et al., 2016).

Music therapy is believed to reduce anxiety levels. In addition, music therapy can also reduce the physiological response of patients, especially children with cancer, to anxiety during hospitalization and chemotherapy. As a nursing intervention, music therapy can be integrated into patients' care plans as an effective method to reduce pain and anxiety, promote relaxation, enhance immune function, and lower blood pressure, pulse, and respiratory rate. Engaging with music prompts the release of endorphins, contributing to a sense of calm and relaxation

in patients (Nikkhah et al., 2014). This is due to the diverse origins of anxiety. Based on experience, it was found that patients experienced anxiety due to the first time of chemotherapy, due to side effects and also caused by the fear of repeated infusions (Latif et al., 2020). Patients can independently undertake this activity without relying on medical staff for assistance. Listening to music can enhance patients' psychological well-being and contribute to their physical health. Additionally, research has indicated positive outcomes in reducing anxiety, alleviating nausea and vomiting, and fostering relaxation among patients undergoing chemotherapy. (Masarogulları, 2017).

Virtual reality has been widely used in recent years as a distraction method in reducing pain, as well as lowering anxiety levels in medical procedures in children. Virtual reality (VR) is an interactive method of diversion, spanning from less immersive to completely immersive experiences, determined by the extent to which the user is isolated from their immediate surroundings. (Lee Wong et al., 2022). VR has been used in children to address a number of painful experiences, including injection procedures, bandage changes, wound care, chronic pain, and post-surgery. Distractors should be able to provide developmentally appropriate sensory stimulation to children, and be a sufficiently interactive method to attract children's attention. (Semerci et al., 2021). Various attributes of virtual reality could influence its efficacy in pediatric cancer care. VR games equipped with high-fidelity features such as immersive head-mounted displays, stereo sound, and interactive controllers offer enhanced immersion, presence, and engagement with narratives, potentially improving pain management (Yap et al., 2020). Hospitalized oncology patients, frequently limited in their activities by treatment or its side effects, could greatly benefit from an experience that instills a sense of control and provides access to an alternate environment, even if virtual. The feeling of being present in this environment leads to focused attention, which can enhance mood, reduce anxiety and pain, and also influence the perception of time, all effects attributable to VR (Erdős & Horváth, 2023).

CONCLUSION

Distraction therapy has significant benefits for reducing various side effects of chemotherapy including nausea, vomiting, alopecia, allergic reactions, and psychological effects such as anxiety and depression. The various non-pharmacological interventions discussed above need to be implemented in Indonesia. However, thorough preparation is essential, particularly in providing education for self-care practices that are feasible for each patient during treatment.

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