Received: 14 December 2021 | Revised: 30 May 2022 | Accepted: 8 July 2022

DOI: 10.1111/hsc.13917

Health and Social Care in the community

WILEY

ORIGINAL ARTICLE

Relationships between parent–infant bonding, dyadic adjustment and quality of life, in an intra-partner sample

Silvia Escribano PhD | Antonio Oliver-Roig PhD | Rocio Juliá-Sanchis PhD | Miguel Richart-Martínez PhD

Department of Nursing, Faculty of Health Sciences, University of Alicante, San Vicente del Raspeig, Alicante, Spain

Correspondence
Antonio Oliver-Roig, Department of Nursing, Faculty of Health Sciencies, University of Alicante, Carretera San Vicente del Raspeig s/n, 03690 San Vicente del Raspeig, Alicante, Spain.
Email: antonio.oliver@ua.es

Funding information
European Regional Development Fund, Grant/Award Number: PI14/01549; Instituto de Salud Carlos III

Abstract

The transition to parenthood represents a moment of change and adaptation in which the dyadic marital relationship becomes a triadic relationship. Facilitating a positive transition requires a thorough understanding of the explanatory model of the relationship between parental–infant bonding, dyadic adjustment and quality of life (QoL) from an integrative perspective of the family unit. The aim of this work was to analyse the relationships between parent–infant bonding, dyadic adjustment and QoL from an intra-partner perspective, 6–12 months after the birth of a child. A cross-sectional observational study was performed in a convenience sample of 222 couples 6–12 months postpartum, enrolled from October 2013 to March 2016. The mean age of the mothers was 34.07 years (*SD* = 3.67), and for the fathers, it was 35.75 years (*SD* = 4.02). Mothers perceived better QoL and greater mother–infant bonding compared to fathers. The perception of an adequate dyadic adjustment, together with positive parent–infant bonding, had positively influenced the individual QoL of both members of the couple 6–12 months after birth. From an intra-partner perspective, the positive transition was influenced by the relationship between parent–infant bonding, dyadic adjustment and QoL. Positive parent–infant bonding in mothers and fathers, as well as promotion of the quality of the relationships between couples, can help promote a better QoL. Positive health results can be achieved in terms of individual and family well-being by designing healthcare interventions that encourage the presence and participation of the family unit.

KEYWORDS
dyadic adjustment, family, intra-partner, parent–infant bonding, postpartum, quality of life, structural equations model

1 | INTRODUCTION

According to the family systems theory, the family is characterised by a hierarchical structure (i.e., it is composed of subsystems that are systems in and of themselves) and adaptive self-organisation able to adjust to change or challenges (Cox & Paley, 2003). The transition to parenthood represents a moment of change for couples at both the intra-personal and inter-personal levels. The term 'transition' is defined as a temporary process during which people must adapt to a new situation (Kralik et al., 2006) and, therefore,

inherently understands that family members assume new adjustments and roles when a baby is born, regardless of whether it is the first child and/or successive siblings (Kuo et al., 2018). During this time, they must face the demands related to the care and upbringing of the baby, and individual, marital and family adaptation (Alves et al., 2018).

Parent–infant bonding is established during this transition, especially in the first year of the baby's life (Kinsey & Hupcey, 2013), and remains stable until infancy (De Cock et al., 2016). Conceptually, the term parent–infant bonding is defined as a 'parent's affective responses and cognitive evaluations of their relationship with their infant' (Kinsey & Hupcey, 2013). This bonding is considered a complex process comprising a set of psycho-emotional and behavioural components that favour positive parent–infant bonding, such as early contact, kisses, hugs, smiling, holding the baby face-to-face or prolonged gazing (Scism & Cobb, 2017). Parent–infant bonding has crucial implications for the proper biological, cognitive and socio-emotional development of the infant, as well as the psychological well-being of parents (Hill & Flanagan, 2020; Riera-Martín et al., 2018). Therefore, viewing individuals within the context of their family systems is crucial to understand how they interact during the transition to parenthood (Johnson & Ray, 2016) and how the adaptive process of the family members works (Korja et al., 2016). For example, a low-quality affective bond with the baby predicts poorer ability to read the baby's signals (Høifødt et al., 2020), higher anxiety, parental stress, depressive symptoms, lower perception of marital support (De Cock et al., 2016) and lower dyadic adjustment in the couple (Riera-Martín et al., 2018), specifically in terms of the perception of support and intimacy (Yu et al., 2012).

It is also important to study the changes that occur in a relevant indicator of individual and psychological well-being (Bower et al., 2013), the dyadic adjustment of couples. The instability of couples can strongly affect the functioning of the family unit (Korja et al., 2016), and their ability to cope during the transition to parenthood (Young et al., 2020). This extends to subsystem interactions and harms the coparenting roles and relationships parents have with their children. Moreover, both variables are negatively associated with the regulation of adaptive emotion in toddlers over the long term (Gallegos et al., 2017). This can lead to an upbringing without parent–infant bonding because of the depletion of the parents' psychological resources.

Young et al. (2020) showed that when mothers discussed their parenting experiences with their partners or made critical comments to them, fathers felt judged, negatively affecting their confidence and role satisfaction. Similarly, those parents with poorer within-couple interactions (Figueiredo et al., 2018) as well as those with conflicts of gender roles (Sihota et al., 2019) showed greater symptoms of postpartum depression. These conflicts underlie the changes in the relationship between the partners and feelings of exclusion from the mother–baby dyad, which can negatively affect parent–infant bonding (de Montigny et al., 2018) and the father's quality of life (QoL; Chen et al., 2010). QoL is a term widely used as a measure of personal well-being and is becoming increasingly valued in the evaluation of adaptation during the transition to parenthood (Sun et al., 2019).

What is known about this topic

- Transition to parenthood is a process that involves changes in all family members.
- Parent-bonding and parent dyadic adjustment are essential to parents' well-being.
- Parent bonding is explained by parent dyadic adjustment.

What this paper adds

- Mothers show excellent parent–infant bonding and quality of life which exceeds that of fathers after 6–12 months postpartum.
- Parent dyadic adjustment is positively affected by partner dyadic adjustment and parent–infant bonding.
- Family unit relationships positively influence the interpersonal quality of life.

Family systems theory proposes that marital distress impairs the triadic interaction by interfering with effective co-parenting (Cox & Paley, 2003), quality of parental involvement and coordination when parents collaborate in raising their child (Korja et al., 2016). To the best of our knowledge, to date, no studies providing healthcare providers with empirical knowledge of family dynamics have been published for Spanish or international populations. In fact, most research continues to focus on the mother's perspective (Riera-Martín et al., 2018; Scism & Cobb, 2017; Yu et al., 2012), despite the recognition of the parenting process as a family process shared by both members of the couple (Pålsson et al., 2017). Based on the availability of significant evidence for the implications of establishing high-quality parent–infant bonding (Scism & Cobb, 2017) and the relationship between parent–infant bonding, dyadic adjustment, and QoL, it would be useful to further examine this explanatory model from a family perspective.

The purpose of the present study was to analyse the relationships between parent–infant bonding, dyadic adjustment and QoL from an intra-partner perspective, 6–12 months after the birth of a child. We hypothesized that from an intra-partner perspective, positive parent–infant bonding in mothers and fathers, as well as promotion of the quality of the relationships between couples, can help promote QoL.

2 | METHODS

2.1 | Design

We conducted a cross-sectional observational study with the postpartum measurement between 6 and 12 months after birth.

2.2 | Setting and participants

A convenience sample of couples who had just had a baby was recruited. This study was part of a wider project on the experience of pregnancy, childbirth and the transition to parenthood, which explored several variables related to the physical and psychological well-being of men and women (Cano-Climent, 2017). The sample was recruited from 16 hospitals in different geographical areas in Spain: the Valencian Community ($n = 13$), Castilla la Mancha ($n = 1$), Catalonia ($n = 1$) and Murcia ($n = 1$). According to the annual registry of births from the hospitals participating in this work, approximately 22,000 mothers were eligible as participants. All the mothers who were at the hospital for the birth of their child were invited to participate in the study together with their partners. Initially, 1580 couples in which both partners were present at the time of discharge from the hospital agreed to participate in the study, of whom 10 were excluded because of the criteria mentioned below. Of the 1570 couples included at the postpartum hospital discharge, 364 were lost to follow-up because they had provided incorrect contact details (email). Furthermore, one or both members of 56 couples notified us that they were leaving the study before the agreed 6-month contact point. Finally, of the 1150 couples considered for questionnaire submission in this study, 222 couples (both members) completed the questionnaires 6–12 months after the birth of their child.

The inclusion criteria were couples who had a fluent command of Spanish enabling them to speak and write without difficulty. The exclusion criteria were: (a) couples with multiple pregnancies; (b) couples whose newborn had had severe health problems requiring admission to an intensive care unit after birth; (c) couples in which the mother had had a serious complication after birth.

2.3 | Instruments

We collected the following sociodemographic data both at the time of the recruitment and at the time of hospital discharge: age; nationality (Spanish/non-Spanish); current civil status (married or domestic partner; separated or divorced; single; widower); educational level (incomplete primary school education, complete primary school education, secondary education, or university education). In addition, we collected data related to the family context as a whole: socioeconomic status (measured as household income, with eight response options ranging from less than 6000 euros to more than 60,000 euros per year); household chores (shared between both members of the couple, shared between the female partner and another person, performed only by the female partner); previous experience with parenthood (counting the child in question as the first, second, third or fourth or more).

We also collected information about the employment situation of the parents, both during the 6–12 months after birth (returned to work full-time, returned to work part-time, not currently working). Of note, according to the legislation in force in Spain during the period of this present study, maternity leave ended 16 weeks after birth.

To evaluate postnatal parent–infant bonding, we administered the short Spanish version of the *Parent Bonding Scale* (PBS; Riera-Martín et al., 2018), adapted and validated from the original version of the *Maternal Postnatal Attachment Scale* (MPAS; Condon & Corkindale, 1998). The PBS comprises a total of 15 items suitable for both mothers and fathers (e.g., 'When I am not with the baby, I find myself thinking about the baby'). Each item is rated on a 5-point scale (1 = low bonding and 5 = high bonding), with a total score ranging from 15 to 75, where higher scores indicate a better bond with the child. The overall score of the Spanish version of the scale showed adequate internal consistency both for mothers ($\alpha = 0.70$) and fathers ($\alpha = 0.78$). In addition, the PBS showed adequate concurrent validity with dyadic adjustment in mothers ($r = 0.39$, $p < 0.001$) and fathers ($r = 0.41$, $p < 0.001$).

To evaluate the quality and adjustment of the relationships of the couples, we used a short version of the *Dyadic Adjustment Scale* (DAS-13) in validated for use in Spanish (Santos-Iglesias et al., 2009). This version is a self-administered 13-item scale (e.g., 'Do you kiss your partner?' or 'How often do you and your partner argue?', etc.). Higher scores indicated that the couple had a personal perception of a good fit, with a cut-off point of 44. The internal consistency value for the overall scale was 0.83.

To assess health-related QoL we used the Spanish version of the Dartmouth Coop Functional Health Assessment/World Organization of National Colleges, Academies and Academic Association of General Practitioners (COOP/WONCA) charts (Lizán Tudela et al., 2000). This instrument contains nine items related to physical fitness, feelings, daily activities, social activities, changes in health status, health status, pain, social support and QoL which are presented as vignettes and are answered on a scale of 1–5, with higher scores reflecting a poorer health-related QoL. The overall scale has an internal consistency of 0.79.

2.4 | Procedure and ethical considerations

Recruitment occurred between October 2013 and March 2016. Couples who had just had a baby were invited to participate at the time of their discharge by midwives and nurses who worked in the maternity service. During recruitment, we asked the participants for their contact details (email and postal mail address) as well as sociodemographic variable data.

The questionnaire was administered between 6 and 12 months postpartum. Three email reminders were sent with an interval of 10 days between them to try to increase the survey response rates. When contact by email was not possible, we sent the questionnaire by postal mail. We sent each participant a link by email containing a unique code that would allow them to interrupt the completion of the questionnaires at any time and save their draft answers for later completion; this code also prevented them from completing

the surveys more than once. A €300 prize was raffled amongst the study's participants to increase the response rate.

The study was approved by the Clinical Research Ethics Committee at the General Direction of Public Health and Higher Public Health Research Center, which both form part of the Valencian Community Health Council. The written informed consent was collected from each member of the couple when the participants were recruited. At the time of recruitment, the participants were informed about the confidential and group treatment of the data, as well as its purpose exclusively for research. They were also informed about the possibility of leaving the study at any time. During the data collection, a unique encryption code was used for each individual, whilst a common one was applied to the couples so that their data could be subsequently matched. Participants received no incentive for their participation in this study except for participation in the raffle.

2.5 | Data analysis

R software (version 3.6.3., R Core Team, 2020) was used for all the analyses. First, we conducted a descriptive analysis of the parental sociodemographic and psychosocial variables of the sample (parent–infant bonding, dyadic adjustment and QoL) by gender. To determine if there were intra-partner differences in the psychosocial variables, we compared the means of related samples using Student *t*-tests. First, we verified the normality of the variables by evaluating kurtosis and asymmetry (which indicated adequate values between 1.60 and −1.60; George & Mailery, 2001). In addition, the psychosocial variables related to the relationships between the couples were analysed by Pearson *R* correlation tests. Next, we implemented independent stepwise multiple linear regression analyses for the mothers and fathers to analyse which variables influenced the individual QoL outcome variables and dyadic adjustment.

To perform the multiple regression analyses, first, we calculated the minimum sample size required for four predictors with a statistical power of 0.8 and a confidence level of 0.05; the final study sample exceeded the recommended sample size of 84 individuals (Soper, 2021). Once the relationships had been analysed, structural equation modelling, employing the maximum likelihood estimation method in the lavaan package, was used to develop an exploratory structural model to represent the correlations found in the regression analyses. To analyse the fit of the model, Chi-squared, Confirmatory Factor Analysis (CFI) and Tucker–Lewis Index (TLI) values exceeding 0.95 were considered adequate (Hu & Bentler, 1999) and Root Mean Square Error of Approximation (RMSEA) values less than 0.05 were considered excellent whilst those between 0.05 and 0.08 were acceptable (Lee et al., 2012).

3 | RESULTS

A sample of 222 couples was obtained. The mean age of the mothers was 34.07 years ($SD = 3.67$, range = 22–42 years) and for the fathers it was 35.75 ($SD = 4.02$, range = 23–49 years). Table 1 shows the other sociodemographic variables for the participants, divided by gender where this data was collected individually. Within the couples, mothers perceived a better QoL ($M = 16.75$, $SD = 4.45$) and a greater mother–infant bonding ($M = 67.27$, $SD = 4.17$) compared to fathers (QoL, $M = 15.46$, $SD = 4.17$; $t = -3.76$, $p < 0.001$; father–infant bonding: $M = 63.55$, $SD = 5.36$; $t = 9.72$; $p < 0.001$; Table 2). However, no statistically significant differences were detected for intra-partner dyadic adjustment ($t = 0.96$; $p = 0.34$).

Table 3 shows the intra-partner relationships between the parent–infant bonding, dyadic adjustment and individual QoL variables. The results show that (1) when mothers perceived their relationship as being of good quality, their respective partners obtained higher scores for their perceived dyadic adjustment, with moderate correlations ($r = 0.61$; $p < 0.001$); (2) when mothers perceived a greater bond with their baby, their partners also perceived a greater bond with the infant ($r = 0.31$; $p < 0.001$); and (3) when mothers perceived a better individual QoL, their partners also perceived a better QoL ($r = 0.29$; $p < 0.001$), although the latter correlations were poor. In general, all the mother's psychosocial variables were related to those perceived by the father (Table 3), except between mother–infant bonding and the dyadic adjustment perceived by the father ($r = 0.10$; $p < 0.13$).

The results of the stepwise multiple regression analysis for the mother and father are shown in Table 4. The main explanatory variable of the dyadic adjustment, both for fathers and mothers, was the dyadic adjustment perceived by their respective partner. On the one hand, we observed that individual QoL was explained by the perceived dyadic adjustment and vice versa; however, QoL was an explanatory variable for dyadic adjustment for both parents in a later step in the regression model. Thus, in the structural equations model, dyadic adjustment was included as a factor that influenced QoL more than QoL influenced dyadic adjustment. On the contrary, the dyadic adjustment variable perceived by the mother was influenced by that perceived by her partner and vice versa, with a high explained variance for both parents (Table 4).

The sample data fit in the exploratory model was excellent (Figure 1; $\chi^2 = 5.10$, $df = 5$, $p = 0.40$; CFI = 1.000, TLI = 0.99 and RMSEA = 0.009; 95% confidence interval = 0.000–0.09) and showed that higher individual QoL 6–12 months after birth was explained by the positive relationships in the family environment (having a better perceived dyadic adjustment and a greater parent–infant bonding), with an explained variance of 23% for the mothers and 27% for the fathers. In turn, the bond with the baby, together with the dyadic adjustment perceived by the couple, were factors that influenced self-perceived dyadic adjustment, with an explained variance of 43% for the mothers and 27% for the fathers. According to these results, the couple's dyadic adjustment strongly influenced the self-perceived dyadic adjustment by the mothers ($\beta = 0.51$; $p < 0.001$), but not by the fathers ($\beta = 0.12$, $p = 0.40$). Although the regression analysis indicated that the mother–infant bonding affected the dyadic adjustment perceived by the father, this relationship was not statistically significant ($\beta = 0.08$; $p = 0.24$) and so

TABLE 1 Descriptive sociodemographic variables ($N = 444$)

	Mother ($n = 222$)	Father ($n = 222$)
	n (%)	*n* (%)
Age (*M*, *SD*), years	34.07 (3.67)	35.75 (4.02)
Current civil status, *n* (%)		
Married or domestic partner	161 (72.5)	143 (64.4)
Separated or divorced	6 (2.7)	6 (2.7)
Single	27 (12.2)	25 (11.3)
Widower	2 (0.9)	-
Lost	26 (11.7)	48 (21.6)
Nationality, *n* (%)		
Spanish	200 (90.1)	174 (78.4)
Not Spanish	9 (4.1)	5 (2.3)
Lost	13 (5.9)	43 (19.4)
Annual wage, *n* (%)[a]		
<€6000	6 (2.7)	
€6000–8999	2 (0.9)	
€9000–11,999	11 (5)	
€12,000–17,999	49 (22.1)	
€18,000–29,999	61 (27.5)	
€30,000–44,999	43 (19.4)	
€45,000–60,000	18 (8.1)	
>€60,000	7 (3.2)	
Lost	25 (11.3)	
Education level, *n* (%)		
Incomplete primary education	7 (3.2)	14 (6.3)
Primary studies	26 (11.7)	51 (23)
Secondary studies	39 (17.6)	31 (14)
Higher education (undergraduate)	123 (55.4)	78 (35.2)
Lost	27 (12.2)	48 (21.6)
Employment situation		
Work full-time	76 (34.2)	186 (83.8)
Work part-time	44 (19.8)	9 (4.1)
Not currently working	102 (45.9)	27 (12.2)
Household chores[a]		
Share mother–father	172 (77.5)	
Mother with another person	27 (12.16)	
Only mother	23 (10.4)	
Previous experience with paternity, *n* (%)[a]		
First child	129 (58.1)	
Second child	70 (31.5)	
Third child o more	11 (5)	
Lost	12 (5.4)	

[a]Data related to the family context.

it was not included in the final model. All the other relationships between the model variables, as shown in Figure 1, were statistically significant ($p < 0.001$).

4 | DISCUSSION

To the best of our knowledge, this is the first study to explore an explanatory model of the relationship between parent–infant bonding, dyadic adjustment and QoL from an intra-partner perspective, 6–12 months after birth whilst also adopting an integrative view of the family unit, understood as a set of mutually influencing subsystems and interactions (Cox & Paley, 2003; Galvin et al., 2015). According to our results, from an intra-partner perspective, the positive transition to parenthood was influenced by the relationship between parent–infant bonding, dyadic adjustment and QoL.

The transition to parenthood is an intense life event in which mothers and fathers experience new individual and family challenges, such as changes in roles, new family demands, chronic fatigue, financial pressures and conflicts between work and family life (Figueiredo et al., 2018), requiring the development of new skills and resources to face these changes (Rowe et al., 2013). The experiences of this adaptation process, when the dyadic marital relationship becomes a triadic or multiple relationships (Lau et al., 2020), impact individual well-being, the conjugal relationship and the parent's ability to support their child during their early years (Young et al., 2019). Therefore, facilitating a positive transition is a topic of interest for researchers and health providers alike.

According to our results, mothers perceive the same dyadic adjustment as their partners 6–12 months after their baby is born. This suggests that the arrival of a baby influences the dyadic marital relationship in both partners, requiring them both to readjust to their new roles in order to meet the needs of the baby, thereby reducing the time and attention devoted towards the romantic couple (Rowe et al., 2013). However, mothers showed greater parent–infant bonding and QoL than their partners 6–12 months after birth. The study conducted in Japanese couples by Sun et al. (2019) did not show differences in QoL between women and their partners until the third year after the birth, at which time, a better QoL was observed in women compared to men (Sun et al., 2019). In contrast, our results showed that the QoL was already higher in women in the first year postpartum.

However, we must consider cultural and sociodemographic factors in order to understand the process of adaptation to parenting. Unlike more traditional cultures in which care roles mainly fall upon women in the first years after birth (Ngai & Ngu, 2013; Sun et al., 2019), in Spain, there is now greater involvement of fathers in these tasks. Our results confirm how common household responsibilities are shared by both members of the couple, supporting the idea of greater involvement of men in the activities of the family unit. Despite this, gender issues continue to be present in the parenting process. For example, our results indicated that approximately half of the women in our sample did not work in the first year after the birth of the baby, allowing them to dedicate more time exclusively to maternity activities. Furthermore, amongst those who chose to return to work, 36.7% worked part-time. This contrasts with the data for the fathers, where the majority went back to work full-time, in so implying that they had taken on the dual roles of work and

TABLE 2 Intra-partner mean difference for outcomes after 6–12 months postpartum

	Mother ($n = 222$)	Father ($n = 222$)			
	n (%)	*n* (%)	*t*-student	*df*	*p*
Dyadic adjustment (*M*, *SD*)	50.14 (7.11)	50.55 (7.27)	0.96	221	0.34
Parental bonding (*M*, *SD*)	67.27 (4.17)	63.55 (5.36)	9.72	221	0.000
Quality of life (*M*, *SD*)	16.75 (4.45)	15.46 (4.17)	−3.76	221	0.000

Note: M = average.

Abbreviation: SD, standard deviation.

TABLE 3 Intra-partner correlations of psychological outcomes

	Mother		
	Dyadic adjustment	Parent–infant bonding	Quality of life
Father			
Dyadic adjustment	0.61**	0.10	−0.27**
Parent–infant bonding	0.25**	0.31**	−0.16*
Quality of life	−0.24*	−0.15*	0.29**

*$p < 0.005$.; **$p < 0.001$.

fatherhood during the new baby's first year of life. Regarding mothers, it is also interesting that sociodemographic factors were considered and that these could have impacted the results. An example of this is that almost 75% of the sample had at least a secondary level of education, with the latter being positively related to QoL (Yoshitake et al., 2016).

The literature also refers to poor recognition of the role of fathers, both by the health system and socially (Rowe et al., 2013), making them feel excluded, defenceless and poorly prepared. The perception of difficulty in establishing an infant bond from the time of birth onwards has also been described for fathers (Baldwin et al., 2018). In addition, Schaber et al. (2021) support the idea that parental leave positively predicts father–infant bonding. However, as previously reported, in the present sample most fathers returned to work. All these aforementioned factors could help explain the decrease in personal well-being and bonding in fathers with respect to the mothers. Thus, healthcare providers should implement specific actions to help prepare fathers for birth by including them in the transition to parenthood. This would facilitate their better adaptation and promote their individual emotional well-being and, consequently, the well-being of the whole family (Baldwin et al., 2018).

Our results also suggest that when mothers perceived a greater bond with their babies, a good dyadic adjustment, or had a better individual QoL, their partners also had a similar perception. In accordance with our findings, the literature shows intra-partner correlations in individual QoL (Brandão et al., 2020; Ngai & Ngu, 2013; Sun et al., 2019), in the dyadic setting (Brandão et al., 2020) and parent–infant bonding (De Cock et al., 2016). These results indicate that couples function as a family unit and their functions are interrelated (Cox & Paley, 2003). Therefore, health providers should implement interventions that are directed at both members of the couple, promoting the participation and presence of the family unit in actions directed towards planning for parenthood (Pålsson et al., 2017).

Although the literature suggests that the perception of marital support is a variable that influences parent–infant bonding (Scism & Cobb, 2017), our results point towards an inverse relationship. The literature reports that adequate parent bonding provides benefits such as feeling more self-secure and better adaption to the new required role (Baldwin et al., 2018). Hence, we believe that mothers and fathers feel more satisfied with their marital relationship when they have a positive bond with the new family member. Having a better bond will help them both to feel more adapted to their new roles, which could lead to a reduction in the daily conflicts that occur between the couple. Indeed, high levels of conflict are one of the predictors of decreased dyadic adjustment from the time of pregnancy to 30 months postpartum (Trillingsgaard et al., 2014).

These results are relevant to healthcare providers when selecting the types and intensity of interventions because the relationships of couples could be influenced by the bond they establish with their baby. In this vein, the scientific literature includes descriptions of interventions aimed at promoting parental resilience and individual and family well-being through quality parenting (Gavidia-Payne et al., 2015); the promotion of prolonged body and eye contact between babies through kisses, hugs, holding the baby close and prolonged gazing, vocalisations tailored to the baby and smiles by both parents (Scism & Cobb, 2017). Notwithstanding, the participation of the father in the labour and delivery process has been described as one of the most effective interventions for promoting father–infant bonding (Hill & Flanagan, 2020).

TABLE 4 Regression analysis by gender

	Mother						Father					
	β	*t*	*p*	R^2	*F*	*p*		*β*	*t*	*p*	R^2	*F*	*p*
Quality of life													
Model 1				0.15	38.86	0.000	Model 1				0.22	61.48	0.000
MDA	−0.39	−6.22	0.000				FDA	−0.47	−7.84	0.000			
Model 2				0.22	32.08	0.000	Model 2				0.27	41.03	0.000
MDA	−0.30	−4.78	0.000				FDA	−0.37	−5.91	0.000			
MB	−0.29	−4.66	0.000				FB	−0.25	−4.04	0.000			
Model 3				0.25	25.33	0.002	Model 3				0.39	30.70	0.000
MDA	−0.26	−4.12	0.000				FDA	−0.33	−5.25	0.000			
MB	−0.28	−4.48	0.000				FB	−0.24	−3.90	0.000			
FQL	0.19	3.07	0.02				MQL	0.16	2.75	0.008			
Dynamic adjustment													
Model 1				0.37	128.08	0.000	Model 1				0.37	128.08	0.000
FDA	0.61	11.35	0.000				MDA	0.61	11.32	0.000			
Model 2				0.43	83.08	0.000	Model 2				0.47	99.74	0.000
FDA	0.58	11.36	0.000				MDA	0.52	10.40	0.000			
MB	0.25	4.78	0.000				FQL	−0.34	−6.75	0.000			
Model 3				0.45	60.64	0.000	Model 3				0.49	71.35	0.000
FDA	0.54	10.49	0.000				MDA	0.50	9.93	0.000			
MB	0.19	3.53	0.001				FQL	−0.29	−5.39	0.000			
MQL	−0.17	−3.07	0.02				FB	0.16	2.85	0.005			
Model 4				0.46	47.26	0.000	Model 4				0.51	59.25	0.000
FDA	0.59	10.46	0.000				MDA	0.54	10.73	0.000			
MB	0.19	3.67	0.000				FQL	−0.29	−5.50	0.000			
MQL	−0.19	−3.38	0.001				FB	0.20	3.64	0.000			
FQL	0.12	2.08	0.04				MB	−0.167	−3.48	0.001			

Note: A stepwise regression analysis was performed, showing the variables that were included in the model with statistical significance.

Abbreviations: FB, father–infant bonding; FDA, father's dyadic adjustment; FQL, father's quality of life; MB, mother–infant bonding; MDA, mother's dyadic adjustment; MQL, mother's quality of life.

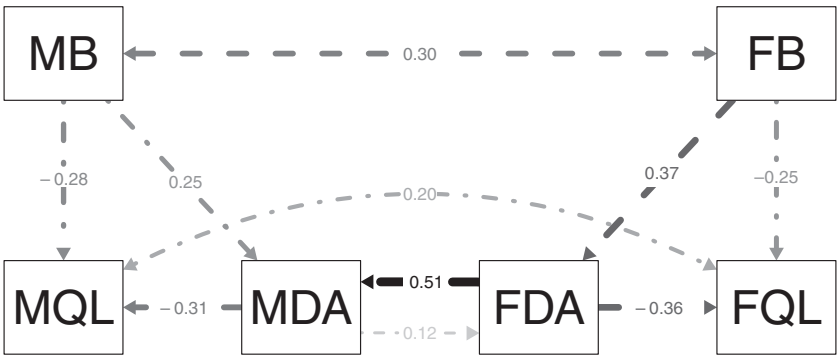

FIGURE 1 Exploratory theoretical model of the relationships between dyadic adjustment, quality of life and parent–infant bonding at 6 months postpartum; MB = mother–infant bonding; FB = father–infant bonding; MQL = mother's quality of life; FQL = father's quality of life; MDA = mother's dyadic adjustment; FDA = father's dyadic adjustment; all relationships were statistically significant with $p < 0.001$; except that mother's dyadic adjustment did not influence the father's dyadic adjustment ($\beta = 0.12$, $p = 0.4$).

Carrying out interventions aimed at promoting a positive bond between mothers and fathers can positively impact the quality of the relationships of couples, which in turn will have a positive influence at the personal level. The results of the structural equations model we created in this current work showed that the perception of adequate relationship quality in the partners, together with a positive bond with the baby, positively influenced individual QoL from 6–12 months after birth. Indeed, findings published in the literature also support these relationships; for example, in a sample of partners during pregnancy, Brandão et al. (2020) showed that dyadic adjustment explained the interpersonal QoL for both the mother and the father. In other work, Baldwin et al. (2018) concluded that better father–infant bonding had multiple personal benefits, such as increased satisfaction and feeling more self-secure. That is, the personal well-being of parents is influenced by how satisfied they feel with their interpersonal relationships within the family unit. Hence, all the above suggests that interventions aimed at promoting the different bonds in family relationships before the arrival of a new member should be implemented to promote positive results in terms of individual health and parental well-being.

4.1 | Limitations

The limitations of this research should be considered when interpreting these results. First, even though the couples were recruited to participate in the study at the time of discharge, months before the study data was obtained, this work was still limited by patient loss to follow-up. However, this strategy allowed us to incorporate more partners more easily than at other contact times, given that 85% of the mothers included in the original study that produced the data presented here were with their partners when they left the hospital to go home with their babies for the first time. In future studies, an email verification system should be established to avoid loss of follow-up due to incorrect or out-of-date contact data. In addition, it would be useful to explore the use of other data collection methods such as the use of smartphones rather than email.

Second, because the sample was incidental, caution should be exercised regarding the external validity of the study. Regarding the sample size, this exploratory model should be confirmed in a larger sample of couples, following adequate recommendations in the literature for achieving sufficient statistical power. Interestingly, in an attempt to summarise these different criteria, Vargas-Habalí and Moral-Esquivel (2017) discussed the current absence of a consensus on how to determine adequate sample sizes to test structural equation models. Therefore, the sample of 222 participants included in this present study may not have been adequate depending on the criteria followed. For instance, Hair et al. (2014) suggested that a minimum sample size of 200 individuals is sufficient. In turn, Kline (2011) considered 10–20 participants per estimated parameter to be adequate; our model estimated 15 independent parameters and so, fulfilled this recommendation. In contrast, when the sample size depends on the desired statistical power, as in the approach proposed by MacCallum et al. (1996), which is itself based on the global fit of the model measured by the RMSEA index, an estimated total of 401 participants (179 more than included in this study), would be necessary to achieve a statistical power of at least 0.8 (Cumming, 2012) for the proposed model, with 5 degrees of freedom and considering a RMSEA of less than 0.08. This present study currently has a statistical power of 0.66 and this calculation was carried out with the syntax developed by Preacher and Coffman (2006).

5 | CONCLUSIONS

Positive parent–infant bonding in mothers and fathers positively impacts the dyadic adjustment and QoL of both members of the couple and therefore, of the family. However, this work focused on a cross-sectional approach to analyse the relationships within the family as well as the personal well-being of mothers and their partners in the first year after the birth of their child. However, it would be useful for future lines of research to analyse the findings from a longitudinal perspective. For example, to test if the parent–infant bonding developed during the first year of life can predict the relationships and quality of the couple in the long term, as well as the quality of their personal lives.

In any case, positive health results can be achieved in individual and family well-being by designing healthcare interventions that encourage the presence and participation of the family unit. Such actions should facilitate a positive transition to parenthood through pre-, intra- and postnatal interventions with the purpose of promoting parental resilience, family triad bonds, the dyadic adjustment of couples and individual and family well-being. For example, actions aimed at promoting a positive bond between the baby and both mothers and fathers could positively impact the quality of the relationships of couples, which in turn, will positively influence both parents at an individual level.

ACKNOWLEDGEMENTS

The authors thank the institution and all the professionals who participated, as well as all the mothers and fathers who contributed to the study.

FUNDING INFORMATION

The present study was granted by the General Sub-Directorate for Evaluation and Promotion of Research (Institute of Health Carlos III, ISCIII) and co-funded by the European Regional Development Fund (FEDER) (No. PI14/01549).

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

DATA AVAILABILITY STATEMENT

Research data are not shared.

ORCID

Silvia Escribano https://orcid.org/0000-0002-7943-3591

REFERENCES

Alves, S., Fonseca, A., Canavarro, M. C., & Pereira, M. (2018). Dyadic coping and dyadic adjustment in couples with women with high depressive symptoms during pregnancy. *Journal of Reproductive and Infant Psychology*, *36*(5), 504–518. https://doi.org/10.1080/02646838.2018.1490496

Baldwin, S., Malone, M., Sandall, J., & Bick, D. (2018). Mental health and wellbeing during the transition to fatherhood: A systematic review of first time fathers' experiences. *JBI Database of Systematic Reviews and Implementation Reports*, *16*(11), 2118–2191. https://doi.org/10.11124/JBISRIR-2017-003773

Bower, D., Jia, R., Schoppe-Sullivan, S. J., Mangelsdorf, S. C., & Brown, G. L. (2013). Trajectories of couple relationship satisfaction in families with infants: The roles of parent gender, personality, and depression in first-time and experienced parents. *Journal of Social and Personal Relationships*, *30*(4), 389–409. https://doi.org/10.1177/0265407512457656

Brandão, T., Brites, R., Hipólito, J., Pires, M., & Nunes, O. (2020). Dyadic coping, marital adjustment and quality of life in couples during pregnancy: An actor–partner approach. *Journal of Reproductive and Infant Psychology*, *38*(1), 49–59. https://doi.org/10.1080/02646838.2019.1578950

Cano-Climent, A. (2017). *Evolución de la fatiga en madres y padres durante los dos primeros años tras el Nacimiento de un hijo* [*Evolution of stress in mothers and fathers during the first two years after the birth of a child*]. (Doctoral Thesis, University of Alicante, Spain). https://hdl.handle.net/10045/83107

Chen, Y. C., Chie, W.-C., Chang, P.-J., Chuang, C.-H., Lin, Y.-H., Lin, S.-J., & Chen, P.-C. (2010). Is infant feeding pattern associated with father's quality of life? *American Journal of Men's Health*, *4*(4), 315–322. https://doi.org/10.1177/1557988309350491

Condon, J. T., & Corkindale, C. J. (1998). The assessment of parent-to-infant attachment: Development of a self-report questionnaire instrument. *Journal of Reproductive and Infant Psychology*, *16*(1), 57–76.

Cox, M. J., & Paley, B. (2003). Understanding families as systems. *Current Directions in Psychological Science*, *12*(5), 193–196. https://doi.org/10.1111/1467-8721.01259

Cumming, G. (2012). *Understanding the new statistics: Effect size, confidence intervals and meta-analysis*. Taylor & Francis.

De Cock, E. S. A., Henrichs, J., Vreeswijk, C. M. J. M., Maas, A. J. B. M., Rijk, C. H. A. M., & van Bakel, H. J. A. (2016). Continuous feelings of love? The parental bond from pregnancy to toddlerhood. *Journal of Family Psychology*, *30*(1), 125–134. https://doi.org/10.1037/fam0000138

de Montigny, F., Larivière-Bastien, D., Gervais, C., St-Arneault, K., Dubeau, D., & Devault, A. (2018). Fathers' perspectives on their relationship with their infant in the context of breastfeeding. *Journal of Family Issues*, *39*(2), 478–502. https://doi.org/10.1177/0192513X16650922

Figueiredo, B., Canàrio, C., Tendais, I., Pinto, T. M., Kenny, D. A., & Field, T. (2018). Couples' relationship affects mothers' and fathers' anxiety and depression trajectories over the transition to parenthood. *Journal of Affective Disorders*, *238*, 204–212. https://doi.org/10.1016/j.jad.2018.05.064

Gallegos, M. I., Murphy, S. E., Benner, A. D., Jacobvitz, D. B., & Hazen, N. L. (2017). Marital, parental, and whole-family predictors of toddlers' emotion regulation: The role of parental emotional withdrawal. *Journal of Family Psychology*, *31*(3), 294–303. https://doi.org/10.1037/fam0000245

Galvin, K. M., Braithwaite, D. O., & Bylund, C. L. (2015). *Family communication: Cohesion and change* (9th ed.). Routledge.

Gavidia-Payne, S., Denny, B., Davis, K., Francis, A., & Jackson, M. (2015). Parental resilience: A neglected construct in resilience research. *Clinical Psychologist*, *19*(3), 111–121. https://doi.org/10.1111/cp.12053

George, D., & Mailery, M. (2001). *Using SPSS for windows step by step: A simple guide and reference*. Aliyn & Bacon.

Hair, F., Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis: Pearson new international* (7th ed.). Pearson.

Hill, R., & Flanagan, J. (2020). The maternal–infant bond: Clarifying the concept. *International Journal of Nursing Knowledge*, *31*(1), 14–18. https://doi.org/10.1111/2047-3095.12235

Høifødt, R. S., Nordahl, D., Landsem, I. P., Csifcsák, G., Bohne, A., Pfuhl, G., Rognmo, K., Braarud, H. C., Goksøyr, A., Moe, V., Slinning, K., & Wang, C. E. A. (2020). Newborn behavioral observation, maternal stress, depressive symptoms and the mother–infant relationship: Results from the northern babies longitudinal study (NorBaby). *BMC Psychiatry*, *20*(1), 300. https://doi.org/10.1186/s12888-020-02669-y

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Johnson, B. E., & Ray, W. A. (2016). Family systems theory. In C. L. Shehan (Ed.), *Encyclopedia of family studies* (pp. 1–5). John Wiley & Sons, Inc..

Kinsey, C., & Hupcey, J. E. (2013). State of the science of maternal–infant bonding: A principle-based concept analysis. *Midwifery*, *29*(12), 1314–1320. https://doi.org/10.1016/j.midw.2012.12.019

Kline, R. (2011). *Principles and practice of structural equation modeling* (3rd ed.). The Guilford Press.

Korja, R., Piha, J., Otava, R., Lavanchy-Scaiola, C., Ahlqvist-Björkroth, S., Aromaa, M., Räihä, H., & STEPS-Study. (2016). Mother's marital satisfaction associated with the quality of mother-father-child triadic interaction. *Scandinavian Journal of Psychology*, *57*(4), 305–312. https://doi.org/10.1111/sjop.12294

Kralik, D., Visentin, K., & van Loon, A. (2006). Transition: A literature review. *Journal of Advanced Nursing*, *55*(3), 320–329. https://doi.org/10.1111/j.1365-2648.2006.03899.x

Kuo, P. X., Volling, B. L., & Gonzalez, R. (2018). Gender role beliefs, work-family conflict, and father involvement after the birth of a second child. *Psychology of Men & Masculinity*, *19*(2), 243–256. https://doi.org/10.1037/men0000101

Lau, Y., Fang, L., & Kwong, H. (2020). Cross-lagged models of marital relationships and intergenerational conflicts during transition to parenthood: Effect of patrilineal coresidence. *Family Process*, *59*(4), 1569–1587. https://doi.org/10.1111/famp.12524

Lee, T., Cai, L., & MacCallum, R. (2012). Power analysis for tests of structural equation models. In R. Hoyle (Ed.), *Handbook of structural equation modeling* (pp. 181–194). The Guilford Press.

Lizán Tudela, L., Reig Ferrer, A., Richart Martínez, M., & Cabrero García, J. (2000). Evaluación de la calidad de vida relacionada con la salud mediante las láminas COOP/WONCA [Study on health related quality of life based on information from COOP/WONCA sheets]. *Medicina Clinica*, *114*(Suppl 3), 76–80.

MacCallum, R., Browne, M., & Sugawara, H. (1996). Power analysis and determination of sample size or covariance structure modeling. *Psychological Methods*, *1*(2), 130–149.

Ngai, F. W., & Ngu, S. F. (2013). Family Sense of Coherence and Quality of Life. *Quality of Life Research*, *22*, 2031–2039. https://doi.org/10.1007/s11136-012-0336-y

Pålsson, P., Persson, E. K., Ekelin, M., Kristensson Hallström, I., & Kvist, L. J. (2017). First-time fathers experiences of their prenatal preparation in relation to challenges met in the early parenthood period:

Implications for early parenthood preparation. *Midwifery*, *50*, 86–92. https://doi.org/10.1016/j.midw.2017.03.021

Preacher, K. J., & Coffman, D. L. (2006, May). *Computing power and minimum sample size for RMSEA* [Computer software]. https://quantpsy.org/

R Core Team. (2020). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. https://www.R-project.org/

Riera-Martín, A., Oliver-Roig, A., Martínez-Pampliega, A., Cormenzana-Redondo, S., Clement-Carbonell, V., & Richart-Martínez, M. (2018). A single Spanish version of maternal and paternal postnatal attachment scales: Validation and conceptual analysis. *PeerJ*, *6*, e5980. https://doi.org/10.7717/peer.5980

Rowe, H. J., Holton, S., & Fisher, J. R. W. (2013). Postpartum emotional support: A qualitative study of women's and men's anticipated needs and preferred sources. *Australian Journal of Primary Health*, *19*(1), 46–52. https://doi.org/10.1071/py11117

Santos-Iglesias, P., Vallejo-Medina, P., & Sierra, J. C. (2009). Propiedades psicométricas de una versión breve de la Escala de Ajuste Diádico en muestras Españolas [Development and validation of a short version of the Dyadic Adjustment Scale in Spanish samples]. *International Journal of Clinical and Health Psychology*, *9*(3), 501–517.

Schaber, R., Kopp, M., Zähringer, A., Mack, J. T., Kress, V., & Garthus-Niegel, S. (2021). Paternal leave and father–infant bonding: Findings from the population-based cohort study DREAM. *Frontiers in Psychology*, *12*, 668028. https://doi.org/10.3389/fpsyg.2021.668028

Scism, A. R., & Cobb, R. L. (2017). Integrative review of factors and interventions that influence early father–infant bonding. *Journal of Obstetric, Gynecologic, and Neonatal Nursing*, *46*(2), 163–170. https://doi.org/10.1016/j.jogn.2016.09.004

Sihota, H., Oliffe, J., Kelly, M. T., & McCuaig, F. (2019). Fathers' experiences and perspectives of breastfeeding: A scoping review. *American Journal of Men's Health*, *13*(3), 1557988319851616. https://doi.org/10.1177/1557988319851616

Soper, D. S. (2021). *A-priori sample size calculator for multiple regression* [software]. https://www.danielsoper.com/statcalc

Sun, Y., Yoshitake, N., Sugawara, M., Matsumoto, S., Sakai, A., Takaoka, J., & Goto, N. (2019). Quality of life in Japanese couples during the transition to parenthood. *Journal of Reproductive and Infant Psychology*, *37*(2), 161–175. https://doi.org/10.1080/02646838.2018.1540862

Trillingsgaard, T., Baucom, K. J. W., & Heyman, R. E. (2014). Predictors of change in relationship satisfaction during the transition to parenthood. *Family Relations*, *63*(5), 667–679. https://doi.org/10.1111/fare.12089

Vargas-Habalí, T., & Moral-Esquivel, R. (2017). Sample sizes using structural equation modeling with latent variables: A practical method. *Actualidades Investigativas en Educación*, *17*(1), 1–34. https://doi.org/10.15517/aie.v17i1.27294

Yoshitake, N., Sun, Y., Sugawara, M., Matsumoto, S., Sakai, A., Takaoka, J., & Goto, N. (2016). QOL and sociodemographic factors among first-time parents in Japan: A multilevel analysis. *Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation*, *25*(12), 3147–3155. https://doi.org/10.1007/s11136-016-1352-0

Young, C., Roberts, R., & Ward, L. (2019). Application of resilience theories in the transition to parenthood: A scoping review. *Journal of Reproductive and Infant Psychology*, *37*(2), 139–160. https://doi.org/10.1080/02646838.2018.1540860

Young, C., Roberts, R., & Ward, L. (2020). Hindering resilience in the transition to parenthood: A thematic analysis of parents' perspectives. *Journal of Reproductive and Infant Psychology*, *22*, 1–14. https://doi.org/10.1080/02646838.2020.1757630

Yu, C. Y., Hung, C. H., Chan, T. F., Yeh, C. H., & Lai, C. Y. (2012). Prenatal predictors for father–infant attachment after childbirth. *Journal of Clinical Nursing*, *21*(11–12), 1577–1583. https://doi.org/10.1111/j.1365-2702.2011.04003.x

How to cite this article: Escribano, S., Oliver-Roig, A., Juliá-Sanchis, R., & Richart-Martínez, M. (2022). Relationships between parent–infant bonding, dyadic adjustment and quality of life, in an intra-partner sample. *Health & Social Care in the Community*, *00*, 1–10. https://doi.org/10.1111/hsc.13917