Influence of Rumination and Coping on Post-Traumatic Growth among Mothers of Children with Autism

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Abstract

Background: The mothers of children with autism need to positively cope with this traumatic event and develop Post-Traumatic Growth .*Aim of the study*:to investigate the influences of rumination and coping on Post-traumatic Growth among mothers of children with autism **Subjects and methods**: This descriptive study was carried out in Abdul Salam Abu Al-Fadl Association in AlmahallaAlkobra city, Gharbia Governorate on 130 mothers of children with Autism Spectrum Disorder. A self-administered questionnaire was used in data collection and involved the Posttraumatic Growth Inventory,the Event-Related Rumination Inventory, and the Brief-COPE scale. The fieldwork lasted from June to September 2019.*Results*: Mothers; age ranged between 25 and 45 years, and 70.8% of the mothers and fathers had university education. Deliberate rumination was more (70.8%) than intrusive (60.0%). Slightly more than half of mothers had high total Post-traumatic Growth (51.5%). The positive approach coping style was the most used (60.0%). In hierarchical regression analysis, intrusive rumination and neither way coping were negative predictors of all domains of Post-traumatic Growth and its total, while deliberate rumination, avoidance and approach coping were positive predictors. ***Conclusion and recommendations***:The mothers of children with autism have average scores of Post-Traumatic Growth, with relatively high rumination especially the deliberate type, and mostly use approach positive coping. Deliberate rumination and coping positively predict their Post-Traumatic Growth, while intrusive rumination is a negative predictor. Based on the finding of the current study, the following is recommended, training in positive coping is recommended for these mothers.

Keywords: Rumination, Coping, Post-Traumatic Growth (PTG),Autism (ASD)

Introduction

The diagnosis of Autism Spectrum Disorder (ASD) in a child constitutes devastating event for child family. This incident is associated with a gamut of negative feelings including denial, anxiety, and anger, followed by guilt sensations, pessimism, grief, and lower quality of life (*Peters-Scheffer, Didden, & Korzilius, 2012; Walsh, Mulder, & Tudor, 2013)*. Then, these parents are faced with many different caregiving problems due the mostly ineffective treatment of this disorder, in addition to the social and psychological stress due to their child discrimination and stigmatization, as well as the economic burden. Mothers are the most affected by such caregiving problems and are more vulnerable to anxiety and depression disorders *(Zhou et al., 2019)*.

In spite of the significant stress experienced by the parents and family caregivers of children suffering from disabilities, many of them are able to deal positively with the situation and even show personal growth from their experience, and may lead successful fulfilling live *(Young et al., 2020)*. Such positive outcomes of being the parent of a child having disability have been described in the literature. The Post-Traumatic Growth (PTG) is one of the most cited of these positive outcomes *(Byra et al., 2017)*. It refers to the positive change that happens as a consequence of the fight against challenging life events. It is explained by that the shocking event leads to emotional distress including anxiety, depression, and anger, but at the same time it may play a role of catalyst or moderator to induce positive changes in the form of better self-esteem, more social relations, and changes in the way of life *(Cetinbakis et al., 2018)*.

Among the factors that may influence family caregivers' ability to deal with the distress resulting from the diagnosis of ASD in their

children and their PTG is rumination. This is a cognitive process essential in modulating their view of life following this traumatic event *(Xu et al., 2016))*. In rumination, the family caregiver would think about this outrageous event again and again, and this often experienced by mothers of children suffering from ASD *(Gull and Husain, 2019)*. However, there are two different types of rumination, namely deliberate and intrusive types. The deliberate type involves careful re-examination and reflection about the event, which may be beneficial to the caregiver, whereas the intrusive type is characterized by focusing on the negative aspects of the event *(Wu et al., 2015)*.

The ability of the family caregivers to cope with their children' ASD diagnosis also has a critical role in their psychological wellbeing in response to the various stressors associated with their caregiving *(Mcauliffe et al., 2017)*. Based *Lazarus and Folkman (1984)* model, there are two main categories of coping, namely problem-based and emotion-based coping. The problem-based type is more proactive using problem-solving, planning, and instrumental support to deal with the source of stress. On the other hand, the emotion-based coping only tends to reduce or deal with the feeling of distress using acceptance, humor, positive reframing, and religion *(Benson, 2010)*. Meanwhile, dysfunctional coping involves denial, self-blaming, and substance use *(García et al., 2018)*. Research showed that positive or problem-focused coping is associated with more wellbeing and lower stress among ASD family caregivers in comparison with those who adopt emotion-focused strategies *(Miranda et al., 2019)*. They are also more able to develop PTG *(García et al., 2016)*.

Significance of the study

The mothers of children with ASD need to positively cope with this traumatic event to be able to adapt to life and develop PTG with more hope and better interpersonal relationship functioning, rather than suffering from related stressors. The positive consequences of PTG enable restoration and improvement of the health of the mother and the child with ASD. Therefore, this study is aimed to investigate PTG and its relations with rumination and coping among mothers of children with ASD.

Aim of the study

This study aimed to investigate the influences of rumination and coping on Post-Traumatic Growth (PTG) among mothers of children with autism (ASD).

Research Questions

1. Is rumination a predictor of PTG among mothers of children with ASD?

2. Is coping a predictor of PTG among mothers of children with ASD?

Subjects and Methods

Research design and setting:This descriptive study was carried out in Abdul Salam Abu Al-Fadl Association in AlmahallaAlkobra city, Gharbia Governorate.It is one of the largest institutions providing free care for developmental disabilities patients. The association serves a variety of urban and rural area at Al-Gharbia Governorate providing many services for them such aslearning, physiotherapy, treatment, and care. It receivesaround repeated 200 child/ adolescent per day.

Study sample: The study population consisted of mothers of children with ASD diagnosis. The only inclusion criterion for children was a confirmed diagnosis of ASD. For mothers, the inclusion criteria were providing care to the child with ASD and having at least a basic level of education. Those mothers suffering any diagnosed mental or psychological disorders were excluded. The sample size was calculated to detect a correlation coefficient of 0.25 or higher with 80% power and at a 95% level of confidence among the scores of coping, rumination, and PTG. Using the Open-Epi software package for sample size estimation for correlation, the required sample size was 123. This was increased to 130 to account for an expected non-response rate of about 5%. The sample size was large enough for further multivariate analyses. Mothers were recruited by convenience sampling to fulfil the required sample size.

Data collection tool:A self-administered questionnaire was used in data collection. It consisted of the following four sections:

▪ *Section I*: This was for respondent's socio-demographic data including mother age, parents' education and job, marital status,

residence, income, and family structure. It also covered child's characteristics such as age, gender, age when diagnosed, birth order, and academic level.

- *Section II*: This consisted of the Posttraumatic Growth Inventory PTGI developed by ***Tedeschi and Calhoun (1996)*** to measure the positive outcomes self-reported by individuals who experienced traumatic events. It consists of 21 items measuring five factors, namely relating to others, new possibilities, personal strength, spiritual change, and appreciation of life. The family caregiver is asked to recall the moment of hearing the diagnosis of Autism for His/her child. The responses were on a 6-point Likert type scale ranging from "*I did not experience this change as a result of my crisis*" to "*I experienced this change to a very great degree as a result of my crisis.*" These are scored from 0 to 5 respectively.

  Scoring: The total of each dimension and of the total scale were calculated by simple summing for a total score ranging between 0 to 105, with a higher score indicating more growth. These scores were standardized by dividing the sum by the number of items, for a maximum score of 5.00. The sums of scores were also converted into percent scores for categorical presentation of each dimension, as well as for the total score, and a score of 60% or higher was considered high, while a score <60% was considered low. For quantitative presentation of each dimension and of the total scale, means, standard deviations, medians and interquartile ranges were computed with a maximum score of 5.00 for each dimension and 25.00 for the total scale.

- *Section III*: This was the Event-Related Rumination Inventory (ERRI) tool developed by ***Cann et al. (2011)*** to measure intrusive and deliberate rumination. It has 20 items, ten for each type. The respondent is assessed for the presence of ruminations about the moment of his/her child's Autism diagnosis over the past 14 days. The responses are on a 4-point Likert type scale ranging from "not at all" to "often."

  Scoring: The items checked "I did not experience this change as a result of my

crisis; I experienced this change to a very small degree; I experienced this change to a small degree; I experienced this change to a moderate degree; I experienced this change to a great degree; I experienced this change to a very great degree as a result of my crisis" were scored from zero to 5 respectively. The total of each of the dimensions and of the total scale were calculated, and standardized by dividing the sum by the number of items, for a maximum score of 5.00. The sums of scores were also converted into percent scores for categorical presentation of each dimension, as well as for the total score, and a score of 60% or higher was considered high, while a score <60% was considered low. For the quantitative presentation of each dimension and for the total scale, means, standard deviations, medians and interquartile ranges were computed with a maximum score of 5.

- *Section IV*: This consisted of the Brief-COPE scale developed by ***Carver (1997)*** for evaluating the coping strategies people use when facing stress. The scale has 28 items covering three coping strategies. The avoidant strategy has 12 items covering 6 subscales namely self-distraction, denial, substance use, behavioural disengagement, self-blame, and venting. The approach strategy has 12 items covering 6 subscales namely active coping, use of emotional support, use of instrumental support, positive reframing, acceptance, and planning. The last strategy is the "neither type" and has 4 items in 2 subscales namely religion and humor. The responses are on a 4-point Likert-type scale from "I have not been doing this at all" to "I have been doing this a lot."

  Scoring: The items checked "I haven't been doing this at all; I've been doing this a little bit; I've been doing this a medium amount; I've been doing this a lot" were scored from zero to 3 respectively. The totals of each strategy were calculated and standardized by dividing the sum by the number of items, for a score ranging from 0.00 of 3.00. The sums of scores were also converted into percent scores for categorical analysis of each strategy, and a score of 60% or higher was considered as high coping, while a score <60% was considered low. Means, standard

deviations, medians and interquartile ranges were computed with a maximum score of 3 for quantitative presentation of each strategy.

Tool validity and reliability: The three scales used in data collection have documented good validity and reliability. Translation and reverse translation of the tool into the Arabic language was done as recommended to ensure its validity *(Behlingand Law 2000 ,)*. A panel of five experts in psychiatric mental health nursing then rigorously revised the toolto test the content and face validity of the questionnaire, which was deemed acceptable. The reliability was examined through assessing the internal consistency of the three scales. They had good level of reliability with Cronbach's Alpha coefficients 0.94 and 0.92 for intrusive and deliberate rumination, 0.97 for PTG, and 0.73, 0.90, and 0.55 for avoidance, approach, and neither type coping respectively.

Pilot study: A pilot study was carried out on 13 mothers with autistic children representing 10% of the required study sample to assess the tool for clarity and applicability as well as the practicality of fieldwork. Based on the pilot results minor changes were made in the tool in the form of rewording or rephrasing some items for more clarity. Participants in the pilot study were informed prior to inclusion that they would not be allowed to participate in the main study.

Fieldwork:After securing all officials permissions, the researchers visited the study settings and met with the director for arrangement of the data collection process. They started to recruit the study sample according to set criteria. Each eligible mother was briefed about the study aim and invited to participate after providing her oral consent. Those who consented were handed the data collection tool along with instructions regarding its filling. The researchers were present all the time for any needed clarification. The filled forms were collected and revised for completion. Each mother needed around 40 minutes to complete the form. Data were collected from June to September 2019.

Ethical considerations: The study protocol was approved by the Research Ethics Committee at the Faculty of Nursing, Zagazig University, and from concerned authorities at Abdul Salam Abu Al-Fadl Association. All official permissions to carry out the study were secured from pertinent authorities. Each participant provided her oral consent after being fully informed about the importance and aim of the study as well as the right to refuse or withdraw at any time.

Statistical analysis:Frequencies and percentages were used to present categorical data and means and standard deviations and medians and interquartile ranges for quantitative ones. The reliability of the scales was tested using Cronbach alpha analysis. The inter-relations among the scores of the three scales and with participants' characteristics were assessed by Spearman rank correlation analysis. The independent predictors of PTG score and the added effects of rumination and coping were identified using hierarchal regression analysis to control for covariates. Statistical significance was set at p-value <0.05.Allanalyses were performed on SPSS 20.0 statistical software package.

Results

The study sample consisted of 130 mothers of children with autism. As shown in Table, mothers' age ranged between 25 and 45 years, 58.5% of them were working. A majority (70.8%) of the mothers and fathers had university education. More than half of the families had sufficient income (69.2%) and resided in rural areas (56.2%). The numbers of family members were 3-7, and of children were 1-5. Approximately two thirds (61.5%) of the participants were aware of autism disorder.

Table 2 indicates that their age ranged between 3 and 14 years, with median 6 years. More than a half of them were males and firstborn, 68.5% and 59.2% respectively. The most frequent age at diagnosis was 3-year-old. Only 16.9%) were attending school, and 7.0% had other affected children with autism in the family.

Table 3 shows that deliberate rumination was more used among mothers (70.8%) than intrusive rumination (60.0%). Their Post-Traumatic Growth (PTG) ranged between 44.6% for new possibilities and 73.8% for spiritual change. Slightly more than half of them had high total PTG (51.5%). The positive approach coping style was the most used (60.0%) while only 8.5% were using the negative avoidant coping style. The median scores of most parameters were around two-thirds of their maximum scores, thus indicating that at least more than a half of the

mothers were having high scores. The only exceptions were the spiritual change score where the median score (4.00) represented 80% of its maximum score, and the avoidant coping where the median score (1.00) represented only one-third of its maximum score.

Table 4 demonstrates that the most used avoidant coping types were those of denial (51.5%) and self-distraction (49.2%). On the other hand, the least used were those of behavioual disengagement and substance abuse, 7.7% and 14.6%. as for the positive approach coping, the use of emotional (94.6%) and informational (93.1%) support were the most commonly used whereas the active coping (57.7%) and positive reframing (50.0%) were the least. As for the "neither" coping style, the use of humor (82.3%) was more than religion (58.8%). Overall, most women were using the positive approach coping (60.0%).

Table 5 demonstrates that intrusive rumination had a statistically significant moderate negative correlation with PTG (r=-0.652), and weak to moderate correlations with the avoidant and neither type coping, while it had a moderate positive correlation with the avoidant coping (r=0.494). Conversely, deliberate rumination had a positive correlation with PTG (r=0.392), as well as with approach and neither type coping. As for PTG and coping, the table shows a strong positive correlation with approach coping (r=0.808) and a weak negative correlation with the avoidant type (r=-0.392), while the correlation with the neither type coping was positive and moderate (r=0.510).

Table 6 points to statistically significant moderate negative correlations between intrusive rumination and mother and father education and family income, while the correlations with deliberate rumination were negative with these variables. Additionally, intrusive rumination correlated negatively with mother and child age and child educational level. As for PTG, it had significant weak to moderate positive correlations with all child and parents' characteristics except for childbirth order and age at diagnosis. As for coping, the avoidant type had significant weak to moderate negative correlations with parents' education and family income, as well as with child age, age at diagnosis, and educational level. These corelations were positive for the approach and neither type coping styles. Meanwhile, childbirth order had a positive correlation with the avoidant style and negative correlations with the other two coping styles.

Table 7 presents the results of hierarchical regression model. In Model 1, the covariates identified in bivariate analyses were entered. The results indicate that mother's awareness of autism and child age were significant positive predictors of all domains of PTG as well as its total, whereas child female gender was a negative predictor. The model r-square for the total PTG was 0.738.

Table 8 shows the results of hierarchical regression model. In Model 2, intrusive rumination and neither way coping were additional negative predictors of all domains of PTG and its total, while deliberate rumination, avoidance and approach coping were positive predictors. The addition of these variables in Model 2 led to significant increases in the corresponding r-squares of Model 1 so that the r-square for total PTG increased from 0.738 to 0.960. These r-square changes were statistically significant.

Table 1: Socio-demographic characteristics of mothers of autistic children in the study sample (n=130)

	Frequency	Percent
Mother age:		
<30	34	26.2
30-	80	61.5
40+	16	12.3
Range	25-45	
Mean±SD	33.1±5.1	
Median	33.0	
Mother education:		
Basic	15	11.5
Secondary	23	17.7
University	92	70.8
Mother job:		
Housewife	54	41.5
Working	76	58.5
Father education:		
Basic	5	3.8
Secondary	33	25.4
University	92	70.8
Father job:		
Unemployed	1	0.8
Working	129	99.2
Marital status:		
Married	129	99.2
Divorced	1	0.8
Residence:		
Urban	57	43.8
Rural	73	56.2
Income:		
Insufficient	40	30.8
Sufficient	90	69.2
Number of children:		
Range	1-5	
Mean±SD	2.6±1.1	
Median	2.0	
Family size:		
Range	3-7	
Mean±SD	4.6±1.1	
Median	4.0	
Aware of autism	80	61.5

Table2: Socio-demographic characteristics of autistic children in the study sample (n=130)

	Frequency	Percent
Child age (years):		
<6	63	48.5
6-	48	36.9
12+	19	14.6
Range	3-14	
Mean±SD	6.9±3.2	
Median	6.0	
Gender:		
Male	89	68.5
Female	41	31.5
Birth order:		
1	77	59.2
2+	53	40.8
Range	1-4	
Mean±SD	1.5±0.7	
Median	1.0	
Age at diagnosis (years):		
2	33	25.4
3	50	38.5
4	47	36.2
Attend school:		
No	108	83.1
Yes	22	16.9
Education level:		
None	74	56.9
Read/write	34	26.2
Primary	16	12.3
Preparatory	6	4.6
Other affected children	9	7.0

Table 3: Mothers' levels and scores of event-related rumination, post-traumatic growth, and coping

	High (60%+)		Scores				Quartiles	
	No.	%	Range	Mean	SD	Median	1st	3rd
Event-Related Rumination (max=3):								
Intrusive	78	60.0	0.60-3.00	1.97	0.69	2.00	1.30	2.68
Deliberate	92	70.8	0.80-3.00	1.93	0.60	1.90	1.55	2.40
Post-traumatic growth (PTG) (max=5):								
Relating to others	65	50.0	0.43-4.00	2.93	0.91	2.93	2.43	3.71
New possibilities	58	44.6	0.00-5.00	2.54	1.45	2.60	1.20	3.60
Personal strength	86	66.2	0.75-5.00	3.16	1.28	3.25	2.25	4.00
Spiritual change	96	73.8	1.00-5.00	3.68	0.92	4.00	2.50	4.50
Appreciation of life	73	56.2	0.33-5.00	2.71	1.39	3.00	1.00	3.67
Total PTG (max=25)	67	51.5	4.64-23.86	15.01	5.58	15.00	9.72	19.45
Coping (max=3):								
Avoidant	11	8.5	0.50-2.25	1.05	0.44	1.00	0.75	1.17
Approach	78	60.0	0.67-2.75	2.01	0.52	2.00	1.58	2.50
Neither	29	22.3	0.25-2.25	1.48	0.45	1.50	1.25	1.75

Table 4: Coping among mothers of autistic children in the study sample (n=130)

Coping: High (60%+)	Frequency	Percent%
Avoidant:		
Denial	67	51.5
Substance abuse	19	14.6
Venting	53	40.8
Behavioral disengagement	10	7.7
Self-distraction	64	49.2
Self-blame	25	19.2
Total avoidant		
High (60%+)	11	8.5
Low (<60%)	119	91.5
Approach:		
Active coping	75	57.7
Positive reframing	65	50.0
Planning	92	70.8
Acceptance	96	73.8
Use emotional support	123	94.6
Use informational support	121	93.1
Total approach		
High (60%+)	78	60.0
Low (<60%)	52	40.0
Neither:		
Humor	107	82.3
Religion	76	58.5
Total neither		
High (60%+)	29	22.3
Low (<60%)	101	77.7

Table 5: Correlation matrix of mothers' total scores of rumination, post-traumatic growth, and coping

	Spearman's rank correlation coefficient					
	Rumination		PTG	Coping		
	Intrusive	Deliberate		Avoid	Approach	Neither
Intrusive rumination	1.000					
Deliberate rumination	.065	1.000				
Post-traumatic growth(PTG)	-.652**	.392**	1.000			
Avoidance coping	.494**	.070	-.392**	1.000		
Approach coping	-.615**	.183*	.808**	-.595**	1.000	
Neither type coping	-.376**	.444**	.510**	-.178*	.503**	1.000

(*) Statistically significant at p<0.05   *(**) Statistically significant at p<0.01*

Table 6: Correlation between mothers' scores of rumination, post-traumatic growth, and coping and their own, family, and child characteristics

Characteristics	Spearman's rank correlation coefficient					
	Rumination		PTG	Coping		
	Intrusive	Deliberate		Avoid	Approach	Neither
Mother age	-.173*	.011	.397**	-.004	.126	.028
Mother education	-.372**	.302**	.553**	-.342**	.578**	.440**
Father education	-.370**	.283**	.557**	-.338**	.564**	.416**
Family income	-.421**	.212*	.460**	-.398**	.491**	.353**
No. of children	-.144	.118	.356**	.169	-.017	.089
Family size	-.147	.123	.364**	.163	-.009	.097
Child age	-.230**	.043	.547**	-.199*	.410**	.274**
Child birth order	.034	-.039	.083	.328**	-.269**	-.220*
Child age at diagnosis	.081	.145	.094	-.233**	.075	.255**
Child education level	-.439**	.092	.628**	-.396**	.521**	.387**

(*) Statistically significant at p<0.05   *(**) Statistically significant at p<0.01*

Table 7: Hierarchal regression models for mothers' post-traumatic growth (PTG) domains and total scores (Model 1)

	Post-traumatic growth (PTG) unstandardized beta coefficients					
	Relating to others	New possibilities	Personal strength	Spiritual change	Appreciation of life	Total PTG
MODEL 1:						
Constant	2.94	2.27	-3.41*	1.66	-1.93	1.53
Mother age	0.00	-0.02	0.00	0.02	-0.02	-0.02
Urban residence	0.13	-0.09	0.46**	0.26	0.16	0.92
Mother education	0.06	0.13	-0.36	0.07	-0.10	-0.20
Father education	0.33	-0.19	0.75**	0.38	0.53	1.81
Family income	-0.26	0.81**	0.29	-0.16	0.17	0.85
No. of children	1.26	1.04	-0.52	1.25*	0.22	3.25
Family size	-1.16	-0.66	0.89	-1.05	0.21	-1.77
Aware of autism	0.86**	1.51**	1.24**	0.71**	1.64**	5.97**
Child age	0.10*	0.24**	0.18**	0.16**	0.15**	0.83**
Child female gender	-0.52*	-1.24**	-0.33	-0.28	-0.07	-2.45
Child education	0.15	0.08	-0.09	-0.19	-0.24	-0.29
R-SQUARE						
Model 1	0.545	0.724	0.798	0.672	0.723	0.738

(*) Statistically significant at p<0.05   (**) Statistically significant at p<0.01

Table 8: Hierarchal regression models for mothers' post-traumatic growth (PTG) domains and total scores (Model 2)

	Post-traumatic growth (PTG) unstandardized beta coefficients					
	Relating to others	New possibilities	Personal strength	Spiritual change	Appreciation of life	Total PTG
MODEL 2:						
Constant	1.42	0.46	-3.87**	0.55	-2.60*	-4.04
Mother age	0.02	0.04**	0.03**	0.05**	0.02	0.17**
Urban residence	-0.18	-0.84**	-0.17	-0.20	-0.54**	-1.93**
Mother education	-0.20	-0.31	-0.57**	-0.20	-0.34*	-1.62**
Father education	0.31	0.22	1.08**	0.70**	0.85**	3.16**
Family income	-0.22	0.50**	-0.03	-0.39	-0.14	-0.28
No. of children	0.82	0.24	-1.17**	0.72	-0.61	0.01
Family size	-0.94	-0.33	1.17**	-0.82*	0.64	-0.27
Aware of autism	0.30	0.15	0.02	-0.33*	0.26	0.39
Child age	0.02	0.10*	0.09**	0.08**	0.02	0.31**
Child female gender	-0.37*	-0.72**	0.08	0.19	0.40*	-0.42
Child education	0.26*	-0.04	-0.23**	-0.38**	-0.31**	-0.71*
Intrusive rumination	-0.25*	-0.89**	-0.93**	-0.66**	-0.99**	-3.73**
Deliberate rumination	0.34**	0.82**	0.74**	0.34**	1.01**	3.25**
Avoidance coping	0.79**	0.53**	0.30**	0.30**	0.22	2.15**
Approach coping	1.34**	1.51**	1.06**	1.02**	1.24**	6.17**
Neither way coping	-0.47**	-0.23	-0.48**	-0.07	-0.73**	-1.97**
R-SQUARE						
Model 2	0.778	0.910	0.960	0.859	0.929	0.960
Change	0.222	0.186	0.162	0.188	0.206	0.202

(*) Statistically significant at p<0.05   (**) Statistically significant at p<0.01

Discussion

The incidence of autism is increasing worldwide and yet the parents of affected children lack needed psychological support due to deficient pertinent resources. This study investigated the influences of rumination and coping on Post-Traumatic Growth (PTG) among mothers of children with autism (ASD). The results of the study provide answers to the set research questions since mothers' rumination and coping were found to be significant predictors of their PTG regardless their socio-demographic characteristics.

According to the present study findings, slightly more than half of the mothers had high total PTG scores. This relatively high PTG might be explained by that all mothers were educated, with more than two-thirds of them having university education. This was also true regarding fathers, in addition to prevailing

sufficient income in the study sample. Such high socioeconomic characteristics would certainly have a positive effect on mothers' PTG. In fact, the study results revealed significant positive correlations with parents' level of education and income. In line with this, *Krakovich et al. (2016)* in a study in the United States found that a lower socioeconomic status among mothers of children with disability is associated with higher distress among them, which may reflect their low ability of developing PTG.

The forgoing present study finding is similar to that reported among mothers of children with ASD in a study in the United States *(Wayment et al., 2019)*. They are also close to the results reported by *Qin et al. (2020)* in a study in China where most participants had moderate PTG, with a small number having high PTG. On the contrary, our PTG results are lower when compared with those reported by *Phelps et al. (2009)* among parents of children with ASD. These differences in the levels of PTG could be attributed to variations in individual backgrounds and support factors as mentioned by *Tedeschi and Calhoun (2004)*.

In the present study, the mothers' PTG domains with the highest scores were those of spiritual change and personal strength. This reflects the role of religious beliefs prevailing in the study's community. Additionally, the personal strength could be attributed to the increasingly growing role of women in this community. The findings are in partial agreement with those of *Wayment et al. (2019)* and **(Zhang, Yan, Barriball, & While, 2015)** in studies of PTG among mothers of children with disabilities. They similarly reported high PTG related to personal strength and conversely low PTG related to spiritual change. The discrepancy is undoubtedly related to differences in community norms and values in various settings. Other studies have also similarly reported high scores in PTG domain related to personal strength *(Byra et al., 2020)* and religious beliefs *Ekas et al., (2009)*.

Most mothers in the current study were having high scores of deliberate and intrusive rumination with the former being higher. The finding is of great importance given the role played by ruminative thinking on parents'

psychological wellbeing, as well as its positive impact on autistic child's functioning. In congruence with this, *Carpita et al. (2020)* in a study of parents' rumination and ASD symptoms found that ruminative thinking had an important role in autistic children's functional outcome.

The role of rumination in developing PTG was investigated in the present study. The bivariate analyses demonstrated that deliberate rumination correlated positively with PTG whereas the intrusive type had a negative correlation with it. In agreement with this, *Morgan et al. (2017)* in a study of PTG and PTSD found thatdeliberate rumination was associated with high PTG; on the contrary, intrusive rumination was associated with more stress symptoms. On the same line, a study of the factors influencing PTG development among nurses in China demonstrated that deliberate rumination had a positive correlation with PTG while intrusive rumination had a negative correlation. The effect of deliberate rumination was further confirmed in multivariate analysis *(Cui et al., 2020)*.

Furthermore, the hierarchical regression analysis of the present study identified intrusive rumination as a negative predictor of all domains of PTG as well as its total. On the other hand, deliberate rumination was a positive predictor. The findings confirm the double role of rumination in the development of PTG among mothers of children with autism. The positive role of deliberate rumination has been attributed to its focus on the hunt for meaning and seeking the positive aspects derived from the incident *(Taku et al., 2009)*. Moreover, the positive role of deliberate rumination in the development of PTG was reported in a study on earthquake victims *(García et al., 2016)*. In the same vein, *Kiełb et al. (2019)* showed that intrusive rumination was associated with more posttraumatic stress, whereas deliberate rumination had positive correlation with PTG. The negative impact of intrusive rumination has been attributed to that it interferes with problem solving and instrumental behavior, and it decreases social support while increasing hopelessness and pessimism *(Gull and Husain, 2019)*.

The current study also addressed the question regarding the role of coping in PTG among mothers of children with autism. Our findings showed that mothers were mostly using the approach coping, while only a very small minority of them were using the avoidant coping type. The former type is expected to be more effective given that it uses positive approaches such as planning, acceptance, and seeking information and support. These findings are consistent with those of *Selvakumar and Panicker (2020)* who similarly reported that the majority of the mothers of children with autism were using positive coping styles depending on positive reframing and problem-solving, and this was associated with more wellbeing among them regardless of the severity of autism.

The bivariate analyses of the present study demonstrated a significant negative strong positive correlation between mothers' PTG scores and the score of approach coping, and a moderate positive correlation with the "neither type" coping. Conversely, PTG had a negative correlation with the avoidant type of coping. In line with this, *Pandya (2020)* in a study of stress among mothers of children with ASD found that approach problem-focused coping strategies were associated with lower levels of stress and better wellbeing among mothers in comparison with the emotion-focused avoidance coping.

In the multivariate analysis, the approach coping type was confirmed as a positive predictor of the PTG score. Conversely, the effect of avoidance coping was reversed to become positive, while the "neither type" coping became a negative predictor of PTG. These changes from the bivariate analyses results are certainly due to the adjustment for important confounding factors related to mothers' socioeconomic characteristics. They indicate that both types of coping are effective in PTG development. However, as the beta coefficients indicate, the positive effects of approach coping on PTG scores are around threefold those of the avoidance coping. A similar significant positive correlation between PTG and positive approach coping was demonstrated by (Zhang, Yan, Du, & Liu, 2013) in a study of the caregivers of children with disabilities in China.

Lastly, our multivariate analysis identified child's female gender as independent negative predictor of mothers' PTG scores, and this was statistically significant in the domains of relating to others and new possibilities. The finding might reflect the still prevailing predilection for male children in comparison with females, particularly in rural communities. This might lead to delays in diagnosis, with consequent poorer prognosis. A similar finding was reported in a study in Italy addressing gender differences in diagnosis of autism *(Green et al., 2019).* The study reported that autism is frequently unrecognized in women due to delays in referral to mental health specialists, and they are less likely to be diagnosed at first assessment.

Conclusion and Recommendations

The mothers of children with autism in the study setting have average scores of PTG, with relatively high rumination especially the deliberate type, and mostly use approach positive coping. Deliberate rumination and coping positively predict their PTG, while intrusive rumination is a negative predictor. **Recommendations** Training in positive coping for these mothers, with more social support and healthcare resources for their children are needed.

References

Behling O.,and Law K. (2000): In: Translating questionnaires and other research instruments: Problems and Solutions. Lewis-Beck MS, editor. Thousand Oaks: Sage, pp. 1–70.

Benson P.R. (2010): Coping, distress, and well-being in mothers of children with autism. Research in Autism Spectrum Disorders; 4(2): 217–228. https://doi.org/10.1016/j.rasd.2009.09.008

Byra S., Zubrzycka R., and Wójtowicz P. (2020): Positive orientation and posttraumatic growth in mothers of children with cystic fibrosis - mediating role of coping strategies. Journal of Pediatric Nursing; xxxx. https:// doi. org/ 10. 1016/ j.pedn.2020.09.009

Byra S., Żyta A., and Ćwirynkało K. (2017): Posttraumatic growth in mothers of children with disabilities. Hrvatska Revija ZaRehabilita ci j s k a I s t r a ž I v a n ja; 53(Supplement): 15–27.

Cann A., Calhoun L.G., Tedeschi R.G., Triplett K.N., Vishnevsky T., and Lindstrom C.M. (2011): Assessing posttraumatic cognitive processes: The event related rumination inventory. Anxiety, Stress and Coping; 24(2): 137–156. https://doi.org/10.1080/10615806.2010.529901

Carpita B., Carmassi C., Calderoni S., Muti D., Muscarella A., Massimetti G., Cremone I.M., Gesi C., Conti E., Muratori F., and Dell'Osso L. (2020): The broad autism phenotype in real-life: clinical and functional correlates of autism spectrum symptoms and rumination among parents of patients with autism spectrum disorder. CNS Spectr.;25(6):765-773. doi: 10.1017/S1092852919001615. Epub 2019 Nov 21. Erratum in: CNS Spectr. 2021 Aug;26(4):435. PMID: 31747980.

Carver C. S. (1997): You want to measure coping but your protocol's too long: Consider the brief COPE. International Journal of Behavioral Medicine; 4(1):92–100. https:// doi. org/ 10. 1207/ s15327558ijbm0401_6

Cetinbakis G., Bastug G., Cetinbakis G., and Bastug G. (2018): Factors contributing to higher caregiving burden in Turkish mothers of children with autism spectrum disorders Factors contributing to higher caregiving burden in Turkish mothers of children with autism spectrum disorders. International Journal of Developmental Disabilities; 3869: 1–8. https://doi.org/10.1080/20473869.2018.1478630

Cui P.P., Wang P.P., Wang K., Ping Z., Wang P., and Chen C. (2020 :(Post-traumatic growth and influencing factors among frontline nurses fighting against COVID-19. Occup Environ Med.; 78(2): 129-135. doi: 10.1136/oemed-2020-106540. Epub 2020 Oct 15. PMID: 33060188; PMCID: PMC7565273.

Ekas, N. V., Whitman, T. L., & Shivers, C. (2009): Religiosity, spirituality, and socioemotional functioning in mothers of children with autism spectrum disorder. Journal of Autism and Developmental Disorders, 39(5), 706–719.

García F.E., Barraza-peña C.G., Wlodarczyk A., Alvear-carrasco M., and Reyes-reyes A. (2018): SarickinClanak.Pdf.

García F.E., Cova F., Rincón P., Vázquez C., and Páez D. (2016): Coping, rumination and posttraumatic growth in people affected by an earthquake. Psicothema; 28(1): 59–65. https:// doi. org/ 10. 7334/ psicothema 2015.100

Green RM, Travers AM, Howe Y, McDougle CJ (2019): Women and Autism Spectrum Disorder: Diagnosis and Implications for Treatment of Adolescents and Adults. Curr Psychiatry Rep. Mar 9;21(4):22. doi: 10.1007/s11920-019-1006-3. PMID: 30852705.

Gull M., and Husain A. (2019): Rumination and Mental Health among Parents of Differently-Abled Children. https:// doi. org/ 10. 15804/tner.2019.56.2.23

Kiełb K., Bargiel-Matusiewicz K.M., and Pisula E. (2019): Posttraumatic Stress Symptoms and Posttraumatic Growth in Mothers of Children with Intellectual Disability – The Role of Intrusive and Deliberate Ruminations: A Preliminary Report. Frontiers in Psychology; 10(September): 1–7. https:// doi. org/ 10.3389/fpsyg.2019.02011

Krakovich T.M., McGrew J.H., and Yu (2016): Stress in parents of children with autism spectrum disorder: An exploration of demands and resources .J Autism Dev Disord;46:2042-53

Lazarus R. S., Folkman S. (1984): Stress, Appraisal and Coping. New York: Springer publishing company

Mcauliffe T., Cordier R., Vaz S., and Thomas Y. (2017): Quality of

Life ,Coping Styles , Stress Levels , and Time Use in Mothers of Children with Autism Spectrum Disorders : Comparing Single Versus Coupled Households. Journal of Autism and Developmental Disorders; 0(0): 0. https:// doi. org/ 10. 1007/ s10803- 017-3240-z

Miranda A., Mira A., Berenguer C., Rosello B., and Baixauli I. (2019): Parenting Stress in Mothers of Children With Autism Without Intellectual Disability. Mediation of Behavioral Problems and Coping Strategies; 10(March):1–12. https:// doi. org/ 10. 3389/fpsyg.2019.00464

Morgan J.K., Desmarais S.L., Mitchell R.E., and Simons-Rudolph J.M. (2017): Posttraumatic stress, posttraumatic growth, and satisfaction with life in military veterans. Military Psychology; 29(5): 434–447. https://doi.org/10.1037/mil0000182

Pandya S.P. (2020): Examining the Effectiveness of WhatsApp Based Spiritual Posts on Mitigating Stress and Building Resilience , Maternal Confidence and Self-efficacy Among Mothers of Children with ASD. Journal of Autism and Developmental Disorders; 1983. https://doi.org/10.1007/s10803-020-04633-x

Peters-Scheffer, N., Didden, R., Korzilius, H., & Matson, J. (2012). Cost comparison of early intensive behavioral intervention and treatment as usual for children with autism spectrum disorder in the Netherlands. Research in developmental disabilities, 33(6), 1763-1772.

Phelps K.W., McCammon S.L., Wuensch K.L., and Golden J.A. (2009): Enrichment, stress, and growth from parenting an individual with an autism spectrum disorder, Journal of Intellectual &Developmental Disability; 34(2): 133-141, DOI: 10.1080/13668250902845236

Qin X., Feng Y., Qu F., Luo Y., Chen B., Chen M., Zou Y., and Zhang L. (2020): Posttraumatic growth among parents of children with autism spectrum disorder in China and its relationship to family function and mental resilience : A cross-sectional study. Journal of Pediatric Nursing. https://doi.org/10.1016/j.pedn.2020.10.026

Selvakumar N., and Panicker A. (2020): Stress and Coping Styles in Mothers of Children with Autism Spectrum Disorder April 2020Indian Journal of Psychological Medicine; 42(3):225 DOI:10.4103/IJPSYM.IJPSYM_333_19

Taku K., Cann A., Tedeschi R.G., and Calhoun L.G. (2009): Intrusive versus deliberate rumination in posttraumatic growth across US and Japanese samples. Anxiety, Stress and Coping; 22(2): 129–136. https:// doi. org/ 10. 1080/10615800802317841

TedeschiR.G.,and Calhoun L.G. (1996): The posttraumatic growth inventory: Measuring the positive legacy of trauma. Journal of Traumatic Stress; 9(3): 455–471. https://doi.org/10.1002/jts.2490090305

Tedeschi RG, Calhoun LG: Target article: ''Posttraumatic growth: Conceptual foundations and empirical evidence.'' PsycholInq 2004;15:1–18.

Walsh, C. E., Mulder, E., & Tudor, M. E. (2013). Predictors of parent stress in a sample of children with ASD: Pain, problem behavior, and parental coping. Research in Autism Spectrum Disorders, 7(2), 256-264.

Wayment H.A., Al-Kire R., and Brookshire K. (2019): Challenged and changed: Quiet ego and posttraumatic growth in mothers raising children with autism spectrum disorder. Autism; 23(3): 607–618. https://doi.org/10.1177/1362361318763971

Wu X., Zhou X., Wu Y., and An Y. (2015): The role of rumination in posttraumatic stress disorder and posttraumatic growth among adolescents after the wenchuan earthquake. Frontiers in Psychology; 6(September): 1–8. https:// doi. org/ 10. 3389/fpsyg.2015.01335

Xu X., Hu M.L., Song Y., Lu Z.X., Chen Y.Q., Wu D.X., and Xiao T. (2016): Effect of Positive Psychological Intervention on Posttraumatic Growth among Primary Healthcare Workers in China: A Preliminary Prospective Study.

Scientific Reports; 6(November): 1–7. https:// doi. org/ 10. 1038/ srep39189

Young S., Shakespeare-Finch J., and Obst P. (2020): Raising a child with a disability: a one-year qualitative investigation of parent distress and personal growth. Disability and Society; 35(4): 629–653. https:// doi. org/ 10.1080/09687599.2019.1649637

Zhou W., Liu D., Xiong X., and Xu H. (2019): Emotional problems in mothersof autistic children and their correlation with socioeconomic status and the children's core symptoms. https:// doi. org/ 10. 1097/ MD. 0000000000016794

Zhang, W., Yan, T. T., Barriball, K. L., & While, A. E. (2015). Post-traumatic growth in mothers of children with autism : A phenomenological study. https:// doi. org/ 10. 1177/ 1362361313509732

Zhang, W., Yan, T. T., Du, Y. S., & Liu, X. H. (2013). Relationship between coping, rumination and posttraumatic growth in mothers of children with autism spectrum disorders. Research in Autism Spectrum Disorders, 7(10), 1204–1210. https:// doi. org/ 10. 1016/j.rasd.2013.07.008