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Relationship between Sense of Stress and Posttraumatic Growth

The Effect of Parent Sex and Child Disability Type

Abstract

Raising a child with a disability is associated with both negative and positive outcomes in parents. We explored the relationship between maternal and paternal stress and posttraumatic growth (PTG) in a Polish sample of 325 parents of children identified with intellectual disability (ID) or Autism Spectrum Disorder (ASD) without ID. We found that t*he highest level of PTG is characteristic of mothers with children with ASD, followed by mothers with children with ID. However, a considerable proportion of fathers also experienced average or high PTG. Mothers experienced lower levels of stress than fathers. Whereas positive correlations (including the quadratic relation) between certain dimensions of stress and PTG were found in mothers, no significant correlations between the variables were indicated in fathers. The results of this study can inform recommendations to improve therapeutic activities aimed at providing them with support and strengthening transformative beneficial changes.*

Keywords: stress, posttraumatic growth, mothers, fathers, intellectual disability, autism spectrum disorder.

Introduction

Parenting a child with a disability, in particular where there is a diagnosis of a more severe form of intellectual disability (ID) or autism spectrum disorder (ASD), is associated with increased burden of care (Kandolkar and Kenchappanavar, 2014), socioeconomic disadvantage (Emerson, 2012), depression and anxiety symptoms (Padden and James, 2017; Scherer, Verhey and Kuper, 2019). A stress-coping paradigm in which a child with a disability (or their characteristics) is conceptualized as 'the stressor' and a parent as a carer who copes with a negative impact from the child disability has been prevailing in most research on raising a child with a developmental disability (Beighton and Wills, 2019) for a long time. Although some studies (e.g. Ambrus, 2019) indicate that stress in parents of children with disabilities is similar to the population mean score, a wide range of challenges resulting from the specifics of raising a child with a disability is considered to be an indicator of increased family stress (Baxter *et al.*, 2000) and general stress (Manor-Binyamini, 2017) in both parents of children with ID (Marchal *et al.*, 2017; Patton *et al.*, 2018; Staunton *et al.* 2020) and ASD (Dąbrowska and Pisula, 2010; Hutchison *et al.*, 2016; Padden and James, 2017).

Research results concerning sex differences in parents of children with disabilities stress are not consistent. In most studies mothers have been found to report higher levels of stress compared with fathers both in case of parents of children identified with ASD (Tehee *et al.*, 2009; Dąbrowska and Pisula, 2010; Jones *et al.*, 2013; Tomeny, 2017) and ID (e.g. Chouhan *et al.*, 2016; Kalgotra and Warwal, 2016). Other studies, though, have indicated no significant differences in the level of stress between mothers and fathers of children with ASD (May *et al.*, 2015) and ID (Dąbrowska and Pisula, 2010; Marchal *et al.*, 2017) or higher levels in fathers as compared to mothers of children with ASD (Rivard *et al.*, 2014).

Referring to child disability type, to our knowledge there is limited literature on differences in its impact on the level of stress between parents of children with different types of disabilities, specifically ID and ASD. Most studies (e.g. Dąbrowska and Pisula, 2010; Allen, Bowles and Weber, 2013; McStay, Trembath, and Dissanayake, 2015; Bonis, 2016; Pastor-Cerezuela *et al.*, 2020) have indicated that parents of children with ASD experienced higher levels of stress than parents of children with ID. Some results, however, have shown higher level of stress among mothers of children with ID as compared to mothers of autistic children (Manor-Binyamini, 2017). Due to this inconsistency further research in this sphere is required.

Whilst stress that comes with raising a child with a disability is inevitable, a growing body of literature focuses on positive aspects of this kind of parent-

ing, including the experience of posttraumatic growth (PTG) (Zhang *et al*., 2015; Waizbard-Bartov, Yehonatan-Schori and Golan, 2019). In the present article we focus on the relationships between negative (sense of stress) and positive (posttraumatic growth) outcomes in parents, looking for possible differences between mothers and fathers as well as between parents of children identified with (1) ID and (2) ASD without ID.

For the purposes of this article we adopt Tedeschi and Calhoun's crisis-related growth model (Tedeschi and Calhoun, 2004), in which PTG is conceptualized as a positive, psychological change that results from successfully dealing with the consequences of a traumatic event. It occurs in five dimensions: appreciation of life, social relationships, personal strength, spirituality, and new possibilities (Tedeschi and Calhoun, 2004) and allows the person to develop and grow beyond their previous level of psychological functioning, adaptation or life awareness (Tedeschi and Calhoun, 2013). Although growth does not relate to general happiness, but rather a sense of wisdom visible in the recognition of the complexity of the world (Calhoun *et al*., 2010), it is associated with increased levels of well-being and decreased levels of depression (Helgeson *et al*., 2006).

The construct of PTG is relevant to various types of crises (Tedeschi and Calhoun, 2004), including parenting a child identified with a disability. Significant positive transformations in personal strength, relationship with spouses, appreciation of life, acknowledging opportunities and priorities were indicated in parents of children with various developmental disabilities (Minnes *et al*., 2015; Young, Shakespeare-Finch and Obst, 2020), including parents of children with ID (Byra and Ćwirynkało, 2020) and ASD (Ambrus, 2019).

Associations between stress and PTG have already been explored in parents of children with disabilities as well. In some studies no correlations between these variables were found (Phelps *et al*., 2009; Kiełb, Bargiel-Matusiewicz and Pisula, 2019). Other researchers, however, point to certain links. For example, Ambrus (2019) suggested that as parenting stress (in parents with ASD) increased, PTG decreased. Negative correlations between stress and PTG were also found by Strecker *et al*. (2014). On the other hand, Manor-Binyamini (2017) found that the relationship between stress and PTG in mothers of children with disabilities was characterized by higher levels of stress being related to more PTG. The relationship, however, was not linear since beyond a medium level of stress, higher levels of stress implied lower levels of PTG.

There is a pressing need to better understand the effect of parent sex and child disability type on parents' levels of stress and PTG. Existing studies rarely provide information on positive aspects of this parenthood and their association with parent and child characteristics. Also, the relationship between stress

and PTG has been scarcely analyzed in the context of comparisons that would take into account parent sex and child disability type. Therefore, this particular research fills the gap in the existing knowledge. Moreover, the present study focuses on parents of children with disabilities considered the most severe: ID and ASD (Thurm *et al*., 2019).

The aim of the current research was to explore the influence of parent sex and child disability type (ID or ASD without ID) on the level of sense of stress and the level of PTG and their subdomains in parents. The research purpose was also to explore the effect of parent sex and child disability type on the relationships between the sense of stress and PTG and their domains in these groups of parents (mothers/fathers, parents of children with ASD/ID). Based on the theoretical considerations and empirical findings from prior studies, we derived two hypotheses. In the first we assumed that the sense of stress and PTG will be higher in parents of children with ASD (as compared to parents of children with ID) and in mothers (as compared to fathers) (H1). The second hypothesis implies that stress would positively correlate with PTG, regardless of parent sex and child disability type (H2).

Method

Participants

Participants who constituted the sample in the present study were parents of children with ID and parents of children with ASD. The following inclusion criteria were considered: a) being a parent of a child identified with ID or a child identified with ASD without ID; b) school age of the child (7–15 years); c) no additional developmental disabilities; d) being married or in a partner relationship. Although potential respondents were informed on the subject of the study related to PTG, we did not select samples on the basis of parents' reports of positive change, but used a non-biased sampling technique. Ethics approval for the project was obtained from a university in Poland [details hidden for peer review].

Parents were recruited through educational and rehabilitation facilities as well as foundations and associations. The invitation addressed to potential participants contained information about the purpose and method of the study, its voluntary nature and anonymity of respondents. In total, 511 invitations with sets of questionnaires were sent to parents, selected on the basis of data obtained from the institutions located in north-eastern and eastern Poland, were

Table 1. Participants' Characteristics

	Mothers of children with ID (n = 87)	Fathers of children with ID (n = 85)	Mothers of children with ASD (n = 78)	Fathers of children with ASD (n = 75)
Place of residence n (%)				
City	59 (67.82)	59 (69.41)	51 (65.38)	50 (66.67)
Rural areas	28 (32.18)	26 (30.59)	27 (34.62)	25 (33.33)
Education n (%)				
Primary	5 (5.76)	2 (2.35)	5 (6.41)	4 (5.33)
Intermediate – vocational	20 (22.99)	27 (31.76)	20 (25.64)	16 (21.33)
Secondary	32 (36.78)	23 (27.06)	25 (32.05)	20 (26.67)
University degree – bachelor's	6 (6.89)	8 (9.41)	6 (7.69)	8 (10.67)
University degree – master's	24 (27.58)	25 (29.42)	22 (28.21)	27 (36.00)
Employment n (%)				
Yes No	59 (67.82) 28 (32.18)	62 (72.94) 23 (27.06)	58 (74.36) 20 (25.64)	60 (80.00) 15 (20.00)
Age M (SD)	40.99 (7.89)	41.02 (9.53)	41,21 (9.40)	40.34 (6.45)
Child age M (SD)	10.12 (8.02)	10.89 (9.11)	11.00 (6.77)	10.79 (9.34)
Child level of ID n (%)				
Mild Moderate Severe Profound	10 (11.50) 13 (14.94) 13 (14.94) 51 (58.62)	10 (11.76) 10 (11.76) 11 (12.95) 54 (63.53)		

sent. 330 questionnaire sets were sent back to the authors either directly by parents or by nominated gatekeepers in the institutions. Out of these 5 were rejected due to incomplete data. Eventually, 325 data from participants were included in the analysis.

The data on the diagnoses of child disability were obtained from two sources: (1) nominated gatekeepers in the institutions who had access to children's disability statements and passed on the invitations to parents who fulfilled the criteria and (2) parents who reported on the details of their children's diagnoses.

Overall, the analysis included 325 parents: 87 mothers of children identified with ID (26.77%), 85 fathers of children with ID (26.15%), 78 mothers of children

identified with ASD (24%), 75 fathers of children with ASD (23.08%). Table 1 presents sociodemographic characteristics of the participants in the current study.

Community Involvement

The authors are involved in supporting institutions associating parents of children with ASD and ID. Representatives of these institutions were consulted on the research subject. Also, community service providers for these families were involved in this study.

Materials

Data were collected using the following inventories: *The Post-traumatic Growth Inventory (PTGI)* by Tedeschi and Calhoun and *Sense of Stress Questionnaire (KPS)* by Plopa and Makarowski.

The Polish version of *The Post-traumatic Growth Inventory (PTGI- RG. Tedeschi, LG. Calhoun)* was used to measure posttraumatic growth. The PTGI contains 21 items rated on a 6-point scale, from 0 – I did not experience this change as a result of my crisis, to 5 – I experienced this change to a very great degree as a result of my crisis. Polish adaptation of the instrument was prepared on the basis of the necessary adaptation procedures to test its reliability, internal stability, and validity (Ogińska-Bulik and Juczyński, 2010). Confirmatory factor analysis performed by Ogińska-Bulik and Juczyński provided grounds for selecting a four-factor structure: 1) changes in self-perception (CHSP) (Cronbach's $\alpha = 0.88$), 2) changes in relations to others (CHRO) (Cronbach's $\alpha = 0.84$), 3) appreciation of life (AL) (Cronbach's $\alpha = 0.75$), 4) spiritual changes (SCH) (Cronbach's $\alpha = 0.69$). The total score of the PTGI is the sum of the results obtained in the 4 subscales; it ranges from 0 to 105. Higher scores imply greater PTG. Satisfactory indicators of reliability and validity of the Polish version of PTGI were obtained. Cronbach's α for the PTGI Total in the current study was 0.98. In accordance with the standards based on sten scores that were developed for the Polish version of PTGI, three categories of PTG scores can be calculated: high (73–105), medium (54–72) and low (0–53).

Sense of Stress Questionnaire (KPS) by Plopa and Makarowski contains 27 items on a 5-point scale, which form three subscales: external stress, intrapsychic stress and emotional tension. The total score of the KPS is the sum of the results obtained in the 3 subscales; it ranges from 21 to 105. The psychometric indicators of the tool are satisfactory: Cronbach's alpha ranges from 0.70–0.81 (Plopa and Makarowski, 2010). In the current study Cronbach's alpha is in the range: 0.74–0.85.

Procedure

Data were analyzed using SPSS. First, descriptive statistics were prepared for the analyzed variables: PTG and sense of stress. To compare the level of individual aspects of PTG and sense of stress across participants, total score obtained by each participant was divided by the number of items. In order to check whether PTG and sense of stress vary among groups of mothers and fathers of children with ID and ASD a two-way analysis of variance for an intergroup plan and the ANCOVA with child age as a covariate, was used. Bonferroni correction was considered. Second, correlation analysis was performed to determine the relationship between sense of stress and PTG (Pearson's correlation coefficient). Finally, the linear and quadratic positive relationships between sense of stress and PTG were tested through hierarchical regression analyses. The predictor (sense of stress) was linearly transformed (centered) by subtracting the mean and entered into the model as Step 1. Then this score was squared to create the quadratic term and entered into the regression model as Step 2.

Results

Sense of stress – effects of parent sex and child diagnostic group

Table 2 shows descriptive statistics for PTG and sense of stress (total scores and their individual dimensions).

As Table 2 illustrates, the highest level of stress was found in fathers of children with ASD, and lowest in mothers of children with ID. Stress in fathers was most manifested in emotional tension, and in mothers as intrapsychic stress.

In the further part of the analyses, the effect of parent sex and the type of a child disability on the level of sense of stress in parents was checked. Potential covariate was assessed by calculating correlation coefficients between children's age and parents' sense of stress. Child age was significantly and negatively related to total sense of stress ($r = -0.21$) and emotional tension ($r = -0.22$). In the case of external stress ($r = -0.01$) and intrapsychic stress (-0.09) significant correlations have not been found. Child age therefore entered as a covariate in the analysis of total sense of stress and emotional tension.

The ANCOVA for total sense of stress revealed significant main and interaction effects. The main effect of a child diagnostic group ($F(1.113) = 9.023$, $p < 0.001$, $\eta 2\text{partial} = 0.034$) was determined. Parents of children with ASD reported significantly higher results in total sense of stress than parents

Table 2. Descriptive Statistics for Posttraumatic Growth and Sense of Stress

Variables	Mothers of children with ID (n = 87)		Fathers of children with ID (n = 85)		Mothers of children with ASD (n = 78)		Fathers of children with ASD (n = 75)	
	M (SD)	$M_{subscale}$ (SD)	M (SD)	$M_{subscale}$ (SD)	M (SD)	$M_{subscale}$ (SD)	M (SD)	$M_{subscale}$ (SD)
PTG-Total	68.11 (14.45)		63.67 (14.11)		74.11 (18.00)		66.14 (15.72)	
CHSP	28.15 (10.17)	3.13 (1.13)	25.59 (6.20)	2.94 (0.76)	31.19 (8.45)	3.46 (0.94)	26.48 (6.84)	2.84 (0.69)
CHRO	22.90 (6.93)	3.28 (0.99)	21.83 (5.03)	3.10 (0.86)	24.29 (7.24)	3.27 (1.03)	22.71 (6.05)	3.22 (0.72)
AL	11.22 (2.94)	3.74 (0.98)	10.67 (3.07)	3.59 (1.07)	12.03 (2.69)	4.01 (0.89)	11.77 (3.22)	3.56 (1.02)
SCH	5.76 (3.23)	2.88 (1.61)	5.57 (2.02)	2.59 (1.00)	6.61 (2.44)	3.30 (1.22)	5.18 (2.01)	2.79 (1.01)
SS-Total	53.12 (10.12)		54.94 (9.42)		56.11 (16.86)		60.88 (10.14)	
ET	20.32(5.36)		19.34 (3.73)		17.79 (6.62)		20.65 (4.53)	
ES	17.19 (6.72)		19.16 (3.07)		17.15 (5.46)		20.20 (3.32)	
IS	19.63 (4.68)		16.83 (3.88)		19.97 (6.08)		19.62 (4.09)	

Note. Abbreviations: PTG-Total: Posttraumatic growth; CHSP: Changes in self-perception; CHRO: Changes in relations to others; AL: Appreciation of life; SCH: Spiritual changes; SS-Total: Sense of stress; ET: Emotional tension; ES: External stress; IS: Intrapsychic stress

of children with ID. The interaction effect child age x child diagnostic group (F (1.113) = 7.022, p <0.009, η2partial = 0.322) was also found. Parents of older children with ASD achieved higher total sense of stress. Based on ANCOVA for emotional tension, the main effect for child disability type (F (1.126) = 5.022, p <0.011, η2partial = 0.034) was determined. Greater intensity in this dimension of stress was noted in parents of children with ASD. The interaction effects child age x parent sex (F (1.126) = 4.235, p <0.022, η2partial = 0.027) and child age x child diagnostic group (F (1.126) = 6.005, p <0.031, η2partial = 0.008) was also found. Fathers of older children with ASD achieved significantly higher results in emotional tension.

In turn, based on ANOVA of external stress the main effect of parent sex was determined (F (1.320) = 12.535, p <0.001, η2partial = 0.08). Fathers achieved higher scores than mothers here. The main effect of parent sex was also determined (F (1.328) = 15.262, p <0.001, η2partial = 0.04) for intrapsychic stress. In this case, the interaction effect child diagnostic group x parent sex (F (1.328) = 5.065, p <0.025, η2partial = 0.02) was also found. Mothers (especially those of children with ASD) demonstrated significantly higher levels of this type of stress than fathers.

PTG – effects of parent sex and child diagnostic group

As indicated in Table 2, mothers of children with ASD received highest scores and fathers of children with ID – lowest scores in PTG-Total. In all groups of respondents, parents scored highest in greater appreciation of life (a dimension of PTG). Other dimensions with high scores were: changes in relations with others (in parents of children with ID and fathers of children with ASD) and changes in self-perception (in mothers of children with ASD). Interestingly, PTG in parents did not significantly correlate with a child age (CHSP: r = 0.02; CHRO: r = –0.10; AL.: r = –0.05; SCH: r = –0.10; PTGI Total: r = –0.05).

A two-way analysis of variance for an intergroup plan 2 × 2, child diagnostic group (ID vs ASD) x parent sex (female or male) indicated statistically significant effects. One main effect was observed: child diagnostic group for total PTG ($F_{(1.336)}$ = 15.941, p<0.001, $\eta 2_{partial}$ = 0.17). Parents of children with ASD demonstrated higher total PTG than parents of children with ID. In the case of changes in self-perception the main effects of parent sex ($F_{(1.336)}$ = 17.970, p<0.001, $\eta 2_{partial}$ = 0.10) and child diagnostic group ($F_{(1.336)}$ = 4.517, p<0.034, $\eta 2_{partial}$ = 0.07) were found. Mothers received significantly higher scores than fathers. In addition, parents of children with autism were characterized by significantly higher positive changes in self-perception than parents of children with ID. The interactive ef-

Table 3. Correlation Coefficients in the Group of Parents of Children with ID

Variables	1	2	3	4	5	6	7	8	9	10
Mothers of children with ID										
1.PTG–Total	–									
2.CHSP	0.94***	–								
3.CHRO	0.92***	0.84***	–							
4.AL	0.73***	0.67***	0.54***	–						
5.SCH	0.69***	0.43***	0.53***	0.44***	–					
6.SS–Total	−0.05	0.01	−0.10	0.07	−0.16	–				
7.ET	−0.08	−0.01	−0.08	−0.08	0.37***	0.91***	–			
8.ES	−0.05	−0.03	−0.10	0.05	−0.04	0.52***	0.46***	–		
9.IS	0.02	0.05	−0.07	0.20	−0.03	0.90***	0.57***	0.46***	–	
10.Age	0.07	0.10	−0.05	0.14	0.12	−0.25**	−0.37***	0.08	−0.09	–
Fathers of children with ID										
1.PTG–Total	–									
2.CHSP	0.93***	–								
3.CHRO	0.85***	0.64***	–							
4.AL	0.79***	0.63***	0.60***	–						
5.SCH	0.82***	0.83***	0.63***	0.50***	–					
6.SS–Total	0.13	−0.05	−0.14	−0.12	−0.18	–				
7.ET	−0.05	−0.08	−0.09	−0.09	−0.15	0.86***	–			
8.ES	−0.11	−0.11	−0.12	−0.15	−0.16	0.82***	0.65***	–		
9.IS	−0.14	−0.18	−0.12	−0.07	−0.06	0.81***	0.45***	0.47***	–	
Age	−0.05	−0.03	−0.06	−0.05	−0.07	−0.32**	−0.15	−0.25**	−0.18	–

Note. PTG-Total: Posttraumatic growth; CHSP: Changes in self-perception; CHRO: Changes in relations to others; AL: Appreciation of life; SCH: Spiritual changes; SS-Total: Sense of stress; ET: Emotional tension; ES: External stress; IS: Intrapsychic stress
*p<0.05, **p<0.01; ***p<0.001

fect was not significant. The main effect of parent sex for appreciation of life was found ($F_{(1.336)} = 7.418$, $p<0.001$, $\eta 2_{partial} = 0.12$). Mothers reported significantly higher results in this dimension than fathers. In the case of positive spiritual changes an interactive effect was indicated: child diagnostic group x parent sex ($F_{(1.336)} = 5.869$, $p<0.016$, $\eta 2_{partial} = 0.09$). It turned out that parent sex differentiates the intensity of these post-traumatic changes, but only in parents of children with ASD. Mothers of children with ASD demonstrated significantly higher spiritual changes than fathers of children with ASD. No differences were indicated in positive changes in relations to others, when parent sex and child disability type were taken into account.

Relationships between sense of stress and PTG

The relationship between sense of stress and PTG was analyzed using Pearson's correlation coefficients, separately for each group of parents. Additionally, the analysis of the relationship between parents' age and PTG and stress (table 3 and 4) was conducted. In both groups of mothers significant negative correlations between age and stress total (weak) as well as between age and emotional tension (moderate) were revealed. Moreover, negative and weak relationships between age and spiritual changes (PTG dimension) were found in mothers of children with ASD. Negative and weak links between age and stress total and external stress have been established in fathers of children with ID. Different results were obtained in fathers of children with ASD, in case of whom positive (but weak) relationships between age and stress total and two dimensions stress (external and intrapsychic stress) were revealed. Their age, however, negatively correlated with another PTG dimension – changes in relations to others.

The present results indicate no significant correlations between sense of stress and PTG in fathers (both of children with ASD and ID). In turn, in the two groups of mothers we found three significant coefficients indicating positive and moderate correlations between beneficial spiritual changes and emotional tension (in mothers of children with ID) and between appreciation of life and stress: external and intrapsychic (in mothers of children with ASD).

In the further part of the analysis, a hierarchical regression analysis was performed in order to check whether quadratic relationship between PTG dimensions (appreciation of life and spiritual change) and sense of stress dimensions (emotional tension, external stress and intrapsychic stress) would exist over and above any positive linear relationship in groups of mothers. In the group of mothers of children with ID, the first regression analysis with the centered

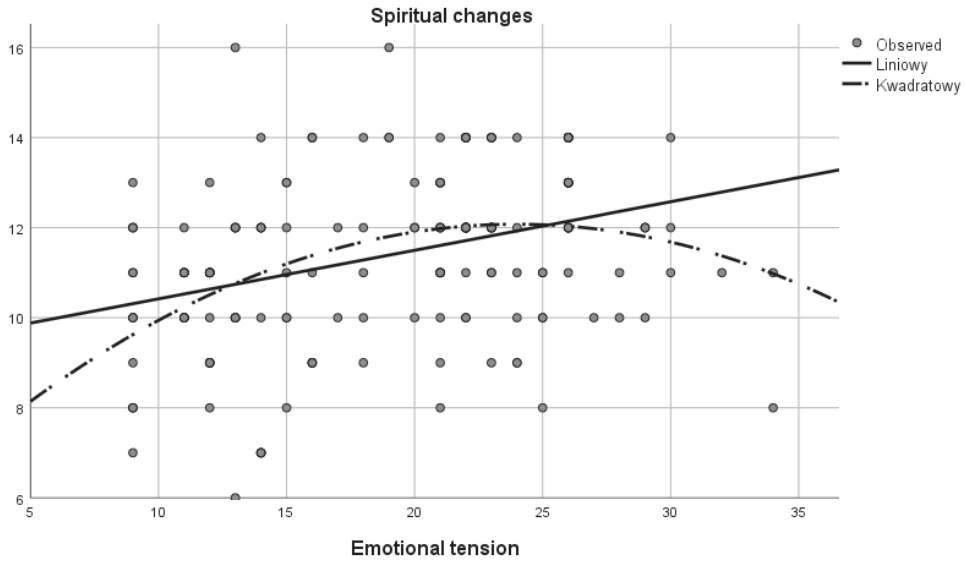
Table 4. Correlation Coefficients in the Group of Parents of Children with ASD

Variables	1	2	3	4	5	6	7	8	9	10
Mothers of children with ASD										
1.PTG–Total	–									
2.CHSP	0.93***	–								
3.CHRO	0.83***	0.75***	–							
4.AL	0.75***	0.65***	0.53***	–						
5.SCH	0.60***	0.60***	0.49***	0.47***	–					
6.SS–Total	0.20	0.20	0.07	0.22	0.12	–				
7.ET	0.19	0.19	0.12	−0.19	−0.05	0.87***	–			
8.ES	−0.20	−0.21	−0.15	0.43***	0.13	0.55***	0.55***	–		
9.IS	0.15	0.14	0.01	0.42***	0.14	0.45***	0.64***	0.55***	–	
10.Age	−0.09	−0.04	−0.03	−0.12	−0.23*	−0.32**	−0.44***	0.17	−0.19	–
Fathers of children with ASD										
1.PTG–Total	–									
2.CHSP	0.90***	–								
3.CHRO	0.89***	0.66***	–							
4.AL	0.75***	0.53***	0.61***	–						
5.SCH	0.87***	0.77***	0.77***	0.52***	–					
6.SS–Total	−0.16	−0.16	−0.12	−0.01	−0.15	–				
7.ET	−0.15	−0.14	−0.16	−0.16	−0.12	0.89***	–			
8.ES	−0.16	−0.09	−0.17	−0.12	−0.15	0.90***	0.83***	–		
9.IS	−0.03	0.04	−0.11	0.04	−0.10	0.77***	0.45***	0.51***	–	
10.Age	−0.17	−0.08	−0.32**	−0.03	−0.17	0.33*	0.19	0.29*	0.30**	–

Note. PTG-Total: Posttraumatic growth; CHSP: Changes in self-perception; CHRO: Changes in relations to others; AL: Appreciation of life; SCH: Spiritual changes; SS-Total: Sense of stress; ET: Emotional tension; ES: External stress; IS: Intrapsychic stress

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

score of emotional tension explaining spiritual changes was significant (β = 0.37, p<0.01, R^2 = 0.121, adjusted R^2 = 0.103, F(2.334) = 13.04, p<0.001). However, in the second step, the addition of the quadric term showed significant increase in R^2 (β = – 0.41, p<0.003, R^2 = 0.151, adjusted R^2 = 0.139, F(2.334) = 10.07, p<0.05). Thus, the obtained results showed a significant quadratic effect in predicting spiritual changes in this group of mothers. As illustrated in Figure 1, PTG dimension: spiritual changes, showed predicted inverted-U quadratic relationship beyond linear relationship.



As for relationships between stress (external and intrapsychic) and greater appreciation of life in the group of mothers with children with ASD, the regression analysis did not reveal a quadratic relationship between these variables. The obtained results confirmed the linear relationship model. In case of relationship between external stress and greater appreciation of life, the following results were obtained in the first step of regression analysis: (β = 0.43, p <0.01, R2 = 0.101, adjusted R2 = 0.095, F (4.111) = 7.16, p <0.029), while in in the second step, no significant increase was observed in R2 (β = 0.44, p <0.031, R2 = 0.109, adjusted R2 = 0.097, F (3.789) = 8.12, p <0.133). The results obtained for relationship between intrapsychic stress and greater appreciation of life were as follows: step 1 (β = 0.42, p<0.01, R^2 = 0.134, adjusted R^2 = 0.129, F(5.002) = 6.12, p<0.011), step 2 (β = 0.45, p<0.01, R^2 = 0.139, adjusted R^2 = 0.130, F(4.342) = 6.71, p<0.145).

Discussion

The results indicated significant intergroup differences due to parent sex and child disability type, both in the level of sense of stress and PTG (with positive changes that constitute it).

Referring to the level of sense of stress, we found that parents of children with ASD experienced higher levels of stress and emotional tension compared to parents of children with ID, which corresponds to prior reports of Pastor-Cerezuela *et al.* (2020), Bonis (2016), McStay *et al.* (2015), Allen, Bowles and Weber (2013) and Dąbrowska and Pisula (2010) and may be due to a wider range of complex and unpredictable problems, triggering a chronic tension and stress in parents of children with ASD (McStay *et al.*, 2015; Pastor-Cerezuela *et al.*, 2020).

Furthermore, unexpectedly, fathers, more frequently than mothers, were found to be characterized by higher levels of external stress: they manifested stress symptoms, revealed negative emotions, and were more responsive to external stressors. These findings are contradictory to numerous studies conducted among parents of children with ID (e.g. Chouhan *et al.*, 2016; Kalgotra and Warwal, 2016) and ASD (e.g. Dąbrowska and Pisula, 2010; Jones *et al.*, 2013; Tomeny, 2017), but in line with studies referring to parents of children with ASD (Rivard *et al.*, 2014). Higher levels of external stress in fathers may result from the characteristics associated with a child disability or external distressing events, e.g. related to professional career or the financial situation of family (Rivard *et al.*, 2014).

The results of the current study indicated the highest levels of sense of stress and emotional tension in fathers of children with ASD. Based on previous studies which demonstrate no significant differences in the level of stress between mothers and fathers of children with ASD (May *et al.*, 2015) or higher levels of stress in mothers of children with ASD (e.g. Tehee *et al.*, 2009; Dąbrowska and Pisula, 2010; Jones *et al.*, 2013; Tomeny, 2017), these findings are surprising, although consistent with the results of Rivard *et al.* (2014). As explained by Rivard *et al.* (2014), parental stress in fathers is caused – to a greater extent than in mothers – by the intensity of autistic symptoms, causing them a sense of helplessness and internal tension. Also, whereas stress in mothers of children with ASD is associated with regulatory problems, in the case of fathers it is associated with externalizing behaviours (Davis and Carter, 2008). Interestingly, child age turned out to be significantly and negatively correlated to emotional tension in a group of fathers of children with ASD, which, again, is in line with the results of Rivard *et al.* (2014).

Similar sex differences in the level of stress were also found in parents of children with ID. Generally, the lowest (taking into account all four stud-

ied groups) intensity of stress was found in mothers of children with ID, out of whom the highest proportion reported low levels of sense of stress. This finding corresponds with the study of Marchal *et al*., (2017), in which the authors showed there was no significant difference in the level of clinical stress between mothers of children with Down syndrome and mothers of typically developing children. It does not align, however, with the results of Chouhan *et al.* (2016) which suggest that mothers of children with ID experience higher levels of parenting stress compared to fathers. It is plausible that in this sample, mothers, who are traditionally more involved in the upbringing and therapy of children with ID or ASD, as a result experienced a greater sense of effectiveness in supporting their child's development and, consequently, a lower level of stress than fathers. It is also worth noting that in the current study, mothers (especially those of children with ASD without ID) experienced intrapsychic stress to the greatest extent and in this sphere they differ significantly from fathers (interaction effect was determined). Last but not least, as far as the sense of stress is concerned, the present research revealed negative correlations between age and stress in parents of children with ID and mothers of children with ASD. On the contrary, in fathers of children with ASD this relationship turned out to be positive, which suggests that older fathers of these children experience higher levels of stress than the younger ones. These findings are in contrast to other studies in which no significant relationships between these variables were found in parents of children with ASD (Phelps *et al*., 2009) and ID (Patton *et al*., 2018).

It was indicated that higher PTG (including greater beneficial changes in the perception of self) was characteristic of parents of children with ASD, which is consistent with previous findings, indicating a significant intensification of positive posttraumatic changes in this group of parents (Waizbard-Bartov *et al*., 2019; Zhang *et al*., 2015; Phelps *et al*., 2009), but not in line with the results of Manor-Binyamini (2016) who found no significant differences in PTG level between the groups of mothers of children with ID and mothers of children with ASD.

Also, a differentiating effect of parent sex was found in explaining the level of PTG in perception of self and appreciation of life. Mothers were characterized by a significantly higher intensity of these changes compared to fathers, which is in line with the findings of other researchers demonstrating that women generally report more PTG than men (Vishnevsky *et al*., 2010). Nonetheless, in the current study the emergence of PTG was not typical of mothers only. A considerable percentage (80%) of fathers experienced average or high levels of PTG, which is consistent with the research by Byra and Ćwirynkało (2020) conducted among fathers of children with ID.

The findings indicated that the highest level of PTG was characteristic of mothers of children with ASD, in whom the greatest beneficial post-traumatic changes were noticed in appreciation of life and perception of self. Interestingly, in the current study just about a quarter of mothers of children with ASD reported low PTG levels, which suggests significant internal differentiation in this group of mothers in terms of PTG. Given the fact that the study group was unified in the sense that these were mothers of ASD children (without a diagnosis of ID), the perceived internal diversity indicates additional factors that affect the emergence and intensity of PTG, for example other child characteristics (Jones *et al*., 2013), personal and partner factors (e.g. Hastings, 2003) or social support (Love and Knott, 2018).

The interactive effect of parent sex and child disability type was revealed only in the sphere of positive spiritual changes, which turned out to be significantly higher in mothers of children with ASD, which is consistent with previous research reports (e.g. Zhang *et al*., 2013).

Interestingly, statistically significant (negative) correlations between age and PTG in mothers (dimension: spiritual changes) and fathers (dimension: changes in relations to others) of children with ASD were found, which does not align with the results of Phelps *et al*., (2009) who suggested that age was not significantly correlated with PTG in parents of children with ASD. In turn, as far as parents' age is concerned, no significant relationship between age and PTG was indicated in parents of children with ID, which is consistent with the results of other researchers (Kiełb, Bargiel-Matusiewicz and Pisula, 2019).

Eventually, we tested the hypothesis associated with the relationship between stress and PTG, taking into account parent sex and child disability type. We assumed that this relationship would be positive and stress was a significant stimulus triggering PTG in parents raising a child with ID or ASD. The results confirmed the hypotheses partially. An important differentiating factor of this relationship turned out to be parent sex. There were no statistically significant correlations between stress and PTG in fathers. The independence of both variables is consistent with current assumptions about the coexistence of stress and PTG (Dekel *et al*., 2012), as well as empirical findings of prior research conducted among parents of children with ASD (e.g. Phelps *et al*., 2009). The relationships between stress and PTG in mothers, in contrast to other studies that indicated the lack of relationships (e.g. Phelps *et al*., 2009; Kiełb, Bargiel-Matusiewicz and Pisula, 2019) or negative correlations (Strecker *et al*., 2014), were found to be positive. Specifically, there was a positive relationship between emotional tension and beneficial spiritual posttraumatic changes in mothers of children with ID. Furthermore, the analysis revealed that this relationship is not linear but square. Therefore, increas-

ing stress becomes a stimulus for mothers to grow on a spiritual level only for a certain time, which is in line with the findings obtained from mothers of children with ID, ASD and deaf children by Manor-Binyamini (2016). It is probable that, with a particularly high level of stress, mothers are beginning to focus on making changes conducive to lowering exhausting negative emotions and use coping strategies focused on their regulation (Padden and James, 2017). As a result, high levels of stress in mothers of children with ID may be conducive (but not determinative) to posttraumatic changes other than spiritual growth. The present research also revealed positive and linear correlations between stress (external and intrapsychic) and PTG – greater appreciation of life in mothers of children with ASD. These results suggest that both of these phenomena may influence each other mutually, and more importantly, with increased growth on the level of appreciation of everyday life, satisfaction and fulfillment from the life as it is, mothers may experience both external and internal tensions arising from confronting the inevitable problems of raising a child with ASD, which aligns with other studies (e.g. Yonemoto *et al*., 2012; Manor-Binyamini, 2016).

Clearly, there are several limitations of the study as well:

1) The sample included in the study was unified in terms of child disability type (ID or ASD) and age (school age: 7–15 years), but these groups varied in the level of child disability.
2) This study focused on analyzing the direct relationship between stress and PTG in parents of children with disabilities, taking into account parent sex and child disability type. However, a small percentage of explained variation in PTG dimensions (spiritual changes and appreciation of life) with the participation of stress dimensions (emotional tension, external and intrapsychic stress) indicates the importance of other, probably more significant, explanatory factors of PTG in mothers. The true impact of raising a child with a disability is dependent on numerous factors, which may include: child characteristics, like their level of disability (Pozo and Sarriá, 2014; Chouhan *et al*., 2016; Kalgotra and Warwal, 2016), behaviour (Pozo and Sarriá, 2014) or sleep problems (Martin *et al*., 2019), parent characteristics (Hassall *et al*., 2005), socio-economic situation and household income (Scherer, Verhey and Kuper, 2019) or social support (Hassall *et al*., 2005; Pozo and Sarriá, 2014; Patton *et al*. 2018) and each of these factors may influence mothers and fathers in a specific way (e.g. Pozo and Sarriá, 2014). Thus, in further studies, the relationship between these variables should be analyzed, taking into account mediators, e.g. related to the resources of parents

and the specificity of child functioning resulting from a particular disability.

3) Since this study is cross-sectional, it provides a static view of parenting and does not allow to capture the dynamics of the analyzed phenomena, both PTG and stress. Longitudinal studies could be more adequate.
4) The recruitment through foundations, associations, educational and rehabilitation facilities, which are service agencies whose aim is to support people with disabilities and their families, may introduce selection bias since the parents who are involved in these agencies might have different perspectives from those who are not. Also, the sample is biased towards these parents who were willing to devote their time to take part in the research.
5) Both variables: PTG and stress that we examined in the study, were determined on the basis of self-reports susceptible to cognitive distortions and the impact of social approval. PTG measurement is particularly sensitive in this respect. Measuring PTG, we focused only on indicating beneficial changes related to raising a child with a disability. This way of measurement makes respondents concentrate only on positive issues, with no opportunity to report any negative changes that may also be experienced. Therefore, to provide a more complete picture of their experiences of raising a child with a disability, further studies should examine both PTG and post-traumatic depreciation in parents.

Despite the limitations listed above, we believe that the current research results provide valuable, complementary information to the existing knowledge about PTG and its relationship with stress in parents of children with disabilities. Sex differences in the impact of child ID or ASD on parents turned out to be robust. The findings allowed us to indicate the significant role of both parent sex and child disability type (ID, ASD) in explaining the intensity of PTG, stress, and the dimensions that comprise them. Another result that we find interesting refers to positive correlations (including the quadratic relation) between stress and PTG in mothers of children with ID and children with ASD. We are certain that these results contribute significantly to extending knowledge on post-traumatic experiences of parents of children with disabilities.

Implications

The results of the present study may be useful for practical purposes. Information on the intensity of stress and PTG in parents of children with disabilities can be used in therapeutic activities aimed at providing them with support and strengthening transformative beneficial changes. The findings could be valuable for parents of children with ASD and ID in raising their awareness of the possibility to experience growth despite the challenges associated with parenting these children. On the other hand, the knowledge that not every parent of a child with a disability experiences PTG could also be of value since it might prevent a sense of guilt for their presumable inability to perceive the positive aspects of this kind of parenting and to adapt to difficult life situation. Secondly, the results concerning the relationships between stress and PTG in mothers can be used to design training programs focused on coping with increased stress and sustaining growth on a spiritual level and in the area of appreciation of life. Interventions in this area might have a positive influence on the whole family system since – as some studies (e.g. Hickey *et al.*, 2019) indicate – relationships between family members are impacted by parent psychological well-being.

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