Impact of Caregiver Stress, Anxiety, and Depression on the Quality of Life of Children with Acute Lymphoblastic Leukemia (ALL) – A Cross-sectional Study

Umme Nusrat Ara[a*], Tania Sultana[b], Abdul Wohab[c]

ARTICLE INFO

Received: 2 Feb 2026
Accepted: 9 Feb 2026
Published Online: 16 Feb 2026

DOI: 10.5281/zenodo.18662465

Volume: 8, Number: 2, Page: 146-149

e-ISSN: 2789-5912
ISSN: 2617-0817

*Corresponding author

ABSTRACT

Background: When a child is diagnosed with Acute Lymphoblastic Leukemia (ALL), caregivers often experience significant psychological stress, which can affect family dynamics and overall well-being of the children. High levels of stress, anxiety, and depression in caregivers can lead to negative communication patterns and emotional distress, ultimately affecting both their mental health and the quality of life of children. This study aimed to examine the relationship between caregiver stress, anxiety, and depression and the quality of life of children with ALL. **Methods & Materials:** A cross-sectional study was conducted in the Department of Pediatric Hematology and Oncology, Bangladesh Shishu Hospital and Institute, Dhaka. Caregiver anxiety and depression were evaluated using the Beck Anxiety Inventory (BAI) and Beck Depression Inventory II (BDI-II), while stress levels in both children and caregivers were measured using the Perceived Stress Scale (PSS). The Pediatric Quality of Life Inventory (PedsQL™) was used to evaluate children's quality of life. Pearson and Spearman correlation tests were performed for statistical analysis. **Results:** No significant correlation was found between caregiver stress levels and children's quality of life (p>0.05). However, caregiver anxiety and depression were negatively correlated with children's quality of life (p<0.05). Furthermore, higher levels of stress in children were associated with a lower quality of life (p<0.05). **Conclusion:** The psychological well-being of caregivers plays a critical role in the quality of life of children with ALL. Although caregiver stress alone may not directly affect results, anxiety and depression in caregivers have a significant negative impact. These findings underscore the need for comprehensive psychosocial support for caregivers and children to improve overall well-being during ALL treatment.

Keywords: *Acute Lymphoblastic Leukemia (ALL), stress, anxiety, depression, Quality of life, mental health, Caregiver burden*

[a.] *Assistant Professor, Department of Pediatric Hematology and Oncology, Bangladesh Shishu Hospital and Institute Dhaka, Bangladesh (ORCID: 0009-0005-1674-843X)*
[b.] *Assistant Professor, Department of Paediatric Hematology & Oncology, Bangladesh Medical University (NMU), Dhaka, Bangladesh*
[c.] *Professor, Bangladesh Shishu Hospital & Institute, Dhaka, Bangladesh*

Introduction

Acute Lymphoblastic Leukemia (ALL) is a common childhood malignancy in Bangladesh, accounting for a significant portion of pediatric leukemia cases[1].

In high-income countries, at least 75–80% of children diagnosed with cancer, particularly ALL, can be cured through intensive chemotherapy provided by fully trained interdisciplinary teams in specialized hospital units. This success has been made possible through collaboration and cooperation at both national and international levels[2, 3].

The diagnosis of ALL in children is not only a critical health event for the child but also has profound psychological and emotional implications for their caregivers. Families of children diagnosed with ALL face increased risks of psychological stress, anxiety, and depression, which can significantly affect family dynamics and caregiving roles. Caregivers of children with cancer, including ALL, often experience high levels of psychological distress, which can lead to negative communication patterns and further emotional strain. Studies have shown that these elevated stress levels in caregivers are closely associated with poor emotional well-being, which can contribute to a cycle of anxiety and depression[4,5]. This emotional burden can indirectly impact the child's quality of life, contributing to worsened physical and emotional outcomes[6].

In children with ALL, the *Quality of Life* (QoL) is often significantly impaired due to the physical, emotional, and social challenges posed by the disease and its treatment[7]. Caregiver stress, anxiety, and depression may exacerbate this decline in QoL, creating a vicious cycle where the child's illness worsens the caregiver's psychological well-being, which, in turn, negatively influences the child's mental health and QoL. While studies have explored the emotional distress of caregivers, the relationship between caregiver psychological well-being and the child's QoL remains underexplored in the context of ALL.

While interventions exist to address the psychological needs of children with cancer, understanding the full scope of caregiver stress, anxiety, and depression, as well as their direct and indirect effects on the child's well-being, is critical. This study aims to explore the relationship between caregiver stress, anxiety, depression, and children's QoL in children diagnosed with ALL, to better understand the psychosocial impact on both caregivers and children, and to highlight the need for comprehensive support systems for families managing childhood leukemia.

Methods & Materials

Study Design:

This cross-sectional study was conducted in the Department of Pediatric Hematology and Oncology, *Bangladesh Shishu Hospital and Institute*, Dhaka, from January to April 2025. The study aimed to examine the relationship between caregiver stress, anxiety, and depression, and the Quality of Life (QoL) of children diagnosed with *Acute Lymphoblastic Leukemia* (ALL). The study was approved by the Institutional Review Board (IRB) before initiation, and informed consent was obtained from all participants.

Participants:

A total of 60 caregivers and their children diagnosed with ALL participated in this study. The inclusion criteria for the caregivers were:

- Caregivers of children diagnosed with ALL for at least 6 months.
- Caregivers aged 18 years and older.

BDJOURNALS.ORG Copyright © 2026 The Planet. Published by Sher-E-Bangla Medical College, Barishal, Bangladesh. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/).

Exclusion criteria were:

- Caregivers with a prior diagnosis of major psychiatric disorders (e.g., schizophrenia, bipolar disorder).
- Children with any other major comorbidities or severe complications not related to ALL.
- Children with any neurological disorders or cognitive impairments that might interfere with the assessment of their quality of life were excluded.

Sample Size:
The sample size was determined based on detecting a moderate correlation between caregiver psychological distress and child quality of life. Previous studies have reported correlation coefficients ranging from -0.34 to -0.53 between caregiver anxiety, stress, depression, and PedsQL™ scores[8]. Assuming an expected correlation coefficient of 0.35, with a two-tailed alpha of 0.05 and 80% power, a minimum sample size of approximately 62 participants was required. Due to the limited number of eligible pediatric ALL cases during the study period, 60 caregiver – child dyads were included.

Assessment Tools:
The Beck Anxiety Inventory (BAI) was used to assess caregiver anxiety levels. The BAI consists of 21 items, each scored on a 4-point scale (0–3). Items are reverse-scored and then transformed to a 0–100 scale, with higher total scores indicating higher levels of anxiety.

Depression levels were assessed using the Beck Depression Inventory II (BDI-II), which consists of 21 items. The total score is calculated by summing the scores of the 21 items. The scores are interpreted as follows: a score between 0 and 21 indicates minimal to no depression, a score between 22 and 35 suggests moderate depression, and a score of 36 or above indicates severe depression. Higher scores reflect more severe depressive symptoms.

The caregiver's perceived stress level was measured using the Perceived Stress Scale (PSS), which consists of 10 items assessing stress perceptions over the past months. Items are reverse-scored and then transformed to a 0–100 scale. Higher total scores indicate greater perceived stress.

The children's quality of life was assessed using the Pediatric Quality of Life Inventory (PedsQL™), a validated tool designed to measure the quality of life in children. The PedsQL™ includes both parent and child versions and covers

physical, emotional, social, and school functioning. Scores are transformed to a 0–100 scale, with lower scores indicating poor quality of life.

Statistical Analysis:
Data analysis was performed using *IBM SPSS* version 26. Descriptive statistics, including means, standard deviations, and percentages, were calculated for demographic and clinical variables. The *Shapiro-Wilk* test was used to assess the normality of the data. For normally distributed data, *Pearson's correlation* was used to examine the relationship between caregiver psychological distress and child quality of life. For non-normally distributed data, *Spearman's correlation* was used. A p-value < 0.05 was considered statistically significant.

Results

Demographic Characteristics:
A total of 60 caregivers and their children diagnosed with *Acute Lymphoblastic Leukemia* (ALL) participated in this study. The majority of caregivers were female (83.3%), with 50 out of 60 being women. The caregivers' age ranged from 20 to 39 years, with the highest percentage (55%) aged between 20-39 years. Regarding education level, the majority (70%) had only completed primary education, while a smaller portion (3.3%) had postgraduate education. Most caregivers were housewife, while a significant proportion of fathers were employed full-time (35%) or self-employed (35%). Monthly family income varied, with the majority (71.7%) reporting a low income of ≤ 20,600 BDT.

Psychological Distress in Caregivers:
Caregiver stress was assessed using the *Perceived Stress Scale* (PSS). Most caregivers (81.7%) reported moderate stress levels, with a small portion (8.3%) reporting high stress and 10% reporting low stress. Anxiety levels in caregivers were predominantly low, with 91.7% reporting low anxiety, and only 1.7% reporting high anxiety. Depression levels were also predominantly minimal, with 46.7% of caregivers reporting minimal depression and 46.7% reporting mild depression. Only a small number (1.7%) of caregivers experienced severe depression. Detailed demographic and psychological characteristics of the caregivers are summarized in *Table I*.

Table I
Demographic Characteristics of Caregivers (n=60).

Variables	n (%)
Caregiver Status	
Parents	60 (100)
Non-parents	-
Sex	
Male	10
Female	50
Age	
10-19 years	3
20-29 years	24
30-39 years	33
Education Level	
Primary Education	42
Secondary Education	14
Higher Secondary	2
Education	
Undergraduate Education	2
Postgraduate Education	-
Maternal Employment	
Employed	-
Unemployed	60
Paternal Employment	
Unemployed	10
Part-time job	16
Full-time job	10
Self-employed	21
Monthly Family Income	
Low Income: <= 20,600	43
Middle Income: 20,600-51,600	17
High Income: >51,600	-
Perceived Stress Scale	
High	5(8.3)
Moderate	49(81.7)
Low	6(10)
Anxiety Level	
High	1(1.7)
Moderate	4(6.7)
Low	55(91.7)
Depression Level	
Severe	1(1.7)
Moderate	3(5)
Mild	28(46.7)
Minimal	28(46.7)

Children's Quality of Life (QoL):
The *Pediatric Quality of Life Inventory* (PedsQL™) was used to assess the children's QoL from both caregiver-reports and child-self-reports. As shown in *Table II*, the QoL scores for children with ALL were lower in all domains compared to typical children. Caregivers reported the most significant impact on school functioning (mean ± SD: 48.45 ± 17.36), followed by physical health (mean ± SD: 64.17 ± 23.66).

The least affected domains were social (mean ± SD: 80.92 ± 14.54) and emotional functioning (mean ± SD: 60.54 ± 20.03). Similarly, child-self-reports indicated moderate impairment, particularly in physical health (mean ± SD: 60.00 ± 32.60) and school functioning (mean ± SD: 45.66 ± 26.31).

Table II
Pediatrics Quality of Life as Assessed by PedsQL™.

	PedsQ™ Scale	
	Caregiver-proxy report (mean ± SD)	**Child-self report (mean ± SD)**
Physical Health	64.17 ± 23.66	60.00 ± 32.60
Psychosocial Health		
Emotional functioning	60.54 ± 20.03	61.00 ± 29.20
Social functioning	80.92 ± 14.54	81.66 ± 10.96
School functioning	48.45 ± 17.36	45.66 ± 26.31

Correlations Between Caregiver Psychological Distress and Child QoL:
The study explored the relationship between caregiver psychological distress (anxiety, depression, and stress) and the quality of life of children with ALL. *Table III* shows the correlation between the *Beck Anxiety Inventory* (BAI), *Beck Depression Inventory II* (BDI-II), *Perceived Stress Scale* (PSS) scores of caregivers, and the children's PedsQL™ scores. A significant negative correlation was found between caregiver depression and child QoL in both caregiver-reported (r = –0.25, p = 0.033) and child-self-reported scores (r = –0.01, p = 0.32). However, no significant relationship was observed between caregiver stress or anxiety levels and children's QoL ($p > 0.05$).

Child Stress and Quality of Life:
In contrast, the study found a significant relationship between child stress and their own QoL. The Perceived Stress Scale (PSS) for children was significantly negatively correlated with both caregiver-reported (r = –0.529, p = 0.001) and child-self-reported QoL (r = –0.398, p = 0.010), indicating that higher stress levels in children were associated with lower QoL. However, caregiver-reported stress did not show a significant impact on the child's QoL (r = –0.076, p = 0.82).
These findings suggest that while caregiver psychological distress (specifically depression) impacts children's QoL, the stress levels reported by children themselves have a more direct and significant effect on their well-being.

Table III
Correlation between Caregiver's Beck Anxiety Inventory, Perceived Stress Scale, and Beck Depression Inventory Score with PedsQL™ Score.

		PedsQL™ (caregiver-proxy report)	PedsQL™ (child-self report)
Beck Anxiety Inventory Score of Caregiver	*p*	0.40	0.39
	r	0.11	0.03
Beck Depression Inventory Score of Caregiver	*p*	0.033	0.32
	r	0.25	0.01
Perceived Stress Scale Score of Children	*p*	0.001	0.010
	r	-0.529	-0.398
Perceived Stress Scale Score of Caregiver	*p*	0.82	0.41
	r	-0.076	-0.029

Discussion

The present study aimed to explore the relationship between caregiver psychological distress (specifically stress, anxiety, and depression) and the quality of life (QoL) in children diagnosed with *Acute Lymphoblastic Leukemia* (ALL). The results revealed a significant negative correlation between caregiver depression and the QoL of children, both from caregiver-reports and child-self-reports. However, no such relationship was found between caregiver stress or anxiety levels and children's QoL. In contrast, the study also found that higher stress levels in children were strongly correlated with lower QoL, suggesting that the children's perceived stress directly affects their well-being. These findings provide valuable insights into the psychosocial impact of caregiver and child distress on the overall QoL of children with ALL, but also highlight the complexities inherent in the relationship between caregiver distress and child health outcomes.
The correlation observed between caregiver depression and child QoL aligns with previous studies, which have shown that depression in caregivers can significantly impact the mental and emotional health of children. For instance, similar studies have found that high caregiver distress contributes to a cycle of emotional strain that exacerbates the challenges faced by children undergoing treatment for ALL[4,9]. The present study supports findings by *Abo Amer et al. (2013)*[10] and *Sultan et al. (2016)*[11], who demonstrated that caregiver depression and anxiety are significant factors influencing the quality of life of children with chronic illnesses, including leukemia.
The lack of significant correlation between caregiver stress and children's QoL in this study contrasts with the findings of other studies, where caregiver stress was identified as a critical factor in reducing children's well-being[12,13]. This discrepancy may be attributed to differences in the measurement tools used to assess stress or the variability in the study populations. The majority of caregivers in this study reported moderate to low stress, with only a small percentage experiencing high levels of stress. This could suggest that the caregiver population in this study might not have been exposed to the same level of intense stress as those in other studies, potentially influencing the observed relationships between stress and children's QoL.
Another key finding of this study was the significant impact of child stress on their QoL. This result is consistent with other research that suggests children with cancer are particularly vulnerable to the negative effects of stress, which can lead to significant impairments in their emotional, physical, and social functioning[14,15]. The

correlation between child stress and reduced QoL underscores the importance of addressing the emotional needs of children with ALL and implementing targeted interventions to manage stress, as it directly influences their overall quality of life. Notably, interventions aimed at reducing stress in children could potentially improve their emotional well-being and help mitigate the negative effects of ALL treatment.

The findings also reveal that although caregiver stress levels did not significantly affect children's QoL in this study, the emotional and psychological well-being of caregivers, especially depression, plays a critical role in the overall family dynamics. The psychological burden on caregivers can manifest in negative communication patterns and emotional distress, which, although indirectly, affect the child's QoL[16]. These results highlight the need for holistic psychosocial support systems that address both the psychological needs of caregivers and the children to improve their overall well-being during treatment.

Conclusion

This study emphasizes the significant role of caregiver depression in the quality of life of children with ALL, while also highlighting the direct impact of child stress on their well-being. Although caregiver stress and anxiety did not show significant effects on children's QoL in this study, the findings support the need for comprehensive support mechanisms that cater to the emotional needs of both caregivers and children. Further studies are needed to explore long-term effects and the interaction between caregiver distress and child stress over the course of ALL treatment.

Limitations

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design prevents conclusions regarding causality between caregiver psychological distress and child quality of life. Second, the study relied on self-reported measures for both caregivers and children, which may introduce reporting or social desirability bias. Third, the study was conducted at a single center with a relatively small sample size, which may limit the generalizability of the results to other populations. Fourth, the majority of caregivers reported moderate stress levels, which may have limited variability and reduced the ability to detect associations between caregiver stress and child QoL. Finally, potential confounding factors such as disease severity, treatment phase, and socioeconomic status were not measured, which could have influenced the observed relationships. Future research with larger, multi-center, longitudinal designs is recommended to better explore the complex interactions between caregiver distress, child stress, and quality of life outcomes.

Conflicts of interest

The authors declare no conflicts of interest.

Funding

No external funding was received for this study

References

1. Islam A, Akhter A, Eden T. Cost of treatment for children with acute lymphoblastic leukemia in Bangladesh. Journal of Cancer Policy. 2015 Dec;6:37–43.
2. Pritchard-Jones K, Sullivan R. Children with cancer: driving the global agenda. The Lancet Oncology. 2013 Mar;14(3):189–91.
3. Mostert S, Arora RS, Arreola M, Bagai P, Friedrich P, Gupta S, et al. Abandonment of treatment for childhood cancer: position statement of a SIOP PODC Working Group. The Lancet Oncology. 2011 Aug;12(8):719–20.
4. Rodriguez EM, Dunn MJ, Zuckerman T, Vannatta K, Gerhardt CA, Compas BE. Cancer-Related Sources of Stress for Children With Cancer and Their Parents. Journal of Pediatric Psychology. 2012 Aug 13;37(2):185–97.
5. Feeley CA, Turner-Henson A, Christian BJ, Avis KT, Heaton K, Lozano D, et al. Sleep quality, stress, caregiver burden, and quality of life in maternal caregivers of young children with bronchopulmonary dysplasia. Journal of Pediatric Nursing [Internet]. 2014 Jan 1 [cited 2020 Mar 25];29(1):29–38. Available from: https://www.ncbi.nlm.nih.gov/pubmed/23999065
6. Murphy LK, Murray CB, Compas BE. Topical Review: Integrating Findings on Direct Observation of Family Communication in Studies Comparing Pediatric Chronic Illness and Typically Developing Samples. Journal of Pediatric Psychology. 2017 Jan 1;42(1):85–94.
7. Hilda H, Lubis B, Hakimi H, Siregar OR. Quality of life in children with cancer and their normal siblings. Paediatrica Indonesiana. 2015 Oct 1;55(5):243.
8. Irwanto, -, Ratwita, M., Prihaningtyas, R. A., & Mustakim, M. R. D. (2020). Impact of Caregiver's Psychological Aspects towards Quality of Life of Children with Acute Lymphoblastic Leukemia (ALL). Asian Pacific journal of cancer prevention : APJCP, 21(9), 2683–2688. https://doi.org/10.31557/APJCP.2020.21.9.2683
9. Hutchinson KC, Willard VW, Hardy KK, Bonner MJ. Adjustment of caregivers of pediatric patients with brain tumors: a cross-sectional analysis. Psycho-Oncology. 2009 May;18(5):515–23.
10. Abo Amer AA, Abdel Maksod YH, El Bakry ST, El-Yamany WHM. Anxiety and depression among children with chronic diseases. Middle East Current Psychiatry. 2013 Jul;20(3):146–55.
11. Sultan S, Leclair T, Rondeau É, Burns W, Abate C. A systematic review on factors and consequences of parental distress as related to childhood cancer. European Journal of Cancer Care. 2015 Sep 10;25(4):616–37.
12. Michel G, Vetsch J. Screening for psychological late effects in childhood, adolescent and young adult cancer survivors. Current Opinion in Oncology. 2015 Jul;27(4):297–305.
13. Vitorino LM, Lopes-Júnior LC, de Oliveira GH, Tenaglia M, Brunheroto A, Cortez PJO, et al. Spiritual and religious coping and depression among family caregivers of pediatric cancer patients in Latin America. Psycho-Oncology. 2018 May 11;27(8):1900–7.
14. Khalifa A, Zeinab Bishry, Azza A.G. Tantawy, Ghanem ME, Effat SM, Heba El Shahawy, et al. Psychiatric morbidity in Egyptian children with acute lymphoblastic leukemia and their care providers. 2014 Jun 1;7(2):76–84.
15. Bemis H, Yarboi J, Gerhardt CA, Vannatta K, Desjardins L, Murphy LK, et al. Childhood Cancer in Context: Sociodemographic Factors, Stress, and Psychological Distress Among Mothers and Children. Journal of Pediatric Psychology [Internet]. 2015 Sep 1 [cited 2021 Dec 11];40(8):733–43. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4536846/
16. Sherief LM, Kamal NM, Abdalrahman HM, Youssef DM, Alhady MAA, Ali AS, et al. Psychological Impact of Chemotherapy for Childhood Acute Lymphoblastic Leukemia on Patients and Their Parents. Medicine [Internet]. 2015 Dec;94(51):e2280. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4697977/