Original Article

Enhancing Quality of Life and Reducing Anxiety in Children with Leukemia Through Social Support: A Pilot Cross-sectional Study

Nesibe S. Kutahyalioglu[1] Gamze Demirbas[2]

[1] Pediatric Nursing Department, Faculty of Health Sciences, Karabük University, Karabük, Turkey
[2] Gerger State Hospital, Board of Trustees, Adiyaman, Turkey

Address for correspondence Nesibe S. Kutahyalioglu, PhD, RN, Karabük Üniversitesi Sağlık Bilimleri Fakültesi Demir Çelik Kampüsü 78050 Karabük, Turkey (e-mail: nkutahya@gmu.edu).

Ind J Med Paediatr Oncol

Abstract

Introduction Approximately 400,000 new cases of cancer are diagnosed annually among children and adolescents. Leukemia, the most prevalent pediatric cancer, is a leading cause of mortality in children under 15 years of age. Despite advances in treatment, patients often face remarkable social and academic challenges. The literature underscores the necessity of developing strategies to address these difficulties and provide comprehensive support to children with leukemia.

Objective This pilot cross-sectional study aimed to enhance emotional well-being and resilience in children with leukemia by fostering a sense of solidarity and self-efficacy through interactions with mentors who have successfully recovered from leukemia.

Materials and Methods The intervention involved 12 participants (7 girls and 5 boys, mean age = 10 years) from the country's eastern provinces. Over 3 months, these children engaged in online sessions with recovered leukemia survivors who provided motivational and academic support.

Results The findings revealed statistically significant improvements in participants' trait anxiety ($p = 0.029$), general quality of life ($p = 0.007$), and coping skills related to cancer ($p = 0.005$). These results indicate that the mentorship program positively influenced the psychological and social well-being of children with leukemia.

Conclusion This initiative demonstrates the potential of such programs to mitigate motivational challenges, foster social benefits, and contribute to pediatric cancer patients' long-term health and productivity.

Keywords
- children
- leukemia
- mentorship
- quality of life
- anxiety
- coping skills

Introduction

Approximately 400,000 new cases of cancer are diagnosed annually among children and adolescents.[1] Besides, 1 in every 285 children is diagnosed with cancer before reaching the age of 20.[2] According to the 2020 data of the World Health Organization, approximately 2% of children diagnosed with cancer die.[1] Leukemia is the most prevalent cancer among children, constituting approximately 25.4% of all pediatric cancer cases.[3] In addition to being the most common childhood cancer, it is one of the leading causes of death in children under the age of 15.[3] When we look at the data from Turkiye, approximately 1,000 new children are diagnosed with leukemia every year.[4]

Leukemia is characterized by a challenging, prolonged, and costly treatment process.

DOI https://doi.org/10.1055/s-0045-1813230.
ISSN 0971-5851.

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

While the etiology of childhood leukemia remains largely unknown, advancements in treatment have greatly improved survival rates. Treatment modalities such as chemotherapy, radiotherapy, and surgical interventions are administered at regular intervals.[5] In recent years, Turkiye has achieved cure rates comparable to those of developed countries. However, despite advancements in treatment, the disease remains challenging to treat, necessitating intensive and prolonged therapy. Cancer symptoms and therapy-related complications continue to adversely affect the quality of life, particularly in pediatric patients.[6,7]

Children with acute lymphoblastic leukemia (ALL) in Turkiye achieve survival rates close to developed countries (~88%).[4] When chemotherapy is insufficient, bone marrow transplantation is performed, with both treatments applied according to European standards. Despite all these positive developments, cancer diagnosis is one of the most challenging experiences in human life and causes many physical (pain, nausea-vomiting, diarrhea, fatigue, etc.) and psychological (anxiety, fear, sadness, hopelessness, depression, trauma, etc.) negativities, especially in children.[7–10] In addition, the prolonged treatment process for pediatric patients with cancer introduces numerous stressors that affect both children and their families. These challenges encompass difficulties in social support and adaptation, disruptions in family dynamics, economic hardships, self-confidence issues, and decreased academic performance.[11–13] Psychosocial support plays a key role in reducing the risk of psychological disorders during and after this challenging process. Such support helps restore family and social relationships and eases the transition back to “normal” life. These interventions not only address immediate emotional and social needs but also contribute to long-term resilience and psychological well-being.[14,15]

In addition to psychosocial support in the healthy management of this process, the positive effect of social support cannot be denied. Social support refers to material or emotional assistance provided by one’s social network during stressful times. It helps reduce stress, enhances psychological well-being, and fosters a sense of belonging.[16] By supporting basic social needs like love, self-esteem, and connection, it positively impacts both physical and mental health. In the context of pediatric care, social support plays a critical role in preserving the child’s holistic health during periods of physical and psychological distress. It has been shown to expedite recovery, enhance adherence to medical treatments, improve quality of life, and contribute to increased longevity in patients. The provision of robust social support systems is therefore essential in optimizing health outcomes and fostering resilience.[8,17]

The literature identifies several factors contributing to the psychological impact on children facing chronic illness. These include concerns about the future, heightened anxiety levels, symptoms of depression, fear of not achieving recovery, and a sense of being different from their peers. These factors collectively influence the emotional well-being of children, underscoring the importance of addressing psychological needs alongside medical care.[18–20] Poirier and colleagues[21] emphasized the need to develop strategies to address the psychological challenges faced by pediatric oncology patients and to ensure they receive appropriate support. Sarman[22] highlighted that support programs for pediatric oncology patients provide significant physical and psychological benefits, emphasizing their vital role in promoting the well-being of thousands of children and families affected by cancer. Similarly, Huang and colleagues[23] delivered weekly recommendation materials through an internet program to 38 pediatric cancer patients over 4 months. The findings showed a significant reduction in anxiety, mood disorders, and depression ($p < 0.05$) in the intervention group, highlighting the effectiveness of such programs in pediatric oncology.

Moreover, Coughtrey and colleagues,[24] in a systematic review of psychosocial support programs for pediatric oncology patients, found these interventions reduced anxiety and depression and improved quality of life. Six studies also reported that invasive interventions lessened pain and symptoms like nausea, enhancing patient well-being. However, intervention types and durations varied, and uncertainties remain about the most effective approaches and optimal timing for support.

The primary objective of this cross-sectional study was to support the adaptation of children with leukemia to the emotional and psychological challenges encountered during their treatment. The study aimed to enhance their quality of life, improve their coping mechanisms in managing cancer, and alleviate anxiety. The study also connected children with leukemia to young volunteers and survivors to provide mentoring support, helping ease emotional challenges and foster solidarity during treatment, reducing feelings of isolation.

Materials and Methods

Study Design

This pilot cross-sectional study utilized a single-group pretest–posttest design to evaluate the impact of a support program for children with leukemia. Initially, a pretest was administered to assess baseline levels prior to the implementation of the support program. The online program was then conducted over a 3-month period, after which the dependent variables were reassessed.

Study Population and Sample Selection

The study population consisted of children aged 7 to 17 years who were diagnosed with leukemia. Based on statistical calculations ($\alpha = 5\%$, confidence level $= 80\%$, expected effect size $= 0.8$, standard deviation $= 1$), a minimum sample size of 13 participants was required.[25] Children were excluded if they were younger than 7 years, older than 17 years, had comorbid chronic illnesses, or had recently been involved in other support programs. A convenience sampling method was used to recruit participants, chosen for its efficiency and cost-effectiveness.[26] One of the researchers, a leukemia survivor under follow-up at Gaziantep Oncology Hospital, promoted the study within the clinic. Of the 47 children invited, 13 (28% response rate) and their families agreed to participate. A total of 13 participants were initially enrolled in the program; however, 1 participant unfortunately passed away during the program and was therefore excluded from the final analysis, as post-intervention data could not be collected. Consequently, the study was completed with 12 participants. All participating children were still in the active treatment phase for leukemia at the time of enrollment; therefore, survivorship duration was not applicable in this study. Additionally, around 10 fully recovered leukemia survivors joined as volunteer mentors to facilitate the support program. Volunteers joined the program after completing a training session—led by a psychologist—that covered topics such as how to approach a child with leukemia and how to use the educational materials.

Measurements

Data collection was conducted via an online program and included demographic questionnaire, the *General Child Quality of Life Scale (KINDL)*, the *State-Trait Anxiety Inventory for Children*, and the *Pediatric Cancer Coping Scale*.

General Child Quality of Life Scale

Developed by Ravens-Sieberer and Bullinger (1998) and adapted into Turkish by Eser and colleagues,[27] the KINDL scale includes Kid- KINDL (ages 8–12) and Kiddo-KINDL (ages 13–16). This 24-item, 5-point Likert scale assesses six dimensions: physical well-being, emotional well-being, self-esteem, family, friends, and school. Higher scores indicate a better quality of life. The scale demonstrated strong reliability (Cronbach's alpha = 0.78). The scale used in this study was previously validated in the Turkish pediatric population, demonstrating acceptable reliability and validity.[28,29]

State-Trait Anxiety Inventory for Children

Developed by Spielberger (1973) and adapted into Turkish by Özusta,[30] this tool comprises two 4-point Likert-type scales measuring state anxiety (current feelings) and trait anxiety (general feelings). The scale showed high reliability for this population (Cronbach's alpha = 0.65).[31]

Pediatric Cancer Coping Scale

Created by Wu et al (2011)[32] and adapted into Turkish by Kisecik Sengul and colleagues,[33] this 33-item scale assesses cognitive coping, problem-focused coping, and defensive coping. Items are rated on a 4-point Likert scale, with higher scores reflecting more frequent use of coping strategies. The scale demonstrated excellent reliability (Cronbach's alpha = 0.91) for this population.[33]

Preparation of the Support Program

Volunteer survivors who had successfully recovered from leukemia and expressed a desire to provide support were recruited through a dedicated website developed by one of the researchers, a leukemia survivor. On this platform, survivor volunteers specified the type of support they were willing to offer, while children currently undergoing treatment created accounts and indicated the kind of support they sought. The program was designed as an individual counseling session, developed based on relevant literature and expert opinions in the field. Each participant received support based on their need. The content included two categories: academic support (e.g., English, Mathematics, Science) and counseling support (e.g., mentoring based on survivors' experiences, art, music, storytelling, and arts and crafts activities). Each session lasted approximately 60 minutes and was delivered by leukemia survivors.

Survivor volunteers participating in the program underwent preliminary interviews conducted by the first author. Additionally, a pediatric nurse and psychologist provided online training sessions to address the volunteers' questions and prepare them for their roles. The program was not a formally structured or standardized module. Instead, it was implemented in a flexible manner tailored to participants' needs. The sessions were conducted on a need-based basis rather than following an identical structure for every participant. Each volunteer was responsible for a specific subject area (e.g., mathematics, science, music, art), and the same volunteer continued to work with the same participant throughout the program. Depending on the individual participant's needs, the volunteers provided either academic support or counseling support. Sessions were conducted twice a week, each lasting approximately 1 hour, over a period of three months. The second author coordinated the scheduling of sessions based on the children's preferences, ensuring that interactions occurred via the Zoom platform. The online format minimized infection risks for children with compromised immune systems and facilitated communication across different cities. This approach offered motivation and mentoring support tailored to the children's preferences and needs, ensuring they felt supported during treatment. Pre-tests were administered online before the program began, and post-tests were conducted after 3 months to evaluate the intervention's effectiveness.

Outcomes

The study's primary outcome includes quality of life in children with leukemia. The secondary outcomes involve anxiety levels and coping strategies used by children with leukemia.

Statistical Analysis

Data were analyzed using the Statistical Package for the Social Sciences (IBM SPSS Statistics for Windows, Version 25.0. Armonk, New York: IBM Corp.) Following data cleaning, missing values and outliers were addressed. Descriptive statistics (e.g., frequency, percentage distributions, medians) were used to describe the sample. Nonparametric tests, including Chi-square, Kruskal–Wallis, and Mann–Whitney U tests, were employed to assess relationships between independent variables and outcomes such as quality of life, coping with cancer, and anxiety levels. Additionally, pre-test and post-test comparisons were conducted to evaluate changes resulting from the program.

Ethical Approval

We confirm that this study was conducted using the principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Clinical Research Ethics Committee of the University (Approval Number: 2022-KAEK-141), and verbal informed consent was obtained from all participants before data collection. Also, written informed consent was obtained from their parents. Data collection occurred through an online survey program, which required approximately 20 minutes to complete and was restricted to one submission per IP address. Participation was voluntary, and all personal information remained confidential. Survivor volunteers received thank-you cards upon program completion, while children were gifted personalized pillows as tokens of appreciation.

Results

The socio-demographic characteristics of the 13 children diagnosed with cancer (8 girls and 5 boys) and their families are detailed in ►**Table 1**. The children had a mean age of 10 years, with the youngest being 7 years old and the oldest 13 years old. Among the participants, an overwhelming majority (92%) were diagnosed with ALL, the most common type of childhood cancer. The diagnosis significantly impacted their education, with more than half of the children (54%) unable to continue attending school after their diagnosis, resulting in an interruption to their education.

In terms of parental education levels, notable disparities were observed. Seventeen percent of mothers were illiterate, while only 8% had attained a university-level education or higher. The remaining mothers had completed some level of primary or secondary education. Fathers had higher levels of educational attainment, with 58% being high school graduates. Despite this, economic challenges were evident, as 31% of fathers were unemployed, and the vast majority of mothers (92%) were housewives, likely contributing to financial strain within these families. These socio-economic factors highlight the additional burdens placed on families dealing with pediatric cancer.

Psychological support within the family was notably limited, with only 15% of participants reporting receiving such support. This finding is concerning, given the known psychological and emotional challenges associated with cancer diagnoses and treatment, particularly in children. Access to psychological resources may play a crucial role in mitigating the stress and anxiety experienced by both the children and their families during this difficult time.

There was considerable variation in the timeline from diagnosis to treatment initiation. Approximately 31% of children began treatment within the first month of their diagnosis, reflecting timely medical intervention. However, 7.5% of participants started treatment within 3 to 6 months, another 7.5% within 6 to 12 months, and a significant proportion (54%) initiated therapy over a year after their diagnosis. These delays could have been influenced by various factors, including access to health care, socio-economic barriers, or delayed recognition of symptoms.

Table 1 Distribution of socio-demographic characteristics of children (*n* = 13) and their parents

Variables	Median, IQR	(Min–Max)
Age	10, 2	(7–13)
	n	**%**
Diagnosis		
Acute lymphoblastic leukemia	12	92
Brain tumor	1	8
Current school attendance		
Yes	7	54
No	6	46
Gender		
Girl	8	62
Boy	5	38
Mother's education		
No literacy	2	17
Primary school	8	58
High school	2	17
University and above	1	8
Father's education		
Primary school	4	34
High school	8	58
University and above	1	8
Mother's working status		
Housewife	12	92
Unemployed	1	8
Father's working status		
Unemployed	4	31
Employed	9	69
Psychological support received in the family		
Yes	2	15
No	11	85
Time between diagnosis and start of treatment		
0–1 month	4	31
3–6 months	1	7.5
6–12 months	1	7.5
More than 12 months	7	54
Treatment methods received		
Chemotherapy	13	100
Radiotherapy	2	17
Surgery	3	25
Duration of treatment (months)		
0–3 months	1	8
6–9 months	1	8
9–12 months	1	8
More than 12 months	10	76

Abbreviation: IQR, interquartile range.

Treatment modalities varied among the participants. All children received chemotherapy, which remains a cornerstone of pediatric cancer treatment. Additionally, 17% underwent radiotherapy, and 25% required surgical interventions as part of their treatment plans. The duration of treatment was extensive for most participants, with 76% undergoing treatment for over 12 months. This prolonged treatment period underscores the enduring physical, emotional, and social challenges faced by these children and their families.

Four key variables—state anxiety, trait anxiety, quality of life, and coping with cancer—were measured both before and after the 3-month support program to assess its impact on children diagnosed with leukemia. ►**Table 2** provides a detailed comparison of these variables' pre-test and post-test results. One participant was excluded from the data analysis due to their passing before completing the 3-month support program.

The State Anxiety Inventory, designed to evaluate anxiety levels at a specific moment, showed a slight reduction in median scores following the program (median pre-test = 36, median post-test = 35.5). However, this change was not statistically significant ($p = 0.157$), suggesting that while the intervention may have affected immediate anxiety, the reduction was insufficient to reach statistical significance. In contrast, the Trait Anxiety Inventory, which assesses more persistent, general anxiety levels, revealed a notable decrease in median scores (median pre-test = 44.5, median post-test = 42.5). This reduction was statistically significant ($p = 0.029$), indicating that the support program effectively alleviated long-term anxiety in the participants.

The General Child Quality of Life Scale measured various dimensions of the children's well-being, including health, emotional state, relationships, and school-related activities. The comparison of pre-test and post-test results revealed a significant improvement in the quality of life scores (median pre-test = 63.6, median post-test = 75.5, $p = 0.007$). This finding highlights the positive impact of the support program on enhancing the children's overall well-being and their ability to engage in daily life activities.

Finally, the Pediatric Coping with Cancer Scale was employed to assess the children's coping mechanisms during their cancer treatment. The results showed a marked increase in coping levels following the intervention (median pre-test = 62, median post-test = 81.5). This improvement was statistically significant ($p = 0.005$), suggesting that the support program played a critical role in equipping the children with practical strategies to manage the emotional and psychological challenges associated with their illness.

In summary, the support program demonstrated a significant positive impact on trait anxiety, quality of life, and coping with cancer among the participating children, with moderate improvements in state anxiety. These findings underscore the value of structured psychosocial interventions in enhancing the psychological and emotional resilience of children undergoing cancer treatment.

Discussion

This study aimed to enhance anxiety management, overall quality of life, and coping mechanisms in children diagnosed with leukemia by providing social support and mentorship. To achieve this, a structured mentorship program was implemented, involving 13 children aged 7 to 13 who participated in biweekly online mentoring sessions over a period of 3 months. The effectiveness of the intervention was assessed using a pre-test/post-test design, revealing substantial improvements in the targeted outcomes.

An analysis of the socio-demographic characteristics of the participants and their families highlighted three key findings. First, a substantial proportion of parents (33%) were unemployed, indicating a potential need for financial support. This economic vulnerability may have contributed to delays in initiating treatment or the lack of psychological support during the treatment process, as only 17% of the children received professional psychological assistance. Second, parental education levels were notably low. This factor appears to be linked to the delay in treatment initiation, as more than half of the families postponed treatment for over 12 months following the initial diagnosis. These findings

Table 2 Comparison of children's pre-test and post-test levels ($n = 12$)

Measurements	Tests	n^a	Median, IQR	Min–max	Wilcoxon	p
State Anxiety Inventory for Children	Pre-test	12	36, 14.5	28–52	21.000	0.157
	Post-test		35.5, 11.5	24–45		
Trait Anxiety Inventory for Children	Pre-test	12	44.5, 10.5	41–55	8.500	0.029^b
	Post-test		42.5, 6.5	37–52		
General Child Quality of Life Scale	Pre-test	12	63.6, 12.5	48.9–88	54.00	0.007^b
	Post-test		75.5, 11.96	63–100		
Pediatric Cancer Coping Scale	Pre-test	12	62, 4.0	23–83	75.000	0.005^b
	Post-test		81.5, 12	57–95		

Abbreviation: IQR, interquartile range.
[a] One sample was not able to complete the study.
[b] $p < 0.05$.

underscore the importance of addressing financial and educational disparities among caregivers to facilitate timely access to medical and psychological support for children with leukemia. Finally, approximately half of the children were unable to attend school during their treatment period. The high demand for academic support among the requested services highlights the important need for educational assistance within this population. The decision to keep children out of school during treatment may be linked to the lower educational levels of parents, which could influence their awareness of alternative educational opportunities. Conversely, this decision may also reflect a deliberate protective parenting strategy aimed at minimizing the risk of infection during a period of heightened vulnerability.

Among the dependent variables, only a slight reduction was observed in the State Anxiety Inventory for children, which was not statistically significant. This minimal change may be attributed to the influence of external factors, such as the immediate environment or situational conditions, on the children's temporary emotional state. In contrast, a statistically significant decrease was found in the Trait Anxiety Inventory, indicating a more substantial and lasting reduction in general anxiety levels. This finding aligns with previous research in the literature.[9,24,34] While the present study demonstrated a decrease in trait anxiety within a relatively short intervention period of 3 months, Altundağ and colleagues[9] reported that the positive effects of similar support interventions persisted for up to 24 months.

A statistically significant increase was observed in the pre-test and post-test scores of the General Child Quality of Life Scale, suggesting that the weekly activities and sessions contributed to the child's ability to more effectively manage challenges related to health, daily activities, emotional well-being, peer relationships, and academic life. This finding is consistent with existing literature, which highlights the positive impact of psychosocial interventions on improving children's quality of life.[7,28,35] Furthermore, a statistically significant increase was observed in the pre-test and post-test scores of the Pediatric Coping with Cancer Scale, indicating an improvement in children's ability to cope with their illness following the intervention. Despite varying durations, similar studies have shown that such interventions effectively enhance coping in pediatric cancer patients.[15]

Strengths and Limitations

A key strength of this study is its innovative, patient-centered design that incorporated leukemia survivor mentors into a structured, interactive online support program. This approach not only offered academic and emotional guidance but also fostered hope and connection through shared experiences. Methodological rigor was ensured by using validated, culturally adapted tools to assess anxiety, coping, and quality of life. The pretest–posttest design strengthened internal validity by tracking psychological changes over 3 months within the same group. Despite a small sample size typical of pilot studies, significant improvements in anxiety, coping, and quality of life underscore the intervention's potential. Importantly, the study addressed an often-overlooked group—children with leukemia from socioeconomically disadvantaged regions—highlighting the value and feasibility of remote psychosocial support.

Recruitment posed a major challenge. Collaboration with national nongovernmental organizations (NGOs; LÖSEV and KAÇUV) was not possible, as their services already covered children in major urban areas with robust support systems. In contrast, our participants—mainly from Eastern and Southeastern Anatolia—reported receiving no institutional or NGO support. However, many could not participate due to limited access to digital devices and internet connectivity, underscoring regional disparities in health care resources. Additional efforts to recruit through Gaziantep Oncology Hospital were hindered when its services were disrupted by the February 6, 2023 earthquake, further limiting the eligible participant pool.

Participant instability also impacted the program. Events such as the death of a participant, a parent's terminal illness, and family disruptions (e.g., divorce) affected children's emotional engagement and participation. Most families had only a single mobile phone with limited internet access, which created further barriers. These challenges highlight the urgent need for equitable access to digital tools and psychosocial support for children with cancer in underserved regions. Finally, as noted, the support provided in our program was need-based, which meant that the type and focus of sessions could vary among participants. We acknowledge that this variability may limit the generalizability of the findings, as not all participants received identical forms of support. However, we believe this approach reflects real-world practice more accurately, where interventions are often tailored to individual needs.

Future Perspectives

The findings of this project highlight the urgent need to expand support programs, particularly in Turkiye's eastern regions. Long-term interventions (at least 12 months) are essential to provide comprehensive support not only for children with leukemia but also for their families. These programs should include educational components to raise parental awareness about child development, the treatment process, and caregiving practices. Early diagnosis and timely treatment are critical, making parent education on symptom recognition a priority. Access to technology is also vital to support children's academic and psychosocial needs after diagnosis.

Low parental education levels in the region may contribute to communication challenges during treatment. To bridge this gap, psychological support should be routinely offered to both children and families. Additionally, establishing systems—through NGOs or social initiatives—to identify newly diagnosed cases can help deliver targeted economic, social, and emotional support. Strengthening collaboration among health care institutions, government agencies, and NGOs is key to ensuring equitable, sustainable support for children with leukemia in underserved areas.

Conclusion

This study demonstrates the positive impact of a structured mentorship program on anxiety, quality of life, and coping in children with leukemia. Over a 3-month period, biweekly online sessions led to a significant reduction in trait anxiety, indicating improved emotional regulation. The program also enhanced overall quality of life, strengthening emotional well-being, peer relationships, and academic engagement. Notably, children's coping skills improved, reflecting the program's effectiveness in helping them manage the challenges of illness. These findings highlight the critical role of psychosocial support in pediatric leukemia care and support the integration of mentorship programs into treatment protocols to address both medical and emotional needs.

Data Availability Statement

Data are available upon request.

Authors' Contributions

N.S.K.: Methodology, conceptualization, preparation of the original draft, data collection and processing, analysis of data, writing, and editing.

G.D.: Methodology, conceptualization, preparation of the original draft, data collection and processing, and writing.

Patient's Consent

Written informed consent was obtained from the parents, and verbal assent was secured from the children.

Funding

This research was supported by TUBITAK 2209/A, 2022, First Period.

Conflict of Interest

None declared.

Acknowledgments

The authors sincerely thank TÜBİTAK for their financial support, which made this study possible. They also extend our heartfelt gratitude to the volunteer survivors for their mentorship and to the children who participated in this research.

References

1 World Health Organization. Childhood Cancer. Published 2020. Accessed June 26, 2022 at: https://www.who.int/news-room/fact-sheets/detail/cancer

2 Ward E, DeSantis C, Robbins A, Kohler B, Jemal A. Childhood and adolescent cancer statistics, 2014. CA Cancer J Clin 2014;64(02):83–103

3 SEER. Cancer Stat Facts: Childhood Leukemia. 2020. Accessed November 4, 2025 at: https://seer.cancer.gov/statfacts/html/childleuk.html

4 Özdoğan O, Ayçiçek A, Tekgündüz S, Uysalol EP, Gökçe M, Bayram C. Overall and event-free survival in children with acute lymphoblastic leukemia and evaluation of treatment related acute toxicity. Cam & Sakura Med J 2022;2(02):49–58

5 Wolfe J, Orellana L, Ullrich C, et al. Symptoms and distress in children with advanced cancer: prospective patient-reported outcomes from the PediQUEST study. J Clin Oncol 2015;33(17):1928–1935

6 Ernst M, Hinz A, Brähler E, et al. Quality of life after pediatric cancer: comparison of long-term childhood cancer survivors' quality of life with a representative general population sample and associations with physical health and risk indicators. Health Qual Life Outcomes 2023;21(01):65

7 Saleh MS, Mohammed AM, Bassiouni D, Mostafa HH, Monir ZM. Evaluation of health-related quality of life and its domains in pediatric patients with cancer. J Egypt Natl Canc Inst 2023;35(01):9

8 Engin EA, Yildirim F, Purutcuoglu E. Psychosocial problems of children with chronic illness: a review focusing on pediatric social work interventions [in Turkish]. Güncel Pediatri Dergisi. 2021;19(02):271–279

9 Altundağ B, Karaçam E, Aydoğan Y, et al. The effects of psychosocial support for children with leukemia [in Turkish]. Kastamonu Educ J. 2016;24(05):2549–2560

10 Cieślak K. Professional psychological support and psychotherapy methods for oncology patients. Basic concepts and issues. Rep Pract Oncol Radiother 2013;18(03):121–126

11 Bretones Nieto B, Pozo Muñoz C, Vázquez López MÁ Needs assessment in parents of children affected by cancer: a qualitative perspective. Children (Basel) 2022;9(12):1957

12 Andersen KK, Duun-Henriksen AK, Frederiksen MH, Winther JF. Ninth grade school performance in Danish childhood cancer survivors. Br J Cancer 2017;116(03):398–404

13 Van Schoors M, De Paepe AL, Norga K, et al. Family members dealing with childhood cancer: a study on the role of family functioning and cancer appraisal. Front Psychol 2019;10:1405

14 Kazak AE, Baxt C, DiDonato S. Psychosocial interventions for children and families in pediatric health care settings. Annu Rev Clin Psychol 2021;17(01):253–279

15 Çoban BA, Olca SP. Mental problems and coping styles of leukemia patients with stress: mental problems and coping styles [in Turkish]. J 5N1Qual 2023;1(02):74–87

16 Thoits PA. Mechanisms linking social ties and support to physical and mental health. J Health Soc Behav 2011;52(02):145–161

17 Uchino BN, Bowen K, Carlisle M, Birmingham W. Social support and physical health: mechanisms and future directions. Ann Behav Med 2012;42(01):74–87

18 Compas BE, Jaser SS, Dunn MJ, Rodriguez EM. Coping with chronic illness in childhood and adolescence. Annu Rev Clin Psychol 2012;8:455–480

19 Gunduz S, Yuksel S, Aydeniz GE, et al. Factors affecting hospital fear in children [in Turkish]. Çocuk Sagligi Hastalik Derg 2016;59:161–168

20 Phipps S, Klosky JL, Long A, et al. Posttraumatic stress and psychological growth in children with cancer: has the traumatic impact of cancer been overestimated? J Clin Oncol 2014;32(07):641–646

21 Poirier AE, Ruan Y, Walter SD, et al; ComPARe Study Team. The future burden of cancer in Canada: long-term cancer incidence projections 2013-2042. Cancer Epidemiol 2019;59:199–207

22 Sarman A. The effect of psychological support practices on children receiving palliative care in pediatric oncology [in Turkish]. Sağlık Akademisi Kastamonu. 2021;6(01):58–66

23 Huang X, O'Connor M, Lee S. School-aged and adolescent children's experience when a parent has non-terminal cancer: a systematic review and meta-synthesis of qualitative studies. Psychooncology 2014;23(05):493–506

24 Coughtrey A, Millington A, Bennett S, et al. The effectiveness of psychosocial interventions for psychological outcomes in

pediatric oncology: a systematic review. J Pain Symptom Manage 2018;55(03):1004–1017

25 Chow SC, Shao J, Wang H. Sample Size Calculations in Clinical Research. 2nd ed. Boca Raton, FL: Chapman & Hall/CRC; 2008:50

26 Bornstein MH, Jager J, Putnick DL. Sampling in developmental science: situations, shortcomings, solutions, and standards. Dev Rev 2013;33(04):357–370

27 Eser S, Saatli G, Eser E, Baydur H, Fidaner C. World Health Organization Quality of Life Module for the Elderly WHOQOL-OLD: Turkey field study Turkish version validity and reliability results [in Turkish]. Turk Psikiyatri Derg 2008;21(01):37–48

28 Duran J, Bravo L, Torres V, et al. Quality of life and pain experienced by children and adolescents with cancer at home following discharge from the hospital. J Pediatr Hematol Oncol 2020;42(01):46–52

29 Ergin D, Eser E, Kantar M, Ekti Genç R Psychometric properties of the oncology module of the KINDL scale: first results. J Pediatr Oncol Nurs 2015;32(02):83–95

30 Özusta G. Adaptation, validity and reliability study of state-trait anxiety inventory for children [in Turkish]. Turk Psikol Derg 1995; 10(34):32–44

31 Pars H, Çavuşoğlu H. Examining the psychological resilience of adolescents with leukemia: a comparative study [in Turkish]. Florence Nightingale Hemsire Derg 2019;27(02):104–118

32 Wu, L. M., Chin, C. C., Chen, C. H., Lai, F. C., & Tseng, Y. Y. Development and validation of the paediatric cancer coping scale. Journal of advanced nursing 2011;67(05):1142–1151

33 Kisecik Sengul Z, Kiliçarslan Törüner E, Ozbek NY. Reliability and validity of the Turkish version of the Paediatric Cancer Coping Scale (PCCS). Int J Nurs Pract 2022;28(04):e13037

34 Çavuşoğlu H, Sağlam H. Examining the perceived social support and psychological symptoms among adolescents with leukemia. J Spec Pediatr Nurs 2015;20(01):76–85

35 Hegazy A, Al Bar H, Alamri SH, et al. Quality of life in pediatric cancer patients. J Adv Med Med Res 2019;30(10):1–11