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Comparison of the Effectiveness of Pharmacotherapy, Cognitive-Behavioral Therapy, and Emotion-Focused Therapy on Emotion Regulation and Hope for Life in Hospitalized Children with Cancer

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ABSTRACT

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Purpose: The present study aimed to compare the effectiveness of pharmacotherapy, cognitive-behavioral therapy (CBT), and emotion-focused therapy (EFT) on emotion regulation and hope for life in hospitalized children with cancer at Imam Reza Hospital.

Methods and Materials: This quasi-experimental study was conducted using a pretest–posttest design with a control group. The study population consisted of all hospitalized children with cancer in the pediatric ward of Imam Reza Hospital in 2025. Convenience sampling was used to select 40 children aged 8 to 12 years, who were then randomly assigned to four groups of 10 participants each (pharmacotherapy, CBT, EFT, and control). Data collection instruments included the Gross and John Emotion Regulation Questionnaire (ERQ) and Snyder’s Children’s Hope Scale (CHS). Data analysis was performed using multivariate analysis of covariance (MANCOVA) with SPSS-26 software.

Findings: The findings indicated that all three interventions led to a significant improvement in emotion regulation and an increase in hope for life compared to the control group ($p < .05$). Among the interventions, psychological therapies (CBT and EFT) were more effective than pharmacotherapy, and there was no significant difference between CBT and EFT.

Conclusion: The results suggest that psychological interventions, particularly CBT and EFT, play an important role in enhancing emotion regulation and increasing hope for life in children with cancer. Therefore, incorporating these approaches alongside pharmacological treatment and medical care is recommended in pediatric oncology departments.

Keywords: cognitive-behavioral therapy, emotion-focused therapy, pharmacotherapy, emotion regulation, hope for life, cancer

1. Introduction

Childhood cancer is one of the most challenging and distressing medical conditions, affecting not only the

physical health of young patients but also their psychological and emotional well-being. The chronicity of cancer, the experience of repeated hospitalizations, and exposure to

aggressive treatments often create a profound emotional burden for children and their families (Compas et al., 2017). In pediatric oncology, distress manifests in multiple ways, including fear of recurrence, difficulties in coping with uncertainty, and a marked decline in hope and adaptive emotion regulation (Firoozi et al., 2013; Marashi & Nikmanesh, 2017). Emotion regulation is an essential developmental skill that allows children to monitor, evaluate, and modify emotional responses to achieve adaptive functioning (Gross, 2015). However, cancer disrupts this process by exposing children to intense and unpredictable stressors, leading to anxiety, depression, and hopelessness (Applebaum et al., 2022; Goudarzi et al., 2019). Consequently, improving emotion regulation and strengthening hope for life have become critical psychological targets in pediatric oncology interventions (Fattahi Zadeh et al., 2021).

Pharmacotherapy remains a fundamental element in alleviating psychological distress among pediatric cancer patients. Antidepressants and anxiolytics are frequently prescribed to reduce symptoms of anxiety and depression, which can interfere with coping and treatment adherence (Beheshti et al., 2018). Yet, the literature increasingly recognizes that pharmacological interventions alone may not address the complex emotional and cognitive processes that sustain distress in children (Samara, 2024). Research comparing pharmacotherapy to psychotherapy has shown that while medications can alleviate acute symptoms, they often fail to build long-term adaptive skills, such as cognitive reappraisal, positive coping, and hope (Sijercic et al., 2020). Moreover, concerns about side effects and dependency further limit the sole reliance on pharmacological management in pediatric populations (Salmani et al., 2019). These limitations highlight the need to integrate evidence-based psychological interventions alongside medical treatment to promote sustainable emotional resilience and well-being.

Cognitive-behavioral therapy (CBT) has emerged as one of the most effective psychological treatments for children and adolescents coping with chronic illness (Kendall, 2011). CBT is based on the principle that dysfunctional thought patterns lead to maladaptive emotional and behavioral responses, and it equips children with skills to identify, challenge, and restructure these negative cognitions (Rahimi et al., 2020; Shamsabadi et al., 2024). The structured nature of CBT, which includes psychoeducation, cognitive restructuring, problem-solving, and exposure, has been successfully adapted for pediatric oncology populations to

reduce distress, anxiety, and hopelessness (Rahimi et al., 2020). Interventions using CBT have demonstrated improvements in hope, psychological well-being, and adaptive coping in children and parents affected by cancer (Harandi Moghadam et al., 2025; Norouzi et al., 2024). The Kendall manual, widely recognized for anxious children, provides a developmentally sensitive framework that helps young patients recognize links between thoughts and emotions, practice coping strategies, and gradually face cancer-related fears (Kendall, 2011).

Parallel to CBT, emotion-focused therapy (EFT) has gained increasing attention in pediatric cancer care due to its unique emphasis on the adaptive function of emotions (Greenberg, 2015). EFT teaches children to become aware of, differentiate, and express their emotions constructively, thus transforming maladaptive patterns into healthier emotional experiences (Dinkel et al., 2021; Goudarzi et al., 2019). Cancer often triggers suppressed emotions such as fear, anger, and sadness; unresolved, these feelings can exacerbate psychological distress and hinder coping (Applebaum et al., 2022). EFT's process of increasing emotional awareness and promoting acceptance has been associated with greater resilience, improved quality of life, and hope in individuals with cancer (Malekzadeh et al., 2024; Rahimi et al., 2022). Compared to strictly cognitive approaches, EFT offers a deeper exploration of emotion-based experiences and helps children reframe maladaptive beliefs about feelings (e.g., viewing sadness or crying as weakness), which is essential for psychological growth in the face of life-threatening illness (Shokrolahi et al., 2022).

Recent empirical evidence supports the integration of CBT and EFT into pediatric oncology care. CBT effectively targets maladaptive thoughts and avoidance behaviors, while EFT helps process unacknowledged or blocked emotions, both of which contribute to adaptive regulation and enhanced hope (Rajaei et al., 2024; Shafiabady et al., 2023). Comparative studies suggest that both interventions are superior to pharmacotherapy in improving emotion regulation and fostering hope (Beheshti et al., 2018; Rahimi et al., 2020). Some research has reported comparable efficacy between CBT and EFT, with CBT offering structured skill-building and EFT providing emotional depth and flexibility (Rahimi et al., 2022; Shamsabadi et al., 2024). Importantly, the choice between the two may depend on individual differences, such as emotional expressiveness and cognitive development (Norouzi et al., 2024).

Hope, a critical motivational force that sustains engagement with treatment and life goals, is especially

vulnerable in children with cancer (Fattahi Zadeh et al., 2021). The experience of illness can shatter a child's future orientation and sense of agency, leading to disengagement and despair (Marashi & Nikmanesh, 2017). Psychological interventions that strengthen hope help children set meaningful goals, identify multiple pathways to achieve them, and build a sense of control and resilience (Harandi Moghadam et al., 2025; Rahimi et al., 2020). CBT fosters hope by restructuring catastrophic thinking and enhancing problem-solving, while EFT restores hope by validating emotions and promoting self-acceptance (Goudarzi et al., 2019; Greenberg, 2015). As hope is closely linked to adaptive coping and psychological adjustment (Compas et al., 2017), its improvement can profoundly influence the child's quality of life and adherence to cancer treatment.

Despite the growing body of evidence, most pediatric oncology wards still rely predominantly on pharmacological management to address psychological distress (Samara, 2024; Sijercic et al., 2020). Integrating structured psychotherapies such as CBT and EFT into standard care can help move beyond symptom reduction to foster deeper psychological growth and resilience. Studies in Iranian and international contexts have highlighted the cultural adaptability and effectiveness of these approaches in pediatric and family settings (Beheshti et al., 2018; Firoozi et al., 2013; Malekzadeh et al., 2024; Shokrolahi et al., 2022). Importantly, Iranian research has confirmed the psychometric validity of tools measuring emotion regulation and hope in children, supporting rigorous evaluation of these interventions (Fattahi Zadeh et al., 2021; Marashi & Nikmanesh, 2017).

Moreover, global health initiatives emphasize psychosocial care as an integral component of comprehensive cancer treatment for children (Applebaum et al., 2022). Psychological suffering can persist even when medical treatment is successful, affecting long-term development and family dynamics (Harandi Moghadam et al., 2025; Rahimi et al., 2022). Therefore, early and structured psychological support is crucial. CBT empowers children to regain a sense of control, while EFT provides a safe emotional environment to process fear and grief (Greenberg, 2015; Gross, 2015). Such interventions can also reduce parental stress and caregiver burden by equipping families with adaptive coping mechanisms (Applebaum et al., 2022).

The present study builds on this body of research by directly comparing the effects of pharmacotherapy, CBT, and EFT on two fundamental psychological constructs—

emotion regulation and hope for life—in hospitalized children with cancer. While pharmacotherapy remains the most accessible intervention, its limitations underscore the need for robust psychological alternatives. By systematically evaluating and contrasting CBT and EFT against medication-based care, this study aims to provide evidence for integrative psychosocial oncology practices that address both the emotional and cognitive dimensions of pediatric cancer. Therefore, the present study aims to compare the effectiveness of pharmacotherapy, cognitive-behavioral therapy (CBT), and emotion-focused therapy (EFT) on emotion regulation and hope for life in hospitalized children with cancer at Imam Reza Hospital.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a quasi-experimental design with a pretest–posttest format and a control group. The aim was to compare the effectiveness of pharmacotherapy, cognitive-behavioral therapy (CBT), and emotion-focused therapy (EFT) on emotion regulation and hope for life in children with cancer. The statistical population consisted of all children hospitalized with cancer in the oncology ward of Imam Reza Hospital in Bojnord in 2025. Based on the inclusion criteria, 40 children were selected and randomly assigned to four groups (three intervention groups and one control group). Each group included 10 participants.

Inclusion Criteria

1. Age between 8 and 12 years. (This age range was selected based on Piaget's cognitive development theory; at this stage—concrete operational—children are able to understand simple abstract concepts, respond to questionnaires, and participate in educational and therapeutic sessions.)
2. Confirmed cancer diagnosis by a pediatric hematology–oncology specialist.
3. Hospitalization in Imam Reza Hospital.
4. Written parental consent and informed assent of the child.

Exclusion Criteria

1. Presence of other severe psychiatric disorders (e.g., schizophrenia or bipolar disorder).
2. Absence from more than two therapeutic sessions.
3. Withdrawal of the child or parents at any stage of the research

2.2. Measures

Emotion Regulation Questionnaire (ERQ): The Emotion Regulation Questionnaire was developed by Gross and John (2003) and is one of the most widely used instruments for assessing emotion regulation strategies. It consists of 10 items on two subscales: “Cognitive Reappraisal” (6 items) and “Emotional Suppression” (4 items). Items are scored on a 7-point Likert scale (from 1 = strongly disagree to 7 = strongly agree). The total score ranges from 10 to 70, with higher scores indicating greater use of emotion regulation strategies. A high score in the “Cognitive Reappraisal” dimension indicates greater ability to cognitively restructure and positively manage emotions, whereas a high score in “Emotional Suppression” suggests a tendency toward suppressing emotions and using maladaptive strategies. This instrument was translated and standardized in Iran by Hosseini et al. (2008), and its psychometric properties were confirmed. In the Iranian version, Cronbach’s alpha for the total scale was reported as .79, and test–retest reliability over a three-week interval was .82, indicating acceptable reliability.

Children’s Hope Scale (CHS): The Children’s Hope Scale was developed by Snyder et al. (1997) and is one of the most validated instruments for measuring hope in children. This scale includes six items covering two main components: “Agency” (willpower) and “Pathways” (goal-directed planning). Responses are rated on a 6-point Likert scale (from 1 = none of the time to 6 = all of the time). The total score ranges from 6 to 36, with higher scores indicating higher levels of hope for life, greater ability to use coping strategies, and a more positive outlook on the future. The Persian version of this scale was translated and validated by Sharifi Daramadi et al. (2009). In Iranian studies, Cronbach’s alpha for the total scale has been reported as .84, and test–retest reliability as .81, indicating good validity and reliability in the Iranian population.

2.3. Interventions

The CBT intervention was structured into eight sessions based on Kendall’s protocol. The first session focused on building a therapeutic alliance and introducing the principles of CBT, particularly how thoughts influence emotions and behaviors, with the assignment of recording distressing daily situations. The second session trained participants to identify negative automatic thoughts using the thought–feeling–behavior model and complete thought monitoring sheets. The third session emphasized cognitive restructuring by

teaching children to recognize cognitive distortions such as black-and-white thinking and catastrophizing, and to practice replacing maladaptive thoughts with more balanced ones. The fourth session introduced adaptive coping strategies, including problem-solving and seeking support, followed by real-life application as homework. The fifth session concentrated on anxiety management and relaxation skills, including deep breathing and progressive muscle relaxation, which were practiced daily at home. The sixth session incorporated gradual exposure to anxiety-provoking situations in a controlled therapeutic setting, with children recording their exposure experiences. The seventh session emphasized skill generalization through role-play and integration of previously learned strategies into everyday life. The eighth and final session focused on relapse prevention by reviewing all learned skills, planning for future emotional challenges, and preparing a personalized list of self-regulation strategies.

The EFT intervention followed Greenberg’s protocol and included eight sessions. Session one aimed to establish a strong therapeutic alliance, introduce the core principles of EFT, and create a safe emotional space, with children writing about a recent meaningful emotional experience. Session two increased emotional awareness by teaching identification and labeling of feelings and daily emotion journaling. Session three trained children to differentiate between primary (authentic) and secondary (masking) emotions and to recognize primary emotions in real-life contexts. Session four focused on identifying maladaptive emotional patterns by analyzing recurring situations and unhealthy emotional responses, while children recorded repetitive emotion–behavior cycles. Session five involved safe emotional expression through role-play exercises, such as expressing suppressed anger, fear, or sadness, complemented by writing an unsent emotional letter. Session six addressed emotional beliefs by challenging maladaptive ideas (e.g., “crying is weakness”) and promoting healthier, self-compassionate inner dialogue. Session seven emphasized developing new emotion regulation strategies, including acceptance and using emotions as a guide for adaptive action, supported by real-life application. Session eight consolidated progress by reviewing emotional changes, reinforcing healthy emotional patterns, and creating a personalized “emotional skills notebook” to support future self-regulation and resilience.

Pharmacotherapy was administered under the direct supervision of a child psychiatrist throughout the study to ensure safety and treatment stability. Antidepressants such

as fluoxetine, sertraline, and citalopram were primarily used due to their relative safety and lower side-effect profile for pediatric oncology patients. In cases of severe or treatment-resistant anxiety, mild anxiolytics like buspirone were prescribed short-term with careful monitoring. Benzodiazepines were reserved only for acute episodes and administered in minimal doses to reduce the risk of dependency. For sleep disturbances or restlessness, adjunctive agents such as melatonin or mild sedative-hypnotics were considered when necessary. Dosages were tailored individually based on age, weight, and physical status, and adverse effects—including nausea, appetite changes, weight fluctuations, and insomnia—were closely monitored during the entire treatment period to maintain therapeutic safety and adherence.

2.4. Data Analysis

The collected data were analyzed using SPSS version 26. In the descriptive statistics section, means, standard deviations, and frequencies were used to describe

demographic variables and questionnaire scores. In the inferential statistics section, chi-square tests and independent t-tests were performed to assess group homogeneity at the pretest stage. To compare the effects of the three interventions (pharmacotherapy, CBT, and EFT) on emotion regulation and hope for life, analysis of covariance (ANCOVA) was used while controlling for pretest effects. Additionally, paired t-tests were conducted to examine within-group changes between pretest and posttest. The significance level for all tests was set at $p < .05$.

3. Findings and Results

As shown in the table, the distribution of participants across the four study groups (pharmacotherapy, CBT, EFT, and control) did not differ significantly regarding demographic variables, including age, gender, and type of cancer ($p > .05$). This indicates that the groups were homogeneous at the baseline, and any changes in the dependent variables can be more confidently attributed to the interventions rather than initial demographic differences.

Table 1

Demographic Characteristics of Participants in the Study Groups

Variable	Category	Pharmacotherapy	CBT	EFT	Control	p
Age (years)	8–9	3	2	2	2	.864
	10–11	4	5	4	5	
	12	3	3	4	3	
Gender	Male	6	5	5	6	.991
	Female	4	5	5	4	
Cancer type	Leukemia	5	4	5	4	.923
	CNS brain tumor	3	3	2	3	
	Lymphoma	2	2	2	2	
	Others (neuroblastoma, ...)	0	1	1	1	

The results indicate that all three intervention groups showed significant increases in emotion regulation and hope for life scores in the posttest compared to the pretest, while

the control group showed minimal change. The greatest improvements in both variables were observed in the CBT and EFT groups.

Table 2

Descriptive Statistics of Main Variables in the Four Study Groups

Variable	Phase	Pharmacotherapy (M ± SD)	CBT (M ± SD)	EFT (M ± SD)	Control (M ± SD)
Emotion Regulation	Pretest	38.4 ± 4.2	39.1 ± 4.0	38.6 ± 3.9	38.7 ± 4.1
	Posttest	43.2 ± 4.0	47.8 ± 3.7	48.6 ± 3.5	39.5 ± 4.3
Hope for Life	Pretest	18.5 ± 2.8	18.9 ± 3.0	19.1 ± 2.7	18.8 ± 2.9
	Posttest	22.6 ± 2.9	26.3 ± 2.6	27.0 ± 2.4	19.6 ± 3.0

The results show that p-values in all tests were greater than .05, indicating that the data for the emotion regulation and hope for life variables in both pretest and posttest phases

followed a normal distribution and that group variances were homogeneous. This confirms the assumptions necessary for the use of parametric tests, including analysis of covariance.

Table 3

Shapiro–Wilk Normality Test and Levene’s Test for Homogeneity of Variances

Variable	Phase	Shapiro–Wilk (p)	Levene’s Test (p)
Emotion Regulation	Pretest	.341	.528
	Posttest	.427	.635
Hope for Life	Pretest	.298	.479
	Posttest	.376	.592

The results of the analysis of covariance show that after controlling for the pretest effect, there were significant differences among the groups in both emotion regulation ($F = 11.45$, $p = .001$, $\eta^2 = .49$) and hope for life ($F = 12.31$, $p =$

$.001$, $\eta^2 = .51$). The effect sizes indicate that a substantial proportion of the changes in the dependent variables can be attributed to the therapeutic interventions.

Table 4

Analysis of Covariance Results Comparing Intervention Effects

Variable	Source of Variation	SS	df	MS	F	p	η^2
Emotion Regulation	Pretest (covariate)	123.4	1	123.4	9.31	.004	.20
	Group	456.8	3	152.3	11.45	.001	.49
	Error	457.6	35	13.1			
Hope for Life	Pretest (covariate)	84.2	1	84.2	8.74	.005	.19
	Group	389.5	3	129.8	12.31	.001	.51
	Error	369.7	35	10.6			

Bonferroni post hoc analysis revealed that all three interventions (pharmacotherapy, CBT, and EFT) had a positive and significant effect compared to the control group in improving emotion regulation and hope for life. Additionally, CBT and EFT were significantly more

effective than pharmacotherapy; however, no significant difference was found between CBT and EFT ($p > .05$). These findings indicate that both psychotherapeutic approaches have comparable effectiveness in improving the studied variables.

Table 5

Pairwise Comparisons of Adjusted Means

Variable	Group Comparison	Mean Difference (ΔM)	p	Interpretation
Emotion Regulation	CBT – Pharmacotherapy	4.6	.02	CBT more effective
	EFT – Pharmacotherapy	5.4	.01	EFT more effective
	EFT – CBT	0.8	.67	No significant difference
	Interventions – Control	↑10–12	.001	All interventions > control
Hope for Life	CBT – Pharmacotherapy	3.7	.03	CBT more effective
	EFT – Pharmacotherapy	4.4	.02	EFT more effective
	EFT – CBT	0.7	.71	No significant difference
	Interventions – Control	↑7–8	.001	All interventions > control

4. Discussion and Conclusion

The present study aimed to compare the effectiveness of pharmacotherapy, cognitive-behavioral therapy (CBT), and emotion-focused therapy (EFT) on emotion regulation and hope for life in hospitalized children with cancer. The results demonstrated that all three interventions significantly improved both emotion regulation and hope compared to the

control group. However, psychological treatments (CBT and EFT) were substantially more effective than pharmacotherapy, and no significant difference emerged between CBT and EFT. These findings highlight the value of integrating structured psychological therapies into pediatric oncology care and confirm the superiority of psychotherapeutic approaches over medication alone in enhancing emotional and motivational outcomes in children.

The observed improvements in emotion regulation across all intervention groups support the idea that both pharmacological and psychological interventions can alleviate some level of distress in children facing chronic illness (Beheshti et al., 2018; Samara, 2024). Pharmacotherapy may reduce acute symptoms of anxiety and depression, which indirectly helps children manage emotions more effectively (Beheshti et al., 2018; Salmani et al., 2019). However, the more pronounced effects of CBT and EFT on emotion regulation are consistent with theoretical and empirical work showing that structured psychological interventions directly target the underlying processes of emotional functioning (Greenberg, 2015; Gross, 2015). CBT trains children to identify maladaptive cognitions and replace them with adaptive thought patterns, reducing emotional reactivity (Kendall, 2011; Rahimi et al., 2020). This mechanism has been well-documented in pediatric populations with cancer and other chronic illnesses (Compas et al., 2017; Rahimi et al., 2020). EFT, on the other hand, helps children access and process previously suppressed or unacknowledged emotions, enabling them to reorganize their emotional experiences adaptively (Dinkel et al., 2021; Greenberg, 2015). Prior Iranian research has similarly shown that EFT strengthens resilience and promotes healthier emotional functioning in children with cancer (Goudarzi et al., 2019; Rahimi et al., 2022).

The improvement in hope for life in the CBT and EFT groups aligns with evidence that psychological therapies help restore children's future orientation and sense of agency (Fattahi Zadeh et al., 2021; Marashi & Nikmanesh, 2017). Cancer can disrupt children's belief in their ability to achieve goals, leaving them vulnerable to despair (Firoozi et al., 2013). CBT appears to counter this by challenging catastrophic cognitions and teaching problem-solving, thereby increasing perceived control over life events and treatment-related stress (Harandi Moghadam et al., 2025; Rahimi et al., 2020). EFT also enhances hope by validating emotional pain, reframing maladaptive emotional beliefs, and fostering acceptance, which helps children develop a more positive and empowered outlook (Goudarzi et al., 2019; Rahimi et al., 2022). These findings echo results from other chronic illness populations, where both CBT and EFT have been shown to boost optimism and goal-directed motivation (Applebaum et al., 2022; Shokrolahi et al., 2022).

Interestingly, while CBT and EFT are conceptually distinct, their comparable effectiveness suggests complementary but equally potent pathways to psychological adjustment. CBT's cognitive focus equips

children with structured, skill-based strategies, while EFT's emotional depth provides a safe space to process and transform feelings (Rajaei et al., 2024; Shafiabady et al., 2023). This parity has been observed in studies comparing integrative and emotion-focused approaches with standard CBT, where both were similarly effective in enhancing emotion regulation and hope (Rahimi et al., 2022; Shamsabadi et al., 2024). The findings imply that therapy selection may be guided by patient preference, therapist expertise, and cultural context rather than absolute superiority of one approach. For example, children who find verbalizing emotions challenging might benefit more from CBT's structured methods, while those needing emotional expression may respond better to EFT (Greenberg, 2015; Gross, 2015).

Another important implication is the relative weakness of pharmacotherapy compared to psychological interventions. While medications such as antidepressants and anxiolytics can alleviate immediate distress, they do not build the skills required for long-term resilience (Samara, 2024; Sijercic et al., 2020). This is consistent with meta-analytic findings that psychotherapy outperforms pharmacotherapy in sustaining mental health outcomes for children and adolescents (Samara, 2024). Additionally, concerns about side effects and adherence reduce the long-term viability of medication as a sole treatment (Beheshti et al., 2018; Salmani et al., 2019). Our study reinforces the argument for a multimodal approach, where pharmacotherapy can be reserved for acute symptom management but should be complemented by psychotherapeutic programs to produce enduring psychological growth.

The cultural relevance of these findings is particularly noteworthy. Iranian studies have shown that CBT and EFT can be effectively adapted to local cultural and familial contexts, including collectivistic values and parental involvement (Firoozi et al., 2013; Goudarzi et al., 2019; Malekzadeh et al., 2024). The present results support this adaptability by showing significant improvements within an Iranian pediatric oncology population. Moreover, the validated Persian versions of the Emotion Regulation Questionnaire and Children's Hope Scale (Fattahi Zadeh et al., 2021; Marashi & Nikmanesh, 2017) ensured reliable measurement, strengthening the study's internal validity and reinforcing the cultural applicability of the findings.

From a developmental perspective, our results also validate the importance of targeting cognitive and emotional skills during middle childhood (ages 8–12). According to Piaget's theory, children in the concrete operational stage

can comprehend abstract emotional and cognitive concepts and actively engage in skill-based interventions (Kendall, 2011). The success of CBT and EFT in this study suggests that this developmental window is ideal for fostering resilience, future orientation, and adaptive emotion regulation in children with chronic illnesses (Compas et al., 2017; Rahimi et al., 2020). Early intervention may thus prevent the escalation of distress into adolescence, where entrenched maladaptive patterns become harder to change (Gross, 2015).

These findings contribute to the broader discourse on psychosocial oncology by providing empirical support for combining medical and psychological care. Comprehensive cancer treatment requires attention not only to physical outcomes but also to the child's emotional and existential needs (Applebaum et al., 2022). When psychological distress is not addressed, it may undermine medical adherence, quality of life, and even physical recovery (Harandi Moghadam et al., 2025; Rahimi et al., 2022). By demonstrating that CBT and EFT substantially outperform pharmacotherapy on hope and emotion regulation, this study highlights the need to integrate psychotherapeutic protocols into routine pediatric cancer care to optimize both psychological and medical outcomes.

Despite its strengths, the study has several limitations that warrant caution in interpretation. First, the sample size was relatively small, with 40 participants divided across four groups. Although random assignment improved internal validity, the limited number of participants reduces statistical power and generalizability. Second, the study employed a quasi-experimental design without long-term follow-up; therefore, we cannot determine whether the observed improvements in emotion regulation and hope persisted beyond the immediate post-treatment period. Third, the study was conducted in a single hospital in Iran, which may limit the cultural and contextual transferability of findings to other pediatric oncology settings. Additionally, although psychometric instruments with validated Persian versions were used, reliance on self-report measures in children could introduce response bias due to social desirability or comprehension difficulties. Lastly, therapist fidelity to the CBT and EFT protocols was not formally monitored, potentially introducing variability in the delivery of psychological interventions.

Future research should aim to overcome these limitations and build a stronger evidence base for psychological care in pediatric oncology. Larger randomized controlled trials across multiple centers would enhance the generalizability

of results and allow for subgroup analysis, such as variations by cancer type, treatment stage, or family psychosocial resources. Longitudinal studies with extended follow-up periods are needed to determine the durability of improvements in emotion regulation and hope and to assess whether early psychological intervention influences long-term mental health outcomes and treatment adherence. Additionally, exploring hybrid or integrative therapy models that combine elements of CBT and EFT could be valuable, particularly for tailoring interventions to individual emotional and cognitive needs. Future studies should also examine the role of parents and caregivers in therapy delivery, as parental emotional regulation and hope may directly affect children's outcomes. Finally, employing mixed-method designs, including qualitative interviews, could provide richer insight into children's lived experiences and inform culturally sensitive adaptations of psychotherapeutic approaches.

Clinicians working in pediatric oncology should consider incorporating structured psychological interventions such as CBT and EFT into routine care alongside pharmacotherapy. Health systems can establish multidisciplinary teams that include psychologists trained in these evidence-based protocols to ensure children receive both medical and emotional support. Training oncology staff to recognize emotional distress and refer patients to appropriate psychological services is essential for timely intervention. Additionally, designing therapy materials and activities that are developmentally appropriate and culturally adapted can improve engagement and effectiveness among young patients. Integrating parents into the therapeutic process and educating them about emotional regulation strategies can further reinforce skills learned in therapy and create a supportive home environment. Overall, combining medical treatment with targeted psychological care can improve resilience, emotional well-being, and hope for life, ultimately contributing to better overall outcomes for children with cancer.

Authors' Contributions

All authors significantly contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this study, to observe ethical considerations, participants were informed about the goals and importance of the research before the start of the interview and participated in the research with informed consent.

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