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A systematic review of the parenting experiences and outcomes of offspring of  
mothers with BPD: Potential mechanisms and clinical implications

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### Abstract

There is growing interest in whether parenting strategies of mothers with borderline personality disorder (BPD) and offspring outcomes differ from those without BPD. We searched PsychINFO, PubMed, EMBASE, Web of Science, Scopus and ASSIA databases for studies examining parenting in mothers with BPD and/or offspring outcomes. PRISMA reporting guidelines were followed. Of 10067 abstracts screened, 101 full-text articles were retrieved and 33 met pre-determined criteria for qualitative synthesis. Overall, studies suggest that mothers with BPD are more likely to engage in maladaptive interactions with their offspring, characterised by insensitive, overprotective, hostile parenting than those without BPD. Adverse offspring outcomes include BPD symptoms, internalising (including depression), externalising problems, insecure attachment patterns, and emotional dysregulation. Findings suggest that vulnerability from mother to offspring may be partly transmitted via maladaptive parenting and maternal emotional dysfunction. Conclusions were limited by study heterogeneity in methodology and construct definitions, and a paucity of clinical comparison. Prospective studies of mothers with BPD and their offspring from pregnancy onwards may further elucidate mechanisms of transmission and identify resilience factors across development. Parenting behaviour awareness, improving attachment behaviours and emotional regulation strategies may be important intervention targets.

A systematic review of the parenting experiences and outcomes of offspring of mothers with BPD: Potential mechanisms and clinical implications

Borderline Personality Disorder (BPD) is a complex mental condition characterised by extreme emotional, behavioural, and interpersonal dysregulation (American Psychiatric Association, 2013). Consequently, it is associated with a range of long-term negative sequelae, including relationship dysfunction (Daley, Burge, & Hammen, 2000), unemployment (Skodol et al., 2002), co-morbid psychopathology (Grant et al., 2008; Zanarini et al., 1998), self-harm and suicide (Black, Blum, Pfohl, & Hale, 2004), high levels of treatment utilisation (Bender et al., 2001) and imprisonment (Black et al., 2007).

BPD affects approximately 1-6% of the general population (Grant et al., 2008; Swartz, Blazer, George, & Winfield, 1990; Trull, Jahng, Tomko, Wood, & Sher, 2010) and is more commonly diagnosed in women (Skodol & Bender, 2003; Trull et al., 2010). Considering the pervasive functional impairments associated with BPD, parenting may be particularly challenging for mothers with the disorder. Individuals with BPD are likely to be separated, divorced or to have never married (Skodol et al., 2002) and those in relationships are at greater risk of experiencing partner conflict and abuse (Chen et al., 2004). As such, mothers with BPD may have limited levels of emotional, social, and financial support potentially exacerbating parenting difficulties.

A small number of narrative reviews of mothers with BPD have examined aspects of parenting and impacts on offspring (Macfie, 2009; Stepp, Whalen, Pilkonis, Hipwell, & Levine, 2012; Wendland et al., 2014). Stepp et al. (2012) hypothesised that certain parenting strategies exhibited by mothers with BPD (i.e., hostile control and passive aloofness) might be involved in the transmission of psychopathology from mother to child. At the time, however, there were limited studies pertaining to

parenting and child outcomes, and only one study (Abela, Skitch, Auerbach, & Adams, 2005) explicitly tested potential mechanisms via which maternal BPD may increase risk of negative child outcomes.

The identification of parenting strategies (and potential associated adverse outcomes for offspring) of mothers with BPD could inform tailored interventions for both mother and child (Stepp et al., 2012). Additionally, an understanding of the mechanisms (beyond predisposition, Crowell, Beauchaine, & Linehan, 2009; Distel et al., 2008; Gratz et al., 2015; Torgersen et al., 2000) underpinning links between maternal BPD and offspring outcome could inform theory regarding aetiological trajectories to BPD and other disorders from infancy onwards.

The aim of the current review was to systematically search and narratively synthesise all research examining parenting behaviours of mothers with BPD/BPD symptoms, mother-offspring interactions and offspring outcomes, comparing findings to those without BPD. Specifically, we addressed the following four questions:

- 1) What are the characteristic parenting behaviours of mothers with BPD?
- 2) How do mothers with BPD and their offspring interact?
- 3) What are the psychopathological and psychosocial outcomes for offspring of mothers with BPD?
- 4) What are the mechanisms (parenting or mother/offspring characteristics) underpinning associations between maternal BPD and offspring outcomes?

## **Methods**

We used the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) (Moher, Liberati, Tetzlaff, & Altman, 2009) guidelines. A scoping search was conducted to confirm that there were no extant systematic reviews addressing our research aims.

## Data Sources

We searched titles and abstracts in PsychINFO, PubMed, EMBASE, Web of science, Scopus and ASSIA to identify articles examining samples of mothers with BPD, and/or children of mothers with BPD, published between 1980 and 6<sup>th</sup> July 2015. We selected 1980 as the earliest date for inclusion to parallel with when BPD was first delineated as a mental disorder in the DSM III. To enhance search sensitivity manual searches were conducted in the *Journal of Personality Disorders* and *Personality Disorders, Theory, Research and Treatment* from January 2010 to July 2015 and the reference lists of retrieved articles and review papers were inspected to identify additional potentially relevant articles.

## Search Terms

We used the following grouped terms: (borderline\* OR “emotionally unstable personality” OR BPD) AND (mother\* OR parent\* OR maternal\*) AND (child\* OR infant\* OR infancy OR offspring OR bab\* OR adolescen\* OR famil\* OR boy\* OR girl\* OR teenager\* OR youth\* OR young\* OR toddler\* OR daughter\* OR son\*).

## Eligibility Criteria

The review included retrospective, cross-sectional, and prospective studies meeting the following inclusion criteria:

- 1) The study included mothers with BPD or BPD symptoms (clinical or community samples) and/or offspring (of any age) of mothers with BPD (assessed via a standardised measure)
- 2) The study reported on maternal parenting, and/or offspring outcomes using a range of assessment methods (i.e., experimental, observational, interview, self-report questionnaires, and other-report questionnaires)

3) Samples in studies reporting on associations with parenting characteristics or child outcomes consisted mainly of mothers (i.e., at least 70% of the parenting sample).

Studies were excluded if they:

- 1) Were reviews, expert opinion commentaries, or individual case studies
- 2) Considered associations with maternal personality disorders generally rather than BPD specifically
- 3) Were not written in English language or were unpublished
- 4) Reported on extreme outcomes resulting in external intervention (i.e. abuse, filicide, etc.).

### **Screening Procedure**

J.E. and C.W. independently screened all titles and abstracts from the initial search to identify articles for full-text retrieval. If a title appeared relevant but no abstract was available, the full article was retrieved. All full-text articles were independently screened by J.E. and C.W. for final inclusion in the review.

### **Data Extraction and Quality Assessment**

Data were extracted using a previously designed data extraction form, which included first author, date and country of study, sample characteristics, BPD assessment tool, study design, methodology and main study aims. The quality of each study was assessed using the Newcastle-Ottawa Scale (Wells et al., 2000). This assessment tool comprises a star rating across various quality domains, can be used for case-control and cohort studies, and has been adapted for use with cross-sectional studies (Herzog et al., 2013). The quality domains of group selection, comparability and exposure were assessed for case control studies (maximum 9 stars awarded). For cohort studies, selection, comparability of cohorts and outcome quality were assessed

(maximum 9 stars). For cross-sectional studies, sample selection, comparability, and outcome were assessed (maximum 10 stars).

### **Data Synthesis**

All studies were qualitatively synthesised. Quantitative synthesis was not feasible due to the heterogeneity across studies in design, measures and outcomes. To address the aims of our review, a narrative overview of the main findings is presented in four major sections: 1) Parenting behaviours (e.g., sensitivity, hostility, overprotection) and maternal perceptions (e.g., maternal rating of parenting efficacy, perceptions of their offspring); 2) Mother-offspring relationship dynamics (e.g., interactions, communications, relationship perceptions); 3) Child outcomes (psychopathological and psychosocial); and 4) Mechanisms underpinning associations between maternal BPD and child outcomes. Whilst some outcomes naturally fall into more than one category (particularly regarding maternal parenting behaviours and interactions), to avoid repetition those have been included in one section only.

## **Results**

### **Included Articles**

We retrieved 10067 records: 10046 from the database search and 21 from hand searching. From abstract screening, 101 articles were identified for full-text retrieval. There was an excellent level of agreement between researchers (Cohen's Kappa,  $\kappa = 0.87$ ;  $p < .001$ ). A total of 33 studies were included in the review. Inter-rater agreement was high ( $\kappa = 0.88$ ,  $p < .001$ ). Any disagreements were discussed and resolved between J.E. and C.W. The main reasons for exclusion included only offspring BPD (not maternal BPD) assessed, studies referred to any relative with BPD and not the mother specifically, maternal personality disorders (not BPD specifically) was assessed, there was no valid measure of BPD (see Figure 1).

## **Study Characteristics and Quality Assessment**

We identified 22 case-control, 7 cross-sectional and 4 cohort studies (see Table 1). Two of the cohort studies were drawn from the same Greifswald Family Study sample (Barnow et al., 2013; Reinelt et al., 2014). Studies of offspring outcomes included a range of age groups: 13 reported infant outcomes, 11 reported child outcomes, 13 reported adolescent outcomes and 4 reported adult outcomes. Some studies utilised samples encompassing both childhood and adolescence (e.g., Abela et al., 2005; Feldman et al., 1995) or adolescence and adulthood (e.g., Cheng, Huang, Liu, & Liu, 2011; Reinelt et al., 2014). Twenty studies reported on parenting characteristics (i.e., behaviours, perceptions and mother-offspring relationship dynamics) of mothers with BPD. The quality assessment indicated low risk of bias in sample selection, low risk of comparability bias, and low-moderate risk of exposure/outcome bias (see Supplementary Table 1).

### **1) Parenting Behaviours and Perceptions**

Studies assessed several maternal parenting behaviours (i.e., sensitivity and intrusiveness, overprotection, emotional warmth, hostility, rejection) and perceptions (i.e., emotion recognition, parenting stress/distress, parenting efficacy, and representations of child). There were wide variations in the definitions and operationalization of parenting constructs across studies (see Table 2 for details).

#### **Parenting behaviours.**

***Sensitivity/intrusiveness.*** Seven studies assessed aspects of maternal sensitivity/intrusiveness. Three studies reported that mothers with BPD (or BPD symptoms) displayed (or reported) significantly lower “sensitivity/non-intrusive sensitivity” with their infants than healthy control mothers (HCs) (Crandell, Hobson, & Patrick, 2003; Howard, Beckwith, Espinosa, & Tyler, 1995; Newman, Stevenson,



Bergman, & Boyce, 2007) and one study reported significantly higher “intrusive insensitivity” in mothers with BPD (Hobson, Patrick, Crandell, Garcia-Perez, & Lee, 2005). Controlling for anxiety and depression, Kiel, Gratz, Moore, Latzman, and Tull (2011) found that mothers with clinically relevant levels of BPD symptoms were significantly more “insensitive” with their infants when infant distress persisted for longer durations, (a pattern not observed in HCs). Hobson et al. (2009) reported that mothers with BPD displayed more “intrusiveness/negativity” with their infants than healthy and depressed controls, but these differences did not quite reach significance. The only adolescent offspring community-based study did not find a significant correlation between offspring-reported maternal “intrusiveness” and BPD symptoms (Zalewski et al., 2014).

***Overprotection.*** Four studies converge in indicating that mothers with BPD are more overprotective (or overinvolved) with their offspring both in infancy (Elliot et al., 2014) and adolescence (Barnow, Spitzer, Grabe, Kessler, & Freyberger, 2006; Reinelt et al., 2014; Zalewski et al., 2014). Elliot et al. (2014) found that mothers with BPD scored significantly higher on self-reported overprotection than HCs. Barnow et al. (2006) found that adolescents of mothers with BPD perceived them as significantly more overprotective than did adolescents of mothers with depressive disorder, cluster C personality disorder or no disorder. Similarly, Reinelt et al. (2014) found that adolescent-reported overprotection was significantly correlated with mother’s BPD symptoms. Finally, Zalewski et al. (2014) found that maternal BPD was significantly correlated with offspring-reported maternal “control through guilt” (after controlling for depression and alcohol use) and negatively correlated with “acceptance of individuation.”

***Maternal warmth.*** Four studies assessed maternal warmth yielding varying results across age groups. When mothers were observed interacting with their preschool children who had behavioural problems, a significant negative correlation between BPD symptoms and warmth (i.e., enthusiastic, encouraging, cheerful, appropriately responding to needs) was observed (Harvey, Stoessel, & Herbert, 2011). This pattern of low warmth was also reported for mothers with anxiety, depression, substance abuse and clusters A and C personality disorders (PDs). In contrast, adolescents did not perceive their mothers with BPD as less “emotionally warm” (e.g., whether parents hugged them or whether they felt their parents wanted to be together with them) than did adolescents of control mothers with depression, cluster C PDs, or no disorder (Barnow et al., 2006). Similarly, in two community samples, adolescent-perceived maternal “warmth” (no specific description reported) was not significantly correlated with maternal BPD symptoms either in unadjusted associations (Reinelt et al., 2014) or following control for demographic variables (Herr, Hammen, & Brennan, 2008).

***Hostility/negativity/harsh punishment.*** Six studies largely converge in suggesting that mothers with BPD may be more hostile or negative than control mothers. Elliot et al. (2014) found that mothers with BPD did not show a significant group difference from HCs regarding hostility towards their infants; however, BPD symptom severity was significantly correlated with raised levels of maternal hostile/reactive behaviours. Newman et al. (2007) found that mothers with BPD scored significantly higher on the “hostility” subscale of a general psychopathology measure than HCs; however while they were more likely to display “slight” or “covert” hostility towards their infant, these differences did not reach significance. Harvey et al. (2011) reported a significant correlation between maternal BPD and

displays of “negative affect” (i.e., irritability, annoyance, frustration, anger) with preschool offspring. The same pattern was observed in mothers with anxiety, depression, substance abuse and cluster A PD. In two studies with adolescent offspring, maternal BPD was significantly associated with offspring-perceived (Herr et al., 2008) and researcher-observed (Frankel-Waldheter, Macfie, Strimpfel, & Watkins, 2015) “maternal hostility,” and this association remained following control for maternal depression (Herr et al., 2008). Similarly, in a high-risk community cohort study of adolescent girls, offspring-perceived “harsh punishment” was significantly associated with maternal BPD following control for depression and alcohol use (Zalewski et al., 2014).

***Rejection.*** Two studies assessed maternal rejection. Barnow et al. (2006) found that mothers with BPD did not significantly differ in adolescent offspring-perceived “rejection” from mothers with depression, cluster C PD, or no diagnosis. Conversely, Reinelt et al. (2014) reported a significant correlation between maternal BPD symptoms and adolescent-perceived maternal rejection.

#### **Parental perceptions.**

***Emotion recognition.*** Two studies assessed emotion recognition. Elliot et al. (2014) found that mothers with BPD were significantly poorer than HCs at “infant emotion recognition.” In particular, neutral infant expressions were more often perceived as sad (Elliot et al., 2014). Another study looked at discrepancies between mother-reported and observed infant expressions (Whalen, Kiel, Tull, Latzman, & Gratz, 2015). Findings showed that as maternal BPD symptom severity increased, there was greater convergence between mother-reported and observed infant anger. This relationship increased in strength as observed infant anger increased. As healthy mothers typically under report infant negative affect, the authors suggest mothers with

BPD may have heightened sensitivity to infant anger. This pattern of convergence between mother-reported and infant observed was also seen for infant fear expression but only with behavioural symptoms of BPD (e.g., fear of abandonment, impulsivity) not BPD pathology in general.

***Mother's perceived parental efficacy and stress.*** In two infant studies, mothers with BPD reported significantly higher parenting stress and distress (Elliot et al., 2014; Newman et al., 2007) and significantly lower parenting satisfaction (Newman et al., 2007) and parental efficacy (Elliot et al., 2014; Newman et al., 2007) than HCs. Increased distress was significantly correlated with increased parental dissatisfaction and efficacy, less sensitive parenting (Newman et al., 2007), and mother's emotional dysregulation (Elliot et al., 2014).

***Perceptions of pregnancy.*** One study explored mothers' perinatal experiences (Blankley, Galbally, Snellen, Power, & Lewis, 2015). Of the mothers with BPD, 31% reported pregnancy as traumatic, 12% anticipated the delivery as traumatic and 31% made requests for an early delivery due to distress associated with the pregnancy. Additionally, 38% were reported as having low levels of antenatal care, by not following care recommendations or having erratic antenatal attendance (<70% attendance). No control group was used with these measures making it difficult to draw statistical conclusions.

***Maternal representations and perceptions of offspring.*** Four studies assessing maternal perceptions of their offspring (in fairly divergent ways - see Table 2) yielded inconsistent findings. Elliot et al. (2014) reported that mothers with BPD rated their infants significantly higher on a 'difficult child' measure in comparison to HCs. In contrast, Newman et al. (2007) found no significant difference between mothers with BPD and HCs on their rating of their infant as 'difficult.' Crittenden and Newman

(2010) reported that mothers with BPD had “balanced” representations of their perceptions, feelings, motives and interpretation of their relationship with their 3-36 month-old infants and did not significantly differ from control mothers. Schacht, Hammond, Marks, Wood, and Conroy (2013) found that mothers with BPD were significantly less likely than HCs to use mind-related descriptors (e.g., interests, imagination) of their children, and suggested that this might indicate a reduced capacity for mentalisation in mothers with BPD.

## **2) Mother-Offspring Relationship Dynamics**

This section includes studies, which assessed mother-infant interactions; mother-infant communication; infant engagement; mother-offspring/family relationships; and dynamics such as cohesion, role-reversal and relationship expectations (see Table 3).

***Mother-offspring interactions.*** Eight studies converge in indicating maladaptive interactions between mothers with BPD and their offspring. Three infant studies reported that mothers with BPD had significantly less “satisfying/engaged,” or more “difficult” or “dysfunctional” mother-child interactions according to observation (Crandell et al., 2003; Newman et al., 2007) and maternal self-report (Elliot et al., 2014) in comparison to HCs. White, Flanagan, Martin, and Silvermann (2011) found that mothers with BPD (without co-morbid major depressive disorder, MDD) demonstrated significantly less imitation, and mothers with BPD (and BPD/MDD) engaged in significantly less smiling, touching, and playing with their infants than mothers with MDD and HCs. Hobson et al. (2009) observed that mothers with BPD displayed significantly greater “frightened/disoriented” (i.e. fearful, hesitant) interaction with their infants than mothers with depression or HCs. They also displayed more “withdrawal” (e.g., interacting silently) with their infants than

depressed and HC mothers, though these differences did not quite reach significance. Wilson and Durbin (2012) found a significant negative correlation between maternal borderline symptoms and mother's response to their child's "bids for attention" (the same was seen for mothers with paranoid, antisocial or histrionic PD but not for the other PDs). In comparison to children of HCs, children of mothers with BPD had significantly lower (i.e., more negative) mother-child relationship expectations (Macfie & Swan, 2009). In the one study of mother-adolescent interactions, mothers with BPD were found to be lacking in "validation," "engagement," and "agreement" regarding their offspring's opinions; were significantly more likely than HCs to over-personalise in disagreements; and significantly more likely to pressure their child to agree without a rational explanation (Frankel-Waldheter et al., 2015).

***Role-reversal.*** Three studies assessed mother-child role-reversal with mixed results. Macfie, Swan, Fitzpatrick, Watkins, and Rivas (2014) found that maternal preoccupied/unresolved attachment pattern (70% of mothers had BPD) was significantly correlated with children's narratives of role-reversal. Similarly, controlling for maternal depression, Macfie and Swan (2009) found that the stories of children of mothers with BPD were significantly more likely to describe mother-child role reversal than children of HCs. Hobson et al. (2009), however, found no significant difference between observations of "role/boundary confusion" with dyads of mothers with BPD, depression or HCs.

***Mother-infant communication.*** Three studies considering communication patterns between mothers with BPD and their infant offspring yielded mixed results (Delavenne, Gratier, Devouche, & Apter, 2008; Hobson et al., 2009; White et al., 2011). White et al. (2011) reported that mothers with BPD did not significantly differ from mothers with depression or HCs in "vocalisations" (i.e. percentage of time spent

vocalising) when interacting with their infants. Delavenne et al. (2008) found no significant difference in overall frequency of vocalisations, but mothers with BPD engaged in significantly fewer phrases and longer end-of-phrase pauses in interactions with their infants in comparison to HCs. Hobson et al. (2009) found that mothers with BPD displayed significantly greater “disruptive affective communication” (i.e., conflicting emotional cues, unresponsive to infant emotion) in interactions with their infants in comparison to depressed and HCs.

***Infant/child behaviour.*** Five studies considering infant/child engagement or interaction, whilst not fully converging, on the whole suggest less engaged infant behaviour. Two studies found that infants of mothers with BPD were significantly “less involved” (Newman et al., 2007), “less available for positive engagement” (Hobson et al., 2005) and “less responsive to their mother’s attempts to engage with them” (Hobson et al., 2005) than infants of HC mothers. In contrast, two studies reported that infants/children of mothers with BPD (or BPD symptoms) were no different in their response to their mother’s bids for attention compared to mothers with other PDs (Wilson & Durbin, 2012), or their availability for positive engagement both during and after a still-face paradigm task compared with HCs (Crandell et al., 2003).

Infants of mothers with BPD appear to demonstrate significantly less eye contact than infants of HC mothers, especially during stressful situations (i.e., still-face paradigm) (Crandell et al., 2003; Hobson et al., 2005). White et al. (2011) only reported greater gaze aversion in infants of mothers with BPD co-morbid with MDD compared with HCs (White et al., 2011). Significantly fewer instances of smiling (White et al., 2011), lowered mood state (Hobson et al., 2005) and lowering of affect

(Crandell et al., 2003) have also been observed in infants of mothers with BPD in comparison to HCs.

***Family relationships.*** Two studies show some evidence that interpersonal dynamics are affected in the families of mothers with BPD. (Feldman et al., 1995) found that mothers with BPD reported significantly lower family “cohesion” and “organisation” than mothers with other personality disorders. Both adolescent-reported “family stress” and mother-reported “chronic relationship stress” were significantly correlated with maternal BPD symptoms in a community sample, even after controlling for maternal depression (Herr et al., 2008).

### **3) Offspring Outcomes**

Studies assessed a range of psychopathological (i.e., BPD and BPD symptoms, depression, internalising and externalising problems) and psychosocial (i.e., self-esteem/self-criticism, interpersonal difficulties) outcomes of offspring of mothers with BPD (see Table 4).

#### **Psychopathology outcomes.**

***Borderline personality disorder.*** Five studies all indicated a significant association between maternal BPD and offspring BPD symptoms (Barnow et al., 2013; Cheng et al., 2011; Conway, Hammen, & Brennan, 2015; Stepp, Olino, Klein, Seeley, & Lewinsohn, 2013) and disorder (Weiss et al., 1996). Weiss et al. (1996) reported that children of mothers with BPD were significantly more likely to have a diagnosis of BPD than children of mothers with other personality disorders. In a community-based study, Barnow et al. (2013) found that maternal BPD symptoms (and sub-threshold BPD symptoms) significantly predicted offspring BPD symptoms five years later (at age 20). In a high-risk community cohort spanning 4 time-points (14, 18, 24 & 30 years of age), Stepp et al. (2013) found that maternal history of BPD



predicted offspring BPD symptoms at age 30, following control for offspring gender, early offspring psychopathology, parental education and other parental psychopathology. However, this association no longer reached significance ( $p=.069$ ) following additional control for offspring MDD at Time 3 and Time 4. Also in a high-risk community sample, Conway et al. (2015) found that maternal BPD was significantly associated with offspring BPD symptoms at age 20 but did not influence offspring symptoms over and above other risk factors (e.g., maternal externalising, offspring internalising). Finally, in a large study of high school students, Cheng et al. (2011) found that maternal BPD traits significantly correlated with adolescent offspring BPD traits, following control for family income, parental relationship and parental rearing behaviour.

***BPD symptoms and related features.*** A number of studies assessed associations between maternal BPD and offspring individual BPD symptoms or related features (e.g., insecure attachment).

*BPD symptoms/features: Emotionally dysregulated temperament and emotion dysregulation.* Four studies suggest that maternal BPD is significantly associated with offspring emotional dysregulation across age groups operationalized in various ways (see Table 4). “Low soothability” in infancy (White et al., 2011); “boundary confusion between self/fantasy or reality/fantasy” (Macfie & Swan, 2009) and “self-regulation” (Macfie et al., 2014) in childhood; and “low self-control” and “negative affectivity” in adolescence (Zalewski et al., 2014) were all significantly associated with maternal BPD. Gratz et al. (2014) did not find a main effect of maternal BPD on infant emotion dysregulation (but see later section on mechanisms of transmission).

*BPD symptoms/features: Unstable self-image/identity.* Two studies examined aspects of offspring’s self-identity. Macfie and Swan (2009) reported that children of

mothers with BPD had significantly poorer self-representations (incongruent and shameful) than children of HCs. In a study examining gender identity disorder (GID), Marantz and Coates (1991) found that mothers of boys with GID were significantly more likely to have a diagnosis of BPD than mothers of boys without GID.

*BPD symptoms/features: Suicide ideation.* Children of mothers with BPD reported significantly more suicide ideation/plans and death wishes, and more suicide attempts (though this difference was non-significant) than children of HCs (Barnow et al., 2006).

*BPD symptoms/features: Insecure attachment.* Four studies indicated that maternal BPD (or BPD/MDD) is associated with offspring insecure attachment in infancy (compared to HCs) (Gratz et al., 2014; Hobson et al., 2005), childhood/adolescence (Abela et al., 2005) and adolescence (Herr et al., 2008). In particular, children's insecure attachment patterns were categorised as disorganised (Hobson et al., 2005), and fearful, after controlling for maternal lifetime depression symptoms (Herr et al., 2008).

***Depression.*** Three studies converge in indicating that children and adolescents of mothers with BPD are at greater risk of developing depression (Abela et al., 2005; Barnow et al., 2006; Herr et al., 2008). The extent to which this association is independent of maternal depression however remains unclear. Abela et al. (2005) found significantly increased offspring depression in offspring of mothers with BPD/MDD compared to offspring of mothers with MDD alone. Barnow et al. (2006) reported offspring of mothers with BPD were more likely to have depressive symptoms than offspring of mothers with depression (although this did not reach significance,  $p < .10$ ). Herr et al. (2008) found youth depression was significantly associated with maternal BPD but not after adjustment for maternal depression.

***Internalising/emotional problems.*** Studies pertaining to offspring internalising/emotional problems suggest an association with maternal BPD (in clinical populations). Barnow et al. (2006) reported significantly increased “emotional problems” in adolescents of mothers with BPD compared to adolescents of mothers with depression or no psychopathology. Jellinek, Bishop, Murphy, Biederman, and Rosenbaum (1991) found that significantly more parents (78% mothers) with BPD had children with high total paediatric symptom checklist scores (representing combined internalising/ externalising problems: attention, emotion, behaviour and somatic difficulties) than parents with other axis II disorders or HCs. In contrast, in a sample of children with internalising or externalising disorders, Bertino, Connell, and Lewis (2012) found no significant association between parental (80% mothers) borderline traits and child’s “internalising” problems.

***Externalising/behavioural problems.*** Four studies indicated that offspring of mothers with BPD are at an increased risk of behavioural problems or externalising symptoms (Barnow et al., 2006; Bertino et al., 2012; Jellinek et al., 1991 see above; Weiss et al., 1996). Barnow et al. (2006) reported significantly more attention, delinquency, and aggression problems in adolescents of mothers with BPD in comparison to adolescents of HCs. Bertino et al. (2012) found a significant correlation between maternal borderline personality symptoms and both child and adolescent externalising symptoms. In comparison to children of mothers with other PDs, Weiss et al. (1996) reported significantly more cases of attention deficit hyperactivity disorder and disruptive behaviour disorder in children of mothers with BPD.

***General psychopathology.*** Barnow et al. (2013) reported that maternal BPD symptoms (and depression), assessed when their children offspring were aged 15

years old, significantly predicted offspring general psychopathology (assessed using the Symptom Checklist-Revised- SCL-90-R) 5 years later. Barnow et al. (2006) reported that adolescents of mothers with BPD demonstrate higher levels of physical symptoms compared to children of healthy mothers or mothers with depression.

**Psychosocial outcomes.**

***Self-esteem/self-criticism.*** Abela et al. (2005) found that maternal BPD/MDD was significantly associated with offspring self-criticism, but not offspring self-esteem in children and adolescents of mothers with BPD. Conversely, Barnow et al. (2006) found significantly lower levels of self-esteem in adolescents of mothers with BPD compared to children of mothers with depression, Cluster C PDs and no disorder.

***Interpersonal difficulties.*** Three studies indicate that offspring of mothers with BPD have difficulties with mental state understanding and social interactions. Schacht et al. (2013) found that maternal BPD was significantly associated with pre-school children's poorer emotional labelling and poorer understanding of causes of emotion, following adjustment for maternal depression, compared to children of HCs. Barnow et al. (2006) reported that scores on the social problem scale were significantly elevated in adolescents of mothers with BPD diagnosis in comparison to adolescents of mothers with depressive disorder, cluster C PDs, or no disorder. Herr et al. (2008) found that maternal BPD remained significantly associated with adolescent offspring's poor self-perception of the ability to make "close friendships" and be "social accepted," even after controlling for maternal depression.

***Temperament.*** One study reported that adolescents of mothers with BPD had significantly higher "harm avoidance" (i.e., fearful, excessive worrying) scores in comparison to children of mothers with depression or HCs (Barnow et al., 2006).

***Stability.*** Children and adolescents of mothers with BPD experienced significantly greater instability, such as frequent changes in school and household composition, than children of mothers with other PDs (Feldman et al., 1995). They were also significantly more likely to witness maternal or paternal suicide attempts and be exposed to parental alcohol/drug abuse (Feldman et al., 1995).

***General impairment.*** Two studies assessed general impairment: one with newborns (Blankley et al., 2015) the other with children/adolescents (Weiss et al., 1996). Blankley et al. (2015) found that newborn infants of mothers with BPD were significantly more likely to have been born preterm (<37 weeks), have required resuscitation at birth, or required referral to special care nursing facilities than control mothers without BPD. They were also significantly more likely to have APGAR scores of less than 7 (an assessment of appearance, pulse, grimace, activity and respiration levels of newborn infants) than infants of control mothers. Weiss et al. (1996) found that children/adolescents of mothers with BPD had significantly higher general impairment in areas of home, school and social life in comparison to children of mothers with non-borderline personality disorder.

#### **4) Potential Mechanisms Underpinning Transmission of Vulnerability from Mother to Offspring**

Six studies have utilised mediation (and/or moderation) analyses to statistically test potential mechanisms contributing to associations between maternal BPD (or core features of maternal BPD) and negative offspring outcomes.

##### ***Maladaptive parenting as a potential mediator or link in a causal chain.***

Two studies (Macfie et al., 2014; Reinelt et al., 2014) considered maladaptive parenting as a potential mediator of transmission of vulnerability from mother to child. Using a prospective community-based family cohort, Reinelt et al. (2014)

found that maladaptive mother-child interactions (represented by a latent variable comprising perceived overprotective and rejecting parenting style and high mother-child discrepancies regarding child's internalising problems) mediated the longitudinal transmission of BPD symptoms from mother to adolescent. Maladaptive mother-child interactions also mediated the relationship between maternal BPD and individual symptoms of impulsiveness, difficulties identifying and describing feelings, and self-esteem.

In a cross-sectional study of young children, Macfie et al. (2014) examined the relationship between mothers' Adult Attachment Interview (AAI) representations (George, Kaplan, & Main, 1984) (70% of the study mothers had BPD), mother's observed parenting, and offspring narratives regarding fear of abandonment. Mother's parenting (i.e., a composite of sensitivity, autonomy support and hostility) significantly mediated the relationship between maternal preoccupied/unresolved attachment and offspring fear of abandonment (i.e., the association between mothers preoccupied unresolved attachment and offspring's fear of abandonment was partly explained by lower levels of parental sensitivity and autonomy support and higher levels of parental hostility).

Examining parenting as an exogenous (rather than mediating) risk factor in a causal chain, Frankel-Waldheter et al. (2015) investigated whether mother's lack of promotion and inhibition of autonomy (i.e., independence) and relatedness (i.e., close relationships) was associated with adolescent outcomes via maternal borderline pathology. Maternal borderline pathology mediated the relationship between lack of promotion of autonomy and relatedness (and inhibition of autonomy and relatedness) and adolescent affective instability and self-harm. Additionally maternal borderline pathology mediated the relationship between maternal inhibition of (and lack of

promotion of) autonomy and relatedness, and adolescent internalising (e.g., anxious depression, withdrawn depression) and externalising symptoms (e.g., aggression). The authors concluded that a lack of maternal promotion of offspring independence and close relationships might underlie maternal borderline features and their effect on offspring outcome. It should be noted, however, that this study was cross-sectional, and whilst difficulties with autonomy and relatedness may contribute towards the development of BPD, it is perhaps more plausible to hypothesise that parenting behaviours mediate the association between maternal BPD and offspring outcome.

***Maternal emotional dysfunction as a mediator.*** In a cross-sectional study, Gratz et al. (2014) reported a significant indirect association between high maternal BPD pathology and infant emotional regulation (ER) difficulties (i.e., mothers with BPD were more likely to experience emotional dysfunction, which in turn increased risk of infant emotional dysregulation). More specifically, maternal emotion regulation difficulties mediated the association between maternal BPD and expressivity-related indicators of infant ER difficulties (e.g., intense emotional expressions). Further, maternal emotional intensity/reactivity facilitated an indirect effect of maternal BPD on lower infant self-focused emotional regulation (e.g., self-stimulation) only in infants with an insecure-resistant attachment relationship (Gratz et al., 2014)

***Offspring characteristics as mediators or moderators of parenting and offspring outcomes.*** In a cross-sectional study of 6-14 year-old offspring, Abela et al. (2005) demonstrated that offspring cognitive and interpersonal vulnerabilities (i.e. ruminative response style, negative attribution style, dysfunctional attitudes, self-criticism, excessive reassurance seeking and insecure attachment style) partially mediated the relationship between parental BPD (84% mothers) and offspring current

depressive symptoms. As highlighted by the authors, cognitive vulnerabilities only partly mediated the association, indicating that other factors not assessed in the study (e.g., emotional dysregulation, Gratz et al., 2014) may play a role in the association between parental BPD and offspring depression.

Within a community sample of adolescent girls, Zalewski et al. (2014) explored whether adolescent temperament (i.e., negative emotionality and low self-control) moderated the association between maternal BPD symptoms and parenting behaviours (i.e., control through guilt, lack of acceptance of individuation, harsh punishment). No significant moderating effect was found (i.e., the parenting patterns of mothers with BPD did not vary according to the temperament of their adolescent offspring).

## **Discussion**

To our knowledge this is the first systematic review examining the parenting behaviours, offspring outcomes, and some of the mechanisms that may underpin the transmission of adverse offspring outcomes from mothers with BPD (or BPD symptoms). Before we summarise the main findings and contextualise within the extant literature, we consider the methodological limitations of the included studies and hence the limitations of the current review.

First, there was a degree of heterogeneity across studies in the operationalization of parenting constructs and offspring outcomes. For example, insensitive parenting was referred to variously as: “maternal sensitivity” (Crandell et al., 2003); “insensitivity” (Kiel et al., 2011), “intrusive sensitivity” (Hobson et al., 2005) and “intrusiveness/negativity” (Hobson et al., 2009). Some studies combined measures into inclusive constructs (e.g., Crandell et al., 2003 amalgamated insensitivity, warmth/hostility and rejection/responsiveness into one construct), while



other studies reported associations with the individual measures. As such, any observed variance in results across studies may be somewhat attributable to study methodology. There was also heterogeneity in the study method design (i.e. different observational studies, mother-reports, adolescent-report, experimental designs etc.). Whilst this may account for some variance there were several instances of robust findings across study types (e.g., studies converge with their finding of “difficult mother-child interactions” when measured via the still-face paradigm, Crandell et al., 2003; mother-report, Elliot et al., 2014; and mother-child play, Newman et al., 2007).

Second, participant selection criteria differed across studies. Mothers with BPD were not always the index sample (e.g., Bertino et al., 2012; Marantz & Coates, 1991), making comparisons across some studies difficult. Bertino et al. (2012), for example, selected their sample on the basis of offspring emotional and behavioural difficulties, likely confounding the observed associations with maternal parenting behaviours. In addition, a number of studies used healthy control groups only as comparators. Consequentially, we could not always ascertain whether certain parenting characteristics (and offspring outcomes) were only specific to mothers with BPD or reflective of maternal psychopathology in general; although where clinical comparisons were made, BPD specificity was often indicated. It may be that having maternal BPD and (for example) maternal depression may pose separate risk factors for their offspring (Herr et al., 2008). Furthermore, the method of assessment of mother’s BPD diagnosis differed across studies and while only studies with standardised BPD assessment measures were included in this review, there is potential for differences amongst individuals meeting diagnosis for the disorder (e.g., only five out of nine DSM-IV criteria are required). The age of offspring also varied with some samples crossing developmental stages (i.e. childhood and adolescence)

(e.g., Abela et al., 2005; Feldman et al., 1995), making it difficult to interpret whether findings were generalizable or age specific. Repeated intra-individual assessments would identify differential age effects.

Third, in some cases there were too few studies in respective domains (e.g., maternal emotion recognition, rejection) to make inter-study comparisons or draw firm conclusions. Given the potential mediating role of poor maternal emotion recognition (Gratz et al., 2014) and parental rejection (Reinelt et al., 2014) in the transmission of vulnerability from mother to offspring, further investigation of these domains is indicated.

Fourth, the quality assessment showed a low-moderate risk of outcome/exposure bias, in particular with respect to researchers and coders not being blind to the mother's diagnosis. Further, our results may have been subject to publication bias due to the 'file drawer' problem, however, given that non-significant findings are also of interest in this study population the likelihood of a results bias is potentially reduced.

Fifth, the review excluded child outcomes that required external intervention, such as child being removed from the home. Whilst some children of mothers with BPD will experience neglect and/or abuse (e.g., Kauppi, Vanamo, Karkola, & Merikanto, 2012; Perepletchikova, Ansell, & Axelrod, 2012) child maltreatment is not restricted only to mothers with BPD or indeed mothers with other psychiatric diagnoses and additional risk factors may be involved such as partner/family violence, serious marital problem, low socioeconomic status, poor education etc. (Chaffin, Kelleher, & Hollenberg, 1996; Department of Health and Human Services, 2013).

Finally, the majority of the studies, with a few exceptions (Barnow et al., 2013; Reinelt et al., 2014; Stepp et al., 2013), were cross-sectional in design. Whilst some convergence of findings was seen between cross-sectional and longitudinal studies

(e.g. offspring BPD), cross-sectional studies cannot take into account intra-individual development over time (Crone & Elzinga, 2015), making it difficult to draw conclusions regarding temporal precedence and aetiological mechanisms.

### **The Parenting Characteristics of Mothers with BPD/BPD Symptoms**

Accepting some inconsistencies across studies, we found that mothers with BPD appear less sensitive, more intrusive, more overprotective, more hostile, show less engagement, and have more complex interactions with their offspring than control mothers. This indicates that mothers with BPD may demonstrate inconsistent parenting characterised by over-involvement (overprotection, e.g., Barnow et al., 2006; Elliot et al., 2014; and inhibiting autonomy, e.g., Zalewski et al., 2014) on the one hand, and disengagement and hostility on the other (e.g., Frankel-Waldheter et al., 2015; Herr et al., 2008; White et al., 2011). A similar pattern of under-and over involvement was previously hypothesised to be unique to mothers with BPD (Stepp et al., 2012), and has been observed in subsequent studies in this review (e.g., Frankel-Waldheter et al., 2015; Reinelt et al., 2014). Furthermore, recent studies highlight a reluctance to promote independence as an additional parenting behaviour that may be characteristic of mothers with BPD (Frankel-Waldheter et al., 2015; Zalewski et al., 2014).

Whilst the parenting of some mothers with BPD is less than optimal, as studies that measured overprotection report a concern for the health and safety of the child (Elliot et al., 2014; Reinelt et al., 2014; Zalewski et al., 2014), it suggests mothers may have the desire but may lack the ‘tools’ to effectuate optimal parenting. The parenting stress and lack of efficacy that mothers with BPD report (Elliot et al., 2014; Newman et al., 2007) further highlights the parenting difficulties mothers with BPD face. Such complex parenting is likely to be a combination of factors including

but not limited to BPD symptoms (emotional dysregulation, interpersonal and fear of abandonment, e.g., Gratz et al., 2014; Macfie & Swan, 2009), symptom severity (e.g., Elliot et al., 2014), comorbid psychopathology (e.g., Abela et al., 2005), and mothers own childhood parenting experience (Bandelow, 2005; Zannarini et al., 1997) . Precisely how parenting strategies play out between mother-offspring dyads (i.e. frequency, duration and magnitude of under/over involvement) requires further explication.

From the limited studies utilising clinical control groups (or statistically controlling for other psychopathology) there is some evidence that maternal BPD is specifically associated with parenting behaviours including “overprotection” (Barnow et al., 2006), “control through guilt” (Zalewski et al., 2014), “maternal hostility” (Herr et al., 2008), and “fearful/hesitant” behaviour (Hobson et al., 2009). Ramifications of such parenting strategies are high, including offspring anxiety (van der Bruggen, Stams, Bögels, & Paulussen-Hoogeboom, 2010), behavioural problems (Gere, Villabø, Torgersen, & Kendall, 2012), social anxiety (Spokas & Heimberg, 2009) and BPD (Bezirgianian, Cohen, & Brook, 1993); many of which were observed within the review studies (see below). More studies with clinical control groups (e.g., depression, bipolar disorder) are now needed to further clarify the specificity of these and other parenting behaviours to maternal BPD.

### **Offspring Outcomes Across Developmental Domains**

A range of psychopathological and psychosocial outcomes for offspring of mothers with BPD were observed across several stages of development, tentatively indicating that negative effects on offspring may be enduring.

Studies, on the whole, reported associations between maternal BPD and offspring individual BPD symptoms/features (e.g., emotional dysregulation, insecure

attachment, depression, internalising and externalising problems, and interpersonal problems) in infancy (Crandell et al., 2003; Gratz et al., 2014; Hobson et al., 2005; White et al., 2011), childhood/adolescence (Abela et al., 2005; Barnow et al., 2006; Jellinek et al., 1991; Macfie & Swan, 2009), and adolescence (Herr et al., 2008; Zalewski et al., 2014). This indicates that these difficulties may manifest across several stages of development, heightening risk of future psychopathology (Winsper & Wolke, 2014) and BPD in particular (Carlson, Egeland, & Sroufe, 2009; Crowell et al., 2009). Indeed, studies were consistent in reporting a significant association between maternal and offspring BPD also in child (Weiss et al., 1996), adolescent (Barnow et al., 2013; Cheng et al., 2011) and adult (Stepp et al., 2013) populations. How psychopathological problems evolve in individual offspring of mothers with BPD, however, requires corroboration with prospective repeated assessment studies.

Collectively, studies demonstrate that offspring of mothers with BPD are a high-risk population who are at increased risk of developing psychosocial and mental health problems across developmental domains, potentially with difficulties even at the perinatal stage (Blankley et al., 2015) (although research of pregnant mothers with BPD is currently scant). The main findings from the review may be viewed within a developmental psychopathology framework (e.g., the biosocial developmental model (BDM), Crowell et al., 2009). Infants of mothers with BPD may inherit a biological vulnerability to emotionality/negative affectivity (Crandell et al., 2003; Hobson et al., 2005), which is potentiated across development by environmental risk factors (Crowell et al., 2009). Aside from potential heritability and other possible risk factors (e.g., in utero stress or substance exposure, sharing of a toxic environment), parental invalidation has been hypothesised as one mechanistic factor underpinning the transmission of BPD from mother to child (Crowell et al., 2009; Stepp et al., 2012).

Recent mediational studies indicate that the transmission of BPD symptoms (either collectively or individually, e.g., emotional dysregulation) may be partly explained by an increased risk of insensitive, rejecting and hostile parenting (Macfie et al., 2014; Reinelt et al., 2014) and maternal emotional dysfunction (Gratz et al., 2014). In this way maladaptive transactions between offspring and mother (and other individuals, e.g., peers, Barnow et al., 2006; and family members, Feldman et al., 1995) may continue giving rise to increasing levels of emotional (Barnow et al., 2006), interpersonal (Herr et al., 2008), cognitive (Macfie & Swan, 2009) and behavioural (Bertino et al., 2012) dysregulation, until they finally coalesce into a mental disorder (Crowell et al., 2009). One likely outcome is the development of BPD in childhood or adolescence (Cheng et al., 2011; Reinelt et al., 2014; Stepp et al., 2013; Weiss et al., 1996). As BPD in adolescence is predictive of BPD in adulthood (Winsper et al., 2015), the transmission of BPD (as described above) may continue across successive generations (Stepp et al., 2012). Other outcomes are also likely. Emotional and behavioural dysregulation (Barnow et al., 2006; Bertino et al., 2012), for example, have been found to predict multifinial outcomes (Abela et al., 2005; Crowell et al., 2009), while resilience factors (e.g., secure attachment) may prevent transmission of symptoms from mother to child (Gratz et al., 2014). Recent research on adolescents with BPD found attachment security served as a buffer by enhancing positive emotion regulation strategies, whilst decreased use of positive emotion regulation strategies mediated the relationship between attachment insecurity and adolescent BPD features (Kim, Sharp, & Carbone, 2014).

### **Research and Clinical Implications**

Offspring of mothers with BPD present an ideal cohort for studying the development of BPD as these samples will yield a higher proportion of individuals

actually developing the disorder (Macfie et al., 2014). This will allow for the prospective examination of processes underpinning the development of clinically relevant levels of BPD from pregnancy onwards (De Genna, Feske, Larkby, Angiolieri, & Gold, 2012). Systemic factors, such as poverty, partner aggression and disordered extended family members, and factors that may provide resilience against offspring psychopathology (Bartsch, Roberts, Davies, & Proeve, 2015; Kim et al., 2014), should also be explored. Concurrently assessing various offspring psychopathologies (e.g., BPD, depression, and substance use disorder) may help elucidate the determinants of multifinality of outcome across development.

Prospective studies would also provide the opportunity to study intra-dyad transactional dynamics, parenting strategies (including potential frequency, duration and magnitude of over/under involved polarised parenting behaviours) and developmental differences in parenting and child outcomes over time. Observing parenting behaviours within the framework of other factors such as the mother's specific BPD symptoms, symptom severity and comorbid psychopathology, would help target key areas for intervention.

Our review highlights several prevention and early intervention opportunities. Insecure attachment (Macfie et al., 2014) and emotional dysregulation (Gratz et al., 2014) are important targets for both mothers with BPD and their offspring. Intervention from pregnancy onwards including dyadic infant-parent psychotherapy (Macfie et al., 2014; Wendland et al., 2014) could help prevent the intergenerational transmission of insecure attachment patterns and self-regulation problems to help prevent offspring from embarking on a maladaptive developmental trajectory. As BPD symptoms often become apparent in adolescence (Chanen & Kaess, 2012) and may be more responsive to treatment than in adulthood (Lenzenweger & Castro,

2005), intervention at this point would be timely. Programmes that have limited exclusions for co-morbid psychopathology (common with BPD) and that combine subsyndromal and syndromal BPD symptoms (e.g., HYPE, Chanen et al., 2009) could provide both intervention and prevention strategies (Chanen & McCutcheon, 2013). A degree of improvement of symptoms has been previously observed with treatments such as cognitive analytic therapy (Chanen et al., 2008), dialectic behavioural therapy for adolescents and mindfulness-based training for adolescents (e.g., Rossouw & Fonagy, 2012) (for a detailed review see Sharp & Fonagy, 2015). Combined therapy with mother and offspring may also help by targeting dyadic interactions (e.g., joint therapy for managing emotion dysregulation). Similarly, interventions which bring awareness to the mother on how their BPD symptoms impact on parenting behaviours and offspring outcomes (Bartsch et al., 2015; Zalewski, Stepp, Whalen, & Scott, 2015) may help further improve mother-offspring interactions (e.g., a lack of promotion of offspring independence may be associated with mother's fear of abandonment difficulties, Frankel-Waldheter et al., 2015; Zalewski et al., 2014).

Whilst the review could not confidently cite many parenting behaviours as unique to mothers with BPD, the differences found between mothers with BPD and healthy control mothers indicate many ineffectual parenting characteristics. With greater consistency of parenting constructs and BPD assessment, future research will continue to identify the specific parenting behaviours of mothers with BPD. Considering the poor outcome trajectory for some offspring of mothers with BPD, timely interventions for both mother and offspring to prevent distress and persistent functional impairment are warranted.



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**Figure 1: Flowchart of the article search and selection process**

(Source: PRISMA, Moher et al 2009)



