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Investigating the Factors Associated with Post-Traumatic Growth in Parents of Children with Special Needs

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Abstract

The study introduces and validates a model of post-traumatic growth among parents of children with special needs. The model incorporates cognitive processes, coping strategies, and sociocultural factors as intra-personal variables. The statistical analysis unveiled significant pathways that connect the factors, explaining 71% of the variance associated with post-traumatic growth. The study highlighted intentional reflection and robust decentralization skills as crucial factors that predict post-traumatic growth. Deliberate rumination functioned as a mediating factor, reducing the impact of trauma and facilitating post-traumatic growth, while social support played a crucial role in initiating purposeful rumination. The study findings indicate that the effect of self-disclosure on post-traumatic growth is not direct but rather indirect, as it is mediated by its influence on social support and deliberate rumination. The study underscores the significance of examining particular characteristics of social support networks and suggests integrating additional variables for future research, such as gender, types of traumatic events, and the age of children with disabilities.

Keywords: *Post-Traumatic Growth, Self-Disclosure, Social Support, Deliberate Rumination, Core Belief Challenge, Decentering, Post-Traumatic Growth*

1. INTRODUCTION

Raising children with special needs involves navigating a multitude of challenges, including emotional complexities, financial constraints, and societal barriers. Various research studies have highlighted the detrimental effects of trauma on parents of children with special needs, emphasizing the importance of increasing awareness in society on this issue (e.g., [1] [2]). When individuals experience a traumatic event, it often disrupts their core beliefs, leading to heightened psychological distress and a reevaluation of their values, potentially altering their entire worldview. Individuals have the capacity to utilize adaptive strategies to cope with the erosion of beliefs, such as engaging in purposeful introspection to find meaning and address obstacles. Conversely, prolonged distress can lead to intrusive rumination. When parents of children with special needs encounter stressors like financial limitations, societal obstacles, and traumatic events related to their child's condition, they employ cognitive appraisals to assess the significance and implications of these stressors [3].

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Initially, parents evaluate the demands of their situation, recognizing the various challenges they must confront. This initial assessment acknowledges the emotional, financial, and societal hurdles associated with caring for a child with special needs [4]. Subsequently, parents engage in a secondary appraisal by evaluating their perceived ability to cope with these demands. Traumatic events, such as receiving a diagnosis or witnessing their child's struggles, have the potential to disrupt parents' fundamental beliefs and raise doubts about their capability to adequately meet their child's needs. This scenario could lead to increased psychological distress, prompting individuals to reassess their values and worldview. In response to the erosion of beliefs and heightened distress, parents may employ adaptive coping strategies, such as intentional introspection [5]. Intentional introspection involves a deliberate process of contemplation and cognitive assessment of the traumatic incident, enabling parents to derive meaning from their experiences, reassess their beliefs, and develop coping strategies to overcome obstacles [6].

Persistent distress experienced by parents may lead to intrusive rumination, as proposed by Cognitive Appraisal Theory [7]. Intrusive rumination involves the involuntary and repetitive contemplation of a traumatic incident, which may exacerbate psychological distress and impede coping mechanisms. The occurrence of trauma in parents of children with special needs can significantly disrupt their psychological well-being. Studies suggest that traumatic experiences often trigger a crisis of faith, prompting individuals to reevaluate their deeply held beliefs and values. This disruption in core beliefs can result in heightened levels of psychological distress as individuals grapple with a profound reassessment of their worldview [8]. When parents are confronted with the reality of their child's special needs and the associated challenges, they may experience cognitive dissonance as their existing beliefs and expectations clash with new information. The discrepancy between individuals' existing beliefs and their current experiences can trigger a crisis of faith, characterized by psychological distress and a significant reassessment of individuals' worldviews [6].

Parents facing cognitive dissonance due to trauma may employ various strategies to alleviate their distress and restore cognitive equilibrium. This process may involve efforts to reconcile their existing beliefs with the new realities they face. This could include seeking meaning in the encounter, reevaluating their self-perceptions and perceptions of their children, and adjusting their expectations for the future. Resolving cognitive dissonance is a complex process that may result in emotional distress as parents strive to reconcile the disparity between their existing beliefs and current experiences. This process involves cognitive restructuring and adaptation, potentially leading to heightened levels of psychological distress as parents seek to make sense of their situation and adapt to their changed reality [9].

Furthermore, the enduring responsibilities associated with caring for children with special needs can intensify feelings of stress and overwhelm, thereby amplifying the impact of trauma. Recent research has challenged the common belief that trauma invariably leads to dysfunction [4]. The proposition suggests that the impact of trauma is largely influenced by the individual's subjective interpretation of events. Trauma not only triggers distress but also presents opportunities for positive growth. Parents may conduct secondary appraisals to evaluate their perceived ability to manage caregiving responsibilities and the effects of trauma. This evaluation entails assessing an individual's resources, coping strategies, and support systems in relation to the prevailing challenges. When faced with the demands of raising children with special needs and coping with trauma, parents may experience feelings of inadequacy or powerlessness if they believe their coping strategies are insufficient to meet the demands of the situation [10]. By employing cognitive reappraisal and coping strategies, caregivers of children with special needs can effectively navigate the challenges and stress associated with caregiving, thereby fostering resilience and positive developmental outcomes [11]. While trauma can induce distress, it also presents opportunities for personal growth and transformation [3].

By reframing their experiences and leveraging their strengths, parents have the potential to access post-traumatic growth, discovering meaning and optimism amidst adversity [5]. Understanding post-traumatic growth in parents of children with special needs has significant implications for enhancing the well-being of their children. Parents who experience post-traumatic growth may adopt a more resilient, resourceful, and optimistic approach to their parental responsibilities, potentially influencing the learning environment and outcomes for their children [12]. Therefore, it is essential for the field of early childhood special education to

recognize and support the post-traumatic growth of parents with children who have disabilities. By adopting a broader perspective that extends beyond trauma, educators and researchers have the opportunity to facilitate positive changes in the lives of parents and enhance the academic performance of children with special needs [13].

Despite the challenges posed by trauma, individuals demonstrate inherent resilience and adaptive capacities. One effective strategy involves intentional introspection, where individuals engage in self-reflection to derive meaning from their experiences and identify opportunities for personal growth. Individuals have the potential to cultivate a sense of agency and empowerment when they actively acknowledge and regulate their emotions to overcome challenges. Seeking social support and professional counseling can provide valuable opportunities for individuals to address trauma and develop coping strategies. It is crucial to recognize the potential risks associated with persistent distress, as it can lead to intrusive rumination and exacerbate psychological symptoms. There is a growing acknowledgment of the factors that contribute to the development of post-traumatic growth in parents of children with special needs.

Numerous studies have emphasized the negative impacts of trauma on parents of children with special needs, underscoring the importance of raising societal awareness (e.g., [1, 14, 15]). The prevailing notion that caring for such children is arduous adds to the already substantial responsibilities of parenting. It is crucial to acknowledge the significant challenges associated with core beliefs regarding the conception and upbringing of children with special needs. Mediating factors, such as self-disclosure, social support, and intentional rumination, have been recognized as mechanisms that facilitate the emergence of post-traumatic growth. The concept of decentralization emerges as a protective factor, offering valuable insights into cognitive processes essential for adaptive outcomes. Understanding post-traumatic growth in parents significantly impacts the academic performance of their children. Parents who undergo post-traumatic growth may develop increased resilience, resourcefulness, and optimism in their capacity as caregivers, potentially influencing the educational environment and achievements of their children.

Recent studies have prompted inquiries into the assumption that trauma always leads to dysfunction. The influence of trauma is believed to be significantly affected by how individuals interpret their traumatic experiences (e.g., [12, 13]). Trauma has the potential not only to induce distress but also to create opportunities for positive growth. Post-traumatic growth serves as a protective factor that helps mitigate the negative effects of trauma, resulting in a positive transformation that surpasses the individual's initial level of adaptation or psychological well-being [16]. The primary psychological response following a traumatic event involves a disturbance in core beliefs, leading to heightened psychological distress and a reassessment of values, thereby challenging the individual's worldview [13]. Individuals employ adaptive mechanisms to mitigate the erosion of core beliefs through intentional reflection. This practice enables the creation of significance and the resolution of issues. Another factor influencing post-traumatic growth is "decentralization," referring to the ability to acknowledge differences between reality and its interpretation [17, 18].

Cognitive strategies that facilitate decentralization play a pivotal role in fostering post-traumatic growth. The correlation between self-disclosure and social support has also been linked to post-traumatic growth [17, 18]. Self-disclosure is associated with post-traumatic growth by alleviating obsessive thoughts and anxiety that stem from consciously suppressing stressful experiences [19]. Furthermore, social support is recognized as a crucial factor that has a positive influence on emotional well-being. Thus, this study aims to develop a structural model of post-traumatic growth in parents of children with special needs by identifying both direct and indirect factors that impact this growth. By evaluating the proposed model and exploring the relationships between variables and post-traumatic growth, this study seeks to enhance interventions designed to promote the post-traumatic growth of parents and, consequently, their children with special needs.

2. HYPOTHETICAL RESEARCH FRAMEWORK

The research framework, based on Calhoun and Tedeschi's (2006) post-traumatic growth model, seeks to clarify the factors that impact post-traumatic growth in parents of children with special needs. The study investigates the mediating roles of self-disclosure, social support, and deliberate rumination in this influence.

Moreover, the inclusion of decentralization as a protective element enhances the model by underscoring the significance of cognitive processes in fostering favorable adjustment to trauma. This comprehensive model considers the significance of core belief challenge and decentering as crucial elements that affect self-disclosure, social support, and intentional reflection. These factors, in turn, influence the final result of post-traumatic growth (Fig.1).

The study suggests that the core belief challenge related to the birth and upbringing of children with special needs operates as an exogenous variable. This indicates that the fundamental beliefs of parents can be influenced by the challenges associated with caring for children with special needs. Decentralization is proposed as a protective mechanism to prevent the breakdown of fundamental beliefs, thereby reducing the likelihood of post-traumatic growth. The concept of decentralization is posited as a protective element that serves to mitigate the collapse of fundamental beliefs, consequently lowering the likelihood of post-traumatic growth. The concept of decentralization, characterized by the capacity to recognize discrepancies in cognition and affect, is thought to support deliberate contemplation, acting as a safeguard against the undermining of core convictions.

The model includes mediating variables to elucidate the mechanisms through which challenging core beliefs impacts post-traumatic growth. Self-disclosure, social support, and deliberate rumination are acknowledged as essential mediating factors. The variables under consideration represent the cognitive and emotional processes that parents utilize to navigate and comprehend the challenges posed by their children's disabilities. Furthermore, decentralization is anticipated to impact post-traumatic growth by enabling intentional introspection and setting a path that involves self-disclosure and social assistance. Self-disclosure, which involves sharing traumatic experiences like the challenges of raising children with special needs, plays a crucial role in promoting deliberate introspection. The process of self-disclosure enables detailed accounts of traumatic experiences, promoting profound introspection and assisting in cognitive and emotional assimilation.

In conclusion, the model posits theoretical pathways by which decentralization impacts post-traumatic growth. The process of decentralization is expected to influence post-traumatic growth by facilitating deliberative reflection, which sets a course involving self-disclosure and social assistance. This paper delves into the psychological ramifications experienced by parents of children with special needs, particularly focusing on the negative impact of trauma. Specifically, this paper explores the role of intentional introspection as a means of finding meaning and overcoming obstacles, while also highlighting the risks of persistent distress leading to intrusive rumination.

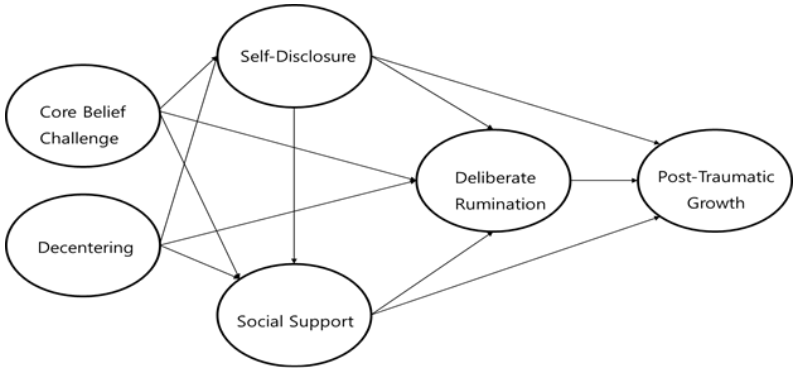

Figure 1. Hypothetical research framework

3. METHODS

3.1 Participants

This study centered on parents responsible for the care of children with special needs, ranging in age from five to thirteen years. Participants in the study were parents of children with special education needs who were

enrolled in summer and winter school programs coordinated by local educational authorities. The programs were specifically developed to cater to children with special educational requirements, with both parents and children participating together. While the children participated in activities, the parents were involved in educational programs. The study's objectives were conveyed to the parents during the camp, and those who consented to participate were provided with research questionnaires and consent forms. A total of 443 surveys were distributed from June 2022 to January 2023. Out of the total number of surveys, 325 completed surveys were included in the final analysis, while 57 surveys were not retrieved and 61 surveys were deemed to contain insincere responses. In terms of participant gender distribution, 283 (87.1%) were female and 42 (12.9%) were male. The most prevalent age bracket in the research was individuals between the ages of 40 and 49, constituting 120 participants (36.9% of the entire sample). In relation to educational achievement, the majority, 141 (43.4%), had completed a four-year university degree, while 115 (35.4%) had obtained a junior college degree. Out of the children with disabilities, 201 (61.8%) were male, and 124 (38.2%) were female. The predominant age groups observed among the children were 6-8 years, constituting 158 (48.0%), and 9-12 years, constituting 81 (24.9%). In relation to the nature of disability, 162 individuals (49.8%) were found to have an intellectual disability, 111 (34.2%) received a diagnosis of autism, and 26 (8.0%) were categorized as deaf.

Table 1. Summary of participant data for the study

(N=325)

Category		N	%
Gender	Man	42	12.9
	Women	283	87.1
Age	Under 29 year-olds	25	7.7
	30-39 year-olds	151	46.5
	40-49 year-olds	120	36.9
	50 year-olds	29	8.9
Education	High-school graduate	54	16.6
	College graduation	105	32.3
	University graduation	151	46.5

3.2 Measurement

3.2.1 Post-traumatic growth

The post trauma growth pertains to the positive psychological changes that occur after experiencing psychological trauma related to the diagnosis of a child's disability and the significant stress associated with caring for a child with a disability (Linley & Joseph, 2004). The evaluation of post-traumatic growth in parents of children with special needs necessitates the utilization of the scale developed by Tedeschi and Calhoun (1996). The Post-Traumatic Growth Scale is utilized to assess the degree of beneficial transformations encountered by an individual following a traumatic incident. The scale consists of 21 items categorized into five factors: 1) new possibilities, 2) interpersonal relationships, 3) personal resilience, 4) gratitude for life, and 5) spiritual transformation. Participants are required to provide their responses utilizing a 6-point Likert scale, with response choices ranging from 0 (not experienced) to 5 (experienced very much). The instrument demonstrated a high level of internal consistency, supported by a coefficient of 0.93. Moreover, the subscales exhibited internal consistencies ranging from 0.75 to 0.88.

3.2.2 Challenge to Core Beliefs

The Core-Belief Challenge is a concise assessment tool created to evaluate disruptions in an individual's assumptive framework (Cann et al., 2010). This statement evaluates the degree to which individuals reflect on their beliefs following a particular event, thus demonstrating their involvement in a particular type of cognitive processing. The Core-Beliefs Inventory (CBI) consists of nine items evaluated using a 5-point Likert scale, ranging from 1 for "not at all" to 5 for "strongly agree." The inventory has shown a reliability coefficient of 0.87 (Cann et al., 2010).

3.2.3 The Scale of Decentering

The Scale of Decentering, as introduced by Kim (2010), serves as a tool for assessing the implementation of decentering, a strategy utilized in Mindfulness-Based Cognitive Therapy. The process of decentering involves establishing psychological distance from one's mental experiences to cultivate an objective and non-judgmental perspective towards oneself. This process involves promptly acknowledging internal reactions to external stimuli without attempting to suppress or avoid emotions, thoughts, and physical sensations. Instead, it entails observing them from an objective standpoint (Kim, 2010). The scale consists of 15 items assessed on a 5-point Likert scale (ranging from 1 for "not at all" to 5 for "always") and covers three dimensions: immediate awareness, acceptance, and distance. The scale demonstrated a reliability coefficient of 0.91.

3.2.4 The Distress Disclosure Index (DDI)

The Distress Disclosure Index (DDI) was introduced by Kahn and Hessling in 2001 to assess individuals' propensity to disclose personally distressing information. This concise self-report questionnaire comprises 12 Likert scale items, with an equal distribution of six positive and six negative items. Each item is evaluated on a scale ranging from one to five. The maximum achievable score on the DDI is 60. A recent study has indicated that the Distress Disclosure Index (DDI) demonstrated a high level of reliability, as evidenced by a Cronbach's alpha coefficient of 0.89. The study exhibited a reliability coefficient of 0.90.

3.2.5 The Multidimensional Scale of Perceived Social Support (MSPSS)

MSPSS was developed by Zimet, Dahlem, Zimet, and Farley in 1988. It consists of a 12-item questionnaire designed to evaluate an individual's perceived social support from family, friends, and significant others. Each item is assessed on a scale ranging from 1 to 7, which includes three subscales for family, friends, and significant others. The study illustrated that the reliability coefficients for each subscale were 0.89 for the family subscale, 0.86 for the friends subscale, 0.82 for the significant others subscale, and 0.91 for the total scale.

3.2.6 Engaging in Deliberate Rumination

The act of deliberate rumination, defined as a focused effort to comprehend and tackle issues, is anticipated to correlate with post-traumatic growth (PTG). The Event-Related Rumination Inventory (ERRI), developed by Cann, Calhoun, Tedeschi, Triplett, Vishnevsky, and Lindstrom in 2011, is utilized to assess this specific construct. The ERRI consists of 10 questions evaluated on a 4-point scale. Higher scores indicate a more effective use of deliberate rumination. The reliability coefficient of the deliberate rumination tool was established to be 0.90

3.3 Data Analysis

The data analysis was performed utilizing SPSS for Windows version 20 and Amos 4.0 statistical software. A significance level below 0.05 was deemed to denote statistical significance. The scores derived from all scales underwent standardization to a 5-point scale, followed by statistical analyses conducted on the standardized scores. The structural equation modeling analyses were executed in a three-step procedure. The investigation commenced with an exploratory factor analysis aimed at examining post-traumatic growth among parents of children with disabilities. The analysis sought to determine the five variables (core-belief

challenges, decentering, self-disclosure, social support, deliberate rumination) that impact post-traumatic growth through the utilization of principal axis factoring and oblique rotation.

These techniques are frequently employed in structural equation modeling to decrease the quantity of variables. Both observed and unobserved variables underwent evaluation for collinearity, and correlated variables were amalgamated into composite factors with distinct factor loadings. The determination of the number of factors was predicated on two criteria: eigenvalues exceeding 1 and the proportion of variance accounted for by the factors being below 70%. Subsequently, the factors were incorporated into a model via confirmatory factor analysis, and the model's compatibility with the data was evaluated through goodness of fit tests. Several models were assessed before identifying the most appropriate one. The model resulting from confirmatory factor analysis was subsequently integrated into a structural equation model to investigate the interconnections among the five variables (core-belief challenges, decentering, self-disclosure, social support, deliberate rumination) and the post-traumatic growth reported by parents of children with special needs.

4. RESULTS

4.1 The validity of the research variables

The outcomes of the validity evaluation conducted on the research variables provide robust evidence supporting their reliability and discriminant validity, thereby confirming their suitability for inclusion in the research model. The outcomes of the normality assessments revealed that the variables displayed skewness values ranging from 0.05 to 0.69 and kurtosis values ranging from 0.06 to 1.05, indicating adherence to a normal distribution. The correlation coefficients between the measured variables ranged from $r = 0.11$ to $r = 0.65$ ($p < 0.05$), signifying significant relationships as hypothesized in the research model. Multicollinearity was assessed by reviewing tolerance values, all of which exceeded 0.10, and variance inflation factors, none of which surpassed 10. The results suggest that there is no multicollinearity present among the independent variables. The variance extraction index of the latent factors ranged from 0.84 to 0.92, surpassing the threshold of 0.50. This indicates that the variables adequately captured the fundamental constructs they were intended to assess. Moreover, the reliability of each concept was evaluated using Cronbach's alpha, ranging from 0.84 to 0.92, exceeding the minimum threshold of .70. This serves to provide additional support for the internal consistency and reliability of the measurement variables. The results presented in this study provide strong empirical evidence that supports the discriminant validity and reliability of the measurement variables. This statement provides support for their incorporation into the research framework, thereby bolstering the credibility of the subsequent analysis and interpretation of findings.

Table 2. Mean and Standard deviation for variable

(N=325)

Variables		Mean (SD)
Core-beliefs challenge		4.14±1.04
Decentering	Immediate awareness	2.97±0.67
	acceptance	3.11±0.64,
	distancing	2.86±0.90
Self-Disclosure		3.16±0.89
Social Support	family	4.13±0.85

	Friends	4.15±0.94
	Significant others	4.09 ±0.72
Deliberate rumination		2.40±1.05
Post-trauma growth	new possibilities	2.11±1.04
	relating to others	2.40±1.13,
	personal strength	2.63±1.05
	appreciation of life,	2.03±1.04
	spiritual change	1.63±1.30

Table 3. Correlations and measured variables

(N=325)

Variables	X1	X2	X3	X4	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
	r	*r*	*r*	*r*	*r*	*r*	*r*	*r*	*r*	*r*	*r*	*r*	*r*	*r*
X1	-													
X2	0.15*	-												
X3	0.26	0.71*	-											
X4	0.20***	0.70**	0.65**	-										
Y1	0.33**	0.24**	0.37**	0.24***	-									
Y2	0.16**	0.20**	0.36**	0.30***	0.59***	-								
Y3	0.13**	0.25**	0.40***	0.21***	0.47***	0.80***	-							
Y4	0.15**	0.28**	0.33***	0.26***	0.49**	0.86***	0.77***	-						
Y5	0.37***	0.33**	0.40**	0.35***	0.36**	0.54***	0.47***	0.43*	-					
Y6	0.31***	0.21**	0.36*	0.26***	0.33**	0.41*	0.41***	0.45***	0.58**	-				
Y7	0.41	0.25**	0.27**	0.28***	0.30*	0.65***	0.59***	0.62*	0.45**	0.61*	-			
Y8	0.17**	0.25**	0.21*	0.30**	0.28	0.47***	0.46***	0.36**	0.62**	0.69***	0.71***	-		
Y9	0.16**	0.20**	0.26***	0.36**	0.35**	0.45*	0.36*	0.42**	0.39**	0.62***	0.65***	0.66***	-	
Y10	0.11**	0.16***	0.17**	0.16**	0.13**	0.18**	0.21**	0.25**	0.18**	0.44**	0.36**	0.40***	0.48***	-
MSD	4.14±1.04	2.97±0.67	3.11±0.64	2.86±0.90	3.16±0.89	4.13±0.85	4.15±0.94	4.09±0.72	2.40±1.05	2.11±1.04	2.40±1.13	2.63±1.05	2.03±1.04	1.63±1.30
Skewness	0.37	0.54	0.47	-0.60	-0.30	-0.15	-0.05	0.41	-0.33	-0.09	-0.37	-0.70	0.49	0.40
Kurtosis	-.1.13	-0.48	-0.67	-0.56	0.48	-0.31	-0.77	-0.70	-0.30	-0.09	-0.24	-0.64	-0.98	-0.38
CCR	0.91		0.88		0.87		0.89		0.92			0.84		
AVE	0.83		0.86		0.82		0.88		0.88			0.76		

*p<0.05, **p<0.01, ***p<0.001

X1=core-beliefs challenge, X2=immediate awareness, X3=acceptance X4=distancing Y1=self-exposure Y2=family Y3=family t Y4=significant others Y5=deliberate rumination, Y6= new possibilities Y7= relating to others, Y8= personal strength, Y9= appreciation of life,, Y10= spiritual change AVE=Average Variance Extracted, CCR: Composite Construct Reliability, M=Mean, SD=Standard Deviation

4.2 Evaluation and Rectification of Hypothetical Models

The structural model for post-traumatic growth among parents of children with developmental disabilities has been subjected to thorough examination and testing. The preliminary fit indices for the theoretical model indicated a generally acceptable fit. However, several pathways were determined to be statistically insignificant. Six theoretically valid paths were subsequently excluded from the analysis due to their lack of statistical significance. This led to an adjusted model with an increased number of degrees of freedom. The fit indices for the hypothetical model were generally deemed satisfactory. This assertion is substantiated by a notable chi-square value ($\chi2=357.04$, $p<0.001$) with 97 degrees of freedom, leading to a chi-square to degrees of freedom ratio ($Q(\chi2/df)=3.68$, 20.8). Furthermore, the model exhibited a goodness of fit index (GFI = 0.93, GFI > 0.90), Tucker-Lewis index (TLI = 0.92, TLI > 0.90), comparative fit index (CFI = 0.93, CFI > 0.90), parsimonious comparative fit index (PCFI = 0.63, PCFI > 0.50), and standardized root mean square residual (SRMR = 0.45, SRMR < 0.50).

A revision was deemed necessary for the pathway where the fixed index was deemed insignificant. The pathways from challenging core beliefs to post-traumatic growth, challenging core beliefs to social support, decentralization to post-traumatic growth, self-exposure to contemplative rumination, and social support to post-traumatic growth did not exhibit statistically significant fixed indices. Consequently, six theoretically valid paths were excluded because the correction index for these paths did not reach statistical significance. The study then proceeded to compare the adjusted model with the initial hypothetical model to ascertain the most effective model following the removal of pathways. The revised model, with an increased degree of freedom of 3, was determined to be superior. The comparison between the adjusted and hypothetical models conclusively illustrated the superiority of the adjusted model, thus affirming the decision to eliminate certain pathways.

4.3 Evaluation and Analysis of the Modified Model

The adequacy of the adjusted model was evaluated by employing various fitness indices, all of which consistently demonstrated a strong fit. The adequacy of the adjusted model in this study was assessed through the utilization of various fitness indices. The results revealed a $\chi2$ value of 370.50 ($p < 0.001$) with 100 degrees of freedom. This yielded a $Q(\chi2/df)$ value of 3.75 (20.8), a GFI of 0.93 (GFI > 0.90), a TLI of 0.92 (TLI > 0.90), a CFI of 0.93 (CFI > 0.90), a PCFI of 0.63 (PCFI > 0.50), and an SRMR of 0.45 (SRMR < 0). The overall fit was assessed to be 0.50. When comparing the hypothetical model and the adjusted model, the CAIC value was utilized, following the suggestion made by Moon (2009). The CAIC value of the hypothetical model was determined to be 426.82, while the adjusted model yielded a value of 405.56. This indicates that the adjusted model exhibited lower CAIC values compared to the hypothetical model. The comparison of the adjusted model with the hypothetical model based on the CAIC value revealed a notably lower CAIC value for the adjusted model, suggesting its superior performance. Consequently, it was determined that simplifying the adjusted model was significantly more effective than simplifying the hypothetical mode.

4.4 Assessing the Statistical Significance of the Estimated Coefficients in the Modified Model

This study investigated the complex interconnections among core-belief challenge, decentralization, self-disclosure, social support, deliberate rumination, and post-traumatic growth in caregivers of children with developmental disabilities. The examination of the adjusted model revealed that all pathways exhibited statistical significance. Upon analyzing the adjusted model, it was noted that all pathways in the modified model showed statistical significance. An observable increase in post-traumatic growth was identified, particularly concerning heightened levels of social support and purposeful rumination. Intentional reflection showed significant correlations with heightened core belief questioning, decentralization, and social backing. Significant enhancements in social support were noted in correlation with increased levels of decentralization and self-disclosure. The degree of self-disclosure exhibited a significant rise in association with elevated levels of core belief challenge and decentralization.

4.4.1 Self-Disclosure

The challenge to core beliefs had a positive impact on self-disclosure (β = 0.27, C.R = 5.40***), indicating that caregivers who faced challenges to their core beliefs were more inclined to engage in self-disclosure. Furthermore, decentering significantly predicted self-disclosure (β = 2.38, C.R = 5.70***), implying that caregivers who underwent a change in their perception of control and autonomy were more likely to participate in self-disclosure.

4.4.2 Social Support

Although the direct relationship between core-belief challenge and social support was found to be nonsignificant, an indirect effect was observed (Indirect effect = 0.07*). This indicates that core-belief challenge may impact social support through intermediary factors. The results demonstrate a significant positive impact of decentering on social support (β = 0.19, C.R = 5.07***), suggesting that caregivers who underwent a transformation in their perception of control and independence were more inclined to receive social support. Additionally, self-disclosure was found to be a significant predictor of social support (β = 2.57, C.R = 5.80***), indicating that caregivers who practiced self-disclosure were more likely to receive social support from their social circles.

4.4.3 Deliberate Rumination

The challenge to core beliefs had a significant positive impact on deliberate rumination (β = 0.35, C.R = 4.53***). This suggests that caregivers who faced challenges to their core beliefs were more inclined to engage in deliberate rumination. Decentering was found to be a significant predictor of deliberate rumination (β = 3.59, C.R = 4.25***). This indicates that caregivers who underwent a change in their perception of control and autonomy were more likely to participate in deliberate rumination. Self-disclosure exhibited a modest yet noteworthy indirect impact on deliberate rumination (Indirect effect = 0.04*). This implies that caregivers who practiced self-disclosure showed a slightly higher tendency to participate in deliberate rumination. Social support had a positive impact on deliberate rumination (β = 0.30, C.R = 3.04***), suggesting that caregivers who received social support were more inclined to engage in deliberate rumination.

4.4.4 Post-Traumatic Growth

Although the direct relationships from core belief challenge, decentralization, and self-disclosure to post-traumatic growth did not show significance, there were notable indirect effects. This suggests that these factors impacted post-traumatic growth through alternative mediators. Social support had a significant positive impact on post-traumatic growth (β = 0.14, C.R = 3.44***), suggesting that caregivers who received social support were more inclined to undergo post-traumatic growth. Deliberate rumination exhibited the most significant direct impact on post-traumatic growth (β = 0.69, C.R = 8.15***). This implies that caregivers who practiced deliberate rumination were more inclined to undergo post-traumatic growth.

Table 4. Parameter estimates for modified structural model and standardized, direct, Indirect, and total effects

(*N*=325)

Path			β	β(SE)	C.R	SMC	Direct effect	Indirect effect	Total effect
Self-disclosure						0.24			
Core-belief challenge	→	Self-disclosure	.27	0.29 (0.04)	5.40***		0.29**	-	0.29**
Decentering	→	Self-disclosure	2.38	0.37 (0.07)	5.70***		0.37**	-	0.37*
Social support						0.41			
Core-belief challenge	→	Social support	-	-	-		-	0.07*	0.07*
Decentering	→	Social support	.19	0.23 (0.03)	5.07***		0.23**	-	0.23*

Self-disclosure	→	Social support	2.57	0.50 (0.09)	5.80***		0.50**	0.09*	0.59**
Deliberate rumination						0.50			
Core-belief challenge	→	Deliberate rumination	0.35	0.26 (0.04)	4.53***		0.26**	0.01*	0.27**
Decentering	→	Deliberate rumination	3.59	0.49 (0.06)	4.25***		0.49**	0.08*	0.57**
Self-disclosure	→	Deliberate rumination	-	-	-		-	0.04*	0.04*
Social support	→	Deliberate rumination	0.30	0.20 (0.03)	3.04***		0.20**	-	0.20*
Postrumatic growth						.71			
Core-belief challenge	→	Post-traumatic growth	-	-	-		-	0.26*	0.26*
Decentering	→	Post-traumatic growth	-	-	-		-	0.51*	0.51*
Self-disclosure	→	Post-traumatic growth	-	-	-		-	0.10*	0.10*
Social support	→	Postrumatic growth	0.14	0.27 (0.04)	3.44***		0.27**	0.04*	0.31***
Deliberate rumination	→	Postrumatic growth	0.69	0.75 (0.09)	8.15***		0.75**	-	0.75***

*p<0.05, **p<0.01***p<0.001

C.R=Critical Ratio, SE=Standard Error, SMC=Squared Multiple Correlation.

4.5 Examination of the Impact of the Modified Mode

An analysis was conducted to assess the influence of the modified model on post-traumatic growth, with a specific focus on the direct, indirect, and overall effects on endogenous variables. The variable that exhibited the most significant impact on post-traumatic growth was deliberate rumination, followed by decentralization, social support, core-belief challenge, and self-exposure. The combined variables accounted for 71% of the variance in the model. The decentralization of core beliefs, collapse of social support, and their subsequent impact on post-traumatic growth were found to be significant, mediated by self-exposure, social support, and deliberate rumination. Moreover, decentralization exerted the most substantial impact on intentional contemplation, with core beliefs being challenged, social support, and self-exposure following suit. Collectively, these factors accounted for 50% of the variability. Self-disclosure demonstrated a notable indirect impact on post-traumatic growth via social support. Moreover, self-disclosure exhibited the most substantial impact on social support, succeeded by decentralization and the collapse of core beliefs, elucidating 41% of the variability. The self-exposure of parents of children with developmental disabilities was primarily influenced by decentralization, with the core belief challenge following closely behind, accounting for 24% of the variance. The process of deliberate rumination exhibited the most substantial direct impact on post-traumatic growth. In contrast, decentralization showed the most notable direct influence on deliberate rumination, and self-exposure had the most significant direct effect on social support. The findings offer significant insights into the determinants of post-traumatic growth in caregivers of children with developmental disabilities, highlighting the intricate interaction of cognitive, emotional, and social processes the trajectory of post-traumatic growth.

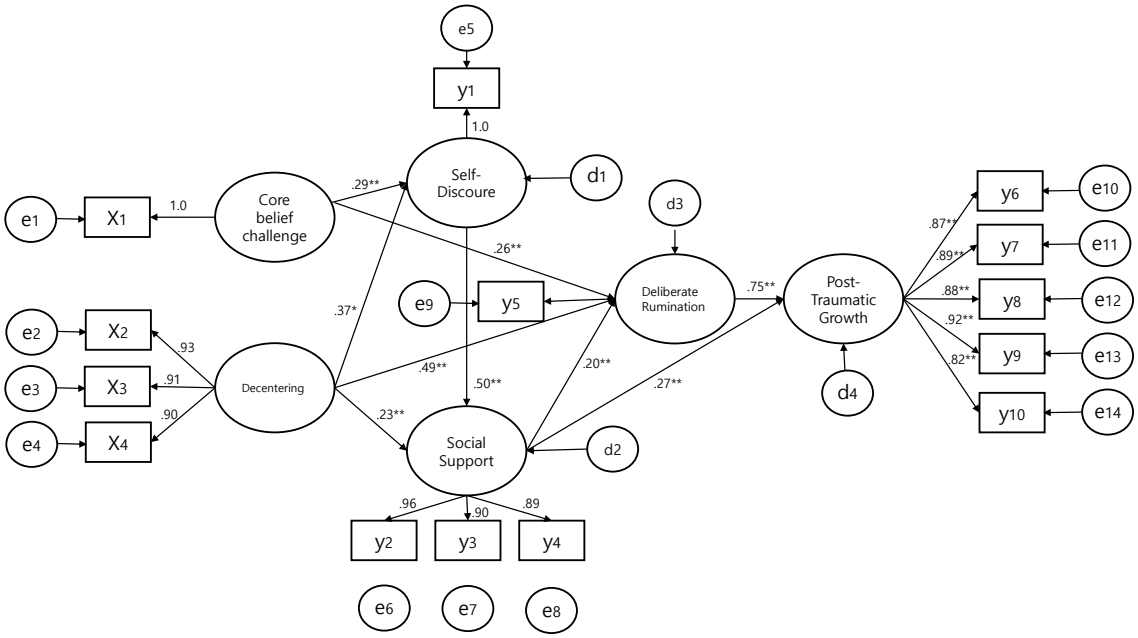

Figure 2. Factors associated with post-traumatic growth in parents of children with special needs

5. DISCUSSION AND CONCLUSION

The principal objective of this study is to propose and authenticate a post-traumatic growth model for parents of children with developmental disabilities by drawing upon current research and the post-traumatic growth model. This study is significant due to its investigation of the progression towards post-traumatic growth. It introduces a comprehensive model that includes cognitive processes, coping strategies, and sociocultural factors as intra-personal variables. The findings of the study revealed that the model and every pathway among the factors demonstrated statistical significance. Core beliefs, decentralization, self-disclosure, social support, and intentional reflection collectively accounted for 71% of the factors linked to post-traumatic growth.

The path analysis underscores the intricate characteristics of post-traumatic growth in caregivers of children with developmental disabilities, emphasizing the interrelatedness among core belief challenge, decentralization, self-disclosure, social support, deliberate rumination, and growth outcomes. By recognizing the complex interconnections among these variables, interventions can be tailored to enhance adaptive coping strategies, establish supportive social networks, and facilitate cognitive processing. This, in turn, can increase the probability of post-traumatic growth within this specific population.

Deliberate rumination has been identified as the primary predictor of post-traumatic growth in parents of children with developmental disabilities. According to theory of Post-traumatic growth (PTG), individuals can experience positive psychological changes following a traumatic event. Deliberate rumination, a cognitive process characterized by purposeful reflection and introspection about one's traumatic experiences, is a key component of this theory [13]. In the context of parents of children with developmental disabilities, deliberate rumination may involve reflecting on the challenges and stressors associated with raising a child with special needs, as well as exploring the positive aspects and personal strengths that have emerged from the experience. By engaging in deliberate rumination, parents may develop a deeper understanding of themselves and their circumstances, leading to greater resilience, personal growth, and post-traumatic growth. Active reflection has been found to enhance the recognition of positive changes that occur following a traumatic event. This discovery is consistent with previous research that suggests the possibility of personal development following exposure to trauma. Moreover, individuals demonstrating high levels of decentralization displayed increased

post-traumatic growth, as indicated by enhanced metacognitive and cognitive problem-solving skills. The study also proposed that intentional reflection serves as a mediating factor within the context of post-traumatic growth. It helps mitigate trauma by encouraging thoughtful contemplation aimed at comprehending traumatic experiences.

Furthermore, the research emphasized the beneficial impact of social support on post-traumatic growth by aiding individuals in viewing their situations from a metacognitive standpoint. Deliberate introspection, guided by purposeful contemplation, has been identified as a significant factor in fostering post-traumatic growth [13, 20]. Social Cognitive Theory suggests that social support facilitates post-traumatic growth by providing individuals with the resources, encouragement, and validation needed to engage in metacognitive processing and deliberate introspection. By receiving support from others, individuals are better able to step back from their experiences, view them from a broader perspective, and make meaning out of adversity. Deliberate introspection, guided by purposeful contemplation, allows individuals to actively process their experiences, reframe their narratives, and identify opportunities for personal growth and resilience [15, 21]. The study underscored the significance of social support for parents of children with disabilities who have experienced trauma, highlighting the necessity of taking into account the distinctive features of their social support networks.

The study emphasized the importance of self-disclosure in post-traumatic growth, revealing its impact on social support and intentional rumination. While self-disclosure did not have a direct effect on post-traumatic growth, it did influence other factors that contribute to growth. The Transactional Model of Stress and Coping, proposed by Lazarus and Folkman(1984) [22], posits that individuals' cognitive appraisal of stressors and their coping strategies influence their psychological responses and adaptation to stressful events. According to this model, coping strategies can be problem-focused (aimed at altering the stressor) or emotion-focused (aimed at regulating emotional distress [23]. Coping is also influenced by social support, which can provide individuals with resources and encouragement to cope effectively with stressors. In the context of post-traumatic growth, the study suggests that self-disclosure plays a significant role in facilitating growth by influencing social support and intentional rumination. Self-disclosure allows parents to share their traumatic experiences and emotions with others, which can lead to increased social support and validation. Social support, in turn, provides individuals with resources, encouragement, and a sense of belonging, facilitating coping and adaptation to the trauma [13, 24].

Additionally, self-disclosure may also influence intentional rumination, which involves purposeful reflection and cognitive processing of the trauma. The Dual Process Model, proposed by Stroebe and Schut(1999) [25], Dual Process Model of Coping with Bereavement suggests that self-disclosure influences intentional rumination by facilitating both loss-oriented and restoration-oriented coping processes. By engaging in purposeful reflection and cognitive processing of the trauma, parents can navigate the emotional and practical dimensions of the traumatic experience, facilitating adaptation, and coping in the aftermath of trauma or loss. In the context of trauma or loss, self-disclosure can influence intentional rumination by facilitating both loss-oriented and restoration-oriented coping processes. Self-disclosure involves sharing one's thoughts, emotions, and experiences with others, which can serve as a form of loss-oriented coping by allowing individuals to confront and process the emotional aspects of the trauma [26]. By disclosing their experiences to others, individuals may engage in deliberate introspection and meaning-making, leading to cognitive reappraisal and personal growth. While self-disclosure may not directly lead to post-traumatic growth, it influences other factors that contribute to growth, such as social support and intentional rumination [19].

The study underscored the significance of counseling programs for parents of children with developmental disabilities in facilitating voluntary self-disclosure as a precursor to post-traumatic growth. The text subsequently delves into the diverse factors that impact post-traumatic growth in these parents. The promotion of mental well-being and the adoption of effective coping mechanisms are facilitated by social support for caregivers. This assistance has the potential to enhance emotional regulation, boost feelings of competence, and improve access to coping mechanisms, thereby increasing the likelihood of experiencing post-traumatic growth. Although direct associations between particular variables and post-traumatic growth may not consistently demonstrate significance, it is imperative for researchers to recognize the indirect influence of these variables through alternative mediators such as intentional rumination. Enhancing access to social

support networks can facilitate emotional regulation and competence, thereby enhancing caregivers' ability to experience post-traumatic growth.

The inclusion of deliberate reflection and the establishment of significance within the Individualized Family Service Plan (IFSP) can enhance the promotion of post-traumatic growth. This can be achieved by enabling caregivers to formulate new narratives and derive meaning from difficult experiences [18]. The significant impact of purposeful contemplation on post-traumatic growth underscores the significance of participating in conscious reflection and the process of creating meaning as crucial elements that affect the outcomes of growth [3]. This discovery is consistent with post-traumatic growth theories, which underscore the significance of cognitive processing in enabling favorable psychological changes after experiencing trauma [18]. By engaging in deliberate introspection, individuals providing care can construct fresh narratives, extract significance from challenging situations, and promote personal growth and resilience in times of adversity [27].

Professionals in the field of special education must consider the complex interrelationships among cognitive, emotional, and interpersonal factors when developing Individualized Family Service Plans (IFSPs) for parents of children with disabilities. Professionals can enhance interventions aimed at promoting adaptive coping strategies, strengthening support systems, and facilitating cognitive processing by acknowledging factors such as core belief challenges, decentering, self-disclosure, social support, intentional rumination, and post-traumatic growth. This approach has the potential to enhance the resilience and well-being of caregivers [28].

Emphasizing the importance of cognitive and emotional processing within the Individualized Family Service Plan (IFSP) is crucial for promoting post-traumatic growth. Through the implementation of interventions that promote adaptive coping strategies, facilitate support networks, and assist in cognitive processing, special educators can improve their support for the post-traumatic growth observed in parents of children with disabilities [29]. Caregivers should receive customized resources and assistance that acknowledge the complex interplay among core belief challenges, decentering, self-disclosure, social support, deliberate rumination, and growth outcomes within the Individualized Family Service Plan (IFSP) framework [10]. This study provides a comprehensive analysis of the determinants that impact post-traumatic growth in parents of children with disabilities. It emphasizes the significance of cognitive mechanisms, perceived social support, and the dynamics of self-disclosure. The findings provide valuable insights for trauma treatment and counseling for parents of children with disabilities. They also underscore the importance of further research to investigate additional variables, including gender, types of traumatic events, age of children with disabilities, and the severity of trauma.

As an academic with expertise in special education and experience as a special education teacher, it is crucial to comprehend the importance of post-traumatic growth among mothers of children with disabilities, as indicated by the findings of this path analysis. The identification of factors that promote post-traumatic growth is crucial for empowering mothers and their children. This highlights the significance of various elements, including challenging core beliefs, decentering, self-disclosure, social support, and intentional rumination, in facilitating growth among caregivers, particularly mothers of children with disabilities [11]. Educators in the field of special education play a vital role in creating a supportive environment for mothers and children with disabilities by recognizing and understanding the factors that promote post-traumatic growth. Encouraging children with disabilities to advocate for themselves, fostering belief in their capacity to surmount challenges, and offering chances for intentional introspection can cumulatively bolster their development and resilience.

Educators can support mothers by facilitating access to support networks, promoting self-disclosure and introspection, and validating their experiences. Educators can enhance the well-being and resilience of mothers of children with disabilities by recognizing the significance of social support and deliberate reflection in promoting post-traumatic growth. Understanding the factors that influence post-traumatic growth in parents of children with special needs is essential for bolstering resilience and empowerment [12, 30]. Educators have the potential to create supportive environments that foster growth and resilience in caregivers and their children through acknowledging the significance of core belief challenges, decentering, self-disclosure, social support, and intentional rumination.

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