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ORIGINAL PAPER

Family Impact and Parenting Styles in Families of Children with ADHD

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Abstract Attention deficit hyperactivity disorder (ADHD) begins in childhood and is characterized by attention deficits, hyperactivity, or impulsiveness that is inconsistent with a child's developmental level. The effects of ADHD are not limited to the child alone but can affect their familial context, particularly parenting styles. Using data from 68 parents of 6–11-year-old ADHD-diagnosed children, we attempted to identify the predictive variables of two parenting styles: criticism-rejection and permissiveness-indulgence. We analyzed two complex predictive models using structural equation modeling. We hypothesized that family impact variables would mediate the relation between the child's behavior and parenting. The data showed that the child's ADHD was only indirectly related to parenting styles, whereas child's behavior problems had a direct relationship. The results stressed the central role of the child's behavior on family social life, parents' marital relationship, and parents' feelings about their children. These variables mediated the relationship between the children's disorders and parenting styles. On the other hand, perceived social support had an inverse relationship with this negative family impact, and it even had relevant indirect effects on criticism and permissiveness.

Keywords Family impact · Parenting styles · Child´s ADHD · Child´s behavior problems · Social support

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Introduction

The Diagnostic and Statistical Manual of Mental Disorders–5th edition (DSM-5™) criteria for ADHD states that people with ADHD show a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development and is characterized by attention deficits, hyperactivity, or impulsiveness that is inconsistent with developmental level (American Psychiatric Association 2013). Many children and adolescents with ADHD have trouble controlling their behavior and following the norms expected for their age, which a source of problems with adapting to their development settings. In this sense, it should be underlined that the effects of ADHD are not limited to the child alone but can affect their closest social contexts and, of course, their family context (Johnston and Mash 2001).

Although it is true that family dynamics are not considered a cause of ADHD, bidirectional influences (parent-to-child and child-to-parent processes) do seem to be the key to the disorder's course (Johnston and Jassy 2007; Pardini 2008). The behavior of children with ADHD poses strong challenges for parents, generating high levels of anxiety and family stress (Donenberg and Baker 1993; Podolski and Nigg 2001). However, family dysfunctions or maladaptive parenting styles can also aggravate both children's ADHD symptoms and their psychological adjustment (Deault 2010; Haack et al. 2014). Several studies have been conducted from this bidirectional perspective. Some genetically based works analyze the decomposition of effects into genetic and environmental influences that can explain parent–child relationships (e.g., Harold et al. 2012, 2013). From a developmental perspective, some models have stated that children are not passive recipients of parents' behaviors; rather, they can actively impact parenting

practices and influence their environment (Bell 1968; Mischel 1973; Pearl et al. 2014). A similar model developed by Patterson (1982, 2002) has proposed a circular theory: the child's negative behaviors increase the probability that parents will use harsh and negative discipline styles, which in a circular, negative interchange, reinforce the child's conduct problems. The model emphasizes the relevance of identifying mediating variables on which to base intervention programs to break this escalation of inadequate parent–child interchanges.

Although a majority of developmental studies have shown that parenting has an impact on disruptive behaviors, some works have suggested that the child's disruptive behavior influences parenting more than parenting influences the disruptive behavior. Thus, ineffective parenting practices may be a result of child's conduct problems rather than a source of the child's behaviors (Burke et al. 2008; Fite et al. 2006). Within this child-to-parent directional approach, many researchers have found that the severity of a child's ADHD predicts parenting style, usually increasing the probability of recurring negative or maladaptive parenting patterns, such as permissiveness or emotional overreaction (Kaiser et al. 2011; Lange et al. 2005; McLaughlin and Harrison 2006). Furthermore, recourse to such inappropriate disciplinary techniques is more frequent when children with ADHD also present associated behavior problems (Johnston and Jassy 2007). Thus, it seems unquestionable that both ADHD symptoms themselves and comorbid problems negatively influence family functioning as a whole and parenting styles in particular. However, it is advisable to separate the effects of the two problems. In fact, some studies have reported that parenting styles are strongly associated with comorbid behavior problems in children but not with the severity of ADHD (Deault 2010; McLaughlin and Harrison 2006).

Although it is true that the same type of parenting practices may have different effects in different ethnic or cultural groups (Javo et al. 2004), several studies have shown that negative parenting is more related than positive parenting to children's disruptive behavior. In fact, it is not very clear whether some practices, such as positive parenting or the parental use of inductive reasoning, are related to the severity of problematic child behaviors such as ADHD symptoms (Cussen et al. 2012; Haack et al. 2014; Sollie et al. 2016). There is more agreement that conduct problems are strongly associated with negative parenting practices (Kaiser et al. 2011; Lange et al. 2005; McLaughlin and Harrison 2006). Even from a practical point of view, in psychosocial interventions to improve a child's functioning, it is more impactful to decrease negative parenting than to increase positive parenting (e.g., Haack et al. 2016).

Given that children's disruptive behaviors increase negative parenting practices, the question then becomes "What variables could play an intermediate role in these interchanges, and how can they be used to refine prevention and intervention strategies?" As Belsky (1984) stated, an ecological view of this question requires the consideration of the context of the child-parent relationship. With this in mind, social support and family functioning variables have been identified as characteristics related to both children with ADHD (and co-morbidities) and parenting. First, research has shown a strong relationship between child ADHD and family dysfunction (e.g., Lange et al. 2005; Sollie et al. 2016). Thus, measures of the effects of family dynamics that break down the impact of children's ADHD on different areas of the family context, such as the parent's feelings and attitudes about the child, marital relations or the family's social life, should also be considered (Bauermeister et al. 2010; Donenberg and Baker 1993). On one hand, a child's ADHD and/or conduct problems impact social family life, marital relations and feelings about parenting; greater severity of conduct problems is associated with a greater effect on the family's social life and lower participation in social events, reduced agreement between parents about child-parent interactions, and more negative feelings and attitudes of parents toward their child (Fleck et al. 2015; Shelton et al. 1998). On the other hand, family dysfunctions were significantly positively correlated with harsh/coercive parental discipline: the greater the number of family problems, the greater the probability of negative parental practices (Jansen et al. 2012; Sanders et al. 2014). Although some research has suggested that the effects of child conduct problems on parenting were indirect and completely mediated by the parents' psychological well-being, including parental stress (Abidin 1990; Nam and Chun 2014), to the best of our knowledge, no studies have analyzed the mediating role of these family problems in child-parent processes. Thus, it would be a challenge to analyze the mediating role of different aspects of family life on the relationship between child problems and parenting styles.

Second, an abundance of evidence highlights the strong relationship between perceived social support and both the severity of child ADHD (or conduct problems) and parenting styles. Bringing up a child with ADHD is usually a serious challenge, particularly if there is no help from family or close relatives. Unfortunately, several studies have shown that the families of children with ADHD perceive having less social support and experience more social isolation than control families (Gau 2007; Lange et al. 2005). Other works stated that when social support decreased, child behavior problems increased (Akcinar and Baydar 2016; Mash and Johnston 1983). Moreover, this feeling of being alone and lacking social and family support is in turn related to less effective parenting (McLaughlin and Harrison 2006; Wallace 2013). In fact, family social

support is closely related to parenting, either directly or indirectly through parental variables such as self-efficacy or psychological well-being (DeGarmo and Forgatch 1997; Forgatch and DeGarmo 1997; Izzo et al. 2014).

Given the importance of this issue, in this study, we attempted to analyze the variables most related to parenting styles in a sample of families with children with ADHD. Similar to the work of Burke et al. (2008), we stated a relationship from child ADHD (and/or conduct problems) to parenting styles. Furthermore, as in Belsky's (1984) model, we have added two contextual variables: social support and impact on family life (measured as family functioning). Of particular interest in the present study is the mediating role of the impact on family life. Additionally, we concentrated on two negative parenting styles, authoritarian and permissive, which have been shown to be associated with negative child outcomes. We therefore analyzed the association of child and contextual variables with criticism from parents—given the high presence of this manifestation of authoritarian style in research with families of children with ADHD—and with overindulgence in the interactions with children, the typical expression of a permissive parenting style. We further considered the separate contribution of ADHD symptom severity and comorbid child behavior problems. However, no studies to date have examined the possible pathways by which child, family, and contextual variables may work together to predict parenting styles. In an attempt to respond this question, we have established the hypotheses shown in Fig. 1, which specifies the relationships among the analyzed variables, which were derived from the review of the scientific literature. Although it is a single illustration, it shows two models: one for the authoritarian style (criticism) and the other for the permissive style (indulgence). We hypothesized that (A) criticism (or indulgence) levels are directly related to (1) the child's ADHD severity; (2) the child's behavior problems; and (3) the impact of the child's conduct and problems on (a) the parents' marital relations, (b) the family's social life, and (c) the feelings and attitudes of parents toward their child. Moreover, we expected that (B) child behavior problems and ADHD severity would be associated with a negative impact on marital relations, the family's social life, and the parents' feelings toward their children. (C) Perceived social support would also relate to the negative impact variables. Additionally, we hypothesized (D) that the child's ADHD severity, the child's behavior problems, and social support would have indirect effects on criticism (or indulgence) levels through their negative impact on marital relations, the family's social life, and the parents' feeling toward their child. Finally, we established (E) that the child's ADHD severity is related to the child's behavior problems and (F) that there is a close relationship between ADHD severity and perceived social support.

Method

Participants

Sixty-eight families with girls or boys aged 6–11 years who were diagnosed with ADHD agreed to participate in this study. Table 1 shows the main characteristics of the children and their families.

As the table shows, most of the children were diagnosed with the combined or inattentive subtype. The mean length of time that the families had been living with the diagnosis of ADHD was 3 years (36.63 months, with a range of 0–96 months). Table 1 shows the most important comorbid problems, although all the families were asked about different types of associated problems, such as substance use or anxiety. Specifically, problems related to learning appeared in 32% of the cases studied.

Procedure

To recruit families, the research team visited educational assistance centers for children with ADHD and associations for families with children and adolescents with ADHD in

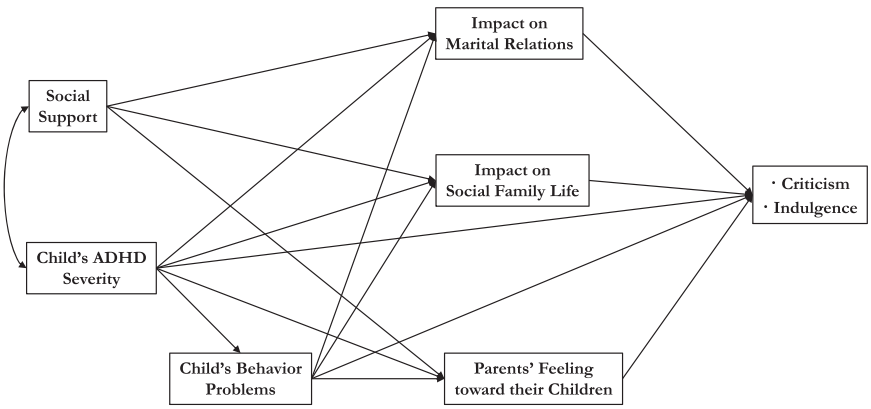

Fig. 1 Theoretical model of parental criticism/authoritarianism and indulgence/permissiveness

Table 1 Socio-demographic variables

Variable	M	SD	N	%
Children				
1. Age	8.94	1.54		
2. Gender: boys			48	71
3. Subtype or presentation of ADHD				
Combined			27	40
Inattentive			22	32
Hyperactive/impulsive			6	9
No answer			14	19
4. Time since diagnosis (in months)	36.63	26.65		
Comorbidity: associated problems				
5. Learning disorders			22	32
6. Oppositional defiant disorder			12	18
7. Speech or expression disorders			12	18
Family				
8. Mother's education				
Low			23	34
Medium			24	35
High			20	29
9. Father's education				
Low			25	37
Medium			22	32
High			13	19
10. Father's age	43.59	7.28		
11. Mother's age	40.44	6.45		

ADHD attention deficit hyperactivity disorder

Huelva (Spain). Professionals working with children and families sought the parents' voluntary participation in the study. The mothers and fathers provided all the information through a self-report questionnaire, including socio-demographic variables and their children's characteristics, diseases, and comorbid problems. The child's ADHD was determined via a previous professional diagnosis (usually pediatricians (60%) or psychologists (40%) who worked with the family associations) according DSM-IV criteria and following Health Authority (Spanish Ministry of Health) recommendations (Ministerio de Sanidad, Política Social e Igualdad 2010).

Of the 90 families contacted to participate in the study, 68 completed the questionnaires, for a 75% response rate. The families completed the questionnaires at home and returned them through the associations and educational centers. The characteristics of the children participating in this study largely coincided with those of other studies carried out with Spanish children, especially in terms of the boys/girl ratio and the most common comorbidities (Catalá-López et al. 2012; Informe PANDAH 2015).

Measures

Criticism-rejection scale

(Bersabé et al. 2001, original version in Spanish). This scale comprises10 five-point Likert-type items (from 1, "Never," to 5, "Always"). High scores are interpreted as symptoms of criticism, rejection, anger, lack of confidence, and general lack of acceptance of the child's behavior (characterizing an authoritarian parenting style). Example of the items include "I criticize him/her for everything" and "I get angry about everything she/he does." Bersabé et al. (2001) provided evidence of the reliability and validity of scores on this scale (internal consistency equal to .81). Salas et al. (2015) found alpha = .78. In this study, Cronbach's alpha was .77.

Indulgent educational style scale

(Bersabé et al. 2001, original version in Spanish). This scale comprises 10 five-point Likert-type items (from 1, "Never," to 5, "Always") that measure parental permissiveness. Item examples include "As long as he/she is happy, I let him/her do whatever he/she wants" and "I don't care if he/she obeys or not." The scale has acceptable psychometric properties; Bersabé et al. (2001) and Salas et al. (2015) reported internal consistency values of .64 and .75, respectively. In this study, Cronbach's alpha was .76.

Child behavior problems

The behavior problems subscale of the Strengths and Difficulties Questionnaire (SDQ-CAS) was used as a measure of child behavior problems (Goodman 1997. We used the Spanish version, available at http://www.sdqinfo.org/py/sdqinfo/f0.py). The scale comprises five Likert-type items (rated from 0, "False," to 2, "Absolutely true"). Examples of items include "Often loses temper" and "Often lies or cheats." Some studies have shown adequate reliability for the Spanish version ($\alpha = .74$, Gómez-Beneyto et al. 2013; and $\alpha = .62$, Rodríguez-Hernández et al. 2012). In this study, Cronbach's alpha was .68.

Child ADHD symptomatology

This variable was explored using Conners' Parent Rating Scale (Conners 1997; Spanish version by Farré-Riba and Narbona 1989), which consists of 10 items with answer choices from 0, "Not at all," to 3, "A lot" (sample items include "Inattentive, easily distracted" and "Excitable, impulsive"). The internal consistency in this study was .83. Reliability and validity have been established for the Spanish version (e.g., Salas et al. 2015; alpha = .92).

Impact on parent feelings and attitudes scale

Donenberg and Baker (1993) (Spanish adaptation by Presentación et al. 2006) comprises 15 items. High scores indicate negative feelings and attitudes of parents toward their child (e.g., "My child brings out feelings of frustration and anger more," "My child's behavior bothers me more"). The answer choices on the items range from 0, "Not at all," to 3, "Very much," although the items are coded as 0, "No impact," or 1, "Impact," following the recommendations of the authors of the Spanish version. In this study, Cronbach's alpha was .84.

Impact on social family life scale

Donenberg and Baker (1993) (Spanish adaptation by Presentación et al. 2006) comprises 10 items, which are coded as 0, "No impact," or 1, "Impact." It shows the degree to which the child's behavior negatively affects the family's relationships and participation in social events (e.g., "My family avoids social outings more (e.g., restaurants, public events) because of his/her behavior," "I have guests over to our house less often than I would like to because of my child's behavior"). The Cronbach's alpha was .79 in the current study.

Impact on marital relations scale

Donenberg and Baker (1993) (Spanish adaptation by Presentación et al. 2006) comprises seven items (0, "No impact," or 1, "Impact") that measure the extent of distancing or disagreement between the members of the couple with regard to the child's behavior (e.g., "My child causes more disagreements between my spouse and me"). The Cronbach's alpha was .78 in the current study. Presentación et al. (2006, 2009) showed that the Spanish version of for the "Parent Feelings and Attitudes Scale," the "Impact on Social Family Life Scale" and the "Impact on Marital Relations Scale" have adequate psychometric properties.

Perceived social support

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al. 1988; Spanish version by Landeta and Calvete 2002) comprises 12 seven-point Likert-type items, from 1, "Very strongly disagree," to 7, "Very strongly agree." It evaluates the person's perception of social support from family, friends and especially relevant people (e.g., "I get the emotional help and support I need from my family," "I have friends with whom I can share my joys and sorrows"). The MSPSS Spanish version has been demonstrated to have adequate internal consistency ($\alpha = .89$, Buesa and Calvete 2013; and $\alpha = .89$, Landeta and Calvete 2002). Internal consistency in the present study for the composite "Perceived Social Support" score ($\alpha = .91$) was high.

Data Analyses

We analyzed the data using SPSS 19. After checking for outliers, missing data, and the assumptions of linearity, normality, and homoscedasticity, we examined the means, standard deviations, and intercorrelations of the study variables. Next, we conducted several ANOVAs, *t*-tests and correlations analyses to study the relationships between each variable in the models and the clinical and sociodemographic variables to determine whether we would need to control for demographic variables in subsequent analyses.

We used AMOS v. 24 to analyze the two structural equation models and to test the direct and indirect effects. To determine the overall model fit, we used the χ^2 test, the non-normed fit index (NNFI/TLI > 0.90), the comparative fit index (CFI > 0.90), and the root mean square error of approximation (RMSEA < 0.08) (Kline 2005). In each model, the children's problems, family and contextual variables, and one parenting style (criticism-rejection or indulgence-permissiveness) were entered simultaneously. A bootstrapping procedure was used to assess the direct and indirect effects (using 10,000 resamples) to obtain the 95% bias-corrected confidence intervals (BC CIs). A CI that did not include zero indicated a significant direct or indirect effect. This approach provides a more powerful test of effects than other approaches in small samples (Woody 2011).

To determine the extent to which our sample size was sufficient, we tested alternative models (Bentler 2006). The sample size is considered adequate and sufficient if it has the statistical power necessary to reject incorrect models (MacCallum et al. 1996). In this study, we therefore tried 12 alternative models (six with criticism-rejection and six with indulgence-permissiveness) with the same number of parameters and degrees of freedom but exchanged the independent variable (IV: one measure of impact on family life), dependent variable (DV: one measure of impact on family life), and mediating variables (MV: parenting style, perceived social support, child ADHD, child conduct problems, and one measure of impact on family life). For example, in the first alternative model, IV = impact on marital relations, DV = impact on social family life, and MV = the rest of the variables. Statistical power was calculated using the Preacher and Coffman (2006) software. Assuming a null hypothesis of close fit (H_0: RMSEA = 0.05) and an alternative hypothesis of unacceptable fit (H_A: RMSEA = the RMSEA value of each alternative model), a power analysis with $\alpha = 0.05$ indicated that the level of statistical power was high. The values were

RMSEA (average = .252; minimum = .133; maximum = .360) and statistical power (average = .95; minimum = .60; maximum = .99).

Moreover, using the empirical power tables for the mediation models of Fritz and MacKinnon (2007), we concluded that the sample size of this work was sufficient ($N = 54$ in the table) to detect a mediated effect (power = .80 and large to medium paths; $\alpha = .59$ and $\beta = .39$). When we used medium paths ($\alpha = .39$ and $\beta = .39$), our sample size was near the $N = 71$ reported in the table.

Results

First, we analyzed the relationships of the variables included in the structural equation models with all the socio-demographic and clinical variables presented in Table 1 using correlations for continuous variables and *t*-tests or univariate ANOVAs to examine the between-groups differences for categorical variables. Significant associations were not found, and the effect sizes were small to medium. The higher correlation was .25—time from diagnosis with the impact on the family's social life; the higher Cohen's *d* was .44—indulgence-permissiveness with gender; and the highest eta squared was .06–subtype of ADHD with ADHD severity. Consequently, these demographic and clinical variables were not entered as covariates in the subsequent analyses.

Table 2 shows the means, standard deviations and correlations of the variables analyzed in this study. We should mention that the mean for child's behavior problems in this sample was on the borderline between normality-abnormality (41% of the children had scores of 4 or higher, which is abnormal or clinical based on Goodman's (2016) criteria). Low scores predominated in the measurements of impact. For example, on the Impact on Social Family Life Scale, only 23% of the parents had scores of 3 or higher.

The correlations and their signs were as expected based on theory and previous data. Most of the variables had statistically significant high correlations with one another. The criticism-rejection variable was highly correlated with almost all the variables, whereas indulgence-permissiveness was more moderately correlated. The impact measurements were associated with one another, with the dependent variables and with social support, conduct problems and ADHD severity. Furthermore, these two variables were closely related.

Prediction Models

Based on the theoretical relationships specified in Fig. 1, we estimated the fit indices and parameters of two different models, one for criticism-rejection and the other for indulgence-permissiveness. Although both models showed acceptable indices of fit, we found non-significant parameters and high modification indices, which suggest the inclusion of new direct paths. However, before making any modification of the original model, we considered whether these changes were theoretically acceptable and occurred in both the criticism-rejection and indulgence-permissiveness prediction models. Otherwise, to control the capitalization on chance, the statistical significance level of the dropped parameters was higher than .20, and the added parameters had a significance level lower than .001.

Table 2 Correlations, means and standard deviations

	1	2	3	4	5	6	7	8
1. CRIT	–							
2. INDUL	.304*	–						
3. BHVR	.589***	.248*	–					
4. ADHD	.490***	.304*	.575***	–				
5. FEEL	.633***	.192	.651***	.465***	–			
6. SOC	.665***	.234	.542***	.520***	.531***	–		
7. MARI	.457***	.423***	.157	.335**	.425***	.397**	–	
8. SUPP	−.441***	−.242*	−.261*	−.406**	−.279*	−.550***	−.462***	–
Mean	20.29	16.53	3.53	17.11	6.35	2.01	2.31	63.76
S.D.	4.77	4.92	2.37	5.55	3.78	2.37	2.11	14.51

CRIT criticism-rejection of the child's behavior/problems, *INDUL* parental indulgence-permissiveness, *BHVR* child's behavior problems, *ADHD* child's attention deficit hyperactivity disorder symptoms, *FEEL* parents' feelings and attitudes toward their child, *SOC* impact of child's problems and behaviors on the family's social relationships, *MARI* impact of child's problems and behaviors on parents' marital relations, *SUPP* perceived social support

* $p < 0.05$; ** $p < 0.01$; *** $p < .001$

First, the model modification indices proposed adding one new parameter relating impact on marital relations with parental feelings and attitudes. After adding this new relationship, we proceeded to eliminate non-significant parameters that appeared in both models. The models resulting from these modifications are shown in Fig. 2 (A and B, for criticism-rejection and indulgence-permissiveness, respectively). These models fit satisfactorily and are explained in detail below.

Prediction of family impact measurements. Since the data for the parameters analyzed in this section were the same in both models, they were analyzed as if there were only one, and the analysis was applicable to both the criticism-rejection and indulgence-permissiveness prediction models (Fig. 2). The model explained up to 54% of the variability in scores for parents' feelings and attitudes toward their child. Conduct problems were positively and significantly related to parents' feelings and attitudes. To a lesser extent, impact on marital relations was associated with parents' feelings and attitudes. Moreover, the parents' feelings and attitudes variable was indirectly related to social support (through impact on marital relations) and ADHD (mainly through conduct problems; see Table 3 for indirect effects). The model further explained 47% of the variance in scores on impact on social life. Behavior problems (positive path coefficient) and social support (negative path coefficient) were related to the impact of the children's problems on the family's social life. Child ADHD severity is indirectly related to the impact on the family's social life through child conduct problems. Impact on marital relations was associated with social support (path coefficient = −.39; 95% BC CI = −.64/−.13) and child ADHD symptoms (path coefficient = .18, 95% BC CI = −.01/.38), Thus, the higher the score on the Conners' scale, the higher the score for impact on marital relations. In contrast, the higher the social support, the lower the impact on the couple's relationship. The model explains 24% of the variance of the impact on marital relations. As the correlation matrix shows, a significant correlation between ADHD and perceived social support (−.41) appeared in both models. Furthermore, child ADHD severity was strongly related to child behavior problems.

Prediction of criticism-rejection. The criticism-rejection model explained 58% of the dependent variable. The variability of the criticism-rejection scores was associated primarily with the impact on family social life (Fig. 2a). Significant direct paths of parent feelings and attitudes, behavior problems and impact on marital relations also appeared. Perceived social support had a significant overall indirect effect on criticism-rejection (see Table 3). This indirect effect was especially manifested through the impact on the family's social life: The more social support available, the fewer negative effects on the family's social life; the less impact on the family's social life, the lower the levels of rejection or criticism of the child. Similarly, the child's ADHD severity had a relevant indirect effect on criticism-rejection through the impact on parents' marital relations and, mainly, the child's behavior problems.

Finally, the possible effects of mediation via the impact on the family's social life and parents' feelings and attitudes on the relationship between conduct problems and criticism-rejection should be emphasized. To test the hypothesis of mediation, we verified that it fulfilled the following criteria (Judd et al. 2001; MacKinnon and Dwyer 1993): (a) a direct effect of the predictive variable (behavior problems) on the predicted variable (criticism-rejection) (c' = .23; 95% BC CI = .01/.48, see Fig. 2a), (b) a direct effect of the predictor (behavior problems) on the mediating variables: impact on the family's social life (α_1 = .43; 95% BC CI = .24/.61) and parents' feelings and attitudes (α_2 = .60; 95% BC CI = .42/.78), (c) a direct effect of the mediating variables impact on the family's social life (β_1 = .35; 95% BC CI = .16/.57) and parents' feelings and attitudes (β_2 = .23; 95% BC CI = .01/.42) on the predicted variable (criticism-rejection), and (d) an indirect effect of the predictor (behavior problems) on the predicted variable (criticism-rejection) through the mediating variables ($[\alpha_1{*}\beta_1]+[\alpha_2{*}\beta_2]$ = .29; 95% BC CI = .15/.45, see Table 3). We therefore conclude that there is a mediating effect: impact on the family's social life and parents' feelings and attitudes mediate in the relationship between behavior problems and criticism-rejection.

Additionally, regarding causal direction, we estimated the fit of one model for criticism-rejection by reversing the path directions, i.e., with criticism-rejection as the independent variable (IV), child ADHD as the dependent variable (DV), and the rest of the variables as mediating variables (MV). This reverse model fit worse than our model: $\chi^2_{(9)} = 12.71$, $p = .18$, NNFI = 0.96, CFI = 0.98 RMSEA = 0.078.

Prediction of indulgence. The specified model explained 24% of the variance in indulgence-permissiveness (Fig. 2b). The variable with the most weight was impact on marital relations, followed by conduct problems. The weights of impact on the family's social life and parents' feelings and attitudes were non-significant. Both social support and ADHD severity had important indirect effects through impact on marital relations (Table 3). To verify the extent to which impact on marital relations mediates the relationship between social support (and ADHD) and indulgence-permissiveness, we divided the matrix into two groups based on the median of the impact on marital relations scores. One group was made up of the families who said they experienced little or no impact on their marital relations, and the other comprised the families who said they experienced a medium to high impact. For each

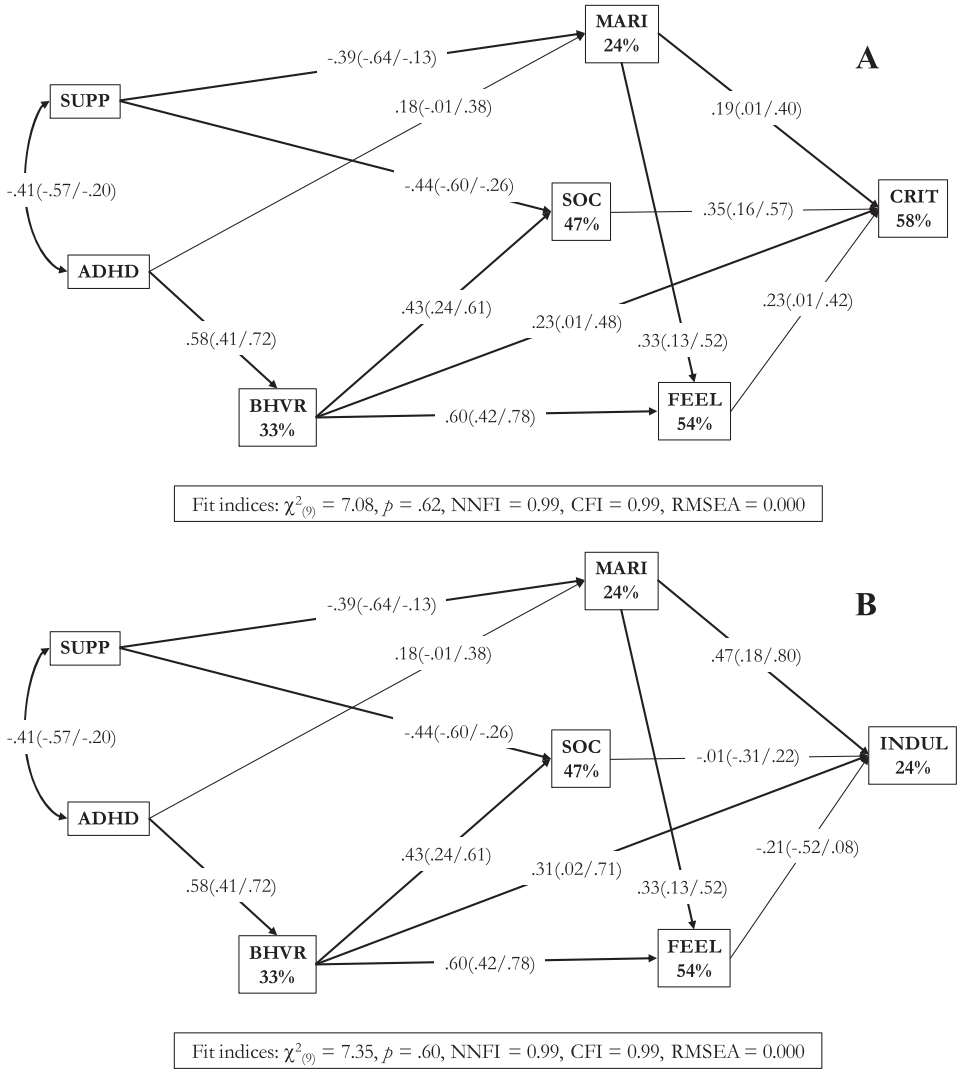

Fig. 2 Standardized parameters for CRIT (*top*) and INDUL (*bottom*) model. *CRIT* criticism-rejection of the child's behavior/problems, *INDUL* parents' indulgence-permissiveness, *MARI* impact of child's problems and behavior on parents' marital relations, *SOC* impact of child's problems and behavior on the family's social relationships, *FEEL* parents' feelings and attitudes toward their child, *BHVR* child's behavior problems, *ADHD* child's attention deficit hyperactivity disorder symptoms, *SUPP* perceived social support. Bootstrapped 95% bias-corrected confidence intervals are in brackets (*lower/upper*)

group, we analyzed the relationship between social support (and ADHD) and indulgence-permissiveness (see Fig. 3).

Figure 3 shows two interaction effects between social support (and ADHD) and impact on marital relations that predict indulgence-permissiveness (as moderating, not mediating, effects). In families that perceived a low impact or change in their marital relations, there was no relationship between the levels of ADHD symptoms of their children and indulgent parenting scores, whereas, when the perceived impact of ADHD symptoms on the couples' relationship was high, there was a high direct relationship between the child's ADHD and indulgent parenting. Additionally, at low levels of perceived social support, permissiveness was high, but only in those families in which the child's ADHD symptoms had a strong impact on marital life. The families with low levels of impact showed low levels of permissiveness, regardless of perceived social support.

As we did previously with the criticism-rejection model, we estimated the fit of one model for indulgence-permissiveness by reversing the path directions, i.e., with indulgence-permissiveness as the IV, the child's ADHD as DV, and the rest of variables as MV. This reverse model did not fit: $\chi^2_{(9)} = 33.59$, $p = .00$, NNFI = 0.64, CFI = 0.84 RMSEA = 0.200.

Discussion

Our purpose was to identify predictive variables of parenting styles, specifically of two maladaptive parenting styles, criticism-rejection and permissiveness-indulgence. We hypothesized, as Burke et al. (2008) suggested, a direct (and indirect) relationship from child ADHD or conduct problems to criticism-rejection or permissiveness-indulgence. We also hypothesized that perceived social support had direct and indirect relationships with criticism-

Table 3 Standardized indirect effect, standard errors (S.E.), and bootstrap confidence interval

	Values	S.E.	95% CI	
			Lower bound	Upper bound
Prediction of family impact measurements				
SUPP→MARI→FEEL	**−.13**	.06	−.27	−.03
Global indirect effects of ADHD on FEEL	**.40**	.07	.25	.53
ADHD→MARI→FEEL	.05	.04	.01	.15
ADHD→BHVR→FEEL	.35	.07	.22	.48
ADHD→BHVR→SOC	**.25**	.06	.14	.37
Prediction of criticism-rejection				
Global indirect effects of SUPP on CRIT	**−.26**	.08	−.43	−.13
SUPP→SOC→CRIT	−.16	.05	−.28	−.07
SUPP→MARI→CRIT	−.10	.06	−.25	−.02
Global indirect effects of ADHD on CRIT	**.34**	.06	.22	.47
ADHD→MARI→CRIT	.05	.03	.01	.14
ADHD→BHVR→CRIT	.29	.06	.19	.43
Global indirect effects of BHVR on CRIT	**.29**	.08	.15	.45
BHVR→SOC→CRIT	.15	.06	.07	.29
BHVR→FEEL→CRIT	.14	.07	.02	.29
Prediction of indulgence-permissiveness				
SUPP→MARI→INDUL	**−.18**	.08	−.36	−.05
ADHD→MARI→INDUL	**.08**	.05	.01	.22

CRIT criticism-rejection of the child's behavior/problems, *INDUL* parents' indulgence-permissiveness, *MARI* impact of child's problems and behavior on parents' marital relations, *SOC* impact of child's problems and behavior on the family's social relationships, *FEEL* parents' feelings and attitudes toward their child, *BHVR* child's behavior problems, *ADHD* child's attention deficit hyperactivity disorder symptoms, *SUPP* perceived social support, 95% *CI* bootstrapped 95% bias-corrected confidence interval

rejection or permissiveness-indulgence. Moreover, the current study extends previous studies by providing empirical support for the mediating role of the impact on the family in the relationship between child variables and parenting styles. The findings partially support our hypotheses: the models explain a significant amount of the variance in criticism-rejection (or permissiveness-indulgence) according to the child's ADHD and social support—directly or, mainly, indirectly—through the family impact variables.

Although the parenting style was only indirectly associated with the child's ADHD, it was directly related to the child's behavior problems. In both models, this last variable had a significant direct positive effect, increasing permissiveness and rejection or criticism. These data coincide with other studies that emphasize the major role of behavior problems comorbid with ADHD in the use of inappropriate parenting practices, even after controlling for child´s ADHD symptoms profile (Fleck et al. 2015, Sollie et al. 2016). In contrast, child ADHD was not directly related to parenting style when behavior problems were included in the predictive model, suggesting an indirect relationship (e.g., Deault 2010; McLaughlin and Harrison 2006).

We would like to stress the central role of the impact on the family on the children's disorders and parenting styles. As described in previous studies, the child's ADHD and behavior problems have a severe negative impact on the parents' marital and social life and negatively influence parents' attitudes and feelings toward their children (Bauermeister et al. 2010; Lambek et al. 2014). In this study, such feelings were much more strongly influenced by the child's behavior problems than by ADHD symptoms themselves, a finding consistent with other research in the same subject (McLaughlin and Harrison 2006). However, the degree of perceived social support seems to reduce the negative impact of children's behavior on the parents' marital and social relations and to have an indirect positive influences on parents' feelings and attitudes. These results agree with other studies that reported that social support is a family resilience factor that reduces parental stress (Bozo et al. 2010; Weiss 2002).

More interesting is the mediating role exerted by the family impact variables. The three measurements of family impact were associated with criticism-rejection, but permissiveness was related primarily to the impact of child factors on marital relations. Children's behavior problems generate criticism from the parents, especially because they generate negative feelings and alter the family's social life. In contrast, ADHD symptomatology was closely related to parental permissiveness, but only in families where the child's ADHD had a very negative impact on the parents as a couple. Thus, parenting styles are more associated with the effects of the child´s behavior in family and marital life than with the child´s disorder itself. The different relationship patterns observed in the models are a relevant area of interest. Indulgence-permissiveness was primary related to the impact on marital relations, whereas criticism was more related to the impact on the family's social life. An explanation could be that marital disagreement or distancing could lead to laxness, minimal supervision and inaction due to the different points of view about parent-child interactions. On the other hand, the more affected the social life of the family was (e.g., because of reductions in social contacts caused by the child's behavior in public), the greater the probability that parents trying to control the child behave in an authoritarian way by showing anger or rejection. Finally, the impact on marital relations had a relevant direct (or indirect) effect on both parenting styles: high levels of marital problems were associated with high levels of negative parenting practices. These findings are consistent

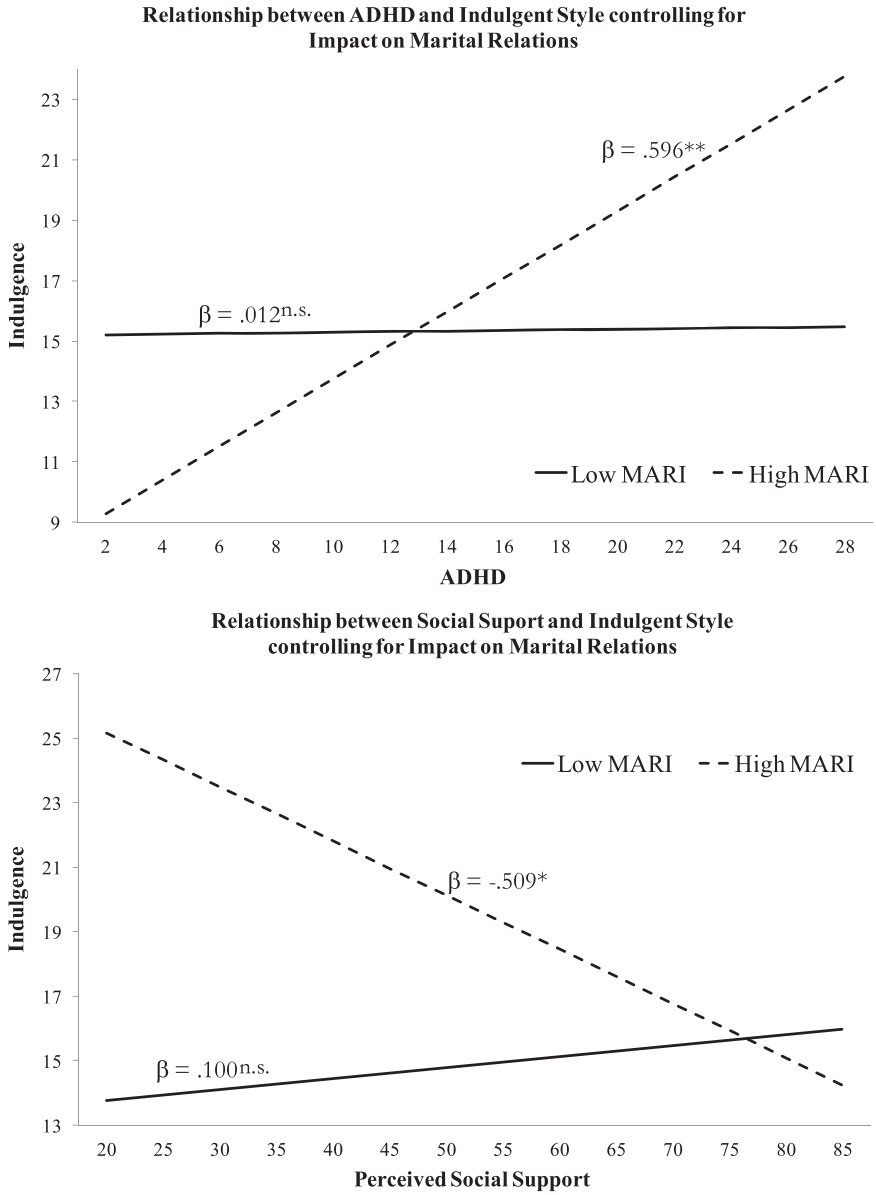

Fig. 3 Relationship between child's ADHD symptoms (*top*), perceived social support (*bottom*) and indulgent style, controlling for impact on marital relations. Low MARI = families who said they experienced little or no impact on their marital relations; High MARI = families who said they experienced a medium to high impact on their marital relations. * $p < .05$; ** $p < .01$; *n.s.* not significant

with the Belsky (1984) model, which emphasizes the central role of the marital relations in the process model of the determinants of parenting. Since we do not know of previous studies that analyzed these impact variables and relationships, we think it would be desirable for future research to verify this mediating (or moderating in permissiveness model) role in other contexts and populations.

Our data also coincide with those of other authors by showing an inverse relationship between perceived social support and the child's ADHD or behavior problems (Akcinar and Baydar 2016; Gau 2007; Lange et al. 2005; Mash and Johnston 1983). Although perceived social support did not have a direct effect on parenting styles, its effect was in the same direction described in other studies that showed its close relationship with parenting styles (DeGarmo and Forgatch 1997; McLaughlin and Harrison 2006). Belsky (1984) asserted that support enhances parenting, sometimes directly but more often through its influence on other mechanisms relevant to parenting, such as well-being. In our data, social support was negatively related to the negative impact that children's problems have on family dynamics, and it even had relevant indirect effects on criticism (reducing the negative effect on the family's social life) and permissiveness (mitigating the effects of the child's ADHD on the parents' marital relations). To better understand these indirect effects, it could be interesting to distinguish different sources of support: couple, friends, or family. Our data show that for families in which the parents' relations are severely altered by their child's problems, social support was negatively associated with parental

permissiveness. In such cases, the support of the other parent was the strongest determinant. Parents who felt supported by their partners had a high sense of parental competence and reported greater agreement with their partners (Belsky 1984). Furthermore, as we stated previously, the greater the agreement within the couple, the greater the probability of reducing the levels of indulgence-permissiveness. On the other hand, the indirect effect of social support on criticism-rejection through the impact on the family's social life could be explained by the family's source of support, mainly by the instrumental support—e.g., having someone who can take care of the children so that their parents can participate in social events. Family instrumental support could reduce the impact of the child's behavior on the family's social life and indirectly reduce the associated high levels of rejection and criticism. This source of support was usually the most important in the Latino/Spanish culture (e.g., Bélanger et al. 2016). Unfortunately, we used only a global, undifferentiated measure of social support and could not separately analyze diverse sources of support. Future research should incorporate these differences.

From the viewpoint of intervention in families with children with ADHD, we agree with other authors (e.g., Presentación et al. 2009) who underscore that interventions with families should include a continued counseling for parents in the affective dimensions of their behavior with their children, providing them not only with techniques for managing child behavior but also problem-solving, cognitive restructuring and relaxation skills to reduce their psychological and emotional stress, and enabling them to use effective discipline and appropriate communication with their children. The effectiveness of some programs or therapies, such as behavioral parent training programs (e.g., Chacko et al. 2008; Chronis et al. 2004; Fabiano et al. 2012) and mindfulness-based therapy or mindful parenting (Corthorn and Milicic 2016; Haydicky et al. 2015; Singh et al. 2010), has been demonstrated. Some of these studies refer to clinically significant changes in various dimensions of family functioning, such as those related to educational strategies or parental stress, and even progress from clinical to normal levels (Gerdes et al. 2012).

Limitations

Despite the relevance of our findings, they should be interpreted keeping in mind some limitations of our study. First, we are aware that a cross-sectional study such as ours cannot extract definitive conclusions regarding cause-and-effect relationships among the variables analyzed. We have presented evidence of statistical mediation, but true mediation requires temporal separation of predictor, mediator, and criterion variables (MacKinnon et al. 2007). However, by testing and rejecting alternatives to the proposed models (with a worse fit), we provide some evidence supporting the hypothesized models. Future research should utilize longitudinal designs to further investigate the developmental pathway between child ADHD and parenting styles.

Second, inattentive cases represent a sizable proportion of our sample. However, some works have shown that inattentive symptoms (predominantly inattentive presentation—ADHD-I) was associated with inconsistent parental discipline, with almost the same correlation coefficient as hyperactive/impulsive symptoms (Sollie et al. 2016) or significantly predict negative parenting (Haack et al. 2014). Moreover, in our sample, we analyzed the differences in ADHD severity or conduct problems among the groups with combined (ADHD-C), predominantly inattentive (ADHD-I), and predominantly hyperactive (ADHD-H) presentations. No significant differences were found. Although we think that this did not significantly affect our findings, future research using a larger sample size could fit the models to these different groups.

Third, the sample size did not allow us to conduct a separate analysis by the gender of child and/or parents. Other studies have highlighted parent and child gender as sources of variability in parent-child relationships (e.g., Sturge-Apple et al. 2004). For example, mothers seem to be more observant and responsive to their children's behavior than fathers, so their lives would presumably be altered to a greater extent (Calzada et al. 2004). Additionally, ADHD symptoms in boys affect family functioning more than those in girls (Bauermeister et al. 2010), and ADHD symptoms in sons are treated more harshly than in daughters (Maniadaki et al. 2005), which may lead to more negative feelings about such behavior. Related to sample size, a further limitation of this study was the limited statistical power to detect or reject a small/medium moderator effect at the conventional alpha level of 0.05 (Shieh 2009). Because of this, we could not calculate the moderator effects found in the indulgence model. It would be interesting to analyze these moderator effects in future research using a larger sample size.

Finally, this work does not discuss the role of culture in moderating the relationship between parenting styles and child or family variables. Some research literature suggests these parent–child relationships might not have the same meanings in families with different racial, ethnic or cultural contexts (e.g., Bornstein 2012; Rudy and Grusec 2006). We think that in future studies, it would be interesting to test the extent to which the findings of this study would yield different results based on the gender of the parents or children or their sociocultural contexts.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no competing interests.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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