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Reducing Pain in Children with Cancer Using A Combination of Benson Relaxation and Peppermint Essential Oil Aromatherapy

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ABSTRACT

Childhood cancer is a chronic disease that often causes significant pain. This pain may result from the disease itself or from procedures necessary for treatment. In addition to pharmacological therapies, non-pharmacological approaches can be utilized to alleviate pain in children with cancer. Benson Relaxation is a non-pharmacological technique that can help reduce pain through deep breathing exercises accompanied by the repetition of positive words aligned with the child's faith. Another non-pharmacological therapy, peppermint oil aromatherapy, is known for its calming properties, which can reduce pain and promote comfort. This study aims to evaluate the combined effect of Benson Relaxation and peppermint oil aromatherapy on pain reduction in children with cancer. Employing a quantitative research design, the study utilized a quasi-experimental approach with a group pre-test and post-test design. The sample consisted of 15 children aged 6 years and older, selected using purposive sampling. Pain levels were measured using a Numeric Rating Scale (NRS) over the course of one week. Data analysis was performed using the Wilcoxon Test, and the results demonstrated a significant effect of the combined intervention in reducing pain levels, with a p-value of 0.001 ($p < 0.05$). These findings suggest that Benson Relaxation combined with peppermint oil aromatherapy is an effective holistic, non-pharmacological intervention for reducing pain in children with cancer during treatment. It is recommended that this intervention be considered as part of comprehensive care strategies for pediatric cancer patients.

Keywords: Benson Relaxation, Children Cancer, Pain, Peppermint Oil Aromatherapy

1. Introduction

Cancer in children is one of the long-term diseases that has become a global concern. According World Health Organization (WHO) (2020) Pediatric cancer refers to cancers that affect individuals under the age of 18. One of the primary characteristics of cancer is the abnormal growth of cells beyond normal limit (Ariyati et al., 2023). According to Globocan data, it was estimated in 2020 that there were 19.3 million new cancer cases and 10 million cancer-related deaths worldwide (Andinata et al., 2023). The International Agency for Research on Cancer (IARC) reported that, in 2020, 8,677 Indonesian children were diagnosed with cancer, representing the highest number among Southeast Asian countries. Furthermore, the 2018 Basic Health Research identified 20,126 cases of cancer in children aged 0–14 years. Riskesdas (2018) reported the most common types of cancer affecting children include leukemia, osteosarcoma, neuroblastoma, malignant lymphoma, and nasopharyngeal carcinoma (Annisa, 2021).

Pediatric cancer patients frequently experience pain associated with the disease itself or as a result of treatments such as chemotherapy, radiation, and other medical procedures (Ibrahim et al., 2021). The lengthy treatment process for cancer can also lead to significant pain and stress for affected children. Both anxiety and pain negatively impact the treatment outcomes for pediatric cancer patients. In fact, the pain caused by medical

procedures and treatments can sometimes pose a greater challenge for children than the cancer itself (Loeffen et al., 2020).

To address acute pain and anxiety, both pharmacological and non-pharmacological therapies are utilized. Non-pharmacological methods of pain management help patients achieve comfort and gain control over their pain. These approaches include acupuncture, music therapy, cold or hot compresses, physical exercise, adopting comfortable positions, massage therapy, social and emotional support, spiritual and religious guidance, relaxation therapy, deep breathing techniques, and distraction techniques (Zeleke et al., 2021). Additionally, non-pharmacological pain management methods consider the affective, cognitive, and sociocultural dimensions of the patient. This comprehensive approach often provides advantages over conventional medicine by addressing broader aspects of patient well-being (Tsegaye et al., 2023).

Relaxation techniques are a form of non-pharmacological therapy. These techniques are believed to distract the patient's focus from pain, reduce stress induced by pain, enhance pain tolerance, improve the effectiveness of pain relief measures, and increase the perception of pain control (Safarina, 2019). One specific relaxation technique that can be used to alleviate pain is Benson relaxation. This technique combines physical relaxation with philosophical or religious belief systems held by the individual. An additional element in Benson relaxation involves the use of belief-based suggestions in the form of specific words, which are thought to reduce pain (Sania, 2024).

The application of Benson relaxation to school-age children has demonstrated substantial benefits. According to Piaget, the religiosity development of school-age children is in a formative stage, making it conducive to fostering religious culture. Strategies to instill religious culture include: (1) providing role models, (2) habituating children to positive practices, (3) teaching discipline, (4) offering motivational encouragement, (5) implementing reward and punishment systems, and (6) creating a religious atmosphere that supports children's holistic growth (Aini, 2012). In addition to Benson relaxation, aromatherapy is commonly employed to manage pain, respiratory conditions, and emotional distress. Aromatherapy is effective due to its ability to provide a calming sensation and alleviate stress. The primary active ingredients in peppermint oil, menthol and methyl salicylate, possess antispasmosdic properties and a calming effect when used internally (Aprilian & Elsanti, 2020). Peppermint oil also exhibits a strong analgesic effect mediated through the activation of kappa-opioid receptors, which block the transmission of pain signals. Its external application has been shown to raise the pain threshold in humans (Balakrishnan, 2015).

Children with cancer, who often experience persistent pain and require prolonged hospital treatments, frequently stay in halfway houses. A halfway house serves as a temporary residence that offers physical, psychological, spiritual, and social support to patients and their families during treatment. By fostering a positive environment, halfway houses can contribute to the healing process. These facilities are particularly intended for child cancer patients from underprivileged backgrounds.

Research indicates that relaxation techniques can help patients manage pain, anxiety, and sleep disturbances commonly associated with cancer treatment (Sania, 2024). Another study demonstrated that peppermint oil aromatherapy effectively reduces pain and anxiety in cancer patients undergoing chemotherapy (Suprapti & Herawati, 2023). Additionally, a significant reduction in pain intensity during AV fistula insertion in hemodialysis patients was observed when Benson relaxation therapy was combined with aromatherapy (Bening et al., 2022). However, previous studies have not explored the combined application of Benson relaxation and peppermint oil aromatherapy, particularly in children with cancer. It is anticipated that this combination will produce a more substantial impact on pain reduction and comfort enhancement. Based on this rationale, the aim of this study is to evaluate the effect of Benson relaxation combined with peppermint oil aromatherapy on the pain scale in children with cancer.

2. Methods

This research employs a quantitative approach with a quasi-experimental design, utilizing a one-group pre-posttest method. The study population consisted of 26 children with cancer, and the sample was selected using purposive sampling, focusing on children aged 6 to 18 years, totaling 15 participants. Data collection was conducted through pretest and posttest questionnaires. The research instrument utilized a Numeric Rating Scale (NRS) to measure the level of pain experienced by patients, ranging from 0 to 10. Benson relaxation intervention combined with peppermint oil aromatherapy was administered before analgesic treatment three times a day for one week, with each session lasting 15 minutes. The intervention involved relaxation techniques accompanied by the inhalation of peppermint oil aromatherapy using an inhaler. Data analysis comprised univariate and bivariate approaches, with the bivariate analysis conducted using the Wilcoxon test. The Directorate of Research and Community Service at Bhakti Kencana University Jakarta issued a research assignment letter (number: 056/08.CAB-JKT/UBK/IX/2024).

3. Results

Table 1 Characteristics of respondents based on age, gender, type of cancer, and duration of treatment (n=15)

Characteristics	f	%
Age		
5 – 7 years	3	20
8 – 12 years	10	66.7
13 – 18 years	2	13.3
Gender		
Male	9	60
Female	6	40
Type of cancer		
Leukemia	7	46.7
Retinoblastoma	3	20
Osteosarcoma	2	13.3
Malignant lymphoma	1	6.7
Others	2	13.3
Duration of treatment		
< 1 year	9	60
1-2 year	6	40

Table 1 highlights that for the age variable, most respondents (66.7%) were aged between 8 and 12 years, amounting to 10 participants. Regarding gender, the majority of respondents were male, comprising 9 participants (60%). For the type of cancer, leukemia was the most common diagnosis, affecting 7 respondents (46.7%). Concerning the duration of treatment, the majority of respondents (60%) had been undergoing treatment for less than one year, totaling 9 participants.

Table 2 Pain scale before and after administration of Benson relaxation intervention combined with peppermint oil aromatherapy (n=15)

Pain scale	Mean	Median	Min	Max	Std. Deviation
Pain scale before	4.53	5.00	3	6	0.743
Pain scale after	1.33	1.00	0	3	0.900

Table 2 reveals that following the Benson relaxation intervention combined with peppermint oil aromatherapy, the mean pain score decreased from 4.53 (before) to 1.33 (after). The median pain score also declined from 5.00 (before) to 1.00 (after). The minimum pain scale value improved from 3 (before) to 0 (after), while the maximum pain scale value decreased from 6 (before) to 3 (after). Additionally, the standard deviation shifted from 0.743 (before) to 0.900 (after).

Table 3 Average of pain scale before and after Benson Relaxation intervention combined with peppermint oil aromatherapy (n=15)

Variable		Mean Rank	Z	*P Value*
Pain scale	Before – After	8.00	-3.426	0.001

Table 3 demonstrates that the pain scale showed a mean rank reduction of 8.00 after the intervention. The results of the statistical analysis indicated a p-value of 0.001 (<0.05), suggesting that the Benson relaxation intervention combined with peppermint oil aromatherapy significantly reduced pain levels in children with cancer.

4. Discussion

The results indicate that children with cancer in halfway houses are predominantly male. This finding contrasts with the Riskesdas report, which states that the prevalence of cancer is higher in women than in men. This discrepancy could be attributed to cancer types specific to women, such as breast cancer and cervical cancer, which are among the most frequently reported cancer types in Indonesia. Additionally, these types of cancer benefit from better early detection coverage compared to other types (Riskesdas, 2018).

The statistical results also reveal that leukemia is the most common type of cancer among children in halfway houses. This finding aligns with data from the *International Agency for Research on Cancer*, which shows that the incidence of cancer is higher in boys, particularly for certain types such as leukemia, lymphoma,

and brain tumors (IARC, 2014). Similarly, research conducted by Putri (2020) found that the incidence of leukemia in boys was 1.5 times higher than in girls, and the prevalence of brain cancer was also greater in boys compared to girls (Putri et al., 2020).

The results indicate that children with cancer residing in halfway houses are predominantly aged 8-12 years. According to research conducted by Rumapea (2023), the majority of children with cancer undergoing chemotherapy fall within the 9-12 age group. At this stage of development, children are more vulnerable to diseases due to increased activities outside the home, exposing them to various environmental factors. Additionally, the immunological processes in children undergo significant changes during this period. Children aged 8-12 have been exposed to environmental factors for several years, and the cumulative effects of such exposure become evident (Arania, 2022).

The findings also reveal that most child respondents in halfway houses have been undergoing treatment for less than one year, during which pain is a common side effect. Research highlights the importance of effective pain management in improving the quality of life for children with cancer. Non-pharmacological techniques such as acupuncture, aromatherapy, and music therapy have been shown to reduce children's perception of pain. This holistic approach to pain management is often more effective than pharmacological methods (Davis, 2017).

Cancer patients frequently experience symptoms such as pain, fatigue, sleep disturbances, anxiety, and depression. These symptoms not only reduce the patient’s functional capacity and quality of life but also contribute to increased stress levels within the family (Yennurajalingam et al., 2018). A key principle of atraumatic care is minimizing pain through non-pharmacological methods, including relaxation techniques. The Benson technique, a form of spiritual healing therapy, exemplifies this approach. This method involves focusing attention on a specific factor by repeating ritual phrases and eliminating distracting thoughts (Samsugito, 2021).

This Benson technique is supported by research conducted by Wainasari (2020), which demonstrates that the technique, when performed before administering analgesics for a duration of 15 minutes daily over three consecutive days, significantly reduces pain intensity. Pain scales are measured using the Numeric Rating Scale (NRS) before and after the intervention. The results revealed that clients experienced a decrease in pain intensity to mild levels, with observable signs of calmness and relaxation (Wainsani & Khoiriyah, 2020). Similarly, Dewiyanti (2022) highlights that Benson therapy is an effective non-pharmacological pain management strategy, as it helps divert the attention of cancer patients to pleasant thoughts, thereby reducing their pain (Dewiyanti, 2022).

Aromatherapy also serves as a non-pharmacological approach to pain reduction in children. Research by Aprilian (2020 indicates that peppermint aromatherapy induces deep relaxation and alleviates pain. The menthol in peppermint stimulates the sense of smell, thereby reducing the production of corticotropin-releasing hormones, which subsequently lowers cortisol secretion from the adrenal glands, leading to pain relief (Aprilian & Elsanti, 2020). Another research conducted by Rumapea (2023) found that Peppermint aromatherapy relaxes the body by stimulating endocrine release and reducing sympathetic nervous system activity. This intervention has been shown to reduce pain and alleviate nausea and vomiting in children with cancer undergoing chemotherapy (Rumapea et al., 2023).

Further research supports the combined use of Benson relaxation therapy and peppermint oil aromatherapy for pain reduction in children with cancer. For instance, Bening (2022 reported a significant reduction in pain intensity during AV fistula insertions in hemodialysis patients when these two methods were combined (Bening et al., 2022). Benson relaxation therapy alone has proven benefits in reducing stress, anxiety, and pain, thereby enhancing patient satisfaction and quality of life (Alzaatreh & Abdalrahim, 2020).

5. Conclusion

The findings from this study demonstrate that combining Benson relaxation therapy with peppermint oil aromatherapy effectively reduces pain in children with cancer, as evidenced by significant decreases in pain scales before and after intervention. This combination represents a non-pharmacological pain management method that is safe, cost-effective, minimally invasive, and suitable for children undergoing cancer treatment.

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