Research Article　　　　　　　　　　　　　　　　　　　　**Open Access**

Emotional Empathy Mediates the Relationship between Mental Health of Parents of People with ASD and the Autistic Symptomatology of the Care Recipient

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Abstract

Caring for people with an autism spectrum disorder (ASD) has been reported to have a negative impact on the caregivers' health. One of the most studied risk factors is the severity of the autistic symptomatology of the care recipient, greater severity of symptoms having been associated with poorer health outcomes in caregivers. However, to our knowledge, no studies have evaluated the role of empathy of the caregivers in this association. This study aimed to explore the possible mediating effect of both cognitive and emotional components of empathy in the relationship between autistic symptoms of the care recipient and caregiver depression and anxiety in 76 caregivers of people with ASD. Only personal distress mediates the association with anxiety, while both components of emotional empathy, personal distress and empathic concern, mediate the relationship between autistic symptoms and depressive symptomatology. In both cases, high scores in empathy were related to high levels of symptomatology. These results have implications for clinical practice, in that evaluating empathy in caregivers could help to foresee and hence take measures to prevent psychological disorders in this population.

Keywords: Autistic symptoms; Empathy; Depression; Anxiety; Caregivers

Introduction

Caring for offspring with an autism spectrum disorder (ASD) has negative consequences for the caregivers' health [1-3]. Among other problems, primary family caregivers of people with ASD have been found to have more somatic symptoms, social dysfunction and higher rates of depression and anxiety than non-caregivers [3-5]. Several studies have analyzed variables that might predict these health outcomes in caregivers. The most studied risk factors have been those associated with the care recipient, specifically, behavior disruption and the severity of autistic symptomatology [6-11]. These two variables related to the functionality of the offspring have shown to be the best predictors of stress [8], depression [12] and anxiety in caregivers [10]. On the other hand, as discussed in previous studies, this association could be mediated by several factors, such as contextual and psychosocial variables [5,12-17]. However, no studies have analyzed the effects of caregiver empathy, which can be divided in cognitive (the intellectual ability to identify the feelings and thoughts of others) and emotional empathy (sharing the emotional experience of another person) [18, 19]. In this regard, Monin and Schulz proposed caregivers empathy as a one of the principal mediators in the association between symptomatology of the care recipient and emotional disorders in caregivers [20]. Based on a classical hypothesis, caregivers with high empathy could be more sensitive to other´s problems and, hence, more prone to exhibit anxiety and depression symptoms [21]. In this regard, emotional empathy has been related to depression and anxiety in many previous studies conducted with clinical and general population [21-24]. Among the few studies that have evaluated the effects of empathy on anxiety and depression in caregivers, some authors found various associations between cognitive and emotional empathy, and stress perception and depression in caregivers of people with dementia [25]. In that study, high cognitive empathy was related to lower levels of stress perception and depression, while emotional empathy was negatively related to life satisfaction of the caregivers. Given all this, in order to test the emotional sensitivity hypothesis on caregivers of people with ASD [20,21], the first aim of the present study was to analyse the relationships between the severity of autistic symptoms of care recipients, and empathy, anxiety and depression in caregivers. Considering the aforementioned results in the literature, we expected to find that anxiety and depression were positively correlated with autistic symptoms and emotional empathy [8,10]. The second aim of the study was to assess whether the two components of empathy (cognitive and emotional) mediate the association between autistic symptoms of care recipients and anxiety and depression in family caregivers. We hypothesized that empathy would mediate this association [20,21]. Furthermore, we expected to find a stronger mediating effect from the components of emotional empathy, than those of cognitive empathy [25].

Material and Methods

Participants and procedure

The sample was composed of 76 parents of people with a diagnosis of an ASD (27 men and 49 women). They were mainly recruited from members of two associations of relatives of people with ASD based in the region of Valencia (Spain). Firstly, a meeting was conducted with caregivers to explain the aim of the research and the criteria for participation: being parent of an ASD patient with a clinical diagnosis; living at home with the patient; and being the main provider of care. Researchers administered a battery of questionnaires for evaluating psychological functioning, empathy and the severity of autistic and socio-demographic characteristics of the participants. All participants

took part in the study voluntarily, and provided written informed consent prior to their inclusion following the ethical principles for human research (Declaration of Helsinki). Descriptive data for all the caregivers are summarized in Table 1.

Variable/characteristics		N=76
Gender	Male	27 (35.5%)
	Female	49 (64.5%)
Age		45.17 ± 6.32
Marital status	Single	2 (2.6%)
	Married	65 (85.5%)
	Divorced	8 (10.5%)
	Widowed	1 (1.3%)
Level of education	Primary	26 (34.2%)
	Secondary	20 (26.3%)
	University	26 (34.2%)
	Other	4 (5.3%)
Source of income	Pension	23 (30.3%)
	Earnings from employment	48 (63.2%)
	Unemployment benefit	0 (0%)
	Other	5 (6.6%)
Care status		
Years of care		12.94 ± 5.26
Time caring per week (hours)		53.12 ± 39.22
Shared care	Yes	63 (82.9%)
	No	13 (17.1%)
Gender of care recipient	Male	70 (92.1%)
	Female	6 (7.9%)
Age of care recipient		14.27 ± 4.76

Table 1: Socio-demographic characteristics of caregivers and care recipients.

Variables and measurement instruments

Anxiety: Trait anxiety was evaluated using the Spanish version of the State-Trait Anxiety Inventory (STAI) [26]. This inventory is composed of 20 items ranked on a 4-point Likert scale and evaluates individual anxiety proneness. The reliability coefficient of this instrument is 0.86.

Depression: Depression symptomatology was evaluated using the Beck Depression Inventory (BDI) [27]. This questionnaire consists of 21 self-report items ranked on a 4-point Likert scale that refer to emotional, cognitive, and somatic aspects of depression mood. This instrument has a reliability coefficient of 0.83.

Empathy: The interpersonal reactivity index (IRI) assesses four aspects of empathic response [18]. We used the Spanish version [28], which includes four subscales: two for the cognitive and two for the emotional empathy. The cognitive factor includes the subscales "perspective taking" defined as the spontaneous attempt of the individual to adopt the perspective of others; and "fantasy", the tendency to imaginatively transpose oneself into the feelings and actions of fictitious characters. The emotional factor includes "empathic concern", consisting of other-oriented feelings of sympathy and concern for the discomfort and distress of others; and "personal distress", defined as self-oriented anxiety and distress when experiencing the negative experiences of others. Items are ranked on a 5-point Likert scale with reliability coefficients ranging from 0.56 to 0.70.

Autism severity: The autism severity of the care recipient was assessed with the Autism Quotient (AQ) [29]. This questionnaire was answered by caregivers and is composed of 50 items ranked on a 4-point Likert scale with a reliability coefficient of over 0.76. A higher score indicates higher severity of autism with a maximum of 50.

Statistical analysis

Spearman correlations were employed to assess the relationships between variables evaluated. Linear regression analyses were used to determine the predictive value of autism severity and empathy in anxiety and depression, controlling for gender. Bootstrapping was applied to test the indirect effect of autism severity of the care recipient on anxiety and depression of family caregivers, through the mediation of empathy. Bootstrapping is a non-parametric technique that can be employed to test mediation models. This method has been shown to be more reliable in small samples than other traditional methods, such as linear regression or the Sobel test [30]. Taking into account the previous demonstrated differences in empathy between genders, this variable will be controlled in further analyses [31,32]. All statistical analyses were performed using SPSS 21.0 software, considering any $p<0.05$ as significant. The descriptive data are expressed as mean and standard deviation (M and SD, respectively).

Results

Relationship between the autism severity of the offspring and empathy, depression and anxiety of the caregivers

Spearman correlations between autism severity, empathy factors, depression and anxiety of caregivers are presented in Table 2. Significant relationships were found between autism severity and fantasy ($p<0.05$) and both components of emotional empathy ($p<0.05$). In the case of psychological outcomes of caregivers, autism severity also showed a positive association with both anxiety ($p<0.01$) and depression ($p<0.05$). With regard to the association between empathy factors and psychological functioning of caregivers, only the components of emotional empathy were related to both anxiety and depression ($p<0.05$).

Autistic symptoms and empathy as predictors of depression and anxiety in caregivers

In order to evaluate the direct association between autism severity and depression and anxiety, two hierarchical regression models have been constructed for depression and anxiety separately. For controlling the potential confounding effect of gender, this variable was included

in the first step. The second step included the autism severity and the third step the empathy factors.

Regarding anxiety, when gender was introduced in the first step, was significant predictor. When the autism severity was introduced in the second step, gender remained significant and autism severity was also significant predictors. Finally, in the third step, when the four components of the empathy were included in the model, only gender

and personal distress were significant predictors of anxiety in caregivers.

In the depression model, gender was not significant predictor. In the second step, autism severity was significant predictor. In the third step, empathy components were included. In this step, both emotional components of empathy, empathic concern and personal distress, were significant predictors of depression (Tables 3 and 4).

	Mean (SD)	Autistic Symptoms	Anxiety	Depression	Perspective Taking	Fantasy	Empathic Concern	Personal Distress
Autistic Symptoms	32.27 (4.92)	-	r=0.312**	r=0.281*	r=-0.039	r=0.278*	r=0.232*	r=0.475**
Anxiety	26.49 (10.22)		-	r=0.764**	r=-0.045	r=0.176	r=0.223*	r=0.509**
Depression	10.21 (8.49)			-	r=-0.002	r=0.210	r=0.309**	r=0.438**
Perspective Taking	24.46 (4.98)				-	r=0.345**	r=0.355**	r=-0.086
Fantasy	20.63 (6.51)					-	r=0.613**	r=0.265*
Empathic Concern	26.89 (4.55)						-	r=0.167
Personal Distress	16.40 (4.83)							-

Table 2: Descriptive statistics and pattern of spearman correlations between autistic symptoms of the offspring, depression, anxiety and components of the empathy trait in caregivers ($^*p<0.05$, $^{**}p<0.01$).

	Step 1			Step 2			Step 3		
	β	R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2
Gender	0.333**			0.296**			0.251*		
$F_{(1,74)}=9.241^{**}$		0.099	0.111**						
Autistic Symptoms				0.308**			0.088		
$F_{(2,73)}=9.400^{***}$					0.183	0.094**			
Perspective Taking							-0.064		
Fantasy							-0.061		
Empathic Concern							0.037		
Personal Distress							0.489***		
$F_{(6,69)}=7.421^{***}$								0.339	0.187**

Table 3: Predictive value of autistic symptoms of the care recipient and empathy of the caregivers in anxiety of the caregivers (*p<0.05; **p<0.01; ***p<0.001).

Indirect effect of autistic symptoms on caregiver´s anxiety and depression mediated by empathy

We investigated the ability of empathy factors to mediate the association between autism severity of the offspring and anxiety and depression of caregivers. Two mediation models were built for each dependent variable separately. For anxiety, it was confirmed that autism severity had a direct effect on these variables after controlling for the gender. Regarding the association between autism severity and empathy mediators, significant relationships were found for fantasy (B=0.372, SE=0.147, p<0.05) and the components of emotional empathy: empathic concern (B=0.245, SE=0.101, p<0.05) and personal distress (B=0.458, SE=0.101, p<0.001). Assessing the association

between mediators and anxiety, only personal distress showed a significant and positive relationship with anxiety (B=1.03, SE=0.232, p<0.00001). The examination of the indirect effect revealed significant mediation by the empathy factors (indirect effect = 0.458; 95% CI for bias-corrected and accelerated indirect effect: lower level=0.17, upper level=0.98), with the effects of autism severity on anxiety of the caregivers being mediated by empathy components. The direct effect of autism severity was not significant after the inclusion of mediators, confirming the mediating effects of empathy in this association (B=0.182, SE=0.228, p>0.10). These analyses allow a comparison of the indirect effects between proposed mediators. In this case, personal distress showed stronger mediating effects than perspective taking (indirect effect=-0.473; 95% CI for bias-corrected and accelerated

indirect effect: lower level=-0.962, upper level=-0.182), fantasy (indirect effect=-0.509; 95% CI for bias-corrected and accelerated indirect effect: lower level=-1.05, upper level=-0.151) and empathic concern (indirect effect=-0.453; 95% CI for bias-corrected and

accelerated indirect effect: lower level=-0.990, upper level=-0.143). When the effects of analyzed covariate was considered, gender reached statistical significance (B=5.33, SE=2.07, p<0.05) (Figure 1).

	Step 1			Step 2			Step 3		
	β	R^2	ΔR^2	β	R^2	ΔR^2	β	R^2	ΔR^2
Gender	0.194			0.156			0.076		
$F_{(1,74)}=2.909$		0.025	0.038						
Autistic Symptoms				0.321**			0.099		
$F_{(2,73)}=5.901$**					0.116	0.101**			
Perspective Taking							-0.071		
Fantasy							-0.14		
Empathic Concern							0.275*		
Personal Distress							0.403***		
$F_{(6,69)}=5.260$***								0.254	0.175**

Table 4: Predictive value of autistic symptoms of the care recipient and empathy of the caregivers in depression of the caregivers (*p<0.05; **p<0.01; ***p<0.001).

Figure 1: Mediation model of anxiety (*p<0.05; ***p<0.001).
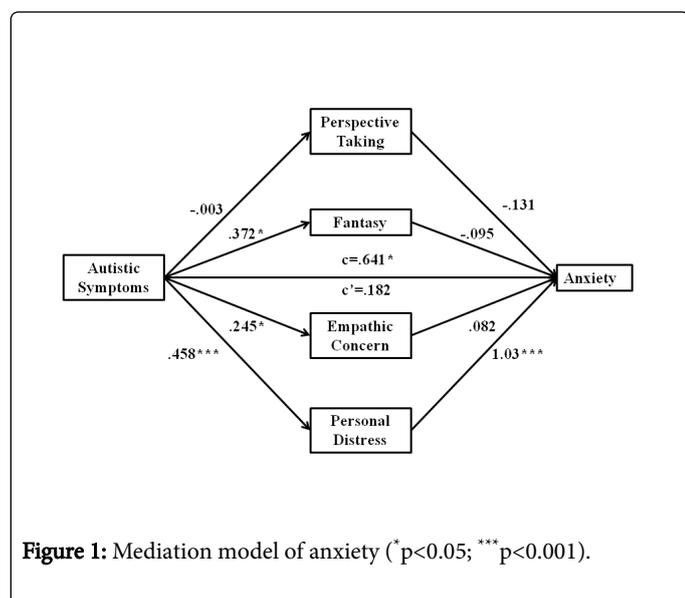
With regard to depression, the same mediation model was tested. In this case, autism severity was again found to have a significant indirect effect (indirect effect=0.382; 95% CI for bias-corrected and accelerated indirect effect: lower level=0.117, upper level 0=0.934). In this case, empathic concern and personal distress were significant mediators (B=0.513, SE=0.255, p<0.05; and B=0.706, SE=0.205, p<0.001, respectively). The direct effect of autism severity on depression did not reach significance when mediators were entered into the model, confirming the full mediation of empathic variables in this association (B=0.171, SE=0.201, p>0.10). When comparing the different effects of the mediators analyzed in the depression model, the effect of personal

distress prevailed over that of perspective taking (Indirect effect =-0.323; 95% CI for bias-corrected and accelerated indirect effect: lower level =-0.789, upper level =-0.069) and fantasy (indirect effect =-0.391; 95% CI for bias-corrected and accelerated indirect effect: lower level =-0.915, upper level =-0.074). In this model, gender did not reached statistical significance (Figure 2).

Figure 2: Mediation model of depression (*p<0.05; ***p<0.001)
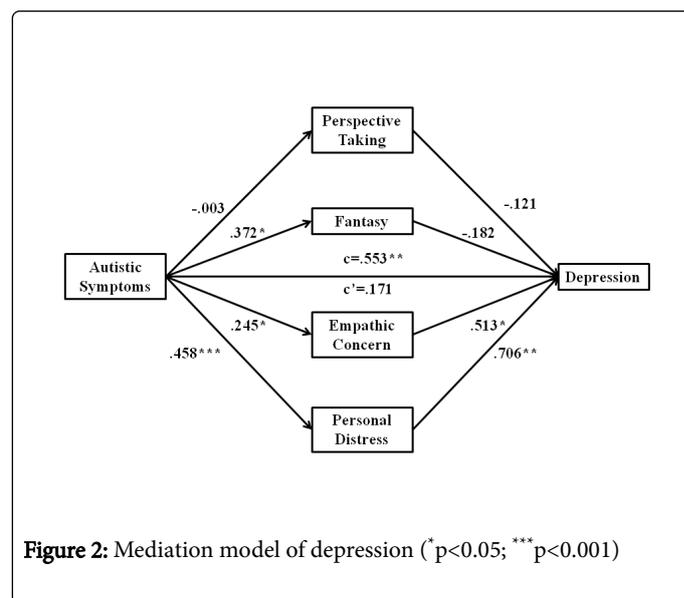
Discussion

These results confirm the association between the severity of autistic symptoms of care recipients and the mental health of their caregivers,

as previously described [6-11]. In particular, a high severity of autistic symptoms has been associated with more anxiety and depression in primary family caregivers. Our results build on these findings, showing that this association is mediated by the empathic traits of the caregivers. Specifically, only the components of emotional empathy seem to mediate this association. In the case of anxiety, personal distress was the only significant mediator, whereas for depression, both emotional empathy components (empathic concern and personal distress) were significant mediators.

Similarly, previous research has indicated a relationship of depression and anxiety with empathy [21-24]. Classical studies characterized humans with a predisposition to empathy, showing that they respond emotionally to the distress of others and attempt to help others when they are suffering [33]. In relation to this, empathy has previously been assessed as a risk factor for mood disorders [34]. O´Connor et al. describe depression as a disorder of "concern for others" in which an excess of empathy is able to promote self-blame and guilt for the distress and discomfort of the others [35]. This issue is especially important when considering the care context. In this case, caregivers could have this type of negative feelings constantly. As explained by the authors, it is normal for individuals to feel that they are not able to control or adequately deal with the distress and discomfort of others, and such a situation promotes stronger negative feelings in high emotional empathy individuals [35]. This issue could be particularly relevant in primary family caregivers, taking into account that previous research found a negative relationship between high levels of perceived control and self-efficacy in the management of the symptoms of care recipients and depression and anxiety in caregivers [14]. Autistic symptoms tend to be less changeable than other variables such as behavioral problems that may be relatively modifiable and over which caregivers may perceive a greater level of control [2].

It is well known that empathy could be a risk factor for anxiety and depression, but our results underline the importance of the emotional rather than the cognitive component of empathy. These results are similar to those obtained when comparing empathy traits in depressed and non-depressed patients [36]. Indeed, patients with depression were not found to differ in the components of cognitive empathy, while they showed higher levels of personal distress than non-depressed individuals. In accordance with these results, in a recent review, empathic distress was found to be the most important empathic trait related to depression [23]. Several hypotheses have been proposed to explain the association between emotional empathy and depression [35]. In the care context, one of the most plausible explanations would be the hypothesis of emotional contagion [20], defined as feeling similar emotions to those of the care recipient [20]. From an evolutionary perspective, to be empathic with care recipient behavior and emotions could provide essential information about their needs and suffering [37]. Although the fact of being empathic could be adaptive, this situation maintained for a long time may well be detrimental for the psychological health of caregivers. As has been noted by other authors, highly empathic caregivers are at particular risk of emotional contagion taking into account their chronic exposure to the suffering of a loved one [20]. Though few studies have analyzed potential emotional contagion in caregivers, a recent review pointed out the negative effect of this potential situation on the mental health of older adult caregivers [20]. These results have been replicated in samples of caregivers of people with cancer or chronic pain [38,39].

Although the association between empathy and depression has been widely studied previously, little is known about the relationship between empathy and anxiety. For instance, several researchers have analyzed the role of empathy in certain types of anxiety disorders, such as generalized anxiety disorder [22,40]. This disorder is characterized by excessive concern about others, worries about family members being the most common, and it has been linked with a specific type of temperament, characterized as "altruistic anxiety" [40]. Studying this type of anxiety from an evolutionary perspective, it has been suggested that this altruistic proneness is an adaptive function for the survival of the human species [41]. Empathy has been closely related to altruism [33], and caregivers with higher levels of empathy may be more likely to experience this altruistic anxiety. This fact, combined with daily living with a person diagnosed with an ASD, could explain the higher anxiety of caregivers with high emotional empathy. Another possible explanation is emotional contagion: as has been proposed for depression, caregivers could be also involved in the association between autistic symptoms and anxiety in caregivers through emotional contagion mechanisms.

To sum up, our results represent a significant advance in the understanding of the negative effects of the severity of the autistic symptoms of care recipients on the mental health of family caregivers. This is particularly important as it has been widely demonstrated that the caregiving role does have an effect on mental health in family caregivers of people with ASD. However, some limitations of the study have to be recognized. The study is cross-sectional and therefore it is not possible to draw conclusions about causality from the results. Further studies are required to analyze other types of characteristics of the care recipient, such as behavior disruption and other types of family caregiver outcome variables, such as quality of life or burden. Emotional intelligence should also be considered in further research, in order to assess whether it has a role in the regulation of emotional contagion proposed in our study.

Acknowledgement

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