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Structural Model of the Relationship between Resilience and Mental Health in Parents of Children with Cancer with the Mediating role of Cognitive Emotion Regulation Strategies

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A B S T R A C T

Objective: The present study aimed to provide a structural model of the relationship between resilience and the psychological well-being of parents of children with cancer, with the mediating role of cognitive emotion regulation strategies.

Materials and Methods: The study population included all parents of children with cancer under the care of the Mahak Institute in the year 2022, whose children were undergoing chemotherapy, radiation therapy, hormone therapy, or were in the treatment process. A total of 250 participants were selected through convenience sampling, and eventually, 236 completed questionnaires were eligible for analysis. The primary data for this study were collected using the Connor and Davidson Resilience Scale (2003), the General Health Questionnaire by Goldberg and colleagues (1972), and the Emotion Regulation Questionnaire by Garnefski et al. (2001). Descriptive statistics (central indices, dispersion) and inferential statistics (structural equation modeling) were used for data analysis.

Findings: The results of the study, through correlation and regression analysis, indicated that the structural model of the relationship between resilience and psychological well-being, with the mediating role of cognitive emotion regulation strategies, fits well in parents of children with cancer.

Conclusion: According to the results, since there is no difference in the effectiveness of virtual reality exposure therapy and cognitive-behavioral therapy, both can be applied to reduce obsession syndromes amongst people with the disorder.

Keywords: *resilience, mental health, cognitive emotion regulation strategies*

1. Introduction

Struggling with severe and chronic diseases is a particular psychological situation that threatens the physical and mental health of children and their families. The onset of a chronic disease profoundly affects the life course of the child and the family. Among these, cancer, as a growing chronic disease, entails more concerns (Udaykar et al., 2023). Cancer is a group of diseases associated with uncontrolled growth and spread of abnormal cells. Today, cancer is considered one of the most significant health problems worldwide (Kunkler et al., 2023; Li et al., 2023). Cancer is noteworthy at any age, but mortality due to it is higher among children aged 3 to 14 years compared to other patients. The prevalence of cancer is equal in both genders pre-puberty, and the ratio of girls to boys increases 2 to 1 in adolescence (World Health Organization, 2022). Cancer affects not only the patient but also the physical, psychological, social, and economic dimensions of the patient's family and caregiver's life. They face issues related to patient care and treatment as well as adapting to the responsibilities arising from it (Jinnouchi et al., 2020). Accordingly, the diagnosis and treatment of cancer in children create psychological stress in them, having negative effects on the health of parents too. Psychological reactions such as anxiety, depression, denial, anger, and decreased self-esteem in parents are observed due to fear of disease recurrence and the future of the child (Aghajani et al., 2017).

Resilience can be considered as a sustainable coping style for cancer treatment in the caregiving group. Resilience is a factor for establishing biological, psychological, and spiritual balance in the face of hazardous conditions (Byeon et al., 2019; Chitra & Karunanidhi, 2021). Essentially, resilience is defined as the human ability to adapt to disaster, adversities, trauma, hardship, or significant sources of stress. Becoming resilient helps individuals use existing resources to cope, resist, and recover in tough situations (Abedini & Joibari, 2023; Foroutan et al., 2023). Some views consider resilience as a response to an event, while others consider it as a sustainable coping style (Byeon et al., 2019; Karami et al., 2017). Characteristics of resilient individuals include experiencing positive emotional and cognitive consequences, self-esteem, optimal social functioning, and resistance against the negative outcomes of adverse life events (Barzilay et al., 2020). Researchers have found a positive and significant relationship between resilience and mental health. Having a mature personality with high cognitive emotional regulation and avoiding emotional suppression can help identify and resolve issues and prevent many costs imposed on the health care sector (Ajele et al., 2021; Brehl et al., 2021; Peng et al., 2023). Resilience is an important construct in positive psychology, referring to individual growth and experience from adverse conditions. It is an internal psychological capability that protects humans from life's adversities and aids in maintaining mental health when faced with risk factors (Caletti et al., 2022; Goudarzi et al., 2022).

Mental health, as one of the pillars of health, is essential for a useful, effective, and satisfying life. Health is not only the absence of disease or disability but also an optimal state of physical, mental, and social well-being (Amiri et al., 2023; Romm et al., 2022). Mental health means that a person can perform daily activities well, establish appropriate relations with family and environment, and not have inappropriate behavior according to the culture and society (Talaeezadeh et al., 2023). Mental health is a concept showing how we think, feel, and act in facing life situations and depends on our understanding of ourselves and our lives. Indeed, mental health is more than the absence of mental illness. Even if many of us don't suffer from a diagnosable mental illness, it is clear that some of us are mentally healthier than others (Niazi et al., 2021). The World Health Organization (2016) has always emphasized the responsibility of countries to provide physical, mental, and social health of individuals, noting that none of these dimensions is superior to the others. Mental health includes mental comfort, a sense of self-empowerment, autonomy, competence, understanding of intergenerational solidarity, and recognizing one's ability to realize mental and emotional capacities (Balliu, 2021). Mental health involves enhancing individuals' and society's capabilities and empowering them to achieve desired goals (Graiver, 2021).

Among the variables related to mental health is emotional cognitive regulation (Anwar et al., 2022; Aritzeta et al., 2022), which refers to a set of cognitive strategies by which individuals aim to direct their self-induced emotions, ultimately causing a change in experiential, behavioral, and physiological responses (Cludius et al., 2020). Emotional cognitive regulation strategies are divided into adaptive and maladaptive strategies (Anwar et al., 2022). Adaptive strategies are associated with mental health and growth after trauma in individuals, while maladaptive strategies can play a role in the creation and continuation of mental disorders (Cludius et al., 2020). From the perspective of Garnefski, Kraaij, and Spinhoven (2001), emotion regulation is a flexible concept that controls internal and external processes

JARAC Assessment and Research in Applied Counseling
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responsible for directing, evaluating, and altering emotional responses. Problems in emotion regulation are the basis of most human distress and are common across the entire spectrum of mental disorders, from neuroses to psychoses (Garnefski & Kraaij, 2006; Garnefski et al., 2001). Unregulated emotion is associated with prominent forms of psychological distress, and it is said that poor emotion regulation can lead to risky behaviors (Taghavi et al., 2021). Emotional cognitive regulation is a complex event involving internal and external processes. It is responsible for controlling, assessing, and interpreting individuals' psychological reactions towards achieving their goals. Disorder in emotion regulation can cause individuals to suffer from psychological damages such as anxiety and depression (Sepehri & Kiani, 2020).

The high incidence of cancer in children on one hand, and the increase in the survival rate of children on the other, causes many parents to face psychological and emotional problems due to their children's illness, necessitating family-centered research in support of children with cancer. The information obtained from this research can be utilized by the secretariat of the Supreme Council of the Cultural Revolution, the psychological system (including psychologists, counselors, and therapists), universities and higher education institutions, both public and private, and especially those responsible for maintaining the mental health of children with cancer. Therefore, the main question of this research is whether the structural model of the relationship of resilience with the mental health of parents of children with cancer, with the mediating role of emotional cognitive regulation strategies, is appropriately fitting?

2. Methods and Materials

2.1. Study Design and Participants

The research method is descriptive, encompassing correlational designs and structural equation modeling. The population of this study consisted of all parents of children with cancer under the supervision of the Mahak Institute in 2022, whose children were undergoing chemotherapy, radiotherapy, hormone therapy, and in the treatment process. Structural equation modeling introduces different sample size estimation methods. Although there is no general agreement on the necessary sample size for structural models, many researchers, including Holter (1983), Garver and Mentzer (1999), Sivo et al. (2006), and Ho (2008), suggest a minimum of 200 participants is defensible. Kline (2011) also believes that a minimum sample size of 200 is defensible (Kline, 2011; Kline, 2023). To avoid the possibility of sample attrition, 250 questionnaires were distributed among parents, and 236 complete questionnaires were received based on inclusion and exclusion criteria (Inclusion criteria included: married parents, parents of children aged from birth to 14 years, parents with at least a high school diploma, parents not using psychiatric drugs. Exclusion criteria included: lack of willingness by one of the parents to continue cooperation, incomplete questionnaire responses). In this study, convenience sampling was used. For sample selection, the Mahak Specialized Pediatric Cancer Hospital in Tehran was chosen as the only dedicated center for children with cancer from birth to 14 years of age. Five oncology and outpatient chemotherapy departments of the hospital were considered for completing the questionnaires. After reviewing patient files and interviewing parents, if necessary criteria were met, the questionnaires were given to parents after explaining the nature and purpose of the research and emphasizing the confidentiality of the information and obtaining informed consent. The retrieval of the questionnaires was deferred due to the absence of a parent, the child's critical condition, lack of concentration, or unsuitable conditions of the accompanying parent.

2.2. Measures

2.2.1. Resilience

Connor-Davidson Resilience Scale (CD-RISC) was developed by Connor and Davidson in 2003 after reviewing resilience research literature from 1979-1991. It contains 25 items rated on a Likert scale from completely false to completely true. Psychometric properties of this scale have been examined in six groups, including the general population, primary care attendees, outpatient psychiatric patients, patients with generalized anxiety disorder, and two groups of post-traumatic stress disorder patients. The developers of this scale believe it can distinguish resilient from non-resilient individuals in clinical and non-clinical groups and can be used in research and clinical settings. The scale is rated on a Likert scale from 0 (completely false) to 4 (always true). Factor analysis results indicate that the test has five factors: personal competence, trust in one's instincts, tolerance of negative affect, positive acceptance of change, and secure relationships, control, and spiritual influences. Connor and Davidson reported a Cronbach's alpha coefficient of 0.89 for the resilience scale. The reliability

JARAC Assessment and Research in Applied Counseling
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coefficient from the retest method over a four-week period was 0.87 (Mir Ahmadi et al., 2022; Singh & Yu, 2010).

2.2.2. *Mental Health*

Goldberg's General Health Questionnaire (1972) is a self-report screening questionnaire designed not for a specific diagnosis in the hierarchy of mental illnesses but primarily to distinguish between mental illness and health, designed for all members of the population. It consists of four subscales: somatic symptoms, anxiety and insomnia, social dysfunction, and depression. Each of these subscales contains seven questions. The test typically takes about 10 to 12 minutes to administer. The scoring method is such that options a to d are assigned scores from zero to three, respectively. Hence, an individual's score in each subscale ranges from zero to 21, and the total questionnaire score ranges from zero to 84. A lower score indicates better mental health. By 1988, more than 70% of the studies about the validity of the GHQ questionnaire had been conducted worldwide. These studies were meta-analyzed, and results showed that the average sensitivity of the 28-GHQ questionnaire was 84% (between 77% to 89%), and the average specificity was 82% (between 78% to 85%). Goldberg (1979) reported the internal consistency for the entire questionnaire as 95% based on the Cronbach's alpha coefficient. Internal stability using Cronbach's alpha method was reported as 93% (Goldberg & Hillier, 1979).

2.2.3. *Emotion Regulation*

Garnefski et al.'s (2001) Emotion Regulation Questionnaire is a multidimensional instrument used to identify individuals' cognitive coping strategies following the experience of negative events or situations. It is a self-report tool consisting of 36 items and has 9 subscales for cognitive strategies: self-blame, acceptance, rumination, positive refocusing, refocusing on planning, positive reappraisal, putting into perspective, catastrophizing, and blaming others. The scale ranges from 1 (almost never) to 5 (almost always). Each subscale consists of four items, and the total score is obtained from the sum of subscales (Garnefski & Kraaij, 2006; Garnefski et al., 2001). Researchers reported the reliability of the questionnaire using Cronbach's alpha for the subscales from 0.67 to 0.89. Also, correlation coefficients between scores of several participants at two intervals, two to four weeks apart, for the subscales ranged from 0.57 to 0.76 at the 0.001 level (Taghavi et al., 2021). Others obtained the reliability of the questionnaire using Cronbach's alpha for the subscales from 0.76 to 0.92 and reported the validity or credibility of the questionnaire through correlation with Schutte's Emotional Intelligence questionnaire as 0.47 at the 0.01 level, indicating high validity of the questionnaire. In this study, internal consistency based on Cronbach's alpha for adaptive and maladaptive emotional regulation strategies was 0.763 and 0.840, respectively, indicating acceptable reliability of this questionnaire (Sepehri & Kiani, 2020).

2.3. *Data Analysis*

Descriptive statistics (central indices, dispersion) and inferential statistics (structural equation modeling) were used for data analysis via SPSS-26 and AMOS-24.

3. Findings and Results

In this study, 235 parents of children with cancer were investigated with a mean age of 36.15 years and a standard deviation of 5.90, within the age range of 25-50 years (mothers' mean age was 32.05 ± 4.01 years and fathers' mean age was 39.01 ± 5.31 years). The mean duration of marriage was 8.02 years with a standard deviation of 5.14, in the range of 3-15 years. Additionally, the children's mean age was 8.10 years with a standard deviation of 3.25, within the age range of 4-13 years. Descriptive statistics (mean, standard deviation, skewness, and kurtosis) of variables such as resilience, adaptive and maladaptive cognitive emotional regulation strategies, and mental health are reported in Table 1.

Table 1

Results of Descriptive Statistics

Variable	Mean	Standard Deviation	Range	Skewness	Kurtosis
Resilience					
Perception of Personal Competence	20.53	6.45	0-32	-0.60	0.29
Tolerance of Negative Affect	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

JARAC Assessment and Research in Applied Counseling
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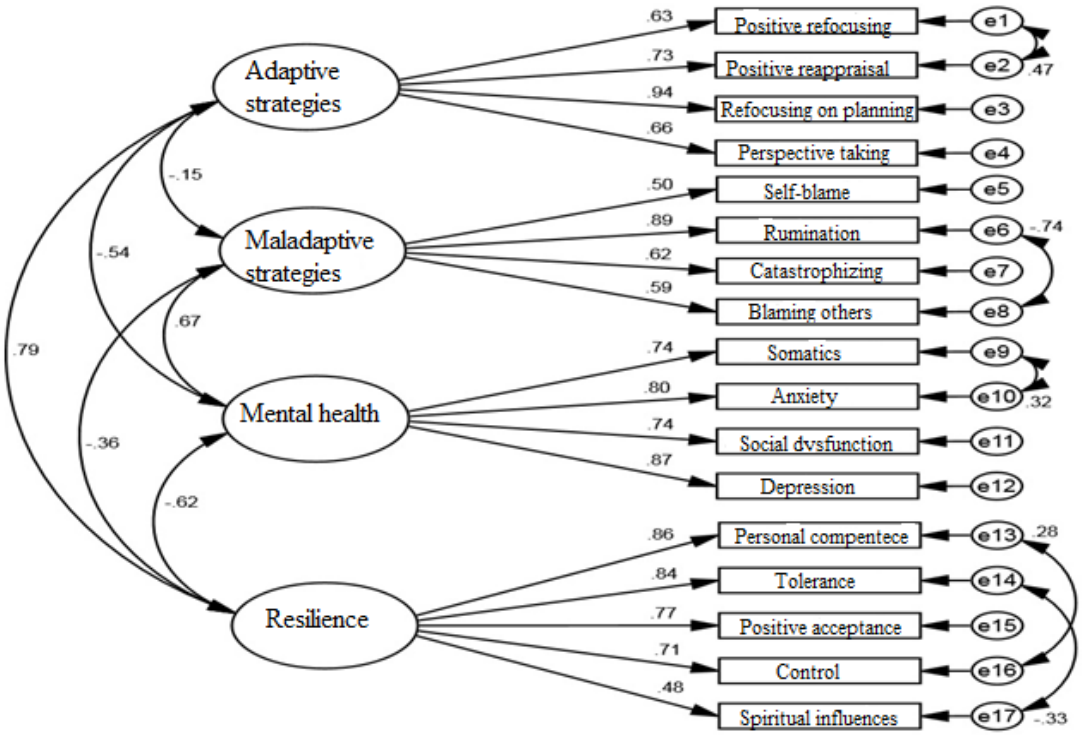
Spiritual Influences	6.29	1.94	0-8	-1.26	1.23
Total Resilience Score	63.05	16.92	0-95	-0.68	0.70
Adaptive Cognitive Emotional Regulation Strategies					
Acceptance	13.44	2.88	5-20	-0.28	-0.01
Positive Refocusing	13.82	2.83	4-20	-0.21	0.01
Refocusing on Planning	15.77	2.76	6-20	-0.53	0.24
Positive Reappraisal	14.42	3.79	4-20	-0.61	-0.25
Perspective Taking	13.62	3.33	4-20	-0.47	0.22
Total Score for Adaptive Cognitive Emotional Regulation Strategies	71.09	11.51	35-97	-0.41	-0.18
Maladaptive Cognitive Emotional 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 Score for Maladaptive Cognitive Emotional Regulation Strategies	44.18	10.35	20-72	0.39	-0.17
Mental Health					
Somatic Symptoms	8.15	4.75	0-21	0.57	-0.26
Anxiety	9.62	4.72	0-21	0.16	-0.41
Social Dysfunction	8.60	3.81	0-19	0.23	-0.01
Depression	6.95	5.51	0-21	0.57	-0.72
Total Mental Health Score	33.33	16.16	0-76	0.33	-0.31

The resilience outcome variable had a mean (standard deviation) of 63.05 (16.92). The mediator variables, adaptive and maladaptive cognitive emotional regulation strategies, had means (standard deviations) of 71.09 (11.51) and 44.18 (10.35) respectively. The intrinsic variable of mental health had a mean (standard deviation) of 33.33 (16.16).

Figure 1

Measurement Model



JARAC Assessment and Research in Applied Counseling
E-ISSN: 3041-8518

Table 2

Fit Indices of Confirmatory Factor Analysis of the Proposed Model

Fit Indices	χ2	Df	P-value	CMIN/df	RMSEA (CL90%)	PNFI	CFI	PCFI	IFI	GFI
Before Correction	329.905	113	>0.001	2.92	0.091 (0.07-0.10)	0.710	0.898	0.746	0.899	0.859
After Correction	223.119	108	>0.001	2.066	0.067 (0.05-0.08)	0.716	0.946	0.751	0.947	0.902

Results of the modified confirmatory factor analysis indicate that all fit indices 0.751=PCFI=, 0.716=PNFI, 0.067=RMSEA, 0.947=IFI, 0.946=CFI, 0.902 GFI=, and 2.066 CMIND/DF= suggest a good fit of the measurement model with the data; and all observed variables had a factor loading higher than 0.3, confirming the measurement section of the proposed model.

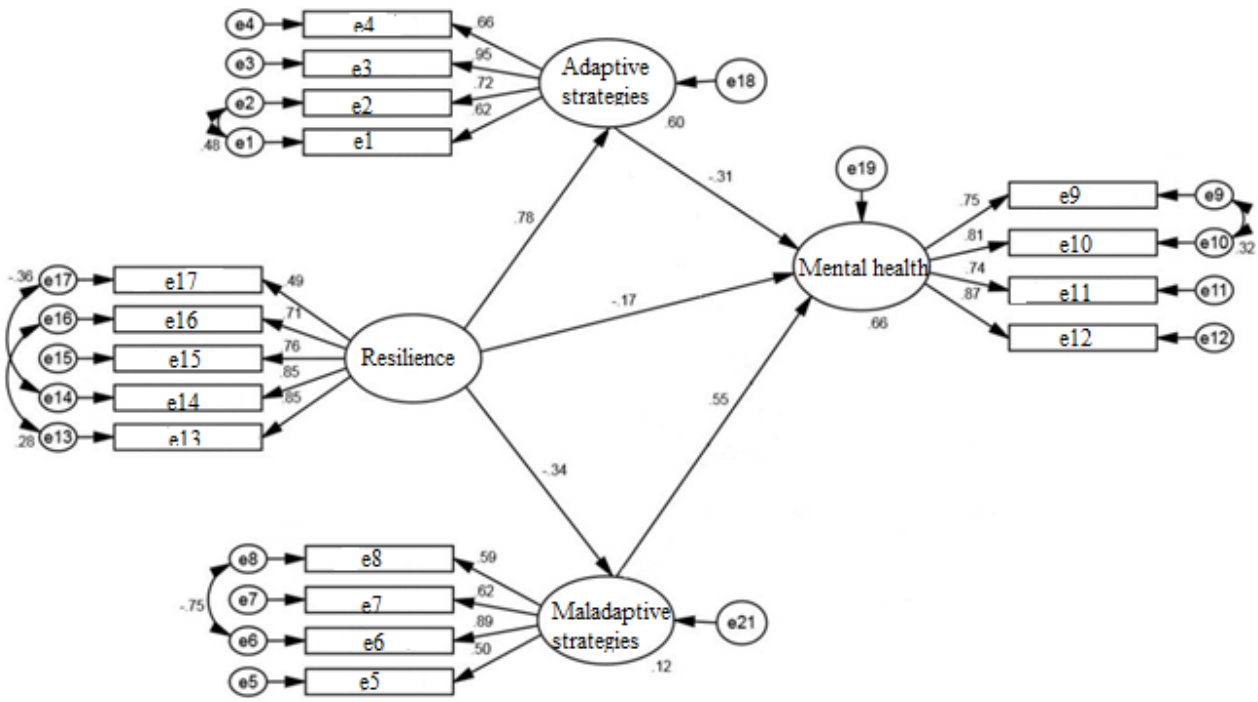
Table 3

Fit Indices for the Proposed Model of the Study

Fit Indices	χ2	Df	P-Value	CMIN/DF	RMSEA (CI90%)	PNFI	CFI	PCFI	IFI	GFI
Proposed Model	253.981	123	>0.001	2.065	0.067 (0.05-0.07)	0.716	0.939	0.755	0.940	0.900

Figure 2

Structural Model



As shown in Table 3, the fit indices 0.755=PCFI, 0.716=PNFI, 2.065=CMIN/DF, 0.067=RMSEA, 0.940=IFI, 0.939=CFI, and 0.900 GFI= indicate a good fit of the proposed model with the data. Therefore, the proposed model is satisfactorily fit.

JARAC Assessment and Research in Applied Counseling
E-ISSN: 3041-8518

Table 4

Standardized Path Coefficients of the Proposed Research Model

Path	Standardized Coefficients	Standard Error	Critical Ratio	P-value
Resilience ---> Mental Health	-0.167	0.062	-2.972	0.048
Resilience ---> Adaptive Cognitive Emotional Regulation Strategies	0.777	0.029	8.574	<0.001
Resilience ---> Maladaptive Cognitive Emotional Regulation Strategies	-0.341	0.026	-4.161	<0.001
Adaptive Cognitive Emotional Regulation Strategies ---> Mental Health	-0.313	0.193	-3.275	0.001
Maladaptive Cognitive Emotional Regulation Strategies ---> Mental Health	0.548	0.181	6.207	<0.001

According to the results shown in Table 4, resilience had a significant negative effect on mental health (P=0.048, β=-0.167) and maladaptive cognitive emotional regulation strategies (P<0.001, β=-0.341) had a significant negative effect, while resilience had a significant positive effect on adaptive cognitive emotional regulation strategies (P<0.001, β=0.777). Adaptive cognitive emotional regulation strategies had a significant negative relationship with mental health (P=0.001, β=-0.313), whereas maladaptive cognitive emotional regulation strategies had a significant positive relationship with mental health (P<0.001, β=0.548).

Table 5

Bootstrap Results for the Indirect Pathways of the Proposed Model

Path	Indirect Effect	Error	Lower Bound	Upper Bound	P-value	Total Effect
Resilience to Mental Health via Adaptive Cognitive Emotional Regulation Strategies	-0.2418	0.0496	-0.3360	-0.1622	<0.001	-0.42
Resilience to Mental Health via Maladaptive Cognitive Emotional Regulation Strategies	-0.1870	0.0347	-0.2630	-0.1140	<0.001	-0.35

As observed in Table 5, the lower bound of the confidence interval for adaptive cognitive emotional regulation strategies as a mediating variable between resilience and mental health is -0.3360, and the upper bound is -0.1622. The confidence level for this interval is 95%, and the bootstrap resampling number is 5000. Since zero is outside of this confidence interval and is statistically significant, adaptive cognitive emotional regulation strategies have a mediating role in the relationship between resilience and mental health, with an indirect effect of -0.2418. The lower bound of the confidence interval for maladaptive cognitive emotional regulation strategies as a mediating variable between resilience and mental health is -0.2630, and the upper bound is -0.1140. The confidence level for this interval is 95%, and the bootstrap resampling number is 5000. Since zero is outside of this confidence interval and is statistically significant, maladaptive cognitive emotional regulation strategies have a mediating role in the relationship between resilience and mental health, with an indirect effect of -0.1870. Therefore, both adaptive and maladaptive cognitive emotional regulation strategies have a mediating role in the relationship between resilience and mental health of parents of children with cancer. The hypothesis was confirmed.

4. Discussion and Conclusion

The present study aimed to establish a structural model of the relationship between resilience and mental health of parents of children with cancer with the mediating role of cognitive emotional regulation strategies. The statistical analysis revealed that both positive and negative cognitive emotional regulation strategies mediate the relationship between resilience and mental health. In fact, 66% of the total effect of resilience on mental health is explained through both positive and negative strategies. According to the correlation matrix results, there was a significant negative relationship between resilience and mental health. Lower scores on the Goldberg Mental Health Questionnaire indicate better overall or mental health; therefore, the higher the level of resilience, the lower the mental health score, indicating better mental health. Furthermore, findings of the study indicate a significant and negative covariance between resilience and mental health based on the covariance measurement model. Similarly, the standardized direct effects indicate that the path between resilience and mental health is significant and negative. Hence, all findings of the present study confirm the significant and negative relationship between resilience and mental health, aligning

JARAC Assessment and Research in Applied Counseling
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with results from other research (Abedini & Joibari, 2023; Mehdigholi et al., 2022; O'Sullivan & Lindsay, 2022; Romm et al., 2022).

Moreover, according to the measurement model, the covariance between resilience and positive cognitive emotional regulation strategies has the highest level of significance among all covariance relationships in the current study, whereas the covariance between resilience and maladaptive strategies showed a significant negative relationship. Additionally, based on the standardized direct effects, the path between resilience and adaptive cognitive emotional regulation strategies is positively significant with the highest level of significance in this study, and the direct relationship coefficients between resilience and maladaptive strategies are negative and significant. The current study's results confirm the significant relationship between resilience and cognitive emotional regulation strategies, in line with findings from research (Babolhavaeji et al., 2018; Faraj Zadeh et al., 2020).

According to the measurement model, the covariance between mental health and adaptive cognitive emotional regulation strategies is negative and significant, and the covariance between mental health and maladaptive strategies is positive and significant. Similarly, based on the standardized direct effects, the path between mental health and adaptive strategies is negative and significant, and the path between mental health and maladaptive strategies is positive and significant. The existing research results indicate that mental health significantly relates to cognitive emotional regulation strategies, consistent with previous findings (Anwar et al., 2022; Aritzeta et al., 2022; Cludius et al., 2020; Conway et al., 2021).

To determine the significance of the mediating relationship and the indirect effect of the independent variable (resilience) on the dependent variable (mental health) through the mediating variable (cognitive emotional regulation strategies), the bootstrap method was used. According to the hypothesis examined, there are two indirect or mediating paths: resilience to mental health through adaptive cognitive emotional regulation strategies and resilience to mental health through maladaptive cognitive emotional regulation strategies. Bootstrap results for the mediating role of adaptive cognitive emotional regulation strategies between resilience and mental health were statistically significant, with an indirect effect of -0.2418. Bootstrap results for the mediating role of maladaptive cognitive emotional regulation strategies between resilience and mental health were statistically significant, with an indirect effect of -0.1870. According to the research findings, resilience affects mental health in parents of children with cancer both directly and indirectly through cognitive emotional regulation strategies.

In fact, resilience in response to these adverse conditions helps parents maintain a balance and preserve physical and psychological health for easier and quicker recovery from stressful situations, thereby exposing themselves less to psychological and emotional turmoil and consequently gaining more active power to deal with life's problems and stresses. Variables such as perception of personal competence, tolerance of negative affect, positive acceptance of change, control, and spiritual influences assist them in showcasing their best abilities to face life's challenges and stresses. On the other hand, positive emotional regulation strategies play an important role in reducing emotional and behavioral problems after encountering stressful events. Cognitive emotional regulation strategies, considered a subset of emotional regulation processes, help individuals flexibly respond to changing circumstances and needs that lead to new emotions, and by managing emotions, adapt to the emotional and physical discomforts they experience. Based on this, parents of children with cancer gain an incredible ability to face and overcome this challenge, and maintaining mental health is one of their achievements. Although we examined resilience, emotional regulation strategies, and mental health as separate processes at a theoretical and statistical level, in reality, these processes are continuously interacting in parents of children with cancer, and the parents' adaptation or lack thereof is a consequence of this ongoing interaction. For example, if an individual is in a satisfactory mental health state, they have greater capacity to deal with emotional issues and can better regulate negative arousal and emotions, experiencing greater resilience.

Mental health is one of the most important factors in human advancement and development. The World Health Organization defines mental health as the full ability to perform social, psychological, and physical roles and considers it the ability to communicate appropriately and harmoniously with others, to change and adjust the personal and social environment, and to logically resolve conflicts and personal inclinations (Cludius et al., 2020; Wilamowska et al., 2010). The concept of mental health includes an internal sense of well-being and confidence in one's efficacy, self-reliance, competitive capacity, self-actualization of potential intellectual and emotional abilities. The diagnosis and treatment of cancer are not only a physical and medical

JARAC Assessment and Research in Applied Counseling
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problem for the individual but also bring about extensive emotional challenges for those around them, especially parents, among which stress and anxiety are the most significant, leading families to face very difficult situations. This can have profound effects on the mental health and social relationships of families (Aritzeta et al., 2022; Shiroodaghaei et al., 2020). Therefore, psychological and social support is vital not only for the affected individual but also for those around them. Cancer treatment should not only be focused on physical aspects but also requires psychological and social support and counseling to help these families adapt and confront the immense challenges they face. If an individual's mental health is affected by challenges, it damages emotional processes such as management and regulation of emotion, and consequently, the use of positive emotional regulation strategies is impaired (Conway et al., 2021). Having emotional self-regulation like reappraisal leads to a reduction in negative feelings, an increase in positive feelings, and adaptive behavior, and consequently will have positive outcomes in interpersonal relationships and coping with problems and issues (Aritzeta et al., 2022; Del Bianco et al., 2023; Hosseini et al., 2023), one of which is an increase in resilience. According to research findings, an individual who is unable to manage their emotional responses to events will experience long and difficult periods of disorders such as depression and anxiety. When parents of children with cancer are less depressed and show better adaptability, they use positive cognitive emotional regulation strategies, and when they feel more depressed and show less adaptability, they use negative emotional regulation strategies. Using positive emotional regulation strategies leads to increased resilience because individuals endure due to strategically and intelligently using positive emotions to achieve superior coping outcomes.

5. Limitations & Suggestions

Among the limitations of the research are the following: this research was conducted at the Mahak Specialized Cancer Hospital in Tehran. For any research work in this center or any other center related to children with cancer, it is mandatory to choose a member of the scientific staff of the respective center as a guide or advisor. Otherwise, cooperation is not possible. Since the statistical population of this research is a small part of the community and consists of parents of children with cancer from the Mahak Institute in Tehran, care must be taken in generalizing the findings to other people due to the limited and specific nature of the sample. Given the negative role of depression, anxiety, insomnia, and stress in the mental health of parents, individual and group therapies such as mindfulness therapy should be conducted through targeted educational courses during the treatment of children to increase the coping capacity, acceptance, and resilience of parents. Educational brochures and multimedia content based on scientific findings in the field of empowering parents of children with cancer should be compiled to increase their mental health (including stress management, anxiety reduction, and depression reduction) and made available to them.

Acknowledgments

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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.

Authors' Contributions

Soheila Rezaei contributed to the conceptualization of the research, data collection, data analysis using structural equation modeling, and the writing of the research manuscript. Leila Kashani Vahid provided oversight and supervision of the research and contributed to the writing and revision of the research manuscript. Maryam Asaseh contributed to the conceptualization of the research, data collection, and the writing and revision of the research manuscript. Gholamali Afrooz played a key role in the conceptualization of the research, supervised the study, and contributed to the writing and revision of the research manuscript. Babak Shekarchi contributed to the research methodology and participated in the writing and revision of the research manuscript. All authors made significant

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contributions to the study, encompassing its conceptualization, data collection, analysis, and the preparation of the research manuscript.

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