



Published in final edited form as:

*J Fam Psychol.* 2022 August ; 36(5): 671–680. doi:10.1037/fam0000940.

## Characteristics of Maternal Depression and Children's Functioning: A Meta-Analytic Review

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### Abstract

Maternal depression is associated with cognitive, emotional, and behavioral problems in offspring, but the substantial heterogeneity of depression precludes a full understanding of these associations. Variation in course of depression, characterized by severity or chronicity, may be related differentially to children's development. The current meta-analytic review examined the relations of these characteristics of maternal depression to children's developmental outcomes. Twenty-nine studies were identified and reviewed; the majority (93%) of studies reported a negative association between some aspect of maternal depression and children's adjustment. Separate meta-analyses revealed significant effect sizes for severity (Fisher's  $z = -.243$ ) and chronicity (adjusted Fisher's  $z = -.337$ ) of maternal depression and children's cognitive or behavioral functioning. Findings are synthesized across features of maternal depression; methodological limitations within the empirical literature are discussed, and recommendations for future research are suggested.

### Keywords

maternal depression; severity; chronicity; child functioning

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A reliable and robust risk factor for psychopathology in children and adolescents is the extent of psychopathology in their parents (e.g., Beardslee et al., 2011). In particular, depression in mothers has been linked with a myriad of problems in offspring throughout their development (Goodman et al., 2011). Depression, however, is quite heterogeneous regarding several characteristics such as its severity and chronicity; much less is known about which aspects of maternal depression are associated with which child outcomes and about the relative strength of these relations.

### Heterogeneity of Depression

Depressive episodes can vary in intensity (i.e., *severity*) and duration and recurrence (i.e., *chronicity*), and often have been examined in tandem (e.g., Hammen et al., 2003, Netsi et

al., 2018). This heterogeneity and variability might partially explain inconsistent findings regarding the relation between maternal depression and offspring functioning (e.g., Cents et al., 2013; Dawson et al., 2003). Both severity and chronicity of maternal depression have been associated significantly with cognitive deficits and with psychopathology in offspring (e.g., Brennan et al. 2000; Deave et al., 2008; Kim-Cohen, et al., 2005; Rouse & Goodman, 2014).

## Functioning in Offspring of Depressed Mothers

Much existing research on the relation between maternal depression and offspring outcomes has focused on two aspects of child development – cognitive functioning and emotional or behavioral functioning. There are direct links between maternal psychopathology and fetal growth as early as mid-pregnancy (for a review, see Van den Bergh et al., 2005) and negative associations have been found between maternal depression and offspring outcomes throughout the lifespan (Goodman et al., 2011; Klein et al., 2005). Maternal depression has been linked with emotional problems (e.g., depression and anxiety), behavioral problems, and social and cognitive impairment in offspring (Gentile, 2017). The current review of the extant literature of maternal depression focused on two commonly studied domains of functioning – cognitive, and emotional or behavioral.

Maternal depression might be associated somewhat differently with specific facets of cognitive, emotional, and behavioral functioning. For example, O'Connor and colleagues (2017) showed that prior severity/chronicity of maternal depression predicted both internalizing and externalizing symptoms in children when controlling for current maternal depressive symptoms at each time point, but that chronicity, apart from severity, also predicted rate of change in youth externalizing symptoms over time. O'Connor et al. recommended that studies of maternal depression in relation to child functioning should explore severity and chronicity of parents' depression and should consider them separately in relation to various child outcomes. Given the high comorbidity among youth cognitive, emotional, and behavioral outcomes (Riglin et al., 2014), the current review examined the links between maternal depression chronicity and severity and child functioning in two central domains – cognitive, and emotional and behavioral.

## Methods

This review was conducted according to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines (Moher et al., 2009). We conducted a systematic search and review of studies relevant to severity and chronicity of maternal depression. Some studies included information about more than one of these characteristics. We included empirical studies that (a) provided longitudinal, retrospective, or multiple cross-sectional assessments of maternal depression over time, and (b) measured some aspect of cognitive or emotional/behavioral functioning in offspring. We included studies that provided prospective (e.g., maternal depression measured continuously, or for 3 discrete measures during the child's life) or retrospective data, whereby at least three prior episodes or three instances of elevated symptoms of maternal depression were assessed at one time point.

We identified articles published between 1983 and 2021 using Google Scholar, PsycINFO, and Pubmed, applying the initial search terms *maternal OR mother, depression OR depressive, child\* OR offspring, AND severity OR chronicity OR perinatal OR postpartum OR development OR behavior OR cognitive OR psychological OR emotional OR behavioral OR disorder OR programming*, eliminating duplicates and inaccurate returns and expanding as necessary. All search returns were downloaded directly into spreadsheets. We evaluated potentially relevant articles using the following inclusion criteria: (a) assessment of maternal depression longitudinally, as described above, (b) measurement of an aspect of child functioning at the final time point, and (c) examination of the relation between a characteristic of maternal depression and child outcome(s). Additionally, we examined the reference lists of relevant articles for other empirical studies and performed a forward reference search of relevant empirical and review articles using Google Scholar. All spreadsheets of potentially relevant articles were coded by two independent raters with 92% reliability; eligibility was determined by consensus, and relevant data were extracted by the first author. This study was not preregistered and did not generate new human data requiring review by the Institutional Review Board.

Inclusion criteria required that studies present some measure of effect size (e.g., Pearson correlation coefficient, odds ratio, or two-group t-test). Ultimately, 29 studies published between 1995 and 2021 met inclusion criteria for this meta-analysis. Eleven studies examined the relation between severity of maternal depression and child outcomes, and 18 studies examined the link between chronicity and child outcomes, with five of these 29 studies reporting outcomes in relation to both severity and chronicity.

### Data Analysis Plan

For studies that reported more than one child outcome (e.g., language development, IQ) within one outcome category (e.g., cognitive development), we calculated pooled effect sizes and standard error values. We adjusted effect directions as needed to appropriately reflect child outcomes across measures. For example, if chronicity of maternal depression and child problem behaviors were correlated positively  $r = .50$ , and chronicity and secure child attachment were correlated negatively  $r = -.50$ , the direction of the first correlation was reversed (e.g.,  $r = .50$  converted to  $r = -.50$ ), such that both correlations represented the association between chronicity and problematic child outcomes.

As risk for transmission of psychopathology may have developmental components and studies of several developmental stages were included in the analyses, average age (in months) of offspring at the time of outcome assessment participants was tested as a moderator.

Quantitative analyses were performed with Comprehensive Meta-Analysis Version 3 (Borenstein et al., 2015), which yielded Fisher's Z-values and confidence intervals of effect sizes to assess statistical significance. Models were set to "random effects," as effect size distributions were heterogenous. Homogeneity of weighted effect sizes were examined with  $I^2$  and Q-tests. An estimate of between study variance (Tau squared) was used as a measure of heterogeneity. Because studies of several developmental stages were included in the

analyses, we used average age (in months) of offspring at the time of outcome assessment as a moderator in meta-regression analyses.

A common concern when interpreting meta-analytic models is publication bias – studies that report significant effect sizes are more likely to be submitted to and published in journals than are those that report nonsignificant or even modest significant effects. We examined funnel plots for each meta-analytic model visually and by calculating Egger's tests for detection of funnel plot asymmetry (Egger et al., 1997). Potential publication bias was addressed using trim and fill analysis.

## Results

### Publication Bias

Visual examination of funnel plots showed an apparently symmetrical distribution of effect sizes in severity analyses and was confirmed with results of Egger's tests ( $p = .489$ ). The funnel plot for chronicity effect sizes, however, appeared skewed and analysis could not rule out the potential for an effect of publication bias ( $p < .05$ ). Therefore, the trim and fill procedure was used to generate an adjusted effect size for the chronicity analysis.

### Severity of Maternal Depression and Children's Outcomes

We conducted a meta-analysis of effect sizes of seven studies that tested differences between offspring of severely depressed mothers versus offspring of less severely depressed mothers (comparison groups varied from minimal depressive symptoms to moderate severity of depression), and four studies that tested the relations between maternal depression severity and child outcomes directly (e.g. correlations between continuous symptom measures of maternal depression and offspring problem behaviors). Analyses revealed a significant effect (Fishers'  $z = -.247$ , 95% CI  $[-.389 -.106]$ , Plot 1) for the relation between severity and child outcomes, indicating that more severe maternal depression was significantly associated with more negative cognitive and psychological outcomes in offspring.

Notably, five studies (Brennan et al., 2000; Campbell et al., 2007; Fihrer et al., 2009; Leadbeater et al., 1996; Oh et al., 2020) used similar methodology, finding significant relations between maternal depression severity (assessed with questionnaires) and offspring emotional and behavioral symptoms as measured with the Child Behavior Checklist (CBCL; Achenbach et al., 2014). For example, in a sample of adolescent mothers and their young children, Leadbeater et al. (1996) found that more severe maternal depression when children were age one significantly predicted higher levels of children's behavior problems on the CBCL at child age five.

We conducted a meta-regression analysis of the severity studies to test whether the relation between severity of parental depression and offspring outcomes varied as a function of child age. Here we used age as a continuous variable (i.e., mean age of sample in months). Results showed that age was not a significant moderator,  $Z = .37$ ,  $p = .71$ .

## Chronicity of Maternal Depression and Child Outcomes

The meta-analysis revealed a significant negative association (adjusted Fishers'  $z = -.337$ , 95% CI  $[-.418, -.251]$ ), indicating a statistically significant relation between chronicity of maternal depression and child functioning. Plot 2 presents results from this model. Most studies revealed that more chronic depression in mothers was associated with worse functioning in offspring. This pattern was found for infant outcomes, including fewer positive interactions and less frequent use of self-regulation strategies (Campbell et al., 1995; Deave et al., 2008; Granat et al., 2017).

Several studies reported a significant positive relation between chronicity of maternal depression and offspring emotional and behavioral symptoms on the CBCL (Brennan et al., 2000; Dawson et al., 2003; NICHD Early Child Care Research Network, 1999; Prenoveau et al., 2017; Trapolini et al., 2007). For example, using latent Trait-State-Occasion modeling, Prenoveau et al. (2017) showed that persistent maternal depressive symptoms (EPDS administered at child ages of 3, 6, 10, 14, and 24 months) during the first two years postpartum, as compared to time-limited maternal depressive episodes occurring at a single time point, significantly predicted higher levels of problem behaviors and negative emotions in offspring at 24 months old.

Of note, chronicity has had several different definitions across studies. Whereas in some studies, chronicity was defined as having a high score on a self-report measure of depressive symptoms, sometimes at as few as two time points (e.g., Diego et al., 2004; Plant et al., 2015), other studies defined chronicity as measured across multiple time points (e.g., Brennan et al., 2000; Deave et al., 2008; NICHD, 1999; Prenoveau et al., 2017), and still others defined chronicity as a cumulative count of the number of months across a two-year period (e.g., Dawson et al., 2003; Murray et al., 2010). Despite these differences, results generally showed that more chronic maternal depression was associated with a greater likelihood of both lower cognitive and emotional/behavioral functioning as compared to less chronic depression in mothers.

In the meta-regression analysis testing age as a continuous variable (i.e., mean age of sample in months), we found that the relation between chronicity of parental depression and offspring outcomes was not significantly moderated by child age,  $\underline{Z} = .13$ ,  $p = .89$ .

## Both Severity and Chronicity

Five studies examined the relations of both severity and chronicity to the same child outcomes, with three studies identifying significant relations between both severity and chronicity and child outcomes (Deave et al., 2008; Fihrer et al., 2009; Hammen et al., 2003). Further, Netsi et al. (2018) defined chronicity as elevated EPDS scores at 2 and 8 months postpartum and examined severity dimensionally. They found that persistence of maternal depression, over and above the severity of mothers' depressive symptoms, predicted increased odds of child behavior problems at age 3.5 years.

In a particularly compelling study, Brennan et al. (2000) reported that both the severity and chronicity of maternal depressive symptoms were related to more behavior problems and lower vocabulary scores in children. Moreover, the interaction of severity and chronicity of

maternal depressive symptoms was significantly predicted higher levels of child behavior problems, but not vocabulary scores. Further analysis of the interaction revealed that children whose mothers had experienced both chronic and severe depressive symptoms had significantly more behavior problems than children of mothers who had experienced either severity or chronicity or neither. Brennan and colleagues concluded that the combination of severity and chronicity appears to be especially potent in relation to child behavior outcome.

## Discussion

Several interesting findings emerged from this review regarding the connections between aspects of maternal depression and child functioning. We focused on two characteristics of maternal depression – severity and chronicity – in relation to salient domains of child development – cognitive and emotional or behavioral functioning. The meta-analyses quantified the strength of the associations between both severity and chronicity and child functioning, yielding significant effect sizes for both.

That more severe maternal depression was associated with more deleterious child functioning is not surprising. Indeed, mothers in the throes of a severe depression might become increasingly impaired. That is, as the intensity of symptoms escalates, mothers might find it increasingly difficult to interact positively with their children (e.g., problems attending, less enjoyment of shared activities, negative affect or negative cognitive style), which then might result in fewer or more maladaptive mother-child interactions and heightened distress and dysfunction in the child (e.g., Dunning et al., 2021).

More severe maternal depression might be categorically distinct from less severe depression, such that different mechanisms underlie risk to offspring of parents at the more severe end of the continuum. For example, more severe depression might reflect greater heritability, more environmental (e.g., family) stress, or both (e.g., Goodman & Gotlib, 1999). Indeed, severity of depression likely reflects an additive or interactive combination of genes and environmental vulnerability (Weissman, 2020).

Depressive symptoms in mothers were not associated with negative outcomes for children in every study, however. DiPietro et al. (2006) showed that low levels of maternal depression (as in low-risk, financially stable families with wanted pregnancies) were associated with *more* adaptive child outcomes as compared to offspring of mothers with no depression. This finding is consistent with the notion of inoculation or the “steeling effect” – that exposure to some mild levels of stress might prepare children optimally for dealing with subsequent adversity (e.g., Yan et al., 2014).

### Chronicity of Maternal Depression and Offspring Functioning

Most studies showed that more chronic depression in mothers was associated with greater impairment in child functioning. With increased length of exposure to maternal depression, offspring might experience more instances of maternal modeling of negative affect, cognitions, and behaviors. In turn, this prolonged exposure to maladaptive thoughts and actions might confer susceptibility to similar depressive tendencies and other problem behaviors in offspring. Depressed parents display more negative parenting behaviors, which,

in turn, are associated with more emotional and behavioral problems in offspring (Neece et al., 2012). Moreover, chronic life stress early in life is known to be associated with maladaptive outcomes such as over-activation of stress responsive-organs, more maladaptive lifestyles, and adverse cardiovascular events. Goodman and Halpern (2019) suggested that maternal depression may be one important vessel of such early life stress.

### Child Functioning

Both severity and chronicity of maternal depression were significantly associated with poorer offspring cognitive functioning, which often is associated with more social and academic problems in general (e.g., Samuels et al., 2016). Deficits in child cognitive functioning may be one pathway through which maternal depression is linked to worse psychosocial functioning in children. Cognitive ability also may be an important predictor of responses to psychological treatments of depression, as interventions that require a higher level of cognitive skills might be less effective with individuals with lower cognitive functioning (Mohlman, & Gorman, 2005).

In one study that examined the interaction between severity and chronicity of maternal depression, Brennan et al. (2000) found that the interaction was significant for child behavior but not cognitive functioning. Brennan and colleagues suggested that this discrepancy might be due to two factors. First, generally there is a lower association between maternal depression and cognitive outcomes as compared to behavioral outcomes. Second, the outcomes differed in how they were assessed. Cognitive outcomes were measured with standardized tools, whereas behavioral problems were assessed by maternal report only, and therefore were more subjective and possibly affected by a negative reporting bias. Ultimately, the distinct risk profiles for different child outcomes should be examined in future studies of chronicity and severity of parents' depression.

### Methodological Concerns

Three methodological factors may have contributed to variability across studies: (a) heterogeneity of measurement, (b) failure to examine additive and interactive effects of severity and chronicity, (c) absence of control for symptoms of depression outside of targeted periods, and (d) lack of specificity in measures of child outcomes.

Studies in this review were quite heterogeneous in their conceptualizations and operationalizations of severity and chronicity of depression. Some studies used continuous measures of depressive symptoms (e.g., BDI-II), whereas some studies used categories (e.g., "mild" vs. "severe") or different cut-off scores on dimensional measures; still other studies used novel descriptors, such as "course" or "pattern" (e.g., high-chronic, low-episodic) that combined characteristics. Ideally, severity would be assessed using a measure designed specifically to determine level of symptoms, such as the Hamilton Depression Rating Scale (Hamilton, 1960). Some investigators, however, have used continuous measures of the number and frequency of symptoms experienced (e.g., EPDS) or a rating of symptom severity on an 8-point scale (e.g., Prenoveau et al., 2017). Because of the heterogeneity of measures of depression and operationalizations of severity and chronicity in the literature,

we included a broad representation of these constructs (i.e., severity, chronicity) in the current review.

A related concern is that definitions and measurement of severity and chronicity sometimes have overlapped, particularly when using dimensional, self-report measures at multiple points across time, thereby making it difficult to determine the unique contribution of each. Although few studies have examined how severity and chronicity separately and together predict child functioning, those that have done so (i.e., Brennan et al., 2000; Netsi et al., 2018; O'Connor et al., 2017) have yielded important results that provide a model for future investigations. Understanding the impact of both severity and chronicity, separately, additively, or multiplicatively, could help identify mechanisms of the intergenerational transmission of psychopathology and possible targets for intervention.

In addition, age of onset and recurrence of maternal depression should be examined. To study the prospective relation between maternal depression and child functioning, future studies should use longitudinal designs and comprehensive measures of parental depression to gather continuous data over time. Measurement of concurrent associations may aid in understanding longitudinal questions, as without collecting child outcome data simultaneously with maternal risk data, predictive analyses may be limited. For example, when depression is assessed prenatally and offspring outcomes are assessed in toddlerhood, the relative contribution of maternal depression during the post-natal versus infancy periods is ambiguous. Because earlier onset of depressive episodes is associated with a more recurrent and sometimes more severe course of depression (van Lang, Ferdinand, & Verhulst, 2007), mothers who experience their first episode as adolescents might be more vulnerable to a more extended course of depression, due to greater genetic or environmental risk. Thus, women with an early onset of depression might confer more risk to their children than mothers who experience their first episode later.

Finally, the definitions and measures of child outcomes also were quite heterogeneous, and many studies utilized general rather than specific measures of child functioning. Therefore, broad categories of cognitive and emotional/behavioral outcomes were the focus of the current review. As such, generalizing findings from disparate measures of children's functioning needs to be done with caution. Thus, a uniform battery of psychometrically adequate measures of both mother and child characteristics should be used across studies.

### **Strengths, Limitations, and Future Directions**

**Strengths.**—The primary strength of this meta-analytic review was that it addressed a notable gap in the literature regarding different aspects of maternal depression in relation to offspring functioning. Recent work has highlighted the importance of “multi-domain and longitudinal [studies] with respect to both mothers’ and offsprings’ function,” (p. 7; Gotlib et al., 2020) and a “greater consideration of the variability within depression” (p. 20; Goodman, 2020). The current review consolidated and synthesized the heterogeneous extant literature in response to these suggestions and provided information about the strength of the associations reported.



Other strengths of this review were the inclusion of heterogeneous measures of various descriptors of maternal depression. Recent work has called for examination of comprehensive, longitudinal data to address both predictor and outcome variables associated with different developmental periods (Goodman et al., 2011; Prenoveau et al., 2017) and to further understand risks associated with severity and chronicity of maternal depression (Allen et al., 2019). To provide a more complete understanding of the various facets of maternal depression, future studies should continue to incorporate prospective and retrospective data and analyses (Granat et al., 2017).

A final strength of this review was its breadth. Studies of maternal depression have emphasized the importance of replicating findings with diverse samples. Moreover, maternal depression should be assessed repeatedly, beginning during critical prenatal months and throughout the children's development. In addition, measures of children's outcomes occurring across multiple developmental stages from infancy to young adulthood are needed (Priel et al., 2019).

**Limitations.**—Limitations of the current review provide directions for future research. First, this review focused on depression only, rather than other common psychopathologies (e.g., anxiety; substance use) or risk factors (e.g., stress, trauma). Our emphasis on depression, however, was justified because it is a particularly debilitating and common disorder (Meaney, 2018) associated with maladaptation in offspring. Second, as noted previously, many studies relied on maternal reports of both their own depression and children's behaviors, which may have overestimated the correlations due to shared method variance. Whereas some studies did include paternal or teacher reports (e.g., Campbell et al., 2007; Fihrer et al., 2009), most did not.

Another limitation of the current review was the variability of samples and depression assessment methods across studies. For example, whereas many studies utilized community samples and assessed depression using symptom level measures (e.g., Hentges et al., 2020), other studies included clinical samples and conducted diagnostic interviews (e.g. Klein et al., 2005). It is not clear to what extent the different assessment methods and measures contributed to discrepancies in the findings across studies.

Finally, another important limitation of this review and the more general literature on maternal depression is an absence of attention to potentially important contextual factors such as poverty or family functioning. Unfortunately, data examining these factors were not consistently available across the papers reviewed. Although some papers did explore context (NICHD Early Child Care Research Network, 1999), this was not done systematically across studies, thereby limiting our ability to quantify and interpret findings concisely. Studies of the relation between parental depression and children's functioning should include conceptually driven and rigorously defined measures of a range of potential contextual influences.

**Future Directions.**—In summary, longitudinal studies of offspring of depressed mothers, beginning at birth or even before (Diego et al., 2009, Goodman, 2020), are necessary for a better understanding of the extent and nature of the potential effects of maternal

depression on children's development. Future research should explore moderators to clarify possible inconsistent associations between the different aspects of maternal depression and various child outcomes (Goodman et al., 2020). Potential moderators include the family environment and both stable (e.g., sex) and dynamic (e.g., age, SES) factors (Bagner et al., 2011; Goodman & Gotlib, 1999; Stein et al., 2014). For example, associations between maternal psychopathology and child outcomes have been found to vary by offspring sex (Sutherland & Brunwasser, 2018), although few articles (e.g., Wen et al., 2017) have provided the relevant data. Recent work has highlighted the importance of considering context such as family socio-economic status when examining the cross-generational transmission of psychopathology (Pelham et al., 2020).

Another important direction for future research is to identify mediators of the relation between maternal depression and children's outcomes. Prior research has identified several likely biomarkers of maternal depression and has examined different biological pathways, including stress hormones and neurotransmitters (Gentile, 2017; Priel et al., 2019; Serati et al., 2016), as well as environmental pathways such as family income, maternal social behavior, parental monitoring and support, positive parenting, and level of parental conflict (Gotlib et al., 2020; Granat et al., 2017). In addition, the current review focused on mothers, but the mental health of other caretakers, such as fathers, also should be explored in relation to child outcomes. For example, having a highly supportive other caretaker may buffer children from some of the negative effects of the mother's depression (Vakrat et al., 2018).

Maternal depression during the perinatal period may not have a direct link to maladaptive child outcomes, but rather may be a distal process that initiates a developmental cascade eventually resulting in poor outcomes in the children (Waters et al., 2014). This cascade might include dysfunctional parenting or abuse by parents (Plant et al., 2015) or dyadic factors (e.g., attachment, Campbell et al., 2004). Researchers also have called for the use of cross-lagged or bidirectional models to further elucidate the potential temporal, reciprocal, and transactional connections between mothers and offspring (Allen et al., 2019; Sutherland et al., 2019).

In summary, studying characteristics of maternal depression is relevant to understanding the relation between maternal depression and offspring adjustment, and ultimately may inform targeted preventive interventions (McDaid et al., 2019). For example, if at-risk offspring of depressed mothers can be identified early for intervention by evaluating the chronicity and severity of the mother's depression, perhaps developmental cascades may be redirected and a pathway of risk curtailed or eliminated (Meaney, 2018).

## Acknowledgments

This work was supported in part by a NIMH grant (R61MH115125) and training grant (T32MH018921)

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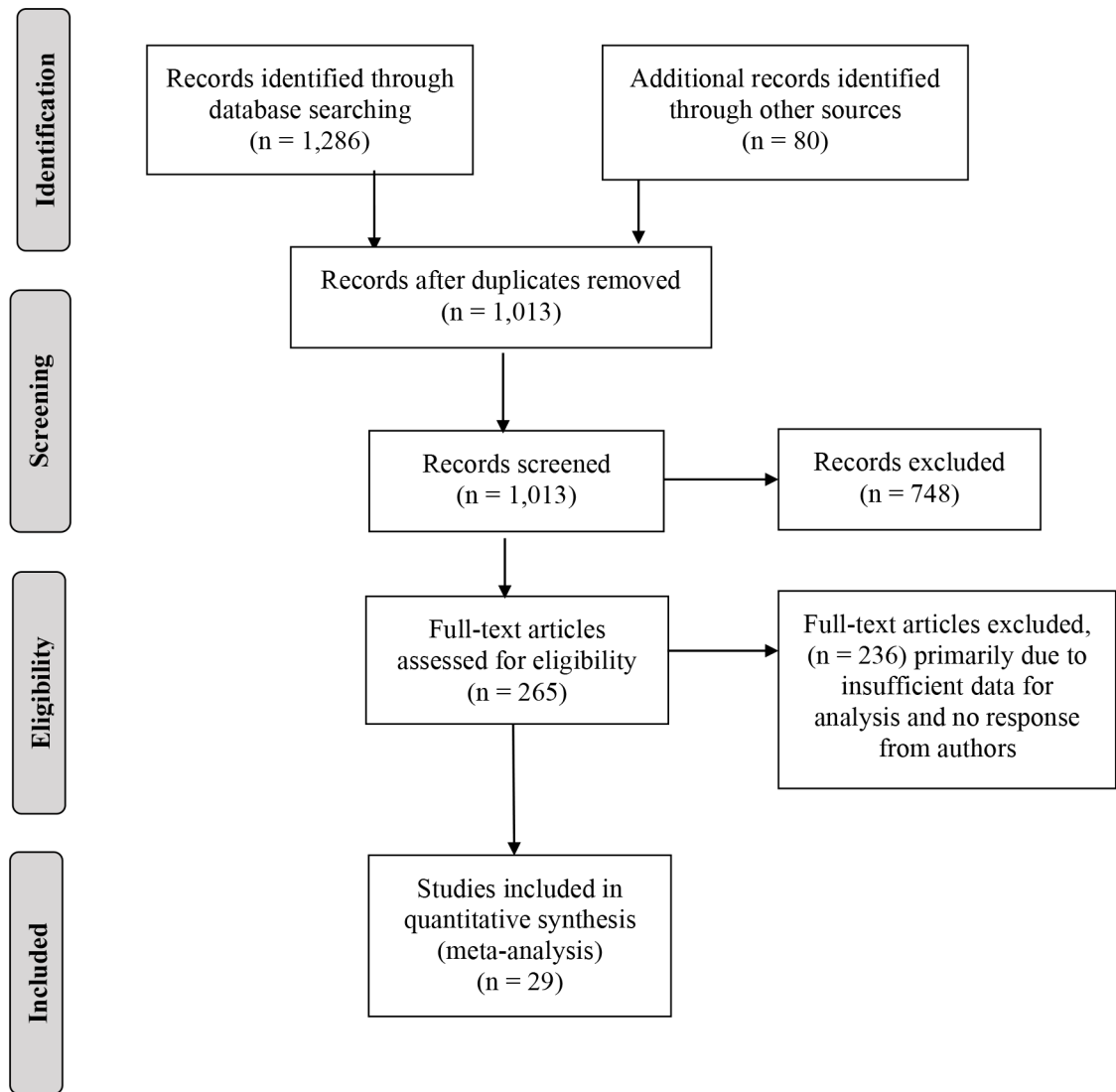
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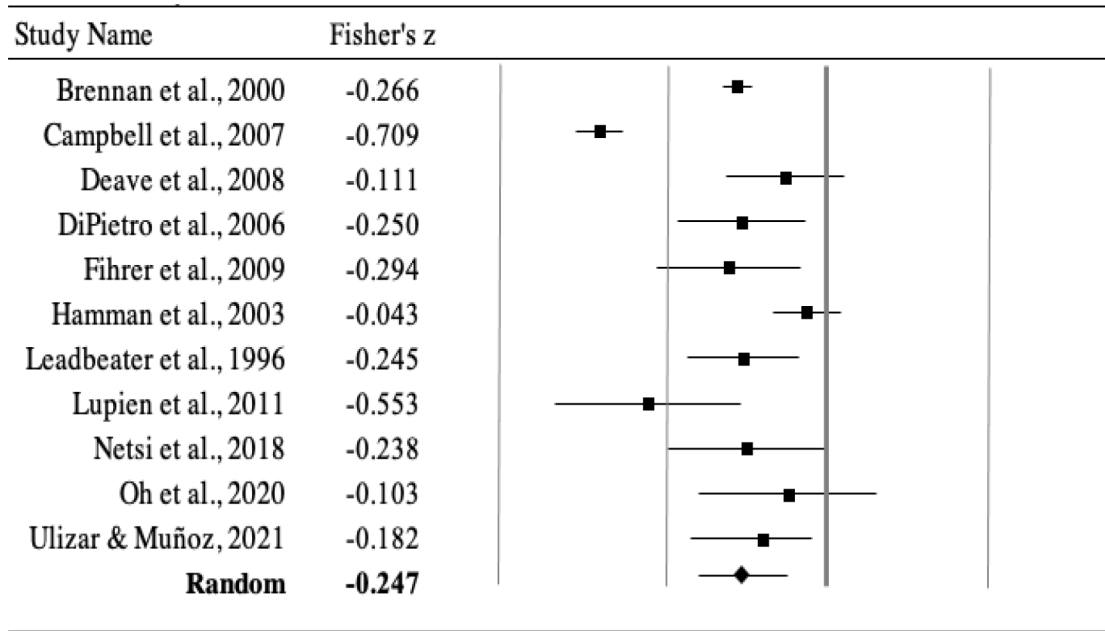
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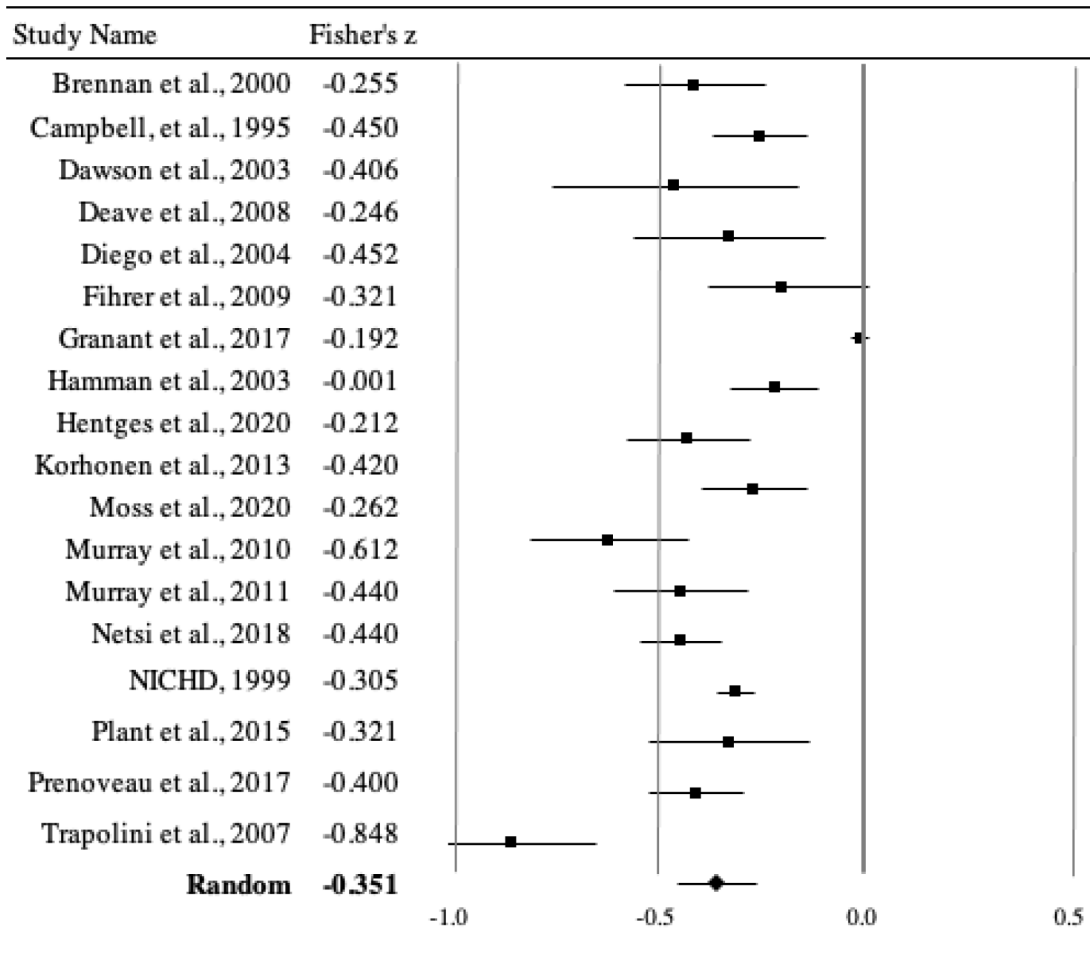


**Figure 1.**  
Prisma Flow Diagram.



**Plot 1.**  
Severity





**Plot 2.**  
Chronicity

Table 1.

## Characteristics of Articles included in the Review

Study Name	N dyads	Maternal Depression Measure	Fisher's $z$ (SE) or Y/N sig. association	Offspring Measures
<b>Severity of Maternal Depression</b>				
<i>Cognitive functioning</i>				
DiPietro et al., 2006	94	POMS	-.250 (.105)	Bayley Scale - PDI, MDI
Brennan et al., 2000	4,953	BDI	-.266 (.014)	PPVT-R
Unizar & Munoz, 2021	96	CES-D	-.138(.121)	Mullen Early Learning
Campbell et al., 2007	1,261	CES-D	-.709 (.039)	Woodcock Johnson-III
Deave et al., 2008	10,125	EPDS	-.111 (.096)	DDST
<i>Emotional/behavioral functioning</i>				
Leadbeater et al., 1996	120	BDI	-.245 (.092)	CBCL (Preschool)
Brennan et al., 2000	4,953	BDI	-.266 (.014)	CBCL (Preschool)
Fihrer et al., 2009	75	CES-D, CIDI Retrospective	-.294 (.118)	CBCL (School age)
Unizar & Munoz, 2021	96	CES-D	-.368(.117)	Vineland Soc-Emo
Oh et al., 2020	688	Kessler Depression	-.119(.038)	CBCL (School age)
Campbell et al., 2007	1,261	CES-D	-.709 (.039)	CBCL (School age)
Hamman et al., 2003	816	SCID, LIFE	-.043 (.055)	KSADS (MDE)
Netsi et al., 2018	7,917	EPDS	-.238 (.129)	Rutter Total Problems
Klein et al., 2005	775	SCID, LIFE	No	KSADS (MDE)
Hamman et al., 2003	816	SCID, LIFE	-.043 (.055)	KSADS (nondepressive disorders)
<b>Chronicity of Maternal Depression</b>				
<i>Cognitive functioning</i>				
Deave et al., 2008	10,125	EPDS	-.246 (.059)	DDST
NICH, 1999	1,215	CES-D	-.164 (.025)	Reynell
Brennan et al., 2000	4,953	DSSI	-.050 (.014)	PPVT-R
Murray et al., 2010	89	EPDS, SADS	-.612 (.098)	General Certificate of Secondary Education
<i>Emotional/behavioral functioning</i>				
Campbell et al., 1995	140	SADS	-.450 (.081)	coded interaction
Granat et al., 2017	215	BDI	-.192 (.105)	coded infant self-regulation
Prenoveau et al., 2017	296	EPDS	-.400 (.058)	CBCL (Preschool)

Study Name	N dyads	Maternal Depression Measure	Fisher's z (SE) or Y/N sig. association	Offspring Measures
NICHD, 1999	1,215	CES-D	-.305 (.024)	CBCL (Preschool)
Trapolini et al., 2007	92	CES-D, CIDI Retrospective	-.907 (.106)	CBCL (Preschool)
Dawson et al., 2003	124	SCID, LIFE	-.529 (.084)	CBCL (Preschool)
Brennan et al., 2000	4,953	BDI	-.255 (.014)	CBCL (Preschool & School)
Korhonen et al., 2013	192	EPDS	-.420 (.076)	CBCL (Preschool & School)
Neisi et al., 2018	7,917	EPDS	-.440 (.050)	Rutter Total Problems
Moss et al., 2020	229	CES-D	-.262(-.389)	Strengths and Difficulties
Murray et al., 2011	100	SADS	-.440(-.083)	KSADS (MDE)
Hentges et al., 2020	338	EPDS, CES-D	-.212(-.318)	BASC
Plant et al., 2015	103	CIS, SADS Retrospective	-.321 (.100)	SCID (MDE)
Hamman et al., 2003	816	SCID, LIFE	-.001 (.003)	KSADS (nondep. disorders)
Hamman et al., 2003	816	SCID, LIFE	-.000 (.003)	KSADS (MDE)
Pawlby et al., 2011	120	SADS, CIS Retrospective	No	CAPA conduct module

Note: BDI = Beck Depression Inventory; BITSEA = Brief Infant-Toddler Social and Emotional Assessment; BSI = Brief Symptom Inventory; CBCL = Child Behavior Checklist; CES-D = Center for Epidemiologic Studies - Depression; CIDI = Composite International Diagnostic Interview; CIS = Clinical Interview Schedule; DAWBA = Development and Well-Being Assessment; DDST = Denver Developmental Screening Test; DSM = Diagnostic and Statistical Manual of Mental Disorders; DSSI = Delusions-Symptoms-States Inventory; EPDS = Edinburgh Postnatal Depression Scale; KSADS = Schedule for Affective Disorders and Schizophrenia for School-Age Children; LIFE = Longitudinal Interval Follow up Evaluation; MDI = Mental Development Index; PDI = Psychomotor Development Index; POMS = Profile of Mood States; SADS = Schedule for Affective Disorders and Schizophrenia; SCID = Structured Clinical Interview for DSM Disorders; WISC = Wechsler Intellectual Scale for Children.

\* Effect present for one gender only.