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Presenting a Structural Model of Resilience Based on Psychological Optimism with the Mediating Role of Cognitive Emotion Regulation Strategies in Parents of Children with Cancer

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A B S T R A C T

Objective: The present study aimed to present a structural model of resilience based on psychological optimism with the mediating role of cognitive emotion regulation strategies in parents of children with cancer.

Methods and Materials: The research method is descriptive and correlational, utilizing structural equation modeling (SEM). The statistical population of this study included all parents of children with cancer under the care of the Mahak Institute in 2022, whose children were undergoing chemotherapy, radiotherapy, hormone therapy, and were in the treatment process. The sample size was considered to be 250 individuals, selected through convenience sampling. In the end, 236 completed and eligible questionnaires were obtained. The primary data for this study were collected using the Resilience Questionnaire (Connor & Davidson, 2003), the Life Orientation Questionnaire (Scheier & Carver, 2015), and the Emotion Regulation Questionnaire (Garnefski et al., 2001). Descriptive statistics (central indices, skewness-kurtosis) and inferential statistics, including structural equation modeling, were used to analyze the data.

Findings: The results of the study, through correlation and regression tests, indicated that the structural model of the relationship between resilience and psychological optimism with the mediating role of cognitive emotion regulation strategies in parents of children with cancer fits well. Cognitive emotion regulation strategies do not mediate the relationship between resilience and psychological optimism in parents of children with cancer.

Conclusion: Resilience, psychological optimism, and cognitive emotion regulation strategies, as an intertwined set, play a fundamental role in overcoming psychological and emotional disturbances in parents of children with cancer.

Keywords: *Resilience, Psychological Optimism, Cognitive Emotion Regulation Strategies*

1. Introduction

Despite significant advancements in medical science and the development of human knowledge in controlling and treating various diseases, cancer remains one of the serious and, in many cases, incurable diseases that threaten many lives (Nicolescu et al., 2024). Cancer is characterized by the abnormal transformation of cells and the loss of cellular differentiation, leading to the abnormal proliferation of cells and their continued irregular growth in the surrounding environment. Facing cancer can, by itself, act as a stressful event, jeopardizing various aspects of the patient's individual health, including physical, psychological, and familial well-being (Nikfarid et al., 2017). Cancer is not limited to adulthood; numerous studies have shown that children are also at risk of developing this group of diseases (Isaevska et al., 2017). Alongside a child with cancer, it is often the parents who are more exposed to psychological harm (Al Qadire et al., 2018). The diagnosis of cancer among children and adolescents is considered a life-changing event for themselves and their families and brings considerable stress to their families (Wikman et al., 2018). Studies indicate that high levels of psychological distress following the diagnosis and treatment process of cancer lead to the emergence of depression and anxiety as the most common psychological problems among the parents of children (Raeisipour et al., 2021), and due to being in a critical and complex period, they face multiple psychological burnout and injuries (Ay, 2018). Some studies also highlight the negative effects of anxiety and depression on interpersonal relationships and their destructive role in these relationships (Durães et al., 2020). Since parents are considered the primary source of care and support for children with cancer, the type of parental attitude towards the illness and the resulting emotional disorders has a special impact on the child's care, which makes research in this area essential (Majmudar et al., 2020). Among the psychological variables that can assist individuals in difficult and challenging conditions against the harmful effects of stress and anxiety to achieve optimal performance and growth is resilience (Razavian et al., 2021).

Resilience is a relatively new concept that has recently gained attention. It reduces negative emotions, promotes mental health, and life satisfaction, and can be considered a defensive mechanism enabling individuals to maintain stability in the face of adversity and improve their mental health (Tanha et al., 2020). Individuals with high resilience tend to resist unavoidable psychological harm and stress, are more likely to find positive meaning in the tensions they experience, effectively confront life's challenges, adapt flexibly to life pressures, and potentially become successful, healthy, and happy individuals in the future (Abedini et al., 2021). Resilience is one of the cognitive emotion regulation variables that can reduce many physical and psychological injuries in patients (Kiaei et al., 2021; Wang et al., 2023). Kaveh Farsani et al. (2020) demonstrated in their research that resilience and optimism could reduce depression and anxiety in cancer patients (Kavehfarsani et al., 2020). Resilience reduces depression, anxiety, and stress, and by creating positive physical and psychological conditions, it facilitates quicker recovery in patients (Shin et al., 2019). Resilience is one of the important constructs in positive psychology that refers to individual growth and gaining experience from adverse conditions. Resilience is a psychological and internal capability that protects individuals against life's adversities and helps maintain mental health when facing risk factors (Golparvar & Parsakia, 2023; Najarian & Badri-Gargari, 2021; Parsakia et al., 2024).

Some studies indicate a close relationship between optimism and the reduction of negative effects of chronic diseases. Optimism is defined as expecting positive outcomes from negative life events and serves as a coping mechanism against a wide range of significant stressors, including life-threatening illnesses. In other words, optimistic individuals perform better in the face of serious health problems (Beshkar et al., 2022; Bouchard et al., 2017; Kheradmand et al., 2021). Research shows that optimism improves relationships with oneself and others, helps create valuable and positive relationships, and aids in emotional regulation (Beiranvand et al., 2019). Therefore, one of the variables associated with positive mental health and post-traumatic growth is optimism. Carver and Scheier define optimism as a general expectation of good events happening in life as opposed to bad ones. Optimistic individuals tend to have a more protective outlook, are more resilient to stress, and use adaptive coping strategies (Bouchard et al., 2017; Burešová et al., 2020). Optimistic individuals are more likely to experience post-traumatic growth compared to pessimistic individuals, and if individuals have a positive self-evaluation and mindset, they will enjoy better health and adaptation. Optimism is one of the traits that can enhance resilience by providing cognitive, coping, and contextual resources (Kheradmand et al., 2021). Moreover, optimism is one of the variables that helps individuals use better coping strategies when facing psychological stress (Eyni et al.,

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2020). Although both optimistic and pessimistic individuals face similar life problems, optimistic individuals do not easily succumb to these problems, whereas pessimistic individuals are more likely to surrender and experience greater depression (Najarian & Badri-Gargari, 2021). Optimism, in essence, means looking at the bright side of things even in catastrophic situations (Bouchard et al., 2017).

Emotional self-regulation, such as reappraisal, reduces negative emotions, increases positive emotions, and leads to adaptive behavior (Liu et al., 2021; Worden et al., 2019). Moreover, research shows that effective emotion regulation has favorable outcomes on mental health, psychological well-being, physical health, and interpersonal relationships (Benfer et al., 2018). Cognitive emotion regulation is employed to develop strategies for how individuals think after experiencing a negative event or trauma. It is an internal and interactive process that helps individuals consciously or unconsciously manage and control their current emotions, thereby regulating their state or arousal, monitoring, evaluating, and adjusting their reactions, and aiding individuals in achieving their goals (Kheradmand et al., 2021; Krifa et al., 2022). The research by Worden, Levi, Das et al. (2019) shows that regulating emotions can reduce levels of stress, anxiety, and psychological problems (Worden et al., 2019). Although research indicates relationships between resilience and psychological optimism (Kheradmand et al., 2021; Maheshwari & Jutta, 2020), resilience and emotion regulation (Abedini et al., 2021; Azara et al., 2022; Liu et al., 2021; Mohamadiheris et al., 2021), and optimism and emotion regulation (Kheradmand et al., 2021; Krifa et al., 2022), no study has examined the relationship between these components in the proposed model of this research.

Since suffering from severe and chronic diseases like cancer creates a unique psychological state that threatens the physical and mental health of children and their families (Bazmi, 2013), the diagnosis of cancer among children and adolescents is considered a life-changing event for themselves and their families, bringing considerable stress to their families and requiring appropriate resilience and adaptive skills (Asghari-Nekah et al., 2015). Although previous research has examined the variables in a simple and linear manner, the collective relationship between these variables has not been studied. Therefore, this study addresses the relationship between these components within a model. Consequently, considering that no research has yet examined and proposed a model of the relationship between resilience and psychological optimism with the mediation of cognitive emotion regulation strategies, this study's novelty lies in utilizing these variables and presenting a causal model. Furthermore, in the reviewed studies, the statistical population has often focused on the mothers of children with cancer. However, studies examining this relationship in parents are scarce. Generally, few studies in this field have included both parents (father and mother simultaneously) in their statistical population, and the focus is usually on one parent, especially mothers. Thus, the main question of this research is whether the structural model of the relationship between resilience and psychological optimism in parents of children with cancer, with the mediating role of cognitive emotion regulation strategies, fits well.

2. Methods and Materials

2.1. Study Design and Participants

The research method is descriptive and correlational, utilizing structural equation modeling (SEM). The statistical population of this study included all parents of children with cancer under the care of the Mahak Institute in 2022, whose children were undergoing chemotherapy, radiotherapy, hormone therapy, and were in the treatment process. Structural equation modeling introduces various methods for estimating sample size, although there is no consensus on the required sample size for structural models. However, according to many researchers, including Holter (1983), Garver and Mentzer (1999), Siu et al. (2006), and Hu (2008), the minimum required sample size is 200 individuals. Kline (2010) also believes that a minimum sample size of 200 is defensible (Habibi, 2017). To prevent potential sample attrition, 250 questionnaires were distributed among parents, and 236 valid questionnaires were obtained based on inclusion and exclusion criteria (inclusion criteria: parents living together, parents of children aged birth to 14 years, parents with at least a high school diploma, parents not taking psychiatric medications; exclusion criteria: unwillingness of one parent to continue cooperation, incomplete questionnaire responses). Convenience sampling was used in this study. Among all the treatment centers for children's blood and oncology diseases, the Mahak Pediatric Cancer Hospital in Tehran was chosen because it is the only center dedicated to children with cancer from birth to 14 years old. Five oncology and outpatient chemotherapy departments of the hospital were selected for questionnaire completion. After reviewing patients' files and interviewing parents, if they met the necessary criteria, they were

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informed about the nature and purpose of the research, assured of confidentiality, and given informed consent forms before providing the questionnaires to the parents. Collecting the questionnaires was postponed due to the absence of one parent, the child's critical condition, lack of focus, and the accompanying parent's unfavorable condition.

2.2. Measures

2.2.1. Resilience

This scale was developed by two prominent theorists in this field, Connor and Davidson, in 2003 by reviewing the 1991-1979 research literature on resilience. The questionnaire has 25 items rated on a Likert scale ranging from completely false to completely true. The psychometric properties of this scale were examined in six groups: the general population, primary care attendees, psychiatric outpatients, patients with generalized anxiety disorder, and two groups of patients with post-traumatic stress disorder. The scale developers believe that this questionnaire effectively distinguishes resilient individuals from non-resilient ones in both clinical and non-clinical groups and can be used in research and clinical settings. The questionnaire has 25 statements scored on a Likert scale from zero (completely false) to four (always true). Factor analysis results indicate that this test has five factors: personal competence, trust in individual instincts, tolerance of negative affect, positive acceptance of change, secure relationships, control, and spiritual influences. Connor and Davidson reported the Cronbach's alpha coefficient of the resilience scale as 0.89. The test-retest reliability coefficient over a four-week interval was 0.87. This scale was standardized in Iran by Mohammadi (2005). Using Cronbach's alpha method, he reported a reliability coefficient of 0.89. To determine the scale's validity, first, the correlation of each item with the total score of the category was calculated, and then factor analysis was used. The item-to-total score correlations, except for item 3, ranged from 0.41 to 0.64. The items of the scale were then subjected to factor analysis using the principal components method. Before extracting the factors based on the item correlation matrix, the KMO index and Bartlett's test of sphericity were calculated. The KMO value was 0.87, and the chi-square value in Bartlett's test was 28.556, both indicating sufficient evidence for factor analysis. In a study by Samani, Jokar, and Sahraei among students, a reliability of 0.93 was reported, and the validity (by factor analysis and convergent and divergent validity) was confirmed by the test developers in various normal and at-risk groups (Kavehfarsani et al., 2020; Tanha et al., 2020). In this study, the internal consistency based on Cronbach's alpha was 0.865, indicating acceptable reliability of this questionnaire.

2.2.2. Life Orientation

The revised Life Orientation Test by Scheier and Carver (2015) is designed to assess optimism and individuals' expectations about the future and contains 10 items. Items 8, 6, 5, and 2 are filler items and are not scored. Items 9, 7, and 3 are reverse-scored. The test scores range from 0 to 24. Repeated studies have shown that dispositional optimism and pessimism are related to a wide range of constructs such as self-esteem, hopelessness, and neuroticism, indicating the convergent validity of this questionnaire. Additionally, factor analysis of dispositional optimism and related constructs has shown that dispositional optimism is an independent and distinct factor (Scheier et al., 2015), indicating the discriminant validity of this construct. The reliability of this questionnaire using Cronbach's alpha method is 0.74, indicating high reliability. This test was standardized in Iran by Khodabakhshi in 2004. The obtained results based on the test-retest method and Cronbach's alpha indicated high reliability of the optimism scale. Concurrent validity coefficients between the optimism scale and depression and self-mastery were 0.649 and 0.725, respectively. Factor analysis of the optimism scale showed that it consists of two factors: hope for the future and a positive attitude towards events (Eyni et al., 2020; Kheradmand et al., 2021). In this study, the internal consistency based on Cronbach's alpha was 0.799, indicating acceptable reliability of this questionnaire.

2.2.3. Emotion Regulation

This questionnaire, developed by Garnefski et al. (2001), is a multidimensional tool used to identify individuals' cognitive coping strategies after experiencing negative events or situations. This self-report questionnaire consists of 36 items and has 9 subscales: self-blame, acceptance, rumination, positive refocusing, planning, positive reappraisal, putting into perspective, catastrophizing, and other-blame. The scale ranges from 1 (almost never) to 5 (almost always). Each subscale includes 4 items, and the total score is obtained by summing the subscales (Garnefski & Kraaij, 2006; as cited in Basharat, 2009). Basharat (2009) reported the reliability of the questionnaire using Cronbach's alpha method for the subscales ranging from 0.67 to 0.89.

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Additionally, the correlation coefficients between the scores of some participants in two sessions with a two to four-week interval for the subscales ranged from 0.57 to 0.76 at the 0.001 level. Hosseini et al. (2012) reported the reliability of the questionnaire using Cronbach's alpha method for the subscales ranging from 0.76 to 0.92, and the validity or credibility of the questionnaire through correlation with the Shot Emotional Intelligence Questionnaire was 0.47 at the 0.01 level, indicating high validity of the questionnaire (Kheradmand et al., 2021). In this study, the internal consistency based on Cronbach's alpha for adaptive and maladaptive emotion regulation strategies was 0.763 and 0.840, respectively, indicating acceptable reliability of this questionnaire.

2.3. Data analysis

In this study, correlation research methods and structural equation modeling methods were used with SPSS26 and AMOS24 software.

3. Findings and Results

Descriptive information (mean, standard deviation, skewness, and kurtosis) for the variables of resilience, adaptive and maladaptive cognitive emotion regulation strategies, psychological well-being, and psychological optimism are reported in Table 1.

Table 1

Descriptive Statistics for Research Variables in Parents of Children with Cancer (N = 235)

Variable	Mean	SD	Min-Max	Skewness	Kurtosis
Resilience					
- Personal Competence	20.53	6.45	0-32	-0.60	0.29
- Negative Emotion Tolerance	15.69	5.51	0-28	-0.39	-0.04
- Positive Acceptance of Change	13.25	3.57	0-20	-0.49	0.69
- Control	7.27	2.92	0-12	-0.39	-0.61
- Spiritual Influences	6.29	1.94	0-8	-1.26	1.23
- Total Resilience Score	63.05	16.92	0-95	-0.68	0.70
Adaptive Cognitive Emotion Regulation Strategies					
- Acceptance	13.44	2.88	5-20	-0.28	-0.01
- Positive Refocusing	13.82	2.83	4-20	-0.21	0.01
- Planning	15.77	2.76	6-20	-0.53	0.24
- Reappraisal	14.42	3.79	4-20	-0.61	-0.25
- Putting into Perspective	13.62	3.33	4-20	-0.47	0.22
- Total Adaptive Cognitive Emotion Regulation Score	71.09	11.51	35-97	-0.41	-0.18
Maladaptive Cognitive Emotion Regulation Strategies					
- Self-Blame	10.65	3.50	4-20	0.13	-0.36
- Rumination	13.34	3.27	5-20	0.02	-0.63
- Catastrophizing	12.20	3.55	4-20	0.13	-0.42
- Blaming Others	7.97	3.84	4-19	0.79	-0.34
- Total Maladaptive Cognitive Emotion Regulation Score	44.18	10.35	20-72	0.39	-0.17
Total Psychological Optimism Score	14.63	3.18	5-23	0.00	0.14

The exogenous variable resilience had a mean (standard deviation) of 63.05 (16.92). The mediating variables, adaptive and maladaptive cognitive emotion regulation strategies, had means (standard deviations) of 71.09 (11.51) and 44.18 (10.35), respectively. The endogenous variable psychological optimism had a mean (standard deviation) of 14.63 (3.18).

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Table 2

Correlation Matrix between Predictor, Mediator, and Dependent Variables of the Proposed Research Model

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1																	
2	.73*	1																
3	.65*	.66*	1															
4	.70*	.59*	.53*	1														
5	.36*	.24*	.36*	.31*	1													
6	.92*	.88*	.81*	.78*	.46*	1												
7	-.04	.07	.04	-.07	.09	.01	1											
8	.49*	.36*	.38*	.48*	.30*	.50*	.14*	1										
9	.58*	.47*	.45*	.51*	.29*	.59*	.16*	.71*	1									
10	.64*	.60*	.52*	.53*	.42*	.69*	.11	.58*	.67*	1								
11	.38*	.34*	.31*	.29*	.44*	.42*	.28*	.42*	.44*	.63*	1							
12	.57*	.52*	.48*	.48*	.43*	.62*	.44*	.76*	.80*	.84*	.78*	1						
13	-.10	-.05	-.02	-.07	.03	-.07	.27*	.08	.07	.08	.15*	.17*	1					
14	-.24*	-.28*	-.28*	-.20*	-.12	-.29*	.30*	-.07	-.01	-.12*	-.07	-.01	.40*	1				
15	-.27*	-.22*	-.26*	-.27*	-.13	-.29*	.31*	-.18	-.11	-.22*	-.09	-.09	.35*	.56*	1			
16	-.21*	-.16*	-.18*	-.06	-.11	-.19*	.01	-.02	-.02	-.13*	-.05	-.05	.38*	.24*	.32*	1		
17	-.28*	-.24*	-.25*	-.20*	-.11	-.29*	.30*	-.06	-.01	-.14*	-.02	-.01	.73*	.73*	.76*	.69*	1	
18	.26*	.28*	.18*	.29*	.27*	.31*	.12	.23*	.19*	.24*	.12*	.25*	-.08	-.02	-.01	-.01	-.03	1

1. Personal Competence; 2. Negative Emotion Tolerance; 3. Positive Acceptance of Change; 4. Control; 5. Spiritual Influences; 6. Resilience; 7. Acceptance; 8. Positive Refocusing; 9. Planning; 10. Reappraisal; 11. Putting into Perspective; 12. Adaptive Cognitive Emotion Regulation Strategies; 13. Self-Blame; 14. Rumination; 15. Catastrophizing; 16. Blaming Others; 17. Maladaptive Cognitive Emotion Regulation Strategies; 18. Psychological Optimism

*p< 0.01

Based on the results of the correlation matrix (Table 2), a positive and significant relationship was observed between resilience and adaptive cognitive emotion regulation strategies and psychological optimism ($p < .001$). There was also a positive and significant relationship between adaptive cognitive emotion regulation strategies and psychological optimism ($p < .001$).

The results of the modified confirmatory factor analysis indicate that all fit indices (PCFI = 0.751, PNFI = 0.716, RMSEA = 0.067, IFI = 0.947, CFI = 0.946, GFI = 0.902, and CMIND/DF = 2.066) suggest a good fit of the measurement model with the data, and all observed variables had factor loadings greater than 0.3, indicating confirmation of the measurement part of the proposed model.

Table 3

Standardized Path Coefficients of the Proposed Research Model

Path	Standardized Coefficient	SE	CR	p
Resilience ---> Psychological Optimism	0.422	0.071	3.427	< .001
Resilience ---> Adaptive Cognitive Emotion Regulation Strategies	0.777	0.029	8.574	< .001
Resilience ---> Maladaptive Cognitive Emotion Regulation Strategies	-0.341	0.026	-4.161	< .001
Adaptive Cognitive Emotion Regulation Strategies ---> Psychological Optimism	-0.054	0.212	-0.456	.648
Maladaptive Cognitive Emotion Regulation Strategies ---> Psychological Optimism	0.110	0.127	1.584	.113

Based on the results in **Error! Reference source not found.**, resilience had a positive and significant effect on psychological optimism ($p < .001$, $\beta = 0.422$) and adaptive cognitive emotion regulation strategies ($p < .001$, $\beta = 0.777$). There was no significant relationship between adaptive cognitive emotion regulation strategies ($p = .648$, $\beta = -0.054$) and maladaptive cognitive emotion regulation strategies ($p = .113$, $\beta = 0.110$) and psychological optimism.

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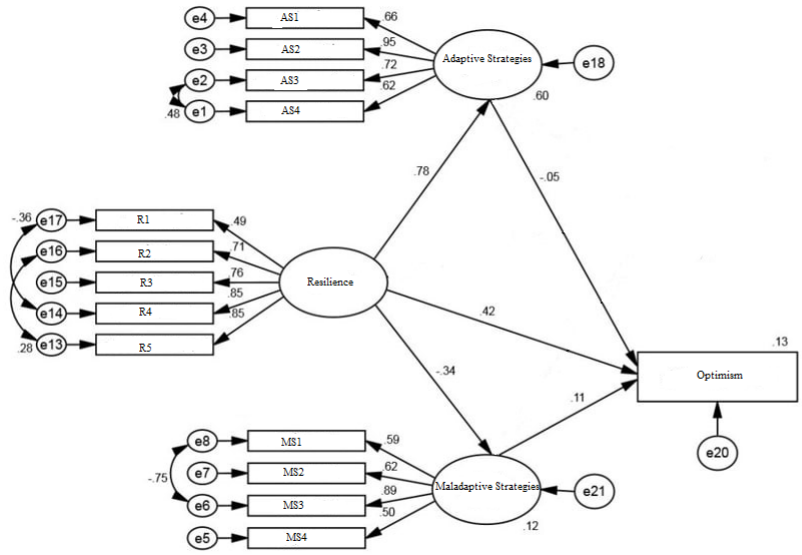
Table 4

Bootstrap Results for Indirect Paths in the Proposed Model

Path	Indirect Effect	SE	Lower Bound	Upper Bound	p	Total Effect
Resilience to Psychological Optimism via Adaptive Cognitive Emotion Regulation Strategies	-0.0390	0.0160	-0.0687	0.0132	.302	0.38
Resilience to Psychological Optimism via Maladaptive Cognitive Emotion Regulation Strategies	-0.0372	0.0153	-0.0542	0.0123	.418	0.39

Figure 1

Model with Beta Values



As shown in Table 4, the lower confidence interval for adaptive cognitive emotion regulation strategies as a mediating variable between resilience and psychological optimism is -0.0687, and the upper confidence interval is 0.0132. The confidence level for this interval is 95%, and the number of bootstrap samples is 5000. Since zero is within this confidence interval and it is not statistically significant, adaptive cognitive emotion regulation strategies do not play a mediating role in the relationship between resilience and psychological optimism. The lower confidence interval for maladaptive cognitive emotion regulation strategies as a mediating variable between resilience and psychological optimism is -0.0542, and the upper confidence interval is 0.0123. The confidence level for this interval is 95%, and the number of bootstrap samples is 5000. Since zero is within this confidence interval and it is not statistically significant, maladaptive cognitive emotion regulation strategies do not play a mediating role in the relationship between resilience and psychological optimism. Therefore, neither adaptive nor maladaptive cognitive emotion regulation strategies mediate the relationship between resilience and psychological optimism in parents of children with cancer. The hypothesis is rejected.

4. Discussion and Conclusion

The present study aimed to present a structural model of resilience based on psychological optimism with the mediating role of cognitive emotion regulation strategies in parents of children with cancer. The statistical analysis results showed that positive and negative cognitive emotion regulation strategies did not mediate the relationship between resilience and psychological optimism. According to the correlation matrix results, there was a significant positive relationship between resilience and psychological optimism. Additionally, the standardized coefficients indicated that the direct effect of resilience on psychological optimism was positive and significant. Therefore, resilience had a direct role in psychological optimism. This finding is consistent with previous studies. For example, in a study by Kheradmand et al. (2021), the role of optimism on mental health and post-traumatic growth of nurses in the COVID-

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19 ward was examined with the mediating role of resilience and cognitive emotion regulation. The results showed that optimism, both directly and indirectly through adaptive cognitive emotion regulation strategies and resilience, had a positive impact on post-traumatic growth and mental health (Al Qadire et al., 2018).

Furthermore, the path from resilience to adaptive and maladaptive emotion regulation strategies was also significant. The correlation matrix results showed a positive and significant relationship between resilience and adaptive cognitive emotion regulation strategies and a negative and significant relationship with maladaptive strategies. Based on the measurement model, the covariance between resilience and positive cognitive emotion regulation strategies had the highest significance among all covariance relationships in this study. The covariance between resilience and maladaptive strategies showed a negative and significant relationship. According to the standardized coefficients of direct effects, the path between resilience and adaptive cognitive emotion regulation strategies was positive with the highest significance level in this study. The standardized coefficients for the direct path between resilience and maladaptive strategies were negative and significant. The results of this study confirm the significant relationship between resilience and cognitive emotion regulation strategies, consistent with findings from previous studies (Abedini et al., 2021; Azara et al., 2022; Liu et al., 2021; Mohamadiheris et al., 2021).

Regarding the relationship between optimism and cognitive emotion regulation strategies, the present study showed that adaptive and maladaptive cognitive emotion regulation approaches did not mediate the relationship between resilience and psychological optimism. According to the correlation matrix results, there was a positive and significant relationship between adaptive cognitive emotion regulation strategies and psychological optimism. However, no relationship was observed between maladaptive cognitive emotion regulation strategies and psychological optimism. The standardized coefficients of direct effects indicated that the paths between adaptive and maladaptive cognitive emotion regulation strategies and psychological optimism were not significant. The lowest coefficient (-0.054) belonged to the path between adaptive cognitive emotion regulation strategies and psychological optimism. This is contrary to previous extensive studies (Kheradmand et al., 2021; Krifa et al., 2022), which showed that emotion regulation affects optimism.

There are several reasons for the inconsistency in the present study's results. Firstly, the sample size and insufficiency led to results inconsistent with previous studies. Furthermore, as seen in the correlation tables, a significant correlation exists between optimism and adaptive emotion regulation strategies. Thus, there was an initial relationship between these two variables, which did not manifest in the path analysis and coefficients, indicating a potential issue with the sample size. Future studies with larger sample sizes might find results consistent with previous findings.

Another explanation for the lack of relationship between emotion regulation strategies and optimism in parents of children with cancer could be that optimism requires the belief that one can successfully manage adversities. If there is doubt or instability in this belief, the individual may become pessimistic. Using adaptive or maladaptive emotion regulation strategies by parents of children with cancer might be learned cognitive skills. These parents might know how to manage emotions logically during positive and negative experiences but have not internalized this skill as a deep motivation affecting their worldview and optimism.

Optimism involves having a positive interpretation of events in the present and future and maintaining a hopeful worldview regarding oneself, others, objects, and events. When an individual deeply believes in achieving their goals, it fosters optimism. Therefore, until emotion regulation skills are deeply internalized, merely using adaptive strategies or avoiding maladaptive strategies cannot guarantee optimism. Parents of children with cancer face various negative and stressful experiences in their lives. In these situations, those with a positive orientation and optimistic outlook are more likely to interpret the traumatic event positively and use adaptive coping strategies (Krifa et al., 2022).

Positive thinking is beneficial for controlling emotions and managing them effectively. Overall, positive thinking and avoiding negative thoughts are good strategies for more effective problem-solving. Positive moods enhance information processing and increase well-being (Beiranvand et al., 2019). During distress, focusing on positive future outcomes rather than catastrophizing allows individuals to put problems into perspective and choose more effective coping strategies. However, due to the complexity of cognitive emotion regulation strategies, not all strategies are effective for every individual or situation. Some strategies may be effective in specific situations but not in others, such as having a child with cancer.

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Thinking about positive events instead of negative ones, planning effective problem-solving strategies, positively interpreting events, and downplaying their importance compared to larger events lead to higher resilience. Therefore, positive individuals facing challenges show resilience and emotional stability, even if progress is slow or difficult, whereas pessimists are hesitant and unstable. This difference is more noticeable in difficult situations. Positive individuals believe that difficulties can end successfully, affecting resilience and increasing the tendency to resist. Resilience provides a strong motivation to face life's challenges and directs behavior towards adapting to conditions, playing a crucial role in psychological growth (Bouchard et al., 2017; Burešová et al., 2020).

However, the conditions of parents of children with cancer might be significantly different from parents who have cancer themselves. When a child is diagnosed with cancer, the psychological pressure and worries of parents increase to the extent that cognitive emotion regulation strategies alone might not meet their needs. Thinking about positive events instead of negative ones, planning effective problem-solving strategies, positively interpreting events, and downplaying their importance compared to larger events lead to higher resilience (Eyni et al., 2020; Najarian & Badri-Gargari, 2021). Therefore, positive individuals facing challenges show resilience and emotional stability, even if progress is slow or difficult, whereas pessimists are hesitant and unstable. This difference is more noticeable in difficult situations. Positive individuals believe that difficulties can end successfully, affecting resilience and increasing the tendency to resist. Resilience provides a strong motivation to face life's challenges and directs behavior towards adapting to conditions, playing a crucial role in psychological growth. Optimistic individuals also tend to offer positive meanings, goals, beliefs, interpretations, and explanations for the events they experience. Therefore, optimistic thinking can facilitate the reconstruction of new beliefs (Maheshwari & Jutta, 2020; Najarian & Badri-Gargari, 2021; Tanha et al., 2020).

Cultural, social, and belief differences among parents of children with cancer should not be overlooked. The impact of cognitive emotion regulation strategies on psychological optimism and resilience varies across different communities and cultures with diverse beliefs. These differences can direct parents' focus and attention more towards controllable or uncontrollable aspects. Moreover, regarding the use of maladaptive emotion regulation strategies and the lack of their impact on optimism, psychological distress is prevalent among parents of children with physical or psychological problems, such as cancer. Other variables, such as anxiety or psychological distress not studied in this research, might influence parents' use of maladaptive emotion regulation strategies, and using these strategies may not solely result from parental pessimism.

Emotion regulation, which involves controlling, evaluating, and modifying emotional responses to achieve goals, includes strategies to reduce, increase, maintain emotions, and cope with stressful situations. Adaptive emotion regulation strategies, such as acceptance, positive refocusing, planning, positive reappraisal, and perspective-taking, have significant correlations with resilience, while maladaptive strategies, such as self-blame, rumination, catastrophizing, and blaming others, have a negative and significant relationship with resilience. When faced with an emotionally challenging situation, feeling good and optimistic is not enough to control emotions. Individuals need to have the best cognitive functioning in these moments and strive to control their emotions constructively and positively (Abedini et al., 2021). Therefore, cognitive emotion regulation strategies help individuals respond appropriately when facing a threatening and unpleasant event.

In general, positive thinking and avoiding negative thoughts improve information processing and enhance emotion regulation. Emotion regulation helps individuals understand, modify, and experience emotions, increasing the likelihood of effectively coping with stressful situations by tolerating negative emotions and experiencing positive emotions. When individuals use adaptive cognitive emotion regulation methods, such as positive reappraisal, perspective-taking, positive refocusing, and planning, these strategies create positive emotions, a positive interpretation of the situation, positive thinking, changes in thought structure, and life philosophy, and hope for improvement, leading to higher resilience.

5. Limitations & Suggestions

Every study, alongside its beneficial and effective results and strengths, may have weaknesses during the process. The limitations of this study include the following: The statistical population was a small subset, consisting of parents of children with cancer at Mahak Institute in Tehran, and generalizing the findings to other populations should consider the sample's limited and specific nature. The only tool used in this study was a questionnaire, which might be

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affected by inaccuracy, impatience, or personal biases of the participants. Since parents of children with cancer might blame their spouses for their child's illness, this can lead to conflicts and even separation in many families. Therefore, it is necessary for the relevant authorities to establish family counseling services in diagnostic and treatment centers to provide accurate education on the causes and treatment of the illness.

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Declaration

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

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics Considerations

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

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors contributed equally.

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