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Levels of hope among children under 18 years old with acute lymphoblastic leukemia undergoing chemotherapy: A descriptive study

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Abstract

Background: Hope is an essential psychological resource that enables children with cancer to cope with the stress and uncertainty of long-term treatment. However, research focusing on the level of hope among children with Acute Lymphoblastic Leukemia (ALL) in Indonesia or Southeast Asia remains limited, as most studies have centered on adults or on depression and anxiety rather than hope. Understanding hope among pediatric cancer patients is crucial for developing psychosocial interventions that enhance emotional resilience and treatment adherence.

Purpose: to describe the levels of hope among children under 18 years old with ALL who were undergoing chemotherapy.

Method: This was a quantitative descriptive study involving 66 respondents selected through convenience sampling. Data were collected using the Children's Hope Scale (CHS), consisting of six items that assess agency and pathway thinking. Ethical approval and parental consent were obtained prior to data collection. Descriptive statistics were applied to analyze respondents' demographic characteristics and hope scores.

Result: The findings showed that most respondents were aged 8–12 years (56.1%), male (59.1%), and diagnosed with high-risk ALL (89.4%). More than half (54.5%) demonstrated a high level of hope, while 45.5% had a low level of hope. Younger children exhibited higher hope levels compared to adolescents. The mean hope score was 22.9 ± 3.95 , with a median of 23 and a score range of 16–32, indicating a moderate to high overall level of hope.

Conclusion: Most children with ALL in this study maintained a moderate to high level of hope during chemotherapy. These results emphasize the importance of assessing hope as part of psychosocial care. Strengthening hope through supportive communication and family-centered interventions can enhance children's PWB and promote better adherence throughout the treatment process.

Keyword: Acute Lymphoblastic Leukemia; Chemotherapy; Children; Hope.

INTRODUCTION

Global data indicate that the incidence of blood cancers among children remains a major challenge in pediatric health. For instance, a 2020 report recorded 67,008 new cases of childhood leukemia worldwide,

with an Age-Standardized Incidence Rate (ASIR) of approximately 3.4 per 100,000 children (Ding, Deng, Xiong, Cheng, & Xu, 2025). More specifically, studies focusing on Acute Lymphoblastic Leukemia (ALL)

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revealed that between 1990 and 2021, the number of ALL cases in children increased by nearly 59%, reaching around 168.879 cases globally in 2021 (Mohammadian-Hafshejani, Farber, & Kheiri, 2024). In addition to this rise in absolute numbers, research also shows that the incidence trend in several developing and urban countries continues to increase. The global standardized average incidence of childhood leukemia has been reported at 4.64 per 100.000 person-years, with annual growth observed in certain regions (Khabarova, Pinaev, Chakov, Chizhov, & Pinaeva, 2024).

The ALL type of cancer is a malignant proliferation of lymphoblastic cells, in which lymphocyte cells grow excessively within the bone marrow and peripheral tissues, thereby inhibiting the growth of normal cells and interfering with platelet formation. The infiltration of leukemia into other organs can cause symptoms such as headaches or vomiting due to central nervous system involvement, as well as bone pain (Campbell, Kiss, Zimmermann, Riccheri, Kowalczyk, Felice, & Schrappe, 2023; Kamilah, Mayetti, & Deswita, 2023; Marcdante & Kliegman, 2019). Cancer treatment involves various therapeutic approaches, including chemotherapy, surgery, radiotherapy, immunotherapy, bone marrow transplantation, peripheral blood stem cell therapy, and hormone therapy (Wilson, Hockenberry, & Rodgers, 2017; Marcdante & Kliegman, 2019).

Chemotherapy is the most commonly used therapeutic method in the treatment of children with cancer, aimed at controlling the proliferation of cancer cells and preventing further spread (Butler, Ludwig, Pacenta, Klesse, Watt, & Laetsch, 2021; Wilson et al., 2017; Marcdante & Kliegman, 2019). Although chemotherapy has therapeutic effects that inhibit cancer cell growth, it can also cause potentially harmful side effects that require medical management (Herfiana & Arifah, 2019; Wilson et al., 2017). However, the effects of chemotherapy are not limited to the physical domain; they also have significant psychological and social impacts, which are often associated with a decline in quality of life and the psychological well-being of patients undergoing

treatment (Anestin, Lippé, Robaey, Bertout, Drouin, Krajnovic, & Sultan, 2018; Kızılocak & Okcu, 2019; Hidayati, 2017).

A previous study conducted in Canada reported that approximately 14% of children with ALL experience anxiety of varying severity, ranging from mild to severe. In addition, 21% of them experienced depression, and 30% experienced emotional disorders (Anestin et al., 2018). Similarly, a study in South Korea found that approximately 0.7% of children showed signs of anxiety, 1.4% experienced depression, and another 1.4% faced stress or adjustment disorders (Heo, Park, Noh, & Shin, 2022). Other studies also explain that children with ALL undergoing chemotherapy often experience psychological effects such as emotional disorders, behavioral changes, mood fluctuations, feelings of isolation, irritability, difficulties in social interaction, sleep problems, anxiety, and depression (Erdmann, Frederiksen, Bonaventure, Mader, Hasle, Robison, & Winther, 2021; Cheung, Li, Ho, Ho, Chiu, Chan, & Chung, 2019). In addition, one of the most significant effects faced by children with ALL undergoing chemotherapy is a decline in overall well-being (Lestari & Nurhayati, 2020; Li et al., 2013; Tremolada, Taverna, Bonichini, Pillon, & Biffi, 2022). This includes feelings of happiness, satisfaction, low stress levels, good physical and mental health, and adequate quality of life (Mustafa, El-Ashry, & Mahmoud, 2019; Ryff, 2013).

Children with cancer who undergo chemotherapy are at a higher risk of experiencing depressive symptoms compared to healthy children. They may withdraw from social interactions and lose their sense of hope, resulting in a lower level of PWB. The long-term effects of chemotherapy contribute to reduced treatment adherence and a decline in the overall quality of life of these children (Lestari & Nurhayati, 2020; Li, Lopez, Chung, Ho, & Chiu, 2013; Mustafa et al., 2019; Tremolada et al., 2022). These psychological and emotional challenges underline the need to identify protective factors that help children cope with the burden of long-term treatment. One key factor is hope, which strengthens emotional resilience

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and encourages children to endure the treatment process (Alya, Hendrawati, & Mediani, 2025; Ho, Li, , Cheung, Ho, Lam, Chiu, & Chung, 2021).

Findings from previous studies have identified hope as an essential element in preventing psychological disorders and enhancing PWB among cancer patients across all age groups (Alya et al., 2025; Ho et al., 2021). Hope is often associated with optimism, resilience, and confidence in a better future (Gallagher & Lopez, 2017). It has been recognized as a key factor linked to reduced depressive symptoms and mood disturbances, which are closely related to positive feelings of well-being and adherence to treatment (Gheihman, Zimmermann, Deckert, Fitzgerald, Mischitelle, Rydall, & Rodin, 2016; Tremolada et al., 2020). Moreover, depression and anxiety often emerge as emotional responses to cancer diagnosis and treatment, which can disrupt overall PWB (Cheung et al., 2019). Children who maintain a positive sense of hope regarding their treatment outcomes tend to be more resilient to stress and demonstrate better PWB. Conversely, when children possess unrealistic expectations or become pessimistic about their future, this can lead to feelings of hopelessness and contribute to the development of psychological disorders (Tremolada et al., 2020).

Hope plays a crucial role in the emotional and psychological health of children undergoing cancer treatment. It is associated with improved coping behaviors, a greater sense of security, and a higher overall quality of life. Children who maintain hope during treatment tend to experience more favorable emotional outcomes, including reduced anxiety and depression. Emphasized the importance of healthcare providers in fostering hope through emotional support and positive experiences to enhance the well-being of children throughout their treatment journey (Piasai & Rakhmawati, 2024). A deeper understanding of children's levels of hope and the factors associated with PWB is essential for healthcare professionals to design and implement appropriate interventions that strengthen coping abilities and promote psychological well-being (Ho et al., 2021). Furthermore, the life expectancy of

children with psychiatric comorbidities tends to be shorter than that of those who can effectively manage their condition. Therefore, assessing hope among childhood cancer survivors is critical to better understand their responses to stress and the challenges they face after recovery (Gheihman et al., 2016; Ho et al., 2021).

Although hope has increasingly been recognized as an important psychological resource in pediatric oncology, research that specifically focuses on hope among children with ALL within the Indonesian or Southeast Asian context remains very limited. Studies in this region tend to prioritize adult populations or emphasize symptoms of depression and anxiety rather than the construct of hope itself, indicating a significant gap in the existing literature. For instance, a review of hope among Asian cancer patients noted that there is still very little research examining the correlation between hope and hopelessness (Mahendran, Chua, Lim, Yee, Tan, Kua, & Griva, 2016). Therefore, understanding the level of hope among children undergoing chemotherapy is essential not only because low hope is associated with poorer PWB, but also because assessing this variable can serve as a foundation for psychosocial interventions within hospital settings. In this regard, nurses and other healthcare professionals are uniquely positioned to recognize children's levels of hope, provide supportive communication, and adopt strategies that strengthen hope, thereby contributing to improved treatment adherence and emotional resilience.

RESEARCH METHOD

This study employed a quantitative descriptive design to identify and describe the levels of hope among children under 18 years old diagnosed with ALL who were undergoing chemotherapy. The design was selected to obtain a factual depiction of the hope variable as measured by a standardized instrument without manipulating any conditions or interventions. The study was conducted in a provincial referral hospital that provides pediatric oncology services. The target population consisted of all children under

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18 years old with a confirmed diagnosis of ALL who were receiving chemotherapy during the study period. Sampling was conducted using a consecutive sampling technique, including every eligible child who met the inclusion criteria until the required number of participants was achieved.

The inclusion criteria were as follows: (1) Children aged 8–18 years diagnosed with ALL; (2) Currently receiving chemotherapy treatment; (3) Being in one of the following chemotherapy phases: induction, consolidation, or maintenance; (4) Receiving treatment while accompanied by their parents or primary caregivers; (5) The parent or guardian provided written consent by signing the informed consent form for participation. The exclusion criteria included: (1) Children with mental retardation or cognitive developmental delays; (2) Children who cannot communicate verbally; (3) Children in unstable physical or hemodynamic conditions that make data collection impossible.

The determination of the sample size in this study was carried out using the Slovin formula. This formula is commonly used to determine the appropriate sample size when the total population is known. Based on the total population and a 5% sampling

error, the final sample size was 66 respondents. This number is considered representative of the population, allowing the study results to accurately reflect the level of hope in children with ALL undergoing chemotherapy.

The data collection tool in this study was the Children Hope Scale questionnaire developed. This questionnaire was then into an Indonesian version that is valid and reliable. This questionnaire contains 6 questions that describe how children think about themselves and how they do things in general. The way to fill out this questionnaire is by placing a check mark (✓) in the circle according to the respondent's answer on the Likert scale provided. The total score of the Children Hope Scale is achieved by adding up the responses to the six items, with "No time" = 1, "A little time" = 2, "Sometimes" = 3, "Often" = 4, "Most of the time" = 5, and "All the time" = 6. The total CHS score ranges from 6 to 36, with higher scores indicating higher levels of hope.

The researcher obtained ethical clearance from one of the provincial referral hospitals in West Java, under approval number DP.04.03/D.XIV.6.5/464/2024.

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RESEARCH RESULT

Tabel 1. Frequency Distributions of Respondents Demographic Characteristics (N=66)

Variable	Results
Age (Mean±SD) (Range) (Year)	(12.41±3.093) (8-18)
8-12	37/56.1
13-18	29/43.9
Gender (n/%)	
Male	39/59.1
Female	27/40.9
Type of ALL	
ALL–SR	7/10.6
ALL–HR	59/89.4
Hope Levels among Children (n/%)	
High Hope	36/54.5
Low Hope	30/45.5

Table 1 shows that the average age of respondents and standard deviation is (12.41±3.093) with an age range of 8-18 years. the demographic characteristics, most respondents were in the 8–12-year age group (56.1%), indicating that the majority of children undergoing chemotherapy were at the school-age level. A smaller proportion, 43.9%, were in the 13–18-year age group. This shows that leukemia affects children in both age categories, but more cases were found among younger children. Regarding gender, the data show that male children (59.1%) outnumbered female children (40.9%). This suggests that more boys than girls were undergoing chemotherapy for ALL at the time of the study. The majority of respondents were diagnosed with the high-risk type of ALL (89.4%), while only 10.6% had the standard-risk type. This finding indicates that most of the children treated at the hospital required more intensive and prolonged chemotherapy protocols.

The analysis of hope levels showed that 54.5% of children had a high level of hope, while 45.5% had a low level of hope. This result indicates that more than half of the respondents remained optimism and positive expectations during their treatment, even though a considerable proportion still experienced lowe.

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Table 2. Descriptive Statistics of the Research Variable (N= 66)

Variable	Mean	Median	SD	Min–Max
Hope	22.9	23	3.95	16–32

Table 2. the mean hope score was 22.9 ± 3.95 , with a median of 23 and a range between 16 and 32. These results indicate a moderate overall level of hope among participants, suggesting variability in

psychological adaptation to illness. Individual differences may be influenced by treatment phase, support systems, age, and coping capacity.

DISCUSSION

Based on the findings of the study, the majority of respondents (54.5%) demonstrated a high level of hope, indicating that they hold an optimistic view of their future and the treatment process they are undergoing. They tend to believe and expect that the ongoing therapy will lead to positive outcomes, such as recovery or improvement in their health condition. However, nearly half of the respondents (45.5%) showed a low level of hope, suggesting that they feel pessimistic or less confident about their prospects, both in terms of treatment and the future in general. Respondents with low levels of hope may experience anxiety, uncertainty, or a sense of hopelessness regarding their health condition, which can affect their psychological well-being and their ability to cope with challenges related to illness and treatment (Ho et al., 2021).

Hope is often associated with optimism, resilience, and confidence in a better future (Snyder et al., 2018). In the context of children with cancer, hope serves as a significant factor influencing their level of PWB, considering the numerous emotional challenges faced by children battling a life-threatening illness such as cancer. Hope has been identified as a key factor related to reduced depressive symptoms and mood disturbances, reinforcing its association with positive feelings of well-being and commitment to treatment during the first year of therapy (Tremolada et al., 2020). It also functions as a coping mechanism that helps children overcome emotional and psychological difficulties resulting from a chronic

illness diagnosis. Moreover, higher levels of hope are linked to feelings of greater happiness, independence, and optimism about the future (Germann, Leonard, Stuenzi, Pop, Stewart, & Leavey, 2015; Griggs & Walker, 2016).

Previous research has shown that lower levels of hope are associated with higher levels of depressive symptoms and lower self-esteem. Conversely, higher levels of hope correlate with better health-related

quality of life, suggesting that fostering hope is essential for improving psychological outcomes among pediatric cancer patients (Koyu, Algül, Altay, & Kilicarslan, 2024). In addition, existing evidence indicates that adolescents with higher levels of hope report greater self-esteem and fewer depressive symptoms compared to those with lower hope levels (Ho et al., 2021).

A previous study conducted in Italy explained that hope was significantly associated with lower levels of depression and mood disturbances. The study showed that children who expressed higher levels of hope were more capable of coping with the challenges imposed by their illness and treatment, which in turn contributed to an improvement in their psychological well-being (PWB). This finding indicates that hope functions as a protective factor against the emotional distress commonly experienced during cancer treatment (Tremolada et al., 2020).

In the present study, most respondents demonstrated a high level of hope. The item analysis

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revealed that the statement with the highest mean score was item number 5, *"I think the things I have done in the past will help me in the future."* This statement reflects the respondents' optimism and confidence that their previous positive experiences and actions can provide benefits or support in facing future challenges, including those related to treatment and therapy. Such a belief indicates that the respondents have confidence in their ability to overcome difficulties and trust in their internal strengths and resources that can help them endure the treatment process successfully. It suggests that the respondents perceive their past experiences whether in dealing with previous difficulties or undergoing medical care as sources of confidence in facing current challenges.

Although the majority of respondents in this study had high levels of hope, nearly half still exhibited low hope. This can be further explained through the item analysis results. The lowest mean score (3.05 ± 1.13) was found in item number 1, which belongs to the agency dimension, stating, *"I think my present situation is good."* The low mean score for this item indicates that although respondents may feel optimistic about the future, they tend to perceive their current health condition as less favorable. This suggests a gap between the hope they hold and the reality they experience in their daily lives during treatment. The low mean score on this item implies that many respondents feel their physical and emotional state is not yet optimal or stable, even though they continue to maintain hope for a better future.

This condition may be influenced by several physical and psychological factors related to the treatment process the children are undergoing. Poor physical conditions can affect children's perceptions of their own state, resulting in lower scores for that item. Uncertainty about the future, particularly concerning treatment outcomes and the possibility of disease recurrence, may also lead children to feel less optimistic. Anxiety about recovery or worries about the long-term effects of treatment often reduce their self-confidence and hinder them from feeling that

their current condition is satisfactory (Taverna, Bellavere, Tremolada, Santinelli, Rudelli, Mainardi, & Tosetto, 2021; Tremolada et al., 2020). Children facing chronic illnesses such as cancer may feel burdened by fear and uncertainty, which diminishes their belief in their overall health condition and, consequently, lowers their sense of hope in life (Bearison & Mulhern, 2011).

The results of this part of the study highlight that fostering hope is essential for enhancing the psychological well-being (PWB) of children and adolescents undergoing cancer treatment. Higher levels of hope are associated with fewer depressive symptoms, better coping strategies, and improved quality of life during therapy. Therefore, these findings emphasize the importance of integrating hope-enhancing interventions within the therapeutic environment to support the emotional health of children with cancer who are receiving chemotherapy.

CONCLUSION

This study provides a descriptive overview of hope among children under 18 years old diagnosed with ALL who were undergoing chemotherapy. The study findings showed that most respondents showed moderate to high levels of hope, indicating that many children-maintained optimism and self-confidence throughout their treatment process. Younger children tended to show higher levels of hope compared to adolescents, suggesting that developmental factors may influence children's perceptions of illness and recovery. These results emphasize the importance of incorporating psychosocial assessments particularly the evaluation of hope into pediatric oncology care. Understanding children's levels of hope enables healthcare professionals, especially nurses, to provide more effective emotional support, develop family-centered interventions, and promote adaptive coping strategies. Strengthening hope can improve psychological well-being, treatment adherence, and overall quality of life among pediatric patients undergoing chemotherapy. Future research is recommended to explore the factors influencing hope and to design evidence-based interventions aimed at enhancing hope and resilience in children facing long-term cancer treatment.

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