

## Original Research

# Adverse Childhood Experiences, Attachment, Guilt, and Mental Health as Predictors of Positive Dyadic Coping Following Perinatal Loss Among Women

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Academic Editors: Chung-Ying Lin and Jose Pedro Espada

Submitted: 31 December 2025 Revised: 28 January 2026 Accepted: 12 February 2026 Published: 23 October 2026

## Abstract

**Background:** Perinatal loss is a highly stressful life event that can profoundly affect women's emotional well-being and couple functioning. This study examined the role of adverse childhood experiences (ACEs), insecure romantic attachment (attachment anxiety and attachment avoidance), guilt, and mental health problems (MHP) in predicting positive dyadic coping (PDC) among women who had experienced perinatal loss. **Methods:** A total of 162 Spanish women completed online questionnaires assessing attachment (experiences in close relationships–revised scale (ECR-R)), ACEs (adverse childhood experiences questionnaire (ACEQ)), as well as guilt and MHP using ad hoc Likert-type items. Data were analyzed using correlation analyses, hierarchical regression, fuzzy-set Qualitative Comparative Analysis (fsQCA), and mediation models (SPSS, PROCESS). **Results:** Hierarchical regression analysis showed that lower attachment anxiety and attachment avoidance were the strongest predictors of PDC, with the final model explaining 68.8% of the variance. fsQCA indicated that no single condition was necessary for either high or low PDC; however, several sufficient configurations accounted for most cases of high PDC, particularly those characterized by low attachment avoidance combined with low attachment anxiety, low guilt, or the absence of ACEs. Configurations associated with low PDC were primarily characterized by higher attachment avoidance and attachment anxiety, often combined with greater psychological distress or guilt. Mediation analyses revealed that insecure attachment, particularly attachment anxiety, mediated the association between ACEs and PDC, suggesting that ACEs influenced coping primarily through indirect pathways rather than direct pathways. **Conclusions:** Overall, these findings highlight the central role of attachment processes and emotional regulation in promoting PDC following perinatal loss and support the utility of integrative, non-linear approaches for understanding adjustment to perinatal bereavement.

**Keywords:** adverse childhood experiences; attachment; positive dyadic coping; guilt; mental health; perinatal loss

## 1. Introduction

### 1.1 The Burden and Significance of Perinatal Loss

Pregnancy and childbirth are typically significant life events, marked by expectations and profound changes. When this process is interrupted by perinatal loss, women and couples may experience a particularly disruptive and often unrecognized form of bereavement, with substantial emotional and relational consequences (Fernández-Alcántara et al., 2012).

According to the World Health Organization (Organización Mundial de la Salud, 2022), perinatal loss includes stillbirth ( $\geq 28$  gestational weeks and/or  $\geq 1000$  g) and early neonatal death (0–7 days after birth), although some definitions extend this range to include early losses before 10 weeks of gestation (Alves et al., 2023) or up to the child's first year of life (Koukopoulos et al., 2020).

Perinatal loss represents a major global public health challenge. The Global Burden of Disease Study 2021 estimated 3.04 million stillbirths globally in 2021 at  $\geq 20$  weeks' gestation, corresponding to a stillbirth rate of 23

per 1000 births (GBD 2021 Global Stillbirths Collaborators, 2024). During the first trimester, spontaneous abortion occurs in 10–15% of clinically confirmed pregnancies (Baschieri et al., 2019). In Spain, approximately 2000 deaths occur from 24 weeks of gestation or within the first month of life (Cassidy, 2021). Globally, over 5 million deaths occur at delivery or during the first month of life (Akuze et al., 2020), with a disproportionate burden in low- and middle-income countries, particularly South Asia and sub-Saharan Africa, which together account for 77.4% of the global total (GBD 2021 Global Stillbirths Collaborators, 2024).

### 1.2 Individual Mental Health Consequences

The mental health impact of perinatal loss is substantial and enduring. Recent meta-analytic evidence (Herbert et al., 2022) shows that perinatal loss is linked to a significantly increased risk of psychopathology, including anxiety, anger, prolonged grief disorder, and trauma-related symptoms (Bellhouse et al., 2019; Cena et al., 2022).



Women who experience such losses exhibit more than a twofold increase in depressive disorders and a markedly higher risk of anxiety compared with women without perinatal loss (Heazell et al., 2016). Furthermore, recent longitudinal studies indicate that psychological distress—especially post-traumatic stress symptoms—can extend into subsequent pregnancies and continue into the postnatal period (Beaumont et al., 2025).

### *1.3 Impact on Couple Relationships and Family Dynamics*

Beyond individual suffering, perinatal loss may also strain couple functioning, disrupt communication, and compromise mutual support during a period of heightened vulnerability (Cunen et al., 2014). The period following loss is characterized by extensive relational consequences, with both partners experiencing grief simultaneously, which may overwhelm their capacity to support one another (Albuquerque et al., 2018). Research indicates that 9% of mothers and 5% of partners report relationship difficulties nine months after stillbirth, with similar proportions experiencing difficulties with extended family members (Heazell et al., 2016). Perinatal loss often leads to social silencing and a sense that grief is minimized or delegitimized, which increases isolation and complicates the grieving process (Fernández-Sola et al., 2020). Family dynamics may be disrupted, with mean Family Assessment Device scores indicating substantial dysfunction in family relationships following loss (Heazell et al., 2016).

### *1.4 Conceptual Framework: Biographical, Relational, and Emotional Determinants of Adaptation to Perinatal Grief*

Grief, including perinatal grief, has been conceptualized through multiple theoretical frameworks, such as psychoanalytic perspectives (Freud, 1917), attachment theory (Bowlby, 1978), stage-based models (Kübler-Ross, 2006), task-oriented approaches (Worden, 2018), and dual-process models emphasizing oscillation between loss-oriented and restoration-oriented coping (Stroebe and Schut, 2010).

While these models have advanced understanding of individual grief responses, they often do not fully capture the relational and contextual dimensions of perinatal loss, particularly within intimate partnerships. Accordingly, adaptation to perinatal grief is increasingly understood as a multifactorial and relational process, shaped by prior life experiences, attachment patterns, and emotional vulnerabilities.

### *1.5 Biographical Factors: Adverse Childhood Experiences (ACEs)*

Adaptation to perinatal grief is shaped by pre-existing factors that influence emotional regulation, notably adverse childhood experiences (ACEs) (Albuquerque et al., 2018; Kersting and Wagner, 2012; Papapetrou et al., 2020; Smith et al., 2016). ACEs are early traumatic events—

such as abuse, neglect, exposure to violence, or parental mental illness—that disrupt developmental environments and have long-term effects on physical and mental health (Felitti et al., 1998). From an attachment perspective, ACEs may shape internal working models of self and others, influencing emotion regulation, expectations of support, and relational functioning in adulthood. The cumulative risk model proposes that a higher number of ACEs increases health risks, whereas the critical periods model emphasizes that exposure during sensitive stages can produce persistent neurobiological and psychological alterations (Fonseca-Rondón et al., 2023).

The ACE pyramid (Centers for Disease Control and Prevention, 2021a; Felitti et al., 1998) illustrates how these experiences contribute to risk factor development and negatively affect health and well-being across the lifespan (Cabrera et al., 2007; Hughes et al., 2017). Recent evidence indicates that women with four or more ACEs are at increased risk of depression, anxiety, and post-traumatic stress during pregnancy (Watson et al., 2024). Greater ACE accumulation has also been linked to pregnancy complications (Mamun et al., 2023) and poorer adaptation to both pregnancy and perinatal grief, increasing vulnerability to stress and mental health difficulties such as anxiety and depression (Smith et al., 2016).

### *1.6 Relational Factors: Romantic Attachment*

ACEs have been shown to influence attachment development (Cooke et al., 2019; Zumdahl et al., 2025). According to Bowlby's attachment theory (1978), secure and emotionally stable early relationships foster a secure attachment style and adequate socioemotional resources. Ainsworth et al. (1978) identified secure, anxious, and avoidant patterns in infancy, which Hazan and Shaver (1987) extended to adult romantic relationships along two dimensions: anxiety (fear of rejection, emotional reactivity, need for closeness, and dissatisfaction with support) and avoidance (desire for autonomy, discomfort with intimacy, and emotional suppression) (Alves et al., 2025; Trombetta et al., 2025). Bartholomew and Horowitz (1991) later described disorganized attachment, characterized by a contradictory search for closeness and fear of rejection. Insecure and disorganized attachment styles have been linked to greater ACE exposure (Anderson, 2021; Bifulco et al., 2006).

In the context of perinatal loss, secure attachment is associated with better emotional adjustment, buffering stress, anxiety, and trauma symptoms, while promoting flexible grief processing and receptivity to social support (Scheidt et al., 2012). In contrast, insecure attachment hinders adaptation: women with anxious or preoccupied attachment often experience heightened shame and distress, whereas those with avoidant attachment may show greater despair, particularly when guilt is present, potentially intensifying suffering even in subsequent pregnancies (Caldwell et al., 2024; Christiansen et al., 2013; Condon, 1993;

Scheidt et al., 2012). Notably, attachment avoidance may undermine positive dyadic coping (PDC) by limiting emotional disclosure and responsiveness to the partner's needs, whereas attachment anxiety may intensify emotional distress while simultaneously increasing support-seeking behaviors (Freedle and Oliveira, 2024; Scheidt et al., 2012).

### *1.7 Emotional Factors: Guilt and Mental Health Problems*

Guilt is an important emotional factor influencing grief adaptation. Parents often perceive it as their responsibility to care for and protect their children and may experience a profound sense of failure if the child dies (Gold et al., 2017; Kokou-Kpolou et al., 2018). ACEs have been shown to increase proneness to guilt, marked by negative self-evaluation, sadness, remorse, and low self-esteem (Caldwell et al., 2021; Wojcik et al., 2019). In the context of perinatal grief, guilt exacerbates psychological distress, particularly when there was ambivalence toward the pregnancy or perceived inadequate behavior (Kersting and Wagner, 2012). Although guilt is recognized as a salient emotional response following perinatal loss, it has been less systematically examined from a relational perspective and is therefore considered here as a potential factor influencing PDC.

Perinatal grief can be intense and prolonged, often associated with significant difficulties in coping (Reynolds and Grünh, 2024). In women, it may manifest as prolonged grief disorder, generalized anxiety, agoraphobia, specific phobias, depression, psychosomatic disorders, and post-traumatic stress disorder (Bellhouse et al., 2019; Cena et al., 2022; Salgado et al., 2021). Pre-existing mental health problems (MHP) further hinder grief processing, increasing emotional vulnerability and limiting both adaptive coping and PDC (Albuquerque et al., 2018; Kersting and Wagner, 2012).

### *1.8 Positive Dyadic Coping as a Relational Resource*

Following perinatal loss, both partners experience grief simultaneously, which may overwhelm them emotionally and hinder mutual support (Albuquerque et al., 2018). Dyadic coping refers to the individual or joint strategies couples use to manage stress and maintain their relationship (Bodenmann, 2005; Bodenmann et al., 2019). The systemic-transactional model emphasizes that stress affects both partners, prompting joint appraisals and shared coping efforts (Bodenmann et al., 2017). Dyadic coping typically emerges when individual strategies are insufficient (Falconier and Kuhn, 2019) and is characterized by (1) interdependence in stress experience, (2) perceiving the partner as the primary support source, and (3) being a dynamic, ongoing process (Landolt et al., 2023).

Dyadic coping may be positive—marked by assertive communication, mutual support, and collaboration—or negative, characterized by control, hostility, or lack of understanding (Falconier et al., 2015; Landolt et al., 2023). In the context of perinatal grief, adaptive strategies en-

hance resilience (Albuquerque et al., 2018) and are associated with greater relationship satisfaction, improved emotional regulation, and relief from distress (Bodenmann et al., 2017; Molgora et al., 2019). PDC is particularly relevant following perinatal loss, as it reflects the couple's ability to jointly manage stress, communicate emotional needs, and sustain relational functioning during a highly destabilizing life event.

### *1.9 Rationale for the Present Study*

Although perinatal grief has been studied, research exploring the predictors of PDC among women in couples who have experienced one or more perinatal losses remains limited, particularly with respect to biographical factors (ACEs), relational factors (romantic attachment), and emotional factors (guilt and MHP) in Spain. Understanding these relationships can shed light on how a history of adversity shapes women's PDC following perinatal loss.

This integrative perspective was chosen over traditional linear models of grief, which do not fully capture the diversity of individual responses or the complex dynamics within couples. Women may achieve similar levels of PDC through different combinations of biographical, relational, and emotional factors—patterns that linear approaches alone may overlook. Adopting this conceptual framework allows for a more nuanced understanding of the multifactorial processes involved in adaptation to loss during pregnancy and the first year of life.

Most existing studies employ linear methodologies, such as hierarchical regression or mediation/moderation analyses, which examine direct associations and predictive contributions but may fail to capture the phenomenon's complexity. To address this, the present study incorporated fuzzy-set Qualitative Comparative Analysis (fsQCA) to identify combinations of factors that facilitate or hinder PDC. Unlike traditional linear approaches, fsQCA can detect multiple configurations leading to the same outcome (Ragin, 2008), providing clinically meaningful insights into different risk and resilience profiles following perinatal loss.

### *1.10 Objectives and Hypotheses*

Given these considerations, this study aimed to examine predictors of PDC following perinatal loss in women, focusing on ACEs, romantic attachment, guilt, and MHP. Specifically, it aimed to: (1) analyze the associations between these factors and PDC, hypothesizing that PDC would be negatively associated with ACEs, insecure attachment, and guilt (H1); (2) examine whether MHP are associated with higher ACEs, greater insecure attachment, higher guilt, and lower PDC (H2); (3) identify the main predictors of PDC, hypothesizing that lower ACEs, lower insecure attachment, lower guilt, and fewer MHP would predict higher PDC (H3); (4) explore combinations of these factors that influence PDC, hypothesizing that different configura-

tions would explain the presence or absence of PDC (H4); and (5) investigate whether insecure attachment mediates the association between ACEs and PDC, hypothesizing that higher ACEs would be associated with greater insecure attachment, which in turn would predict lower PDC (H5).

## 2. Materials and Methods

### 2.1 Participants

The final sample consisted of 162 Spanish women in a romantic relationship, aged 22–59 years ( $M = 38.84$ , standard deviation ( $SD$ ) = 5.96). Most identified as heterosexual and were married or cohabiting, with an average relationship duration of 12.28 years ( $SD = 6.24$ ). The most common relationship durations were 15 years (10.9%), 6 years (8.0%), and 10 years (7.2%). Most participants had children, lived with two household members (partner and children), held a university degree, had permanent employment, and reported an annual income between €20,001 and €30,000.

Regarding clinical, obstetric, and reproductive characteristics (Table 1), 16.7% were pregnant at the time of the study. Most were in their third pregnancy (60.0%), and 95.5% had singleton pregnancies. The majority had experienced a single perinatal loss (67.9%), most commonly occurring at least three years prior to participation (32.7%). Most participants (69.1%) had not had a live birth before their most recent loss, and 11.7% reported medically indicated terminations. Among the 137 cases with gestational age data, losses occurred primarily during the first trimester (75.5%), followed by the second (19.7%) and third (5.1%). Following the loss, 13.6% of participants reported MHP, primarily anxiety and depression (40.9%). Regarding treatment, 40.9% were currently receiving care, while 50.0% had received treatment in the past.

Inclusion criteria were (1) having experienced a perinatal loss, (2) being of legal age, (3) residing in Spain, (4) having been the pregnant person, (5) providing informed consent, and (6) completing all questionnaires. Participants were excluded if they did not meet these criteria: 36 for not having experienced a perinatal loss, 3 for not residing in Spain, 6 for not having been the pregnant person, and 171 for incomplete responses.

The final sample was relatively homogeneous, consisting predominantly of highly educated women in stable romantic relationships, with perinatal losses occurring primarily during the first trimester. This homogeneity partly reflects the recruitment strategy and the characteristics of women more likely to engage in reflective research on perinatal loss.

### 2.2 Instruments

An ad hoc online form was developed to collect sociodemographic (e.g., age, sex assigned at birth, gender identity, place of residence, sexual orientation, marital status, number of children, household composition, educa-

tional level, employment status, income), relational (e.g., presence of a partner in the past year, partner gender identity, relationship duration), and clinical variables. Clinical variables included obstetric and reproductive history (e.g., current pregnancy, pregnancy type, number of pregnancies and perinatal losses, time since last loss, gestational week at loss, type and cause of loss, presence of living children before/after the loss) and mental health (e.g., history of MHP, type of disorder, and treatment received).

Guilt associated with the perinatal loss was assessed using a single ad hoc item capturing its subjective intensity. Participants rated their agreement on a Likert-type scale. This brief measure was selected to reduce participant burden in a highly sensitive population and to facilitate online completion.

ACEs were assessed using the Adverse Childhood Experiences Questionnaire (ACEQ). The ACEQ evaluates exposure to 10 types of adversity in adults ( $\geq 18$  years) via dichotomous (yes/no) responses. Total scores range from 0 to 10, with scores above 3 indicating higher health risk (Felitti et al., 1998). The questionnaire comprises two dimensions: personal adversity (abuse and neglect) and family-related adversity (household dysfunction). The Spanish adaptation showed moderate reliability (total  $\alpha = 0.68$ ; abuse  $\alpha = 0.70$ ; neglect  $\alpha = 0.45$ ; Mendoza and Meza, 2022). In the present study, Cronbach's alpha values were 0.59 for the total scale, 0.63 for abuse, and 0.31 for neglect. These relatively low coefficients are consistent with previous research and are expected given the cumulative and formative nature of the ACEQ, which assesses exposure to heterogeneous and largely independent adverse events rather than a single latent construct (Centers for Disease Control and Prevention, 2021b; Mendoza and Meza, 2022). Low internal consistency may also reflect weak intercorrelations among less frequent experiences, such as parental loss or incarceration. Although internal consistency for the total ACE score was acceptable, lower reliability coefficients were observed for specific subdimensions, particularly neglect. This pattern aligns with previous studies suggesting that ACE instruments assess diverse and relatively independent adverse experiences rather than a single underlying construct (Finkelhor et al., 2015).

Insecure romantic attachment was measured using the short Spanish version of the Experiences in Close Relationships–Revised Scale (ECR-R; Fraley et al., 2011; Fernández-Fuertes et al., 2011). This self-report scale comprises 18 items rated on a 7-point Likert scale, distributed across two dimensions: anxiety and avoidance. Subscale scores were calculated as summed item scores. The Spanish validation reported adequate reliability ( $\alpha = 0.80$  for anxiety;  $\alpha = 0.86$  for avoidance). In this study, Cronbach's alpha values were 0.86 for anxiety and 0.92 for avoidance.

PDC was assessed with the Dyadic Coping Inventory (DCI; Bodenmann, 2008; Ledermann et al., 2010), Spanish adaptation by Falconier et al. (2013), which evaluates how

**Table 1. Sociodemographic and clinical characteristics.**

| Variable              | Category                      | <i>n</i> | %     |
|-----------------------|-------------------------------|----------|-------|
| Sexual orientation    | Heterosexual                  | 139      | 85.80 |
|                       | Homosexual                    | 7        | 4.30  |
|                       | Bisexual                      | 15       | 9.30  |
|                       | Asexual                       | 1        | 0.60  |
| Marital status        | Single                        | 26       | 16.00 |
|                       | Married or in a relationship  | 132      | 81.50 |
|                       | Separated or divorced         | 4        | 2.50  |
| Number of cohabitants | 0                             | 7        | 4.30  |
|                       | 1                             | 47       | 29.00 |
|                       | 2                             | 58       | 35.80 |
|                       | 3                             | 35       | 21.60 |
|                       | 4                             | 8        | 4.90  |
|                       | 5                             | 1        | 0.60  |
| Lives with            | Partner                       | 43       | 26.50 |
|                       | Parents                       | 2        | 1.20  |
|                       | Partner and children          | 83       | 51.20 |
|                       | Parents and children          | 3        | 1.90  |
|                       | Parents, partner and children | 1        | 0.60  |
| Education             | Primary studies               | 2        | 1.20  |
|                       | Secondary studies             | 23       | 14.20 |
|                       | Higher education              | 132      | 81.50 |
| Occupation            | Public servant                | 35       | 21.60 |
|                       | Self-employed                 | 23       | 14.20 |
|                       | Permanent contract            | 70       | 43.20 |
|                       | Temporary employment contract | 8        | 4.90  |
|                       | Unemployed                    | 7        | 4.30  |
|                       | Household work                | 5        | 3.10  |
|                       | Unemployment benefit/subsidy  | 2        | 1.20  |
|                       | Other                         | 4        | 2.50  |
| Annual income         | Less than €5000               | 8        | 4.90  |
|                       | €5001–€10,000                 | 6        | 3.70  |
|                       | €10,001–€15,000               | 19       | 11.70 |
|                       | €15,001–€20,000               | 24       | 14.80 |
|                       | €20,001–€30,000               | 44       | 27.20 |
|                       | €30,001–€40,000               | 32       | 19.80 |
|                       | More than €40,000             | 24       | 14.80 |
| Pregnancy number      | 2                             | 8        | 32.00 |
|                       | 3                             | 15       | 60.00 |
|                       | 4                             | 2        | 8.00  |
| Perinatal loss        | 1                             | 110      | 67.90 |
|                       | 2                             | 37       | 22.80 |
|                       | 3                             | 8        | 4.90  |
|                       | 4                             | 2        | 1.20  |
|                       | 5                             | 2        | 1.20  |
|                       | 6                             | 2        | 1.20  |
|                       | More than 6                   | 1        | 0.60  |
| Time since last loss  | Less than 3 months            | 21       | 13.00 |
|                       | Between 3 and 6 months        | 16       | 9.90  |
|                       | Between 6 months and 1 year   | 19       | 11.70 |
|                       | Between 1 and 2 years         | 35       | 21.60 |
|                       | Between 2 and 3 years         | 18       | 11.10 |
|                       | More than 3 years             | 53       | 32.70 |

Table 1. Continued.

| Variable        | Category                        | <i>n</i> | %     |
|-----------------|---------------------------------|----------|-------|
| Perinatal guilt | Never                           | 17       | 10.50 |
|                 | Rarely                          | 21       | 13.00 |
|                 | Sometimes                       | 59       | 36.40 |
|                 | Regularly                       | 40       | 24.70 |
|                 | Always                          | 25       | 15.40 |
| Type of MHP     | Anxiety                         | 3        | 13.64 |
|                 | Depression                      | 2        | 9.09  |
|                 | OCD                             | 1        | 4.55  |
|                 | Personality Borderline Disorder | 1        | 4.55  |
|                 | PTSD                            | 2        | 9.09  |
|                 | ADHD                            | 2        | 9.09  |
|                 | Generalized Anxiety Disorder    | 2        | 9.09  |
|                 | Anxiety and depression          | 9        | 40.90 |

MHP, mental health problems; OCD, obsessive compulsive disorder; PTSD, post traumatic stress disorder; ADHD, attention deficit hyperactivity disorder.

couples manage stress together. The inventory contains 37 Likert-type items across subscales, including stress communication, supportive coping, delegated coping, negative coping, joint coping, and coping evaluation. Negatively keyed items were reverse-coded before computing subscale and total scores. Original cutoffs classify total scores as below average (<111), normative (111–145), or above average (>145) (Bodenmann, 2008). The Spanish validation reported high total reliability ( $\alpha = 0.94$ ) and adequate subscale reliabilities ( $\alpha = 0.64$ – $0.92$ ), with some moderate values observed in women (problem-focused supportive coping  $\alpha = 0.55$ ; negative coping  $\alpha = 0.60$  self,  $\alpha = 0.59$  partner). In this study, Cronbach's alpha values were as follows: stress communication 0.69 (self)/0.81 (partner); supportive coping 0.67/0.89; delegated coping 0.70/0.82; negative coping 0.73/0.81; joint coping 0.88; coping evaluation 0.95; total score 0.95.

MHP were treated as a contextual vulnerability factor rather than a diagnostic indicator.

### 2.3 Procedure

This study is part of a broader research project approved by the Ethics Committee of the University of Valencia (2024-PSILOG-3468509). Prior to dissemination, expert consultations were conducted to ensure the sensitivity and appropriateness of the survey, and minor wording adjustments were made based on input from the perinatal grief association Umamanita.

The final survey was distributed online through personal contacts, WhatsApp (WhatsApp LLC/Meta Platforms, Inc.) groups, and social media platforms Instagram (Meta Platforms, Inc.), and X (X Corp.). In addition, 56 national and provincial associations related to pregnancy, breastfeeding, perinatal grief, and maternal–infant health, as well as professional colleges of gynecology and obstetrics in Spain, were contacted via email and invited to col-

laborate in dissemination. Further outreach was conducted via Instagram with the support of associations, centers, and 17 healthcare professionals (psychologists, midwives, and gynecologists).

The survey was administered via the University of Valencia's LimeSurvey platform (University of Valencia, Valencia, Spain). All participants provided electronic informed consent, and data were collected anonymously between October 2024 and January 2025. Completion time ranged from 20 to 35 minutes.

### 2.4 Data Analysis

Data were analyzed in several stages using IBM SPSS Statistics, version 29.0.2.0 (IBM Corp., Armonk, NY, USA). First, descriptive statistics were calculated to characterize the study variables. Second, independent-samples *t*-tests were conducted to examine group differences according to the presence of mental health problems, and effect sizes were estimated using Cohen's *d*. Third, correlation analyses were performed to examine associations among ACEs, attachment dimensions, guilt, MHP, and PDC.

Subsequently, a stepwise multiple linear regression analysis was conducted to identify predictors of PDC. Adjusted  $R^2$  values were reported to provide a more conservative estimate of explained variance, accounting for sample size and number of predictors.

fsQCA, version 4.1 (Charles C. Ragin and Sean Davey, Irvine, CA, USA) was employed to identify configurations of conditions associated with high and low levels of PDC. Variables were calibrated using established cut-off points, and analyses of necessary and sufficient conditions were performed, with intermediate solutions reported in accordance with established methodological guidelines (Ragin, 2008; Eng and Woodside, 2012; Pappas and Woodside, 2021). fsQCA procedures followed Ragin's (2008) recommendations. Variables were calibrated into fuzzy sets us-

ing theoretical and empirical anchors corresponding to full membership, the crossover point, and full non-membership. Calibration thresholds were based on sample percentiles (10th percentile (P10), median (P50), and 90th percentile (P90)).

A consistency threshold of 0.74 was adopted to identify sufficient conditions, consistent with prior research. Both the presence and absence of PDC were examined to capture asymmetric causal pathways.

Finally, mediation analyses, including both simple and multiple mediation models, were conducted using the PRO-CESS macro for SPSS, version 4.2 (Andrew F. Hayes, New York, USA) to examine whether insecure attachment dimensions mediated the association between ACEs and PDC. Although the overall sample comprised 162 participants, the mediation analyses were conducted using 136 participants due to missing data on one or more variables included in the mediation models. Cases with missing data were excluded using listwise deletion. Prior to mediation analyses, continuous predictor variables were mean-centered to reduce multicollinearity and facilitate interpretation of indirect effects.

### 3. Results

#### 3.1 Descriptive Analysis: Sociodemographic, Relational, and Clinical Variables

A total of 13.60% of participants reported a history of MHP, most commonly anxiety and depression (40.90%). Among these women, 40.90% were currently receiving psychological treatment, while 50% reported having received treatment in the past. Regarding perinatal guilt, most participants reported experiencing it sometimes (36.40%), regularly (24.70%), or always (15.40%), whereas fewer reported experiencing it rarely (13.00%) or never (10.50%).

Participants generally reported low total ACE scores; however, 16.25% exceeded the threshold of three ACEs. Mean scores for both anxiety and avoidance attachment dimensions were relatively low. Using the median-split method proposed by Fraley et al. (2000, 2013), the predominant attachment style in the sample was secure (39.10%), followed by fearful (28.30%), preoccupied (21.00%), and dismissing/avoidant (11.60%).

The mean PDC score was moderately high. Applying the cut-off points proposed by Bodenmann (2008) for exploratory purposes, 13.20% of participants fell below the average range, 52.90% were within the normative range, and 33.80% were above average (Table 1).

#### 3.2 Mean Differences

Mean difference analyses were conducted to examine whether MHP function as a vulnerability marker associated with distinct emotional and relational profiles following perinatal loss. Differences in ACEs, insecure attachment, guilt, and PDC were examined according to the presence of MHP (Table 2).

Significant differences were observed for attachment anxiety, ACEs, and guilt, with women reporting MHP scoring higher on these variables. Effect sizes were moderate to large, indicating that the observed differences are not only statistically significant but also potentially meaningful at clinical and psychological levels.

However, given the imbalance in group sizes, effect size estimates may be unstable. Therefore, these findings should be interpreted with caution and are considered exploratory.

#### 3.3 Correlational Analyses

Correlational analyses examined associations among ACEs, insecure attachment dimensions, PDC, and guilt (Table 3). ACEs were positively correlated with attachment anxiety, attachment avoidance, and guilt, and negatively correlated with PDC and several of its subscales. Attachment anxiety was positively associated with avoidance and guilt, and negatively associated with PDC and its subscales. Attachment avoidance showed a positive correlation with guilt and a negative correlation with PDC and its subscales. Finally, guilt was negatively correlated with PDC and several of its subscales.

Although the PDC scale includes both self- and partner-oriented dimensions, the total PDC score was used in subsequent analyses to capture overall perceived PDC within the relationship. This approach was adopted to reduce model complexity and multicollinearity given the sample size.

#### 3.4 Linear Regression Analysis

A stepwise hierarchical regression was conducted to examine predictors of PDC (Table 4). In Step 1, MHP was entered, explaining a minimal proportion of the variance in PDC ( $\Delta R^2 = 0.002$ ,  $\Delta F = 0.219$ ,  $p = 0.641$ ). In Step 2, ACEs and attachment dimensions (anxiety and avoidance) were added, resulting in a significant increase in explained variance ( $\Delta R^2 = 0.696$ ,  $\Delta F = 99.158$ ,  $p < 0.001$ ). Within this model, attachment anxiety ( $\beta = -0.302$ ,  $t = -5.114$ ,  $p < 0.001$ ) and attachment avoidance ( $\beta = -0.659$ ,  $t = -11.893$ ,  $p < 0.001$ ) emerged as significant negative predictors of PDC, while MHP showed a small positive effect ( $\beta = 0.148$ ,  $t = 2.779$ ,  $p = 0.006$ ), and ACEs were not significant ( $\beta = -0.048$ ,  $t = -0.952$ ,  $p = 0.343$ ). In Step 3, guilt related to perinatal loss was added, which did not significantly improve the model ( $\Delta R^2 = 0.002$ ,  $\Delta F = 0.883$ ,  $p = 0.349$ ). In the final model, attachment anxiety and avoidance remained significant negative predictors of PDC, MHP maintained a small positive association ( $\beta = 0.16$ ,  $t = 2.91$ ,  $p = 0.004$ ), and ACEs ( $\beta = -0.04$ ,  $t = -0.88$ ,  $p = 0.383$ ) and guilt a small negative association ( $\beta = -0.05$ ,  $t = -0.94$ ,  $p = 0.349$ ) were not significant. Overall, the final model accounted for 68.8% of the variance in PDC.

**Table 2. Group differences based on the presence of MHP in ACEs, insecure attachment, dyadic coping, and guilt.**

|                                        | Without MHP    | With MHP       | <i>t</i> | <i>p</i>         | <i>d</i> |
|----------------------------------------|----------------|----------------|----------|------------------|----------|
|                                        | M (SD)         | M (SD)         |          |                  |          |
| ACEs                                   | 1.44 (1.52)    | 2.68 (1.99)    | 2.79     | 0.010            | 0.78     |
| Anxiety                                | 25.44 (10.89)  | 37.58 (10.50)  | −4.52    | <i>p</i> < 0.001 | −1.12    |
| Avoidance                              | 17.45 (9.34)   | 20.26 (11.89)  | −0.98    | 0.337            | −0.29    |
| Individual communication               | 15.22 (2.65)   | 15.84 (1.92)   | −1.24    | 0.226            | −0.24    |
| Partner communication                  | 13.07 (3.41)   | 12.37 (2.22)   | 1.17     | 0.250            | 0.21     |
| Individual supportive coping           | 20.05 (2.52)   | 19.68 (3.09)   | 0.49     | 0.627            | 0.14     |
| Partner supportive coping              | 19.45 (4.11)   | 19.42 (4.27)   | 0.03     | 0.977            | 0.01     |
| Individual delegated coping            | 7.88 (1.22)    | 7.89 (1.24)    | −0.05    | 0.958            | −0.01    |
| Partner delegated coping               | 7.24 (1.65)    | 7.21 (2.07)    | 0.07     | 0.948            | 0.02     |
| Individual negative coping             | 17.02 (2.49)   | 17.05 (2.91)   | −0.05    | 0.961            | −0.01    |
| Partner negative coping                | 16.34 (3.03)   | 15.68 (3.59)   | 0.75     | 0.460            | 0.21     |
| Joint coping                           | 18.43 (4.23)   | 17.58 (4.68)   | 0.74     | 0.467            | 0.20     |
| Individual evaluation of dyadic coping | 7.62 (2.10)    | 7.37 (2.31)    | 0.44     | 0.664            | 0.12     |
| PDC                                    | 134.97 (19.49) | 132.68 (21.43) | 0.44     | 0.666            | 0.12     |
| Guilt over perinatal loss              | 3.13 (1.15)    | 3.91 (0.97)    | −3.02    | 0.002            | −0.70    |

Note. M, Mean; SD, Standard Deviation; *t*, *t*-value; *p*, *p*-value; *d*, Cohen's *d*; ACEs, adverse childhood experiences; PDC, positive dyadic coping.

### 3.5 Fuzzy-Set Qualitative Comparative Analysis (fsQCA)

#### 3.5.1 Necessary Conditions

Descriptive statistics and calibrated values used in the fsQCA are presented in Table 5. The necessity of each condition—and its negation—was examined for both the presence and absence of PDC (Table 6). No condition reached the conventional consistency threshold of  $\geq 0.90$  to be considered strictly necessary for the presence of PDC. Although the absence of attachment avoidance approached this threshold (consistency = 0.8989), it did not meet the criterion and therefore cannot be interpreted as a strictly necessary condition. Similarly, no condition met the necessity criterion for the absence of PDC.

#### 3.5.2 Sufficiency Conditions

Sufficiency analyses identified multiple configurations associated with high and low levels of PDC. For high PDC, five sufficient configurations jointly accounted for approximately 92% of cases. Table 7 presents the three major configurations. Three pathways were particularly prominent: Path 1, characterized by the absence of MHP combined with low attachment avoidance, showed the highest coverage (78%); Path 2, combining low attachment avoidance with low guilt, accounted for 58%; and Path 3, defined by the absence of ACEs together with low attachment avoidance, accounted for 55% of cases.

For low PDC, four sufficient configurations explained approximately 90% of cases. Table 7 presents the three major configurations. The most relevant pathways included: Path 1, characterized by high attachment avoidance; Path 2, combining low MHP with high attachment anxiety; and Path 3, characterized by high ACEs together with high attachment anxiety (Table 7). Overall, these findings high-

light multiple, asymmetric pathways leading to both high and low PDC in the sample.

### 3.6 Mediation Analysis: The Role of Insecure Attachment in the Relationship Between ACEs and PDC

A mediation analysis was conducted to examine whether attachment anxiety and attachment avoidance mediated the relationship between ACEs and PDC (Fig. 1). The mediation analysis was conducted on 136 participants. ACEs were significantly and positively associated with attachment anxiety ( $B = 1.44$ ,  $SE = 0.69$ ,  $p = 0.019$ , 95% CI [0.24, 2.65]) and attachment avoidance ( $B = 1.00$ ,  $SE = 0.50$ ,  $p = 0.047$ , 95% CI [0.01, 1.99]).

The full mediation model, which included ACEs, attachment anxiety, and attachment avoidance as predictors of PDC, explained 68.8% of the variance in PDC (Adjusted  $R^2 = 0.688$ ,  $F(3, 132) = 96.08$ ,  $p < 0.001$ ). Both attachment anxiety ( $B = -0.45$ ,  $SE = 0.09$ ,  $p < 0.001$ , 95% CI [−0.64, −0.27]) and attachment avoidance ( $B = -1.36$ ,  $SE = 0.11$ ,  $p < 0.001$ , 95% CI [−1.59, −1.13]) were significantly associated with lower PDC, whereas the direct effect of ACEs on PDC was not significant ( $B = -0.24$ ,  $SE = 0.68$ ,  $p = 0.696$ , 95% CI [−1.43, 0.96]).

Bootstrap analyses based on 10,000 resamples indicated a significant total indirect effect of ACEs on PDC through attachment dimensions (effect = −2.01,  $BootSE = 0.92$ , 95% CI [−3.81, −0.28]). Examination of specific indirect effects revealed a significant pathway through attachment anxiety (effect = −0.65,  $BootSE = 0.29$ , 95% CI [−1.29, −0.15]), whereas the pathway through attachment avoidance was statistically significant (effect = −1.36,  $BootSE = 0.77$ , 95% CI [−2.89, −0.10]). These findings suggest that the association between ACEs and PDC pri-

**Table 3. Associations among ACEs, insecure attachment, PDC, and guilt.**

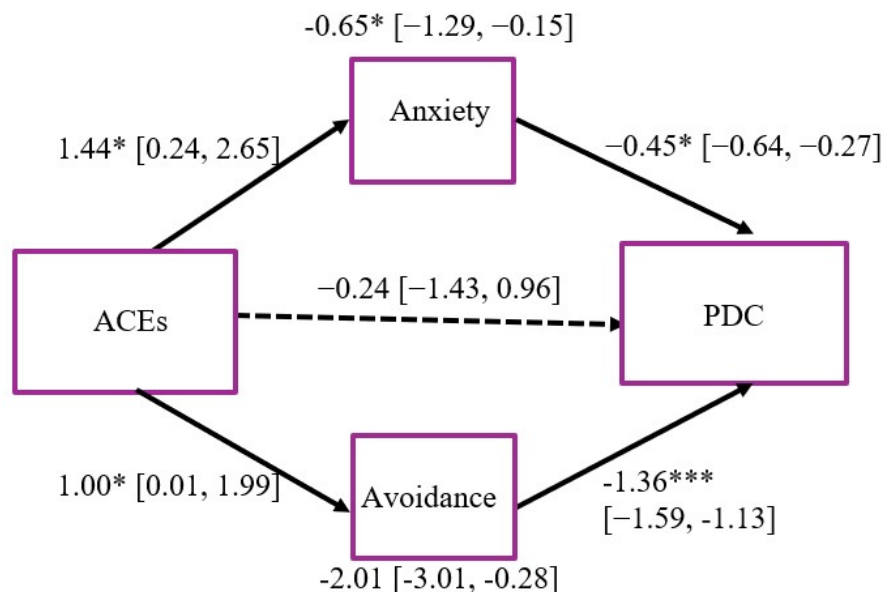
|                           |                              | 1      | 2       | 3       | 4      | 5      | 6       | 7      | 8      | 9      | 10     | 11     | 12     | 13     | 14     | 15 |
|---------------------------|------------------------------|--------|---------|---------|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|----|
| ACEs                      | ACEs                         | 1      |         |         |        |        |         |        |        |        |        |        |        |        |        |    |
| Romantic attachment       | Anxiety                      | 0.20*  | 1       |         |        |        |         |        |        |        |        |        |        |        |        |    |
|                           | Avoidance                    | 0.17*  | 0.48**  | 1       |        |        |         |        |        |        |        |        |        |        |        |    |
| PDC                       | Individual communication     | -0.08  | -0.29** | -0.58** | 1      |        |         |        |        |        |        |        |        |        |        |    |
|                           | Partner communication        | -0.08  | -0.35** | -0.28** | 0.19*  | 1      |         |        |        |        |        |        |        |        |        |    |
|                           | Individual supportive coping | -0.10  | -0.37** | -0.67** | 0.57** | 0.27** | 1       |        |        |        |        |        |        |        |        |    |
|                           | Partner supportive coping    | -0.16  | -0.48** | -0.76** | 0.52** | 0.40** | 0.52**  | 1      |        |        |        |        |        |        |        |    |
|                           | Individual delegated coping  | -0.03  | -0.16   | -0.20*  | 0.28** | 0.27** | 0.34**  | 0.23** | 1      |        |        |        |        |        |        |    |
|                           | Partner delegated coping     | -0.06  | -0.42** | -0.51** | 0.50** | 0.10   | 0.35**  | 0.58** | 0.25** | 1      |        |        |        |        |        |    |
|                           | Individual negative coping   | -0.12  | -0.37** | -0.47** | 0.40** | 0.01   | 0.41**  | 0.44** | 0.19*  | 0.45** | 1      |        |        |        |        |    |
|                           | Partner negative coping      | -0.18* | -0.60** | -0.64** | 0.48** | 0.26** | 0.47**  | 0.70** | 0.17   | 0.56** | 0.53** | 1      |        |        |        |    |
|                           | Joint coping                 | -0.20* | -0.51** | -0.71** | 0.53** | 0.41** | 0.62**  | 0.77** | 0.34** | 0.56** | 0.51** | 0.66** | 1      |        |        |    |
|                           | Individual evaluation        | -0.20* | -0.55** | -0.76** | 0.58** | 0.39** | 0.57**  | 0.84** | 0.25** | 0.64** | 0.51** | 0.73** | 0.79** | 1      |        |    |
|                           | PDC                          | -0.19* | -0.59** | -0.79** | 0.69** | 0.49** | 0.68**  | 0.88** | 0.39** | 0.68** | 0.62** | 0.81** | 0.83** | 0.90** | 1      |    |
| Guilt over perinatal loss | Guilt                        | 0.20   | 0.25**  | 0.21**  | -0.17* | -0.10* | -0.26** | -0.18* | 0.02   | -0.10  | -0.16  | -0.18* | -0.20* | -0.30* | -0.23* | 1  |

Note: \* $p \leq 0.05$ ; \*\* $p \leq 0.01$ ; 1 = ACEs; 2 = anxiety; 3 = avoidance; 4 = individual communication; 5 = partner communication; 6 = individual supportive dyadic coping; 7 = partner supportive dyadic coping; 8 = individual delegated coping; 9 = partner delegated coping; 10 = individual negative coping; 11 = partner negative coping; 12 = joint coping; 13 = individual evaluation of dyadic coping; 14 = total positive dyadic coping; 15 = guilt over perinatal loss.

**Table 4. Hierarchical stepwise regression model predicting PDC.**

| Predictor              | PDC          |            |          |        |      |
|------------------------|--------------|------------|----------|--------|------|
|                        | $\Delta R^2$ | $\Delta F$ | $\beta$  | $t$    | VIF  |
| Step 1                 | 0.002        | 0.219      |          |        |      |
| Mental health problems |              |            | 0.158**  | 2.91   | 1.26 |
| Step 2                 | 0.696***     | 99.158     |          |        |      |
| ACEs                   |              |            | -0.044   | -0.88  | 1.10 |
| Anxiety                |              |            | -0.30*** | -5.02  | 1.50 |
| Avoidance              |              |            | -0.65*** | -11.65 | 1.34 |
| Step 3                 | 0.002        | 0.883      |          |        |      |
| Guilt                  |              |            | -0.049   | -0.940 | 1.14 |

Note. Adjusted  $R^2$ , adjusted coefficient of determination;  $\Delta R^2$ , change in  $R^2$ ;  $\Delta F$ , change in  $F$ ;  $\beta$ , standardized regression coefficient;  $t$ ,  $t$ -value; VIF, variance inflation factor; \*\* $p < 0.01$ , \*\*\* $p \leq 0.001$ . Hierarchical multiple regression predicting DCI. Step 1:  $R^2 = 0.002$ ,  $\Delta R^2 = 0.002$ ,  $\Delta F(1, 132) = 0.219$ ,  $p = 0.641$ . Step 2:  $R^2 = 0.698$ ,  $\Delta R^2 = 0.696$ ,  $\Delta F(3, 129) = 99.158$ ,  $p < 0.001$ . Step 3:  $R^2 = 0.700$ ,  $\Delta R^2 = 0.002$ ,  $\Delta F(1, 128) = 0.883$ ,  $p = 0.349$ . Standardized coefficients ( $\beta$ ),  $t$  values, and variance inflation factors (VIF) are from the final model (Step 3). Durbin-Watson = 1.704.

**Fig. 1. Mediation analysis of the relationship between ACEs and PDC, mediated by insecure attachment (anxiety and avoidance).**

\* $p \leq 0.05$ , \*\*\* $p \leq 0.001$ . The coefficients obtained from the PROCESS analyses are unstandardized coefficients (B).

marily operates through indirect mechanisms, particularly via attachment-related anxiety, consistent with an indirect-only mediation model.

To further examine the contribution of each mediator, separate simple mediation models were conducted. In the model including attachment anxiety as the mediator, ACEs were positively associated with attachment anxiety ( $B = 1.44$ ,  $SE = 0.61$ ,  $p = 0.019$ ). This model explained 35% of the variance in PDC ( $R^2 = 0.35$ ,  $F(2, 133) = 35.78$ ,  $p < 0.001$ ). Attachment anxiety was significantly associated with lower PDC ( $B = -0.96$ ,  $SE = 0.12$ ,  $p < 0.001$ , 95% CI  $[-1.20, -0.72]$ ), whereas the direct effect of ACEs on PDC

was not significant ( $B = 0.86$ ,  $SE = 0.86$ ,  $p = 0.319$ , 95% CI  $[-0.84, 2.57]$ ). Bootstrap analyses confirmed a significant indirect effect of ACEs on PDC through attachment anxiety (effect = 1.39,  $BootSE = 0.54$ , 95% CI  $[0.39, 2.52]$ ).

In contrast, the simple mediation model including attachment avoidance indicated that ACEs were positively associated with attachment avoidance ( $B = 1.00$ ,  $SE = 0.50$ ,  $p = 0.047$ ), although the variance explained in this mediator was modest ( $R^2 = 0.03$ ). This model explained 63.1% of the variance in PDC ( $R^2 = 0.63$ ,  $F(2, 133) = 113.52$ ,  $p < 0.001$ ). Attachment avoidance was strongly associated with lower PDC ( $B = -1.61$ ,  $SE = 0.11$ ,  $p < 0.001$ , 95%

**Table 5. Descriptive statistics and calibrated values for fsQCA.**

|            | ACEs | Anxiety | Avoidance | Guilt | PDC    |
|------------|------|---------|-----------|-------|--------|
| <i>M</i>   | 1.63 | 27.41   | 17.91     | 3.22  | 134.25 |
| <i>SD</i>  | 1.64 | 11.83   | 9.64      | 1.17  | 19.95  |
| Min        | 0.00 | 9.00    | 9.00      | 1.00  | 85.00  |
| Max        | 7.00 | 61.00   | 62.00     | 5.00  | 174.00 |
| <i>P10</i> | 0.00 | 12.00   | 9.00      | 2.00  | 104.70 |
| <i>P50</i> | 1.00 | 27.00   | 16.00     | 3.00  | 137.00 |
| <i>P90</i> | 4.00 | 44.00   | 32.10     | 5.00  | 159.00 |

Note. *M*, Mean; *SD*, Standard Deviation; Min, Minimum; Max, Maximum; *P10*, 10th percentile; *P50*, Median; *P90*, 90th percentile; fsQCA, fuzzy-set Qualitative Comparative Analysis.

CI  $[-1.83, -1.39]$ ), while the direct effect of ACEs on PDC was not significant ( $B = 0.64$ ,  $SE = 0.65$ ,  $p = 0.325$ , 95% CI  $[-0.64, 1.91]$ ). However, the indirect effect of ACEs on PDC through attachment avoidance was significant (effect =  $-1.36$ ,  $BootSE = 0.77$ , 95% CI  $[-2.89, -0.10]$ ).

Overall, these findings indicate that although attachment avoidance is strongly associated with PDC, it does not mediate the relationship between ACEs and PDC. Instead, attachment anxiety appears to represent the primary pathway linking early adverse experiences to dyadic coping following perinatal loss.

## 4. Discussion

The findings of this study indicate that adaptation to perinatal grief through PDC is a multifactorial process influenced by biographical vulnerabilities (ACEs), relational patterns (attachment), and emotional factors (guilt and MHP). Consistent with attachment theory (Bowlby, 1978) and the systemic-transactional model of dyadic coping (Bodenmann, 2005), attachment avoidance emerged as the strongest predictor of reduced post-loss PDC, whereas ACEs appeared to influence PDC primarily through indirect pathways mediated by attachment anxiety (Freedle and Oliveira, 2024; Scheidt et al., 2012; Smith et al., 2025).

### 4.1 Attachment Styles

Attachment styles emerged as the strongest predictors of PDC, with attachment avoidance showing a robust negative association and attachment anxiety also contributing to lower PDC, albeit with a smaller effect. These findings support H1 and H3, highlighting the central role of attachment-related emotion regulation processes in couples' adjustment to perinatal loss (Albuquerque et al., 2018; Caldwell et al., 2024; Christiansen et al., 2013; Condon, 1993; Kersting and Wagner, 2012; Scheidt et al., 2012). They are also consistent with Bowlby's attachment theory (1978), which posits that insecure attachment compromises both affect regulation and the ability to rely on significant others during distress.

Low attachment avoidance constituted a core condition for high PDC across all fsQCA configurations, supporting H4 and underscoring the pivotal role of avoidance in shaping PDC. This finding can be theoretically grounded in attachment theory, particularly the concept of the secure base (Mikulincer and Shaver, 2018). Effective PDC requires partners to remain emotionally accessible, responsive, and willing to engage in mutual vulnerability when facing stressors. In contrast, attachment avoidance undermines the emotional openness and proximity-seeking behaviors that sustain this secure base within intimate relationships.

At the neurobiological level, avoidantly attached individuals exhibit automatic deactivation of the attachment system under distress, which inhibits emotional disclosure and proximity-seeking (Mikulincer and Shaver, 2018). In the context of perinatal grief—a stressor that threatens both individual and relational identity—this deactivation may disrupt shared meaning-making, emotional co-regulation, and coordinated coping processes that define high-quality PDC (Freedle and Oliveira, 2024; Wendołowska et al., 2022).

In contrast, although attachment anxiety was negatively associated with PDC in regression analyses, its effect was less pronounced than that of avoidance. This pattern may reflect the paradoxical tendency of individuals with high attachment anxiety to actively seek connection and support, albeit often in less adaptive ways (e.g., hyperactivation of the attachment system and excessive reassurance-seeking) (Leroy et al., 2020). Although potentially dysregulated, this connection-seeking may preserve some level of dyadic communication. In contrast, attachment avoidance is more likely to produce emotional disengagement and isolation, which are particularly detrimental to joint coping (Bröning and Wartberg, 2024; Freedle and Oliveira, 2024).

### 4.2 The Role of ACEs: Indirect Pathways Through Attachment Anxiety

ACEs were associated with lower PDC, and mediation analyses indicated that this relationship was driven primarily by attachment anxiety rather than attachment avoidance, partially confirming H5. Women with higher ACE exposure reported greater attachment anxiety, which, in turn, was linked to reduced PDC. This pattern is consistent with developmental attachment models suggesting that early adversity fosters hyperactivation of the attachment system, characterized by fear of abandonment, emotional dysregulation, and heightened dependency needs (Höltge et al., 2023; Shahab et al., 2021; Widom et al., 2018; Zum Dahl et al., 2025). In the context of perinatal loss, such hyperactivation may intensify distress and relational strain, undermining effective PDC even when the desire for closeness is present.

The absence of a significant indirect effect through attachment avoidance suggests that avoidant strategies may

**Table 6. Necessary analysis for high and low levels of PDC.**

| Condition                     | High levels of PDC |          | Low levels of PDC |          |
|-------------------------------|--------------------|----------|-------------------|----------|
|                               | Consistency        | Coverage | Consistency       | Coverage |
| Mental health problems        | 0.137              | 0.493    | 0.147             | 0.507    |
| Absence of MHP                | 0.863              | 0.514    | 0.853             | 0.486    |
| Adverse childhood experiences | 0.630              | 0.685    | 0.535             | 0.557    |
| Absence of ACEs               | 0.593              | 0.571    | 0.698             | 0.644    |
| Anxiety                       | 0.463              | 0.486    | 0.750             | 0.755    |
| Absence of anxiety            | 0.767              | 0.762    | 0.490             | 0.466    |
| Avoidance                     | 0.386              | 0.447    | 0.794             | 0.883    |
| Absence of avoidance          | 0.899              | 0.820    | 0.503             | 0.440    |
| Guilt                         | 0.662              | 0.603    | 0.755             | 0.659    |
| Absence of guilt              | 0.625              | 0.727    | 0.545             | 0.607    |

**Table 7. Sufficiency analysis for high and low levels of PDC.**

|                    | High levels of PDC          |      |      | Low levels of PDC           |      |      |
|--------------------|-----------------------------|------|------|-----------------------------|------|------|
|                    | Consistency threshold: 0.80 |      |      | Consistency threshold: 0.83 |      |      |
|                    | 1                           | 2    | 3    | 1                           | 2    | 3    |
| MHP                | ◦                           |      |      |                             | ○    |      |
| ACEs               |                             |      | ◦    |                             |      | ●    |
| Anxiety            |                             |      |      |                             | ●    | ●    |
| Avoidance          | ◦                           | ◦    | ◦    | ●                           |      |      |
| Guilt              |                             | ◦    |      |                             |      |      |
| Raw coverage       | 0.78                        | 0.58 | 0.55 | 0.79                        | 0.61 | 0.42 |
| Unique coverage    | 0.07                        | 0.00 | 0.04 | 0.22                        | 0.05 | 0.00 |
| Consistency        | 0.82                        | 0.90 | 0.84 | 0.88                        | 0.79 | 0.82 |
| Consistency global |                             | 0.79 |      |                             | 0.79 |      |
| Overall coverage   |                             | 0.90 |      |                             | 0.90 |      |

Note. The fsQCA analysis identified five sufficient configurations for high PDC and four for low PDC. Table 7 presents the three major configurations for each outcome. Expected vectors according to Pappas and Woodside (2021). For high levels of PDC: 0, 0, 0, 0, 0; For low levels: 1, 1, 1, 1, 1; Large circles indicate the presence of core conditions, whereas small circles indicate the presence of peripheral conditions; ● circles represent the presence or high level of the condition, and ○, ◦ represent the absence or low level of the condition.

reflect relatively stable relational orientations that are less directly shaped by cumulative childhood adversity, whereas attachment anxiety appears more sensitive to early relational trauma. ACEs such as abuse, neglect, and exposure to violence are thought to generate internal working models characterized by relational hypervigilance and preoccupation with partner availability, which may manifest as attachment anxiety in adulthood (Höltge et al., 2023; Shahab et al., 2021; Widom et al., 2018; Zumdahl et al., 2025). In this sense, ACEs may sensitize the attachment system toward fear of abandonment rather than defensive disengagement from intimacy.

At the same time, pathways from ACEs to attachment appear to be type- and timing-specific. Emotional abuse and emotional neglect have been shown to differentially predict anxious and avoidant attachment, respectively (Höltge et al., 2023), and earlier exposure to adversity has been associated with greater parental attachment insecurity

(Zumdahl et al., 2025). Moreover, ACEs also showed direct associations with PDC in some analyses, suggesting that early adversity may compromise PDC through multiple pathways, including persistent difficulties in emotion regulation, trauma-related beliefs, heightened guilt, and vulnerability to MHP, independently of attachment patterns (Shahab et al., 2021; Widom et al., 2018).

#### 4.3 Guilt and MHP as Vulnerability Markers

Guilt was negatively associated with PDC, supporting H1 and aligning with previous evidence indicating that self-blame and perceived responsibility intensify distress following perinatal loss (Caldwell et al., 2024). Although guilt was assessed using a single-item measure, its association with reduced PDC suggests that guilt may inhibit emotional sharing and mutual support by fostering withdrawal, shame, or fear of burdening the partner.

MHP were also associated with a broader vulnerability profile. However, H2 was not supported in relation to PDC, as group differences were not significant and the adjusted regression showed a small positive association between MHP and PDC. Women reporting MHP showed higher ACE exposure and greater attachment insecurity, suggesting cumulative risk pathways that may constrain relational coping resources during grief. Given the cross-sectional design and measurement limitations, these findings should be interpreted cautiously; however, they underscore the importance of considering both emotional distress and relational patterns when supporting women following perinatal loss.

#### 4.4 Multiple Configurations: Equifinality and Clinical Profiles

Beyond linear associations, fsQCA indicated that PDC following perinatal loss follows an equifinal and asymmetric logic, confirming H4: multiple configurations of attachment patterns, ACEs, guilt, and MHP can lead to either high or low PDC, with no single factor sufficient on its own. The absence of key risk conditions—particularly high attachment avoidance—often proved more decisive than the presence of protective factors, highlighting the utility of configurational approaches for capturing the complexity of couple adaptation to loss.

These findings suggest that there is no single risk or resilience profile but multiple pathways toward adaptation or maladaptation. For example, high PDC may occur despite elevated ACE exposure when attachment avoidance is low and MHP are absent, whereas low PDC may emerge even with minimal ACE exposure if high avoidance co-occurs with elevated guilt. Such patterns allow the identification of clinically meaningful profiles to guide intervention.

Three broad profiles can be distinguished. High vulnerability, characterized by high anxiety, high avoidance, and high guilt, carries the greatest risk of emotional disconnection and complicated grief, warranting interventions targeting emotion regulation, guilt, and avoidance-of-intimacy. Attachment-driven vulnerability (high anxiety or avoidance without MHP) indicates the potential benefit of attachment-based couple therapy to strengthen secure base functioning and emotional disclosure. Protective profiles—low anxiety and low avoidance, with or without ACEs—are associated with high PDC and may benefit from consolidating supportive dyadic practices and community resources.

#### 4.5 Cultural Context: Spanish Sample

The study was conducted with a Spanish sample, and expressions of grief, attachment patterns, and PDC may vary across cultures (Smid et al., 2018; Zhou et al., 2023). Spanish culture, shaped by Mediterranean and Catholic traditions, may emphasize family support and community mourning practices that could facilitate PDC or impose specific gender expectations on the expression of grief that

limit emotional openness. For example, German-speaking mourners in Switzerland tend to display more emotion than mourners in China, and cultural norms dictate whether emotions should be expressed more when alone or with close others (Zhou et al., 2023). Similarly, the distribution of attachment styles varies across cultures, with avoidant and dismissive styles more common in Japanese samples and anxious styles more prevalent in Italian and Spanish samples (Hoenicka et al., 2022). Therefore, the findings should be interpreted with caution, as the observed patterns may reflect the specific sociocultural context of the sample, potentially limiting generalizability to other cultural settings.

#### 4.6 Limitations

Despite its contributions, this study has several limitations. The sample (N = 162) consisted predominantly of highly educated Spanish women in stable relationships, with most losses occurring during the first trimester (75.48%), limiting generalizability to other populations. Selection bias is possible, as women inclined toward reflective or adaptive coping may have been overrepresented, potentially underestimating the prevalence of negative PDC and severe psychopathology. The small sample size reflects the difficulty of accessing this population, despite extensive recruitment through over 50 associations and professional social media accounts, and the sensitive nature of the topic may have further constrained participation and contributed to attrition.

Cultural specificity is particularly relevant, as grief expression, attachment patterns, and PDC vary across cultures; the Spanish context may have shaped the observed patterns. Replication in diverse cultural settings (e.g., non-Western, non-Catholic, or more individualistic contexts) is necessary to determine whether the centrality of attachment avoidance and the mediating role of attachment anxiety generalize beyond this population. Additionally, other relational domains affected by perinatal loss—such as family, social, or work environments—were not explored (Salgado et al., 2021; Fernández-Alcántara et al., 2012; Fernández-Sola et al., 2020; Mota et al., 2023), and variability in time since the loss may have influenced grief experiences (Tseng et al., 2017). PDC was assessed solely from women's perspectives, limiting the understanding of shared dyadic processes with their partners (Bodenmann et al., 2019).

Regarding measurement, guilt was assessed with a single-item measure due to the lack of validated instruments specific to perinatal loss. Although validated tools exist for trauma-related or general clinical guilt (e.g., *Trauma-Related Guilt Inventory* [TRGI; Kubany et al., 1996] and *State Shame and Guilt Scale* [SSGS; Marschall et al., 1994]), their content is not directly applicable to the perinatal context, highlighting a methodological limitation. The retrospective assessment of ACEs may introduce recall bias (Gomes et al., 2019); however, such measures are widely used and demonstrate acceptable reliability in research on

early adversity (Pinto et al., 2014). The ACEQ itself shows low internal consistency due to its cumulative, formative nature, reflecting heterogeneous and distinct childhood exposures. As a cumulative index, the total score represents overall risk rather than a single latent construct, making *Cronbach's alpha* an inappropriate reliability metric (Fitzgerald and Gallus, 2025; Lacey and Minnis, 2020; LaNoue and Hass, 2025).

All variables were assessed via self-report at a single time point, introducing potential common method bias, which may inflate correlations. Future research should consider procedural remedies (e.g., temporal separation of measurements, partner reports, counterbalancing item order) or statistical controls to mitigate this risk. The cross-sectional design further limits causal inference; reverse causality and unmeasured confounders cannot be ruled out. While fsQCA identifies configurational and asymmetric relationships, these patterns reflect complex associations rather than temporal causality. Longitudinal studies tracking attachment, mental health, and PDC before and after perinatal loss are needed to robustly test mediation pathways and identify risk and protective factors.

Despite these limitations, the study has several strengths. It is among the few to jointly examine ACEs, attachment styles, guilt, and MHP in PDC following perinatal loss in a Spanish sample. The life-cycle approach and mixed-method design—combining linear analyses, mediation models, and fsQCA—provide a nuanced understanding of mechanisms influencing PDC in perinatal grief. Moreover, the findings allow identification of distinct clinical profiles, informing targeted therapeutic interventions. This underscores the value of flexible, pluralistic frameworks in clinical practice, offering multiple pathways for support rather than a single standardized approach.

#### 4.7 Future Research

Future studies should aim to include larger and more diverse samples, taking into account different sociocultural contexts as well as gender and sex identities, to enhance the generalizability of findings. It would also be valuable to examine additional protective factors in perinatal grief, such as social support, relationship quality, and the presence of children (Bellhouse et al., 2019; Testoni et al., 2022). Longitudinal designs are recommended to investigate the evolution of coping strategies over time (Tseng et al., 2017). Finally, incorporating the perspectives of both partners and diverse family configurations is essential, as focusing on a single individual limits the understanding of relational dynamics and may constrain the development of interventions that are inclusive and sensitive to family diversity.

#### 4.8 Practical Implications

The findings of this study underscore the importance of preventive interventions that foster secure attachment across the life course. Psychoeducational programs aimed

at promoting emotional regulation, affective expression, and couple resilience may help mitigate the impact of ACEs and facilitate more adaptive coping in response to stressful events such as perinatal loss.

Assessment of attachment patterns can identify women at greater risk for impaired PDC and inform tailored intervention strategies that address relational barriers to mutual support. Women with high attachment avoidance may benefit from interventions that prioritize establishing emotional safety and respecting autonomy before introducing explicit PDC techniques. For women with high attachment anxiety, interventions may focus on emotion regulation, communication skills, and cognitive restructuring of abandonment-related beliefs. Managing relational hyperactivation in these women may enhance the effectiveness of PDC. In cases of high ACE exposure, trauma-informed approaches that combine attachment-focused and relational components may be particularly beneficial.

Couple-based interventions that emphasize emotional regulation, open communication, and mutual support are likely to be most effective. Evidence indicates that programs incorporating cognitive-oriented strategies, prioritizing face-to-face delivery when feasible, and adopting individualized formats that accommodate each couple's attachment patterns and relational needs tend to yield the best outcomes (Heazell et al., 2016; Li et al., 2024). Furthermore, the identification of distinct clinical profiles suggests that interventions should be flexible rather than uniform, tailored to the relational and emotional configurations of each couple. Early intervention and reinforcement of shared emotional skills may reduce psychological vulnerability, strengthen dyadic resources, and improve adaptation during moments of crisis. Overall, these findings highlight that there is no single path to coping; rather, multiple pathways can be supported through personalized, flexible interventions aligned with each couple's unique needs.

## 5. Conclusions

This study advances understanding of PDC following perinatal loss by highlighting the central role of adult attachment—particularly low avoidance—and demonstrating the value of integrative, multi-method approaches. By identifying both linear predictors and configurational pathways, the findings provide a nuanced framework for supporting women and couples navigating perinatal grief, informing tailored interventions that address relational and emotional vulnerabilities.

## Availability of Data and Materials

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

## Author Contributions

RSG, LLT and FGS conceived and designed the study. RSG and LLT recruited the participants and collected the data. LLT performed the statistical analyses. RSG and LLT interpreted the results. RSG drafted the first version of the manuscript. LLT and FGS reviewed the manuscript. LLT serve as a coordinator of the study. All authors critically revised the manuscript for important intellectual content. All authors read and approved the final version of the manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work in accordance with the ICMJE criteria.

## Ethics Approval and Consent to Participate

The study was conducted in accordance with the principles of the Declaration of Helsinki. The research protocol was reviewed and approved by the Ethics Committee of University of Valencia (2024-PSILOG-3468509). Written informed consent was obtained from all participants prior to their inclusion in the study.

## Acknowledgment

We extend our deepest gratitude to the women who generously participated in this study, sharing and revisiting a profoundly painful experience with the sole purpose of helping other women in similar circumstances, and doing so with complete selflessness. We are also sincerely grateful to Dr. Pau Cassidy for his invaluable guidance, which has helped us make our research more sensitive and humane—also offered entirely altruistically. Finally, we would like to thank Ana Pereira-González, graduate in psychology, for her assistance with the dissemination of the survey and for her support during the early stages of the project.

## Funding

This research received no external funding.

## Conflicts of Interest

The authors declare no conflicts of interest. Laura Lacomba-Trejo and Francisco González-Sala are serving as one of the Guest editors of this journal. We declare that Laura Lacomba-Trejo and Francisco González-Sala had no involvement in the peer review of this article and have no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to Chung-Ying Lin and Jose Pedro Espada.

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