

Mothers' Reflective Functioning and Resilience of Children with Cancer: The Mediating Role of Maternal Empathy

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Submitted: 23 November 2022

Accepted: 7 January 2023

Int J Behav Sci. 2023; 16(4): 226-233

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Abstract

Introduction: The purpose of this study was to examine the hypothesized model of the causal relationship between mothers' reflective functioning and resilience of children with cancer through mothers' empathy.

Method: The present descriptive and correlational study lay within the Structural Equation Modeling (SEM) framework. For this purpose, 207 mothers of children aged 5 to 12 years with cancer who had referred to Mahak Hospital and Tehran Children's Medical Center joined this study. Participants completed the Parental Reflective Functioning Questionnaire (2017), the Child and Youth Resilience Measure-Revised Person Most Knowledgeable version (2018), and the Empathy Quotient Questionnaire (2004). The statistical procedures were run in SPSS21 and AMOS22.

Results: The results showed that the hypothetical model has a good fit with the data. Based on the findings of this study, it is presumed that due to the positive impact of mothers' reflective functioning on their psychological abilities and interpersonal relationships, strengthening this capacity can lead to improved resilience in children with cancer.

Conclusion: According to the findings of the present study, mothers' empathy plays a mediating role in the relationship between mother's reflective functioning and children's resilience.

Keywords: Cancer, Child, Empathy, Mothers, Reflective Functioning, Resilience

Introduction

The prevalence of childhood cancer has been steadily increasing globally since the late 1970s, yet childhood mortality rates declined over the past few decades [1]. Each year, nearly 400,000 children and adolescents aged 0-19 years are diagnosed with cancer [2]. As studies expand, physicians get to use more effective treatments. Fortunately, with advances in the diagnosis and treatment of this disease, children have a better chance of survival than in the past [3]. Nonetheless, suffering from cancer is such an unpleasant experience and can jeopardize successful adjustment throughout life [3]. The disease and its treatment process have long-term biological, psychological, social, and spiritual consequences for individuals and it is an obstacle to a child's development [4, 5]. This is where the importance of addressing protective factors such as resilience in dealing with adverse and stressful situations becomes apparent [6]. Despite the vulnerability of children to diseases and traumatic experiences, research have shown that some children are significantly more resilient than others [7].

Resilience is the ability to deal more effectively with a traumatic event and regain mental health in the face of adversity [8, 9]. High levels of resilience in cancer patients are negatively associated with emotional distress, and strengthening resilience reduces depression and anxiety in individuals involved in a crisis [10]. As a result, resilience can help us while facing an illness crisis, during treatment and even in post-treatment care, thus facilitating recovery process.

Examining the factors involved in the formation of resilience, it is worth noting that the capacity of resilience, in addition to individual variables, is also influenced by social variables and the environment around the person [11]. Family factors such as communication strategies, attachment security and parenting styles can influence children's resilience [12,13] by changing cognitive and emotional aspects of their behavior [14]. Positive and effective parent-child relationships in adverse conditions such as cancer could be associated with more resilience and higher quality of life in children recovering from traumatic events [5,15].

In recent decades, new conceptualizations of the parent-child relationship have addressed parents' capacity of reflective functioning and its importance in children's wellbeing. Reflective Functioning (RF) refers to understanding oneself and others based on what is happening within the individual [16]. Maternal RF operates as a regulation system enabling children to tolerate traumatic situations and change unpleasant experiences [17]. Indeed, understanding the unpleasant experience and knowing about its effects on one's child and on oneself can alleviate negative impacts of the event, and capacitate the child to benefit from social support and relationships when faced with a potentially traumatic event. This capacity is considered as an effective factor in resilience of children when facing psychological traumas [18,19].

Studies have also shown that empathy is another predictor of resilience [20, 21]. Cao and Chen [22] found that empathy has a direct and significant effect on resilience through feeling and hearing. Studies have shown that physicians' empathy with patients suffering from chronic pain, positively affects pain relief and the quality of life in patients [23]. In the case of children going through medical experiences, empathy reduces their stress, and empathetic painting gives them the feeling that they are seen and heard more, and that they are not alone during this experience, improving their performance [24].

Empathy, the ability to recognize mental states of others and to respond appropriately to them [25], is created by understanding the other mentalities, experiencing the feeling, and sharing it. Researchers have shown that high levels of RF may lead to an increase in ability to empathize with others [26]. Bringing children to mind may be the basis for maternal empathy. In order to understand and empathize with children's emotional experiences, parents ought to acknowledge and bring to mind their child's unique inner worlds [19].

There is a positive relationship between mothers' RF and

their empathy, and this relationship has psychological advantages for children, including formation of secure attachment in them [27]. Meins et al. [28] stated that mothers' ability to consider their six-month-old baby as a person with a mind can predict safe and empathetic communication with them. Follow-up studies have yielded similar results in mothers and fathers of older infants as well as in preschool children [29, 30].

However, Preliminary evidence from studies of autism and psychopathology reveals that RF and empathy are distinct abilities, each with specific neural circuits [31, 32]. RF is associated with the activation of the middle prefrontal areas of the brain especially the paracingulate cortex [33]. While neural circuits underlying cognitive empathy are in the ventromedial prefrontal cortex and ones underlying emotional empathy include the anterior insula, the midcingulate cortex and the inferior frontal gyrus [34].

The primary aim of this study was to test the direct and indirect effects of maternal RF and empathy on resilience of children with cancer. Based on previous research, it was hypothesized that a positive association would be found between mother's RF, empathy, and resilience of children. The main hypothesis of the present study is that mothers' RF can increase their empathy, and it will ultimately result in an increase in resilience of children with cancer. Such research can take a step towards more effective psychological interventions by looking at the parent-child communication patterns.

Method

The present study was a descriptive-correlational study using structural equation modeling methods. A total of 207 volunteer mothers were selected. The inclusion criteria were as follows: having at least one child aged 5 to 12 suffering from cancer at the time of study, the children do not have a disease other than cancer, ability to read, write and understand Persian and the presence of the mother as the main caregiver of the child. The exclusion criteria were as follows: unwillingness to continue cooperation and lack of complete response to the questionnaires.

Ethical approval was obtained from the ethics committee of Shahid Beheshti University of Tehran (IR.SBU.REC.1400.010). The sampling process was done during a period of six months in 2021 in Mahak Hospital and Tehran Children's Medical Center. First, all participants were briefly instructed about the purpose of the study, and were ensured about confidentiality of the data. After obtaining informed consent, the participants were asked to complete the paper-and-pencil questionnaires in addition to some questions on socio-demographic factors including age, age of child, marital status, education, type of cancer, and duration of diagnosis and treatment. The following instruments were employed in the present study:

Parental Reflective Functioning Questionnaire (PRFQ):

This questionnaire was developed by Luyten et al. [35] and includes 18 statements split into three subscales: pre-mentalizing, certainty about mental states, and interest and curiosity. Parents respond to phrases about their

children is scored on a 7-point Likert scale, from a score of 1 for "strongly disagree" to a score of 7 for "strongly agree". Items 11 and 18 are scored in reverse. The purpose is to assess parents' curiosity about their children's mental states, their understanding of these states and their ability to recognize the impact of mental states on children's behavior. In their study, Luyten et al. [35] reported Cronbach's alpha for each of the subscales as follows: pre-mentalizing ($\alpha = .73$), certainty ($\alpha = .67$), and interest and curiosity ($\alpha = .64$). In Iran, Goudarzi et al. (in review) confirmed the three-factor structure of the questionnaire. Cronbach's alpha was 0.69 in the pre-mentalizing subscale, 0.77 in the certainty subscale, and 0.69 in the interest and curiosity subscale.

The concurrent validity of this questionnaire was calculated through correlation with the scale of interpersonal awareness in parenting (IM-P) ($r_{PM} = -0.29$, $r_{CM} = 0.30$ and $r_{IC} = 0.24$). The criterion validity of the questionnaire was obtained from the correlation with the Abilities and Problems Questionnaire (SDQ) from $r = -0.26$ to $r = 0.60$. In the present study, Cronbach's alpha for the three subscales were 0.66 for pre-mentalizing, 0.71 for certainty and 0.63 for curiosity.

Child and Youth Measure-Revised Person Most Knowledgeable Version (PMK-CYRM-R): This questionnaire was designed and validated in 2019 by Jefferies et al. [36]. The present version consists of 17 items which are scored on a 5-point Likert scale. To get the total score of an individual's resilience, the scores of all questions must be added together. There are no inverse scoring questions and all questions weigh the same. The minimum score is 17 and the maximum is 85. In addition to the total score, this questionnaire consists of two subscales of personal resilience and caregiver resilience. Higher scores on the subscales and overall scale indicates higher resilience of the person. The items in this questionnaire measure children and adolescents' resilience through an informed person who has the most knowledge of them. Indeed, this version can be used in situations where direct access to children is not possible. In the present study, due to the spread of Covid-19, the weak immune system of children with cancer and some of them being isolated, there was a limited access to children.

In the study of Jefferies et al. [36], Cronbach's alpha for the whole scale was 0.87, for the subscale of personal resilience was 0.82, and for the caregiver resilience was 0.82. Three factors (personal, caregiver and friends) were extracted, and Cronbach's alpha was calculated for the caregiver subscale (0.723), the personal subscale (0.729) and the friends subscale (0.641). In Iran, Homayounpour et al. (in review) obtained three factors that included individual, caregiver, and friend subscales. The internal consistency of each of these three subscales was also reported to be acceptable. The Cronbach's alpha of caregiver subscale was 0.723, individual subscale was 0.729, and friends subscale was 0.641. Concurrent validity of this scale was investigated through correlation with emotion regulation checklist, child behavior questionnaire and child behavior checklist. The results showed that the

total score of the questionnaire and its subscales have a positive and significant correlation with adaptive variables such as emotion regulation and a negative and significant correlation with maladaptive and pathological variables. In the present study, Cronbach's total alpha of the questionnaire was 0.85.

Empathy Quotient (EQ): This questionnaire, developed by Baron-Cohen and Wheelwright [37], is one of the most widely used questionnaires available for measuring empathy. The responses to the statements are captured through a 4-point Likert spectrum, which includes strongly agree, agree, disagree and strongly disagree. Half of the statements express empathy and the other half express empathetic behavior. The minimum and maximum scores in each question are zero and two. The original form of Baron-Cohen's Empathy Quotient has 60 questions that are divided into two parts: 40 questions measure the empathy of individuals and 20 questions are considered as neutral questions aimed at preventing the respondents' bias towards the concept of empathy. The highest score will be 80 and the lowest will be zero. More empathy is demonstrated by higher scores in this questionnaire.

This questionnaire was initially used to measure cognitive and emotional empathy. Although in the study of Lawrence et al. [38] the dimension of social skills was also discussed in addition to the two dimensions of cognition and emotion, it seems that these three factors, namely cognitive empathy, emotional responsiveness and social skills, seem to predict a significant amount of empathy. Numerous studies have been performed in order to examine the factor structure of this questionnaire [38, 39]. In a study by Baron-Cohen and Wheelwright [37], Cronbach's alpha was reported to be 0.92. In Iran, Abolghasemi in a group of students, in which the internal consistency was 0.88 and the retest validity after four weeks was 0.8, validated the 40-question form of this questionnaire [40]. In a research conducted by Mousavi et al. on a sample of Iranian adults, the Cronbach's alpha of this 40-question questionnaire was 0.74 [41]. In the present study, Cronbach's total alpha of the questionnaire was 0.83.

Data analyses were conducted using SPSS (version 21.0) and AMOS (version 22.0).

Results

The socio-demographic characteristics and clinical data of the participants are summarized in Table 1. The mean age of mothers and children were 35.38 years ($SD = 5.56$, range = 23-53) and 7.64 years ($SD = 2.68$, range = 5-12) respectively.

Descriptive statistics, reliability estimates (Cronbach's alpha coefficients), and correlations between all the study variables are presented in Table 2.

The measurement model revealed a very satisfactory fit to the data: $\chi^2 = 76.856$, $df = 41$; $RMSEA = 0.065$; $SRMR = 0.047$; $IFI = 0.959$ and $CFI = 0.958$. All the factor loadings of the indicators on the latent variables were in the range of 0.52 - 0.87 and were reliable ($p < 0.05$), signifying that all the

latent variables were well represented by their respective indicators.

Structural model fit indices indicated proper fit of the model. All model indicators were within the acceptable

range ($\chi^2 = 128/052$, $df = 65$; $RMSEA = 0.069$; $SRMR = 0.046$; $IFI = 0.941$ and $CFI = 0.940$). Therefore, the hypothetical structural model of the research was approved (Figure 1).

Table 1. Socio-Demographic Characteristics and Clinical Data

Variable	Frequency	Percentage	
Mother's age	23-33	81	39.1
	34-44	114	55.1
	45-55	12	5.8
	Total	207	100
Mother's education	Lower than diploma	54	26.1
	Diploma	69	33.3
	Associate degree	18	8.7
	Bachelor	51	24.6
	MA	14	6.8
	PhD and above	1	0.5
Total	207	100	
Marital status	Living with a child's father	196	94.7
	Divorced	9	4.3
	Remarriage	2	1
	Total	207	100
Child gender	Girl	88	42.5
	Boy	119	57.5
	Total	207	100
Child age	5-8	133	64.3
	9-12	74	35.7
	Total	207	100
Type of cancer	ALL	79	38.2
	AML	9	4.3
	Brain tumor	54	26.1
	Bone tumor	22	10.6
	Others	43	20.8
	Total	207	100
Duration of diagnosis	Less than a year	107	51.7
	1-3	76	36.7
	3-5	11	5.3
	More than 5 years	13	6.3
	Total	207	100
Duration of treatment	Less than 3 months	46	22.2
	3-6 months	32	15.5
	6-9 months	21	10.1
	9-12 months	24	11.6
	1-3 years	65	31.4
	3-5 years	10	4.8
	More than 5 years	9	4.3
	Total	207	100

Table 2. Means, Standard Deviations (SD), Reliabilities and Intercorrelations among Study Variables

Variable	Mean	SD	α	1	2	3	4	5
1. Resilience	68.98	8.68	0.85	1				
2. Empathy	18.33	5.62	0.83	0.27**	1			
3. Pre-mentalizing	2.61	1.19	0.66	-0.31**	-0.13	1		
4. Certainty	5.23	0.99	0.71	0.30**	0.35**	-0.11	1	
5. Interest & curiosity	6.15	0.80	0.63	0.25**	0.29**	-0.32**	0.41**	1

The positive associations between resilience with pre-mentalizing ($p < 0.05$, $\beta = 0.28$), certainty ($p < 0.05$, $\beta = 0.19$) and empathy ($p < 0.05$, $\beta = 0.23$) were statistically significant, as was the relation between empathy with certainty ($p < 0.05$, $\beta = 0.37$) and curiosity ($p < 0.05$, $\beta = 0.17$).

Moreover, the indirect effect of pre-mentalizing on resilience through empathy ($p > 0.05$, $b = -0.08$) and also

the indirect effect of curiosity on resilience through empathy as a mediator ($p > 0.05$, $b = 0.14$) were not significant. Though the indirect effect of certainty on resilience was significant through empathy ($p < 0.05$, $b = 0.25$). The 95%CI (as displayed in Table 3) for the indirect effect did not contain zero, indicating that empathy mediated the association between certainty and resilience.

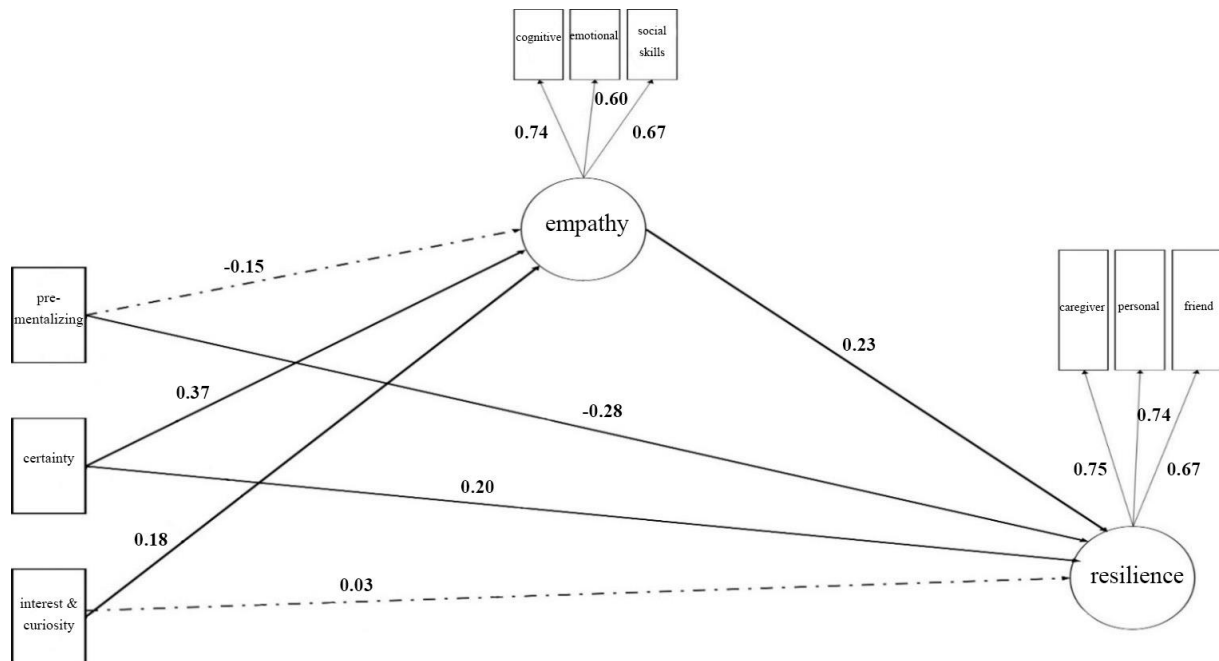


Figure 1. Structural equation model of empathy of mother mediating the relation between mother's RF and resilience of children with cancer.

Table 3. Bootstrapping Indirect Effects and 95% Confidence Intervals (CI) for Final Mediation Model

independent variable	Mediator Variable	dependent variable	b	Lower	Upper	P
Pre-mentalizing	Empathy	Resilience	-0.08	-0.29	0.006	0.079
Certainty	Empathy	Resilience	0.25	0.03	0.60	0.028
Interest & curiosity	Empathy	Resilience	0.14	-0.02	0.62	0.11

Discussion

The primary purpose of the present study was to examine the hypothesized model of the causal relationship between mothers' RF and resilience of children with cancer through mothers' empathy. Results demonstrated a good fit of the assumed model with the data. This finding is consistent with the results of research on the relationship between mothers' RF and children's resilience [17, 18], the relationship between RF and empathy [41, 42] and the relationship between empathy and resilience [22–24]. Indeed, the results of these studies showed that the more mature maternal RF, the greater their ability to empathize. In addition, mothers' RF is also related to children's resilience. The results of the present study also confirmed these relationships. Nonetheless, in each of the above-mentioned studies, the relationships of the variables have been studied in discrete pairs.

Given that the hypothetical model had a good fit, it can be concluded that the more developed the mothers' RF, the better they will be able to consider their own and others' inner worlds and react more appropriately to events [18, 19]). In such mother-child relationship, the

mother is capable of identifying emotions, thoughts, desires and intentions of the sick child, adjusting to them, and finally reflecting them to the child like a mirror to aid him to better understand and deal with the mental states resulted from the experience of being sick. Hence, should the mother have the desired capacity for reflection, she will firstly be able to reflect on her emotions and regulate them, and then to identify, adjust and correct her child's feelings, and finally generate an empathetic response taking her child's inner world and the circumstances he is struggling with, into account [17, 18, 26]. This provides a sense of security, stability and support that the child requires to receive from his family. As a result, the child is more likely to be resilient in detrimental situations such as cancer.

It was posited that empathy would be a mechanism that contributes to explaining the association between mothers' RF and resilience of children with cancer. The findings of this study support the mediation hypothesis in the relationship between certainty aspect of maternal RF and resilience and are consistent with previous research literature [19] which highlight acceptance of ambiguity

and uncertainty about the inner world of children as the key to providing the parents with the opportunity to understand children's inner worlds, to separate their own experiences from their children's, to reflect on them, and to emotionally respond more appropriately. As a result, it ultimately improves children's well-being.

When the mother accepts the uncertainty about her child's inner world and considers the child's mind and experiences it differently from hers, she will give herself more opportunity to listen to her child's inner world [18, 19, 42]. In such a case, the mother will be better able to understand what is happening to the child during illness and treatment resulting to more appropriate and empathetic responses. The child will feel more secure and supported when he or she feels heard and understood by the parents, and will form a better attachment relationship with his sensitive and accessible parents. Ultimately, such a supportive and welcoming atmosphere can promote resilience in children when facing a crisis such as cancer.

On the other hand, it was observed that the indirect effect of pre-mentalizing and curiosity on resilience through empathy is not significant. This finding is inconsistent with previous research [21, 33, 42], which stipulate that evolved RF leads to interest in others' inner world and attempt to bringing it to mind. While in pre-mentalizing states, this process will be jeopardized, and as a result, the other person's feelings will not be properly understood and the empathizing will not progress properly.

It can be noted that among the three factors extracted from RF, the role of uncertainty in this regard is greater than pre-mentalizing and curiosity. Actually when people accept uncertainty, they are more likely try to understand others' inner world, and as a result are more likely to better recognize the other person's emotion, show a more proportionate empathetic response, and may eventually improve the resilience of their children by providing such a supportive environment [42]. Given that the study participants were selected from among mothers of children with cancer, the mothers are more likely to perceive the critical situation similarly to their children. As a result, the mental gap between mothers and children is not serious enough to make mothers' presence in pre-mentalizing state cause problems in their understanding of inner states of children. Hence, this lack of significance may be influenced by the research participants. On the other hand, the limitations of the RF assessment tools can have a role in the non-significance of some relationships as well. In the research literature, the concepts related to PRF (parents' pre-mentalizing, certainty about mental states, and interest and curiosity) are discussed in relation to each other, and separating them in this study might have affected the results.

The present study had several limitations. Due to the prevalence of covid-19 and the weakened immune system in cancer patients, it was not possible to measure children's resilience directly and through themselves. Second-hand measure of child resilience might be one of the reasons why some relationships were insignificant. Moreover, participants were selected in a convenience sampling procedure which reduces the possibility of

generalizing research findings. Despite obtaining the code of ethics and a referral letter from Shahid Beheshti University, many medical centers did not agree to cooperate with sampling, which restricted us to only two medical centers in Tehran (Mahak Hospital and Tehran Children's Medical Center). Completion of research questionnaires by mothers in the form of self-report instead of observing the actual behaviors of children might have led to producing socially approvable answers which are not necessarily based on reality. Besides, limitations in RF assessment tools might have contributed to insignificance of some relationships.

Considering the possibility of the tendency to providing socially-acceptable answers in the version of the informed person of resilience questionnaire, it is suggested that in future research, the resilience of children should be measured both directly and through an informed person and results be compared. Given the differences in treatment procedures and side effects of different types of cancer, it is suggested that the relationship between reflection capacity and resilience in different types of this disease be compared in future research, to provide a more comprehensive view of the factors contributing to successful coping with the adverse experience of children's suffering from cancer. According to the results of this study, it is suggested that in future studies, the effectiveness of treatments based on parental RF on the resilience of children with cancer be investigated.

Conclusion

The findings from the present study indicated that empathy is a mediating factor in the effect of mothers' RF on resilience of children with cancer. A more developed mothers' RF leads to a better understanding of the children's inner world and the mother can show a more empathetic response to the situation the child is facing. Indeed, child's emotions were clarified and mothers accompany them appropriately. Understanding the situation and communicating more effectively can help the child experience the illness with less stress. In this regard, it is recommended that psychological interventions and training aiming at improving RF and empathy be used for mothers in medical centers and hospitals in order to improve children's resilience.

Conflict of interest

The authors declare no conflicts of interest in this study.

Ethical Approval

This research took into account all ethical principles. Researchers informed the participants of the study's objectives. Also, participants were assured that their information would remain confidential.

Acknowledgement

We are profoundly grateful to the staff at the Mahak Hospital and Tehran Children's Medical Center for providing us with the study sample.

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