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Comparison of the Effectiveness of Self-Compassion-Focused Therapy and Stress Inoculation Training on Perceived Stress among Parents of Children with Cancer

Shadi. Salehi[1], Afsaneh. Taheri[2*], Farah. Lotfi Kashani[3]

[1] PhD Student, Department of Psychology, Ro.C., Islamic Azad University, Roudehen, Iran
[2] Department of Psychology, Ro.C., Isclamic Azad University, Rudehen, Iran
[3] Associate Professor, Department of Psychology, Faculty of Medicine, Tems.C., Islamic Azad University, Tehran, Iran

*** Corresponding author email address**: 0040830683@iau.ir

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A B S T R A C T

The present study aimed to compare the effectiveness of Self-Compassion-Focused Therapy (SCFT) and Stress Inoculation Training (SIT) on perceived stress among parents of children with cancer. This study employed a quasi-experimental design with a pretest–posttest control group and a two-month follow-up assessment. The statistical population consisted of parents of children with cancer who attended medical and psychological treatment centers in Tehran in 2026. Among them, 45 participants were selected through convenience sampling based on the study inclusion criteria and were randomly assigned to three groups of 15 participants each (two experimental groups and one control group). Data were collected using the Perceived Stress Scale (PSS) developed by Cohen et al. (1983). The therapeutic interventions included the implementation of the Self-Compassion-Focused Therapy protocol based on Gilbert's treatment program (2012) and Stress Inoculation Training based on Meichenbaum's psychological inoculation program (Mobini, 2007). Each intervention was administered in a group format over 10 weekly sessions for the experimental groups. The control group received no intervention during the study period. Data were analyzed using descriptive statistics and mixed-design repeated-measures analysis of variance. The results indicated that both Self-Compassion-Focused Therapy and Stress Inoculation Training significantly reduced perceived stress among parents of children with cancer, and the therapeutic effects remained stable at the follow-up assessment ($p < .05$). Furthermore, the comparison of the two interventions demonstrated that Stress Inoculation Training was more effective than Self-Compassion-Focused Therapy in reducing perceived stress. The findings suggest that both therapeutic approaches can be utilized as effective psychological interventions to improve the mental health of parents of children with cancer.

Keywords: *perceived stress, Self-Compassion-Focused Therapy, Stress Inoculation Training, parents of children with cancer.*

1. Introduction

Childhood cancer is one of the most challenging chronic health conditions affecting not only children but also their families. The diagnosis and treatment of cancer in children often impose substantial psychological, emotional, social, and financial burdens on parents, who serve as the primary caregivers throughout the treatment process. Parents are frequently required to manage complex medical regimens, cope with uncertainty regarding treatment outcomes, and provide continuous emotional support to their children while simultaneously maintaining family functioning and daily responsibilities. Consequently, parents of children with cancer experience elevated levels of psychological distress, anxiety, depression, and perceived stress compared to parents of healthy children and even parents of children with other chronic illnesses (Carlsson et al., 2019; Cohn et al., 2020).

Perceived stress refers to the degree to which individuals evaluate situations in their lives as unpredictable, uncontrollable, and overwhelming. Unlike objective stressors, perceived stress reflects a subjective appraisal of environmental demands and personal coping resources. According to psychobiological models of stress, prolonged exposure to perceived stress can negatively affect emotional functioning, physical health, cognitive performance, and interpersonal relationships (O'Connor et al., 2021). Parents of children with cancer are particularly vulnerable to heightened levels of perceived stress because they must simultaneously confront fears regarding their child's survival, uncertainty about treatment effectiveness, financial pressures, disruptions in family routines, and concerns about the future (Deribe et al., 2023; Lam et al., 2022).

The psychological burden associated with pediatric cancer extends beyond temporary emotional discomfort. Research has consistently shown that parental distress is associated with poorer psychological adjustment, reduced well-being, and diminished quality of life among caregivers (Cohn et al., 2020; Morhun et al., 2020). Furthermore, parental distress has important implications for the adjustment and quality of life of children with cancer. A meta-analysis demonstrated a significant relationship between parental psychological distress and lower quality of life among pediatric cancer patients, suggesting that parents' psychological functioning may directly influence children's adaptation to illness and treatment (Bakula et al., 2020). Similarly, parental stress has been identified as a mediator between symptom burden and quality of life among children with cancer, highlighting the importance of addressing parental mental health as part of comprehensive pediatric oncology care (Lam et al., 2022).

Recent investigations have emphasized the role of resilience and adaptive coping mechanisms in mitigating the negative consequences of caregiving stress. Parents who possess greater psychological resilience tend to report lower levels of psychological distress, better coping abilities, and higher quality of life (Chung et al., 2023). Moreover, resilience has been found to mediate the relationship between stress and psychological distress among parents of children with cancer, suggesting that interventions aimed at strengthening adaptive psychological resources may help reduce caregiver burden (Luo et al., 2024). Nevertheless, despite the importance of resilience, many parents continue to experience persistent emotional difficulties and require structured psychological interventions to effectively manage stress and maintain psychological well-being.

Among contemporary therapeutic approaches, Self-Compassion-Focused Therapy has received increasing attention as an effective intervention for reducing emotional distress and promoting psychological adjustment. Compassion-Focused Therapy was originally developed by Gilbert to help individuals who experience excessive self-criticism, shame, and emotional dysregulation (Gilbert, 2014, 2021). The approach is grounded in evolutionary psychology, attachment theory, affect regulation systems, and social mentality theory. According to Gilbert, compassion involves sensitivity to suffering in oneself and others, combined with a commitment to alleviate and prevent that suffering (Gilbert, 2014). Self-compassion specifically refers to extending understanding, kindness, and acceptance toward oneself during times of failure, suffering, or inadequacy rather than responding with self-criticism and self-judgment (Neff & Germer, 2018).

The theoretical foundations of self-compassion suggest that individuals who respond to adversity with self-kindness, mindfulness, and recognition of common humanity experience lower emotional distress and greater psychological resilience. Self-compassion enables individuals to regulate negative emotions more effectively, reduce rumination, and develop adaptive coping responses to stressful situations (Neff & Germer, 2018; Verhagen, 2025). Recent evidence has further demonstrated that self-compassion contributes to healthier emotional climates within families and may reduce the intergenerational transmission of psychological distress (Zhou et al., 2025). Because parents of children with cancer frequently

experience guilt, helplessness, self-blame, and chronic worry, cultivating self-compassion may provide a valuable mechanism for improving psychological adjustment and reducing perceived stress.

Empirical studies have provided support for the effectiveness of self-compassion-based interventions in caregiver populations. Internet-based mindful self-compassion interventions have been associated with improvements in psychological functioning among parents of children with cancer (Tan et al., 2023). Similarly, self-compassion-focused interventions have demonstrated positive effects on anxiety reduction and quality of life enhancement among parents of pediatric cancer patients (Borjali et al., 2021). Research conducted in other populations has also shown that self-compassion training improves emotional regulation, enhances psychological well-being, and reduces vulnerability to stress-related disorders (Neff & Germer, 2018; Verhagen, 2025). These findings suggest that self-compassion-focused approaches may represent a promising intervention strategy for parents facing the ongoing challenges associated with childhood cancer.

Another intervention that has shown considerable effectiveness in reducing psychological distress is Stress Inoculation Training (SIT). Stress Inoculation Training was originally developed by Meichenbaum as a cognitive-behavioral intervention designed to enhance individuals' coping abilities through education, skills acquisition, and application phases. The conceptual foundation of SIT is closely related to inoculation theory, which proposes that exposure to manageable challenges can strengthen resistance to future stressors, much like a medical vaccine strengthens immunity against disease (Ivanov, 2017). Through cognitive restructuring, problem-solving training, relaxation techniques, and coping skills development, SIT aims to equip individuals with practical strategies for managing stressful situations before they become overwhelming.

The theoretical rationale underlying Stress Inoculation Training is consistent with broader health behavior frameworks emphasizing cognitive appraisal and perceived control. The Health Belief Model suggests that individuals' beliefs regarding threats, susceptibility, coping resources, and self-efficacy significantly influence health-related behaviors and psychological adaptation (Green et al., 2020; Skinner et al., 2015). By enhancing coping self-efficacy and reducing maladaptive cognitive responses to stress, SIT may facilitate more adaptive interpretations of stressful experiences and reduce psychological distress among caregivers.

A growing body of empirical evidence supports the effectiveness of Stress Inoculation Training across various populations. Studies have demonstrated that SIT can reduce perceived stress among pregnant women with a history of infertility (Taghizadeh et al., 2013), improve emotional functioning and psychological adjustment among adolescents with hearing impairment (Esmaeili & Yazdi, 2023), and enhance academic emotions and social problem-solving abilities among students experiencing social anxiety (Rezapour et al., 2023). More recent findings have also shown positive effects of SIT on emotional regulation, childbirth self-efficacy, and anxiety reduction (Masipour, 2025). Importantly, SIT has been found to reduce psychological distress among parents of pediatric cancer patients by strengthening coping skills and improving responses to cancer-related stressors (Cunningham et al., 2018; Jones et al., 2022).

Although both Self-Compassion-Focused Therapy and Stress Inoculation Training have demonstrated effectiveness in reducing psychological distress, they operate through distinct theoretical mechanisms. Self-Compassion-Focused Therapy primarily targets emotional acceptance, self-kindness, and compassionate self-relating, whereas Stress Inoculation Training emphasizes cognitive preparation, coping skill acquisition, and stress management techniques. Consequently, it remains unclear whether one approach may be more effective than the other in addressing perceived stress among parents of children with cancer. Given the substantial psychological burden experienced by these parents and the critical role of parental well-being in family functioning and child adjustment, identifying the most effective intervention strategies represents an important clinical and research priority.

Furthermore, despite growing interest in both therapeutic approaches, direct comparative studies examining the relative effectiveness of Self-Compassion-Focused Therapy and Stress Inoculation Training among parents of children with cancer remain limited. Most previous investigations have examined these interventions independently or within different populations, making it difficult to determine their comparative value for pediatric oncology caregivers (Borjali et al., 2021; Cunningham et al., 2018; Tan et al., 2023). Therefore, comparative research is needed to clarify which intervention provides greater benefits for reducing perceived stress and promoting psychological adaptation in this highly vulnerable population.

Accordingly, the present study aimed to compare the effectiveness of Self-Compassion-Focused Therapy and Stress Inoculation Training on perceived stress among parents of children with cancer.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a quasi-experimental design using a pretest–posttest control group framework with a two-month follow-up assessment. The target population consisted of parents of children diagnosed with cancer who attended medical and psychological treatment centers in Tehran, Iran, during 2026. Participants were recruited through convenience sampling based on predefined inclusion criteria, including being the parent of a child with a confirmed cancer diagnosis, willingness to participate in the study, and the absence of severe psychiatric disorders that could interfere with participation in the intervention sessions. A total of 45 eligible parents were selected and randomly assigned to three groups, including two experimental groups and one control group, with 15 participants in each group. The first experimental group received Self-Compassion-Focused Therapy (SCFT), the second experimental group received Stress Inoculation Training (SIT), and the control group received no psychological intervention during the study period. Assessments were conducted at three time points, including pretest, posttest, and a two-month follow-up. The study was conducted online during the spring and summer of 2026. Prior to participation, informed consent was obtained from all participants, and the confidentiality and anonymity of the collected information were ensured throughout the research process.

2.2. Measures

Perceived stress was assessed using the Perceived Stress Scale (PSS) developed by Cohen et al. (1983). The original version of the instrument consists of 14 items designed to evaluate the extent to which individuals perceive situations in their lives as stressful during the previous month. The scale includes seven positively worded items and seven negatively worded items. The negative factor assesses feelings of lack of control and negative emotional reactions, whereas the positive factor evaluates perceived coping ability in response to external stressors. Each item is rated on a five-point Likert scale ranging from 0 (Never) to 4 (Very Often). Total scores are obtained by summing item responses after reverse-scoring the positively phrased items, with higher scores indicating greater levels of perceived stress and lower scores reflecting lower stress and a stronger sense of control over life circumstances. The scale has demonstrated satisfactory psychometric properties across diverse populations. Cohen et al. (1983) reported adequate validity and reliability for the original measure. In Iranian samples, internal consistency coefficients ranging from .84 to .86 have been reported, and significant correlations have been observed between perceived stress and life events, depressive symptoms, physical symptoms, healthcare utilization, anxiety, and reduced life satisfaction. The content validity of the Persian version has been confirmed by experts, and Mousavi et al. (2014) reported a Cronbach's alpha coefficient of .74. In the present study, the internal consistency of the scale was acceptable, with a Cronbach's alpha coefficient of .72.

2.3. Intervention

The Self-Compassion-Focused Therapy intervention was developed based on Gilbert's (2012) Compassion-Focused Therapy program. The intervention was delivered in a group format across ten weekly sessions. The initial session focused on participant orientation and the introduction of perceived stress and psychological challenges experienced by parents of children with cancer. Subsequent sessions introduced the principles of self-compassion and its role in stress reduction and psychological well-being. Participants were trained in self-compassion exercises, the concept of common humanity, and compassionate thinking skills. Mindfulness practices, body scanning, breathing exercises, emotional regulation techniques, and strategies for tolerating distressing situations were incorporated throughout the program. Additional sessions emphasized self-acceptance, understanding the limitations of self-esteem-based coping, self-care practices, identification of stressful situations, and enhancement of distress tolerance. Participants were also introduced to compassionate imagery, compassionate reasoning, and compassionate attention. Group discussions facilitated the sharing of experiences, emotional expression, empathy development, and mutual support among parents. The final sessions focused on practical stress-management strategies, increasing daily self-compassion practices, strengthening social support, cultivating kindness toward oneself, and consolidating acquired compassion skills to promote long-term psychological adjustment.

The Stress Inoculation Training intervention was based on Meichenbaum's psychological inoculation approach and was adapted from the psychological immunization training program translated by Mobini (2007). The intervention was implemented in a group format over ten weekly sessions. The program began with participant introductions, discussion of personal life experiences, creative hopelessness exercises, and completion of awareness-based worry worksheets. Subsequent sessions introduced behavior change principles, mindfulness concepts, metaphorical exercises, and mindful breathing practices. Participants were trained in acceptance skills, value clarification, and mindfulness-based coping strategies. The intervention emphasized the distinction between personal values and goals, utilizing experiential exercises and metaphors to facilitate psychological flexibility. Additional sessions focused on cognitive fusion and defusion techniques, identification of barriers to committed action, cognitive coping exercises, and review of behavioral progress. Participants explored primary and secondary suffering, evaluated their commitment to change, and engaged in self-management and relapse-prevention planning. The final sessions reinforced value-based action, acceptance practices, daily mindfulness exercises, future planning, goal setting, and strategies for maintaining treatment gains in the face of future stressors.

2.4. Data Analysis

Data were analyzed using IBM SPSS Statistics version 25. Descriptive statistics, including means and standard deviations, were calculated to summarize participant characteristics and study variables. Inferential analyses were conducted using mixed-design repeated-measures analysis of variance (ANOVA), incorporating one within-subjects factor (time: pretest, posttest, and follow-up) and one between-subjects factor (group: Self-Compassion-Focused Therapy, Stress Inoculation Training, and control). Prior to conducting the analyses, statistical assumptions were examined. The normality of score distributions was assessed using the Shapiro–Wilk test, homogeneity of variances was evaluated through Levene's test, equality of covariance matrices was examined using Box's M test, and the sphericity assumption was assessed with Mauchly's test. When violations of sphericity were detected, Greenhouse–Geisser or Huynh–Feldt corrections were applied as appropriate. Significant main effects and interaction effects were followed by Bonferroni-adjusted pairwise comparisons to identify differences between assessment time points and study groups. Statistical significance was established at $p < .05$.

3. Findings and Results

The participants in the three groups were homogeneous in terms of age, education, and gender, and no significant differences were observed between the groups ($p > .05$). In addition, the examination of statistical assumptions indicated that the distribution of the variables was normal and that variances were homogeneous ($p > .05$). Box's M test also confirmed the homogeneity of the variance–covariance matrices; however, due to the violation of the sphericity assumption in some variables, the Greenhouse–Geisser correction was used in the analyses.

The descriptive indices of perceived stress, quality of life, and loneliness in the two experimental groups and the control group at the pretest, posttest, and follow-up stages are presented in Table 1.

Table 1

Descriptive Indices of Perceived Stress in the Experimental and Control Groups

Variable	Stage	Self-Compassion-Focused Therapy M	Self-Compassion-Focused Therapy SD	Stress Inoculation Training M	Stress Inoculation Training SD	Control M	Control SD
Perceived self-efficacy	Pretest	18.23	3.14	17.36	4.199	18.57	3.797
Perceived self-efficacy	Posttest	14.31	4.461	10.29	2.894	18.86	4.016
Perceived self-efficacy	Follow-up	14.31	4.442	9.86	3.278	19.00	4.69
Perceived helplessness	Pretest	19.54	2.436	19.21	3.556	19.57	2.277
Perceived helplessness	Posttest	15.36	2.088	11.95	3.503	18.67	2.501
Perceived helplessness	Follow-up	15.44	2.038	12.17	3.424	18.55	2.424

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Perceived stress, total score	Pretest	37.46	3.688	36.57	5.273	37.57	3.502
Perceived stress, total score	Posttest	29.31	4.926	22.24	5.034	37.12	3.978
Perceived stress, total score	Follow-up	29.44	4.18	22.02	5.44	37.00	5.101

Table 1 shows that, in the dimensions of perceived stress and its total score, the mean scores of participants in the Self-Compassion-Focused Therapy and Stress Inoculation Training groups decreased from pretest to posttest and follow-up.

The significance levels of the Shapiro–Wilk test for perceived stress and its dimensions indicated that the distribution of all variables was normal across groups at the .05 level. The results of Levene's test showed that the homogeneity of variances was established for perceived stress and its dimensions across the assessment stages. The results of Box's M test and Bartlett's test indicated that the homogeneity of the variance–covariance matrix of perceived stress was established ($p > .05$). The examination of Bartlett's test of sphericity also showed that there were moderate and significant correlations among the dimensions of the variables ($p < .05$).

The results of Mauchly's test of sphericity showed that the sphericity assumption was not met for the perceived helplessness subscale ($p < .05$); therefore, the Greenhouse–Geisser epsilon correction was required to estimate the differences for this variable.

To examine the first to third hypotheses, multivariate factorial repeated-measures analysis of variance was used. The results of this analysis are presented in Table 2.

Table 2

Results of the Multivariate Test for Examining Between-Group Differences in Perceived Stress

Variable	Source of Variation	Wilks' Lambda	F	p	Partial Eta Squared
Perceived self-efficacy	Test	.459	21.835	.001	.541
Perceived self-efficacy	Test × Group membership	.524	7.046	.001	.276
Perceived helplessness	Test	.430	24.550	.010	.570
Perceived helplessness	Test × Group membership	.651	4.437	.010	.193
Perceived stress, total score	Test	.275	48.809	.001	.725
Perceived stress, total score	Test × Group membership	.401	10.697	.001	.366

The above table shows that the Wilks' Lambda multivariate test was significant for the assessment stages and the interaction between assessment stage and group membership for perceived stress and its subscales ($p < .05$). The results of the repeated-measures analysis of variance are presented in Table 3.

Table 3

Examination of Within-Group and Between-Group Differences in Perceived Stress

Variable	Source of Variation	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared
Perceived self-efficacy	Test	357.386	2	178.693	23.691	.001	.384
Perceived self-efficacy	Group membership	836.053	2	418.027	13.444	.001	.414
Perceived self-efficacy	Test × Group membership	275.075	4	68.769	9.117	.001	.324
Perceived helplessness	Test	456.006	1.017	448.566	48.885	.001	.563
Perceived helplessness	Group membership	422.477	2	211.239	15.427	.001	.448
Perceived helplessness	Test × Group membership	179.268	2.033	88.172	9.609	.001	.336
Perceived stress, total score	Test	1610.612	2	805.306	68.788	.001	.644
Perceived stress, total score	Group membership	2221.724	2	1110.862	27.176	.001	.589
Perceived stress, total score	Test × Group membership	908.003	4	227.001	19.390	.001	.505

The results presented in Table 3 show that there were significant differences among the Self-Compassion-Focused Therapy, Stress Inoculation Training, and control groups in perceived stress and its subscales based on assessment stage, group membership, and the interaction effect of assessment stage and group membership ($p < .05$).

The results of the Bonferroni post hoc test for comparing means according to group membership and assessment stages are presented in Table 4.

Table 4

Bonferroni Post Hoc Test for Comparing Mean Perceived Stress According to Treatment Approach and Assessment Stage

Variable	Comparison Type	First Comparison	Second Comparison	Mean Difference	Standard Error	p
Perceived self-efficacy	Treatment approaches	Self-Compassion-Focused Therapy	Stress Inoculation Training	3.115*	1.240	.049
Perceived self-efficacy	Treatment approaches	Self-Compassion-Focused Therapy	Control	-3.194*	1.240	.042
Perceived self-efficacy	Treatment approaches	Stress Inoculation Training	Control	-6.310*	1.217	.001
Perceived self-efficacy	Assessment stages	Pretest	Posttest	3.570*	.607	.001
Perceived self-efficacy	Assessment stages	Pretest	Follow-up	3.665*	.624	.001
Perceived self-efficacy	Assessment stages	Posttest	Follow-up	.095	.590	1.000
Perceived helplessness	Treatment approaches	Self-Compassion-Focused Therapy	Stress Inoculation Training	2.333*	.823	.022
Perceived helplessness	Treatment approaches	Self-Compassion-Focused Therapy	Control	-2.151*	.823	.038
Perceived helplessness	Treatment approaches	Stress Inoculation Training	Control	-4.484*	.808	.001
Perceived helplessness	Assessment stages	Pretest	Posttest	4.115*	.591	.001
Perceived helplessness	Assessment stages	Pretest	Follow-up	4.058*	.574	.001
Perceived helplessness	Assessment stages	Posttest	Follow-up	-.057	.064	.935
Perceived stress, total score	Treatment approaches	Self-Compassion-Focused Therapy	Stress Inoculation Training	5.124*	1.422	.003
Perceived stress, total score	Treatment approaches	Self-Compassion-Focused Therapy	Control	-5.162*	1.422	.002
Perceived stress, total score	Treatment approaches	Stress Inoculation Training	Control	-10.286*	1.395	.001
Perceived stress, total score	Assessment stages	Pretest	Posttest	7.647*	.811	.001
Perceived stress, total score	Assessment stages	Pretest	Follow-up	7.715*	.837	.001
Perceived stress, total score	Assessment stages	Posttest	Follow-up	.068	.598	1.000

*The mean difference is significant at $p < .05$.

The results of the two-way repeated-measures analysis of variance on one factor, presented in Table 3, showed that the mean differences in perceived stress and its subscales were significant across the study groups ($p < .05$). The partial eta squared value indicated that 58.9% of the variance in perceived stress was explained by the grouping variable, namely the intervention. Furthermore, the results of the Bonferroni post hoc test for comparing means according to group membership, presented in Table 4, showed that the difference between the mean score of the Self-Compassion-Focused Therapy group and the control group was significant ($p < .01$). Therefore, it can be stated that Self-Compassion-Focused Therapy was effective in reducing perceived stress among parents of children with cancer. In addition, the results of the Bonferroni post hoc test for comparing the effect of time showed that the changes observed in the mean scores of perceived stress remained stable after the completion of the treatment period.

The results of the Bonferroni post hoc test for comparing means according to group membership showed that the differences between the mean scores of perceived stress and its subscales in the Stress Inoculation Training group and the control group were significant ($p < .01$). Therefore, it can be stated that Stress Inoculation Training was effective in reducing perceived stress among parents of children with cancer. In addition, the results of the Bonferroni post hoc test for comparing the effect of time showed that the changes observed in the mean scores of perceived stress remained stable after the completion of the treatment period.

After confirming the effectiveness of both therapeutic approaches in reducing perceived stress, the two treatment methods were compared. Based on the results presented in

Table 4, the mean difference in perceived stress between the Self-Compassion-Focused Therapy group and the Stress Inoculation Training group was significant ($p < .01$). Therefore, the research hypothesis was confirmed, and it can be stated that there is a difference between the effectiveness of Self-Compassion-Focused Therapy and Stress Inoculation Training on perceived stress among parents of children with cancer, with Stress Inoculation Training being more effective in reducing perceived stress. The results of Table 4 show that, in both experimental groups, the mean scores of perceived stress and its subscales decreased from pretest to posttest and from pretest to follow-up, and these differences were statistically significant ($p < .05$). The differences from posttest to follow-up were not significant ($p > .05$), indicating that the therapeutic effects remained stable over time. Therefore, it can be concluded that the effectiveness of Self-Compassion-Focused Therapy and Stress Inoculation Training on perceived stress among parents of children with cancer was stable over time.

4. Discussion

The present study aimed to compare the effectiveness of Self-Compassion-Focused Therapy (SCFT) and Stress Inoculation Training (SIT) on perceived stress among parents of children with cancer. The findings demonstrated that both interventions significantly reduced perceived stress and its dimensions, including perceived self-efficacy and perceived helplessness, compared with the control group. Furthermore, the therapeutic gains remained stable during the two-month follow-up period, indicating the durability of treatment effects over time. The results also revealed a significant difference between the two interventions, with Stress Inoculation Training demonstrating greater effectiveness than Self-Compassion-Focused Therapy in reducing perceived stress among parents of children with cancer.

The first major finding of the study indicated that Self-Compassion-Focused Therapy significantly reduced perceived stress among parents of children with cancer. This finding is consistent with previous research demonstrating the beneficial effects of self-compassion-based interventions on psychological well-being, anxiety, emotional regulation, and quality of life among caregivers and parents facing chronic stressors (Borjali et al., 2021; Neff & Germer, 2018; Tan et al., 2023). The present results also align with evidence suggesting that self-compassion serves as a protective psychological factor that reduces vulnerability to emotional distress and facilitates adaptive coping during periods of adversity (Verhagen, 2025; Zhou et al., 2025). Parents of children with cancer often experience persistent worry regarding treatment outcomes, uncertainty about the future, feelings of guilt, and concerns about their child's suffering. Such emotional experiences frequently lead to heightened self-criticism and chronic psychological strain. Self-Compassion-Focused Therapy appears to mitigate these maladaptive processes by encouraging individuals to respond to personal suffering with kindness, understanding, and emotional acceptance rather than judgment and self-blame.

From a theoretical perspective, the effectiveness of Self-Compassion-Focused Therapy can be explained through Gilbert's affect regulation model. According to this framework, psychological distress is often maintained by an overactivation of the threat-protection system and insufficient activation of soothing and affiliative emotional systems (Gilbert, 2014, 2021). Parents of children with cancer are continually exposed to stressors that activate threat-related responses, including fear, anxiety, and hypervigilance. Through mindfulness, compassionate imagery, self-acceptance exercises, and the cultivation of compassionate self-relating, SCFT helps individuals regulate threat-based emotions and activate feelings of safety and emotional balance. As a result, parents become better able to tolerate distressing emotions without becoming overwhelmed by them, leading to reductions in perceived stress.

Another explanation for the observed effectiveness of Self-Compassion-Focused Therapy involves the enhancement of cognitive and emotional flexibility. Self-compassion encourages individuals to recognize that suffering and adversity are universal aspects of the human experience rather than personal failures. This perspective reduces feelings of isolation and fosters a sense of connectedness with others facing similar challenges (Neff & Germer, 2018). In the context of pediatric cancer, parents frequently perceive themselves as isolated in their struggles and may experience feelings of helplessness regarding their inability to protect their child from illness. Self-compassion interventions help reframe these experiences in a more balanced and accepting manner, thereby reducing perceived helplessness and enhancing coping self-efficacy. The significant improvements observed in both dimensions of perceived stress in the present study support this interpretation.

The second major finding demonstrated that Stress Inoculation Training significantly reduced perceived stress among parents of children with cancer. This result is consistent with previous investigations reporting the effectiveness of SIT in reducing stress, anxiety, and emotional difficulties across diverse populations (Esmaeili & Yazdi, 2023; Masipour, 2025; Rezapour et al., 2023; Taghizadeh et al., 2013). The finding is also congruent with studies specifically examining caregivers and parents experiencing chronic health-related stressors, which have shown that stress inoculation approaches can improve coping capacity and reduce psychological distress (Cunningham et al., 2018; Jones et al., 2022). The present findings extend this body of literature by demonstrating the effectiveness of SIT among parents of children with cancer, a population that experiences substantial and prolonged caregiving demands.

The effectiveness of Stress Inoculation Training may be explained by its emphasis on cognitive restructuring and coping skills development. SIT conceptualizes stress not only as a response to external demands but also as a consequence of how individuals interpret and respond to those demands. Through psychoeducation, cognitive reframing, relaxation techniques, problem-solving strategies, and behavioral coping skills, participants learn to perceive stressful situations as more manageable and controllable. As a result, their appraisal of stress changes, leading to lower levels of perceived stress. This explanation is consistent with inoculation theory, which proposes that gradual exposure to manageable challenges and adaptive coping responses strengthens resistance to future stressors (Ivanov, 2017). By repeatedly practicing coping strategies during treatment sessions, parents may have developed greater confidence in their ability to manage cancer-related challenges, thereby reducing perceptions of helplessness and increasing feelings of self-efficacy.

The effectiveness of Stress Inoculation Training may also be understood through the lens of the Health Belief Model. This framework suggests that individuals' responses to health-related stressors are influenced by their perceptions of threat, coping resources, and self-efficacy (Green et al., 2020; Skinner et al., 2015). SIT directly targets these cognitive factors by increasing perceived control, strengthening coping beliefs, and providing practical strategies for managing stress. Parents who perceive themselves as capable of effectively responding to treatment-related uncertainties and caregiving demands are likely to experience lower levels of psychological burden. The significant reductions observed in perceived helplessness and total perceived stress among participants receiving SIT provide empirical support for this interpretation.

Another important finding of the present study was the stability of treatment effects at follow-up. The absence of significant differences between posttest and follow-up scores in both intervention groups suggests that the therapeutic benefits were maintained over time. This finding is particularly important because parents of children with cancer often face chronic and recurring stressors throughout the course of their child's illness. Interventions that produce only short-term symptom relief may have limited practical value in such contexts. The persistence of treatment gains observed in the present study indicates that both SCFT and SIT may foster enduring psychological resources that continue to benefit participants beyond the immediate intervention period. Previous studies on self-compassion interventions and stress inoculation programs have similarly reported sustained improvements in psychological adjustment following treatment completion (Cunningham et al., 2018; Neff & Germer, 2018; Tan et al., 2023).

The most noteworthy finding of the present study was that Stress Inoculation Training demonstrated greater effectiveness than Self-Compassion-Focused Therapy in reducing perceived stress among parents of children with cancer. This finding warrants careful consideration. Although both interventions significantly improved outcomes, SIT produced larger reductions in perceived stress and its subcomponents. One possible explanation is that parents of children with cancer are confronted with numerous immediate and practical stressors, including medical decision-making, financial concerns, caregiving responsibilities, and uncertainty regarding treatment outcomes. In such situations, interventions that provide concrete coping strategies and problem-solving skills may produce more immediate reductions in perceived stress than interventions focused primarily on emotional acceptance and self-compassion.

Stress Inoculation Training offers a highly structured framework for identifying stressors, challenging maladaptive thoughts, developing coping plans, and practicing behavioral responses to stressful situations. These skills may directly address the daily demands faced by parents of children with cancer. In contrast, Self-Compassion-Focused Therapy emphasizes emotional acceptance, self-kindness, and compassionate awareness, which may require a longer period of practice before

producing maximal benefits. Therefore, although self-compassion may contribute substantially to long-term psychological resilience and emotional well-being, SIT may be more effective in producing immediate reductions in perceived stress due to its direct focus on coping with external demands.

Another possible explanation relates to the nature of perceived stress itself. Perceived stress reflects cognitive evaluations of control, predictability, and coping capacity. Because SIT explicitly targets cognitive appraisals and coping beliefs, it may exert a stronger influence on perceived stress than SCFT. By increasing coping self-efficacy and reducing catastrophic thinking, SIT directly modifies the cognitive mechanisms underlying stress appraisal. This interpretation is supported by the substantial improvements observed in the perceived self-efficacy dimension among participants receiving Stress Inoculation Training. Enhanced confidence in one's ability to manage stressors likely contributed to the greater reductions in overall perceived stress observed in this group.

The findings also have important implications for understanding psychological adaptation among parents of children with cancer. Previous research has shown that parental distress adversely affects family functioning, caregiver well-being, and children's quality of life (Bakula et al., 2020; Lam et al., 2022). Similarly, studies have documented high levels of psychological distress, reduced quality of life, and emotional difficulties among parents of children undergoing cancer treatment (Carlsson et al., 2019; Morhun et al., 2020). The present findings suggest that both SCFT and SIT may serve as valuable interventions for addressing these challenges. By reducing perceived stress and strengthening adaptive psychological functioning, these interventions may indirectly improve broader family outcomes and enhance the caregiving environment experienced by children with cancer.

The current findings should also be considered in light of research emphasizing the protective roles of resilience, coping skills, and psychological flexibility among caregivers (Chung et al., 2023; Deribe et al., 2023; Luo et al., 2024). Both interventions appear to strengthen these protective resources, albeit through different mechanisms. Self-Compassion-Focused Therapy primarily enhances emotional regulation, self-acceptance, and compassionate self-awareness, whereas Stress Inoculation Training focuses on coping competence, cognitive restructuring, and behavioral adaptation. Consequently, both approaches may contribute to resilience development, although the pathways through which they achieve this goal differ.

5. Conclusion

Overall, the results of the present study provide strong support for the use of psychological interventions targeting stress management among parents of children with cancer. Both Self-Compassion-Focused Therapy and Stress Inoculation Training effectively reduced perceived stress and maintained their benefits over time. However, Stress Inoculation Training demonstrated superior effectiveness, suggesting that interventions emphasizing active coping and stress-management skills may be particularly beneficial for caregivers confronting ongoing medical and psychosocial challenges. These findings contribute to the growing literature on caregiver mental health and provide evidence-based guidance for the development of psychological support programs in pediatric oncology settings.

Several limitations should be considered when interpreting the findings of this study. First, the sample size was relatively small, which may limit the generalizability of the results to broader populations of parents of children with cancer. Second, participants were recruited using convenience sampling from treatment centers in a single city, potentially introducing selection bias. Third, all data were collected using self-report measures, which may be influenced by social desirability and response biases. Fourth, the follow-up period was limited to two months, preventing conclusions regarding the long-term sustainability of treatment effects. Finally, the study focused exclusively on perceived stress and did not assess other potentially relevant outcomes such as depression, anxiety, family functioning, caregiver burden, or resilience.

Future studies should recruit larger and more diverse samples from multiple treatment centers and geographical regions to enhance external validity. Researchers may also consider extending follow-up assessments to six months or one year to evaluate the long-term maintenance of treatment gains. Comparative studies involving additional therapeutic approaches, such as Acceptance and Commitment Therapy, Cognitive Behavioral Therapy, and mindfulness-based interventions, would provide valuable information regarding the relative effectiveness of different treatment models. Future investigations should also examine potential mediators and moderators of treatment outcomes, including resilience, coping styles, social support, illness severity, and family functioning. Furthermore, mixed-methods and

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qualitative studies may provide deeper insight into parents' experiences of psychological interventions and their perceived mechanisms of change.

Healthcare providers working in pediatric oncology settings should consider integrating structured psychological interventions into routine family-centered care. Screening programs can be implemented to identify parents experiencing elevated levels of stress and psychological burden early in the treatment process. Group-based interventions may offer a cost-effective method for delivering psychological support while simultaneously fostering peer support and shared understanding among caregivers. Mental health professionals should tailor intervention selection according to parents' specific needs, preferences, and presenting difficulties. For parents requiring practical coping skills and stress-management techniques, Stress Inoculation Training may be particularly beneficial, whereas Self-Compassion-Focused Therapy may be especially useful for individuals struggling with self-criticism, guilt, and emotional distress. Comprehensive psychosocial support programs incorporating both approaches may provide the greatest benefit for promoting parental well-being and enhancing family adaptation to childhood cancer.

Authors' Contributions

Authors equally contributed to this article.

Declaration

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

Transparency Statement

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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