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Marie Pellegrini, BSc

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Ass.-Prof. Mag. Dr. Jakob Pietschnig,
Privatdoz.

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Abstract

Children of parents with borderline personality disorder (BPD) may face numerous difficulties, including behavioural, emotional, attachment, psychiatric, family, and birth problems. The aim of this meta-analysis and systematic review was to better understand the magnitude and consistency of the impact of parental BPD on child outcomes. A systematic literature search of 7 data bases yielded 46 studies (including 8,513,136 children), which were pooled in two random-effects meta-analyses. Subset analyses for outcomes with at least two independent effect sizes and different study characteristics were conducted. Outcomes were also combined into topics and further analysed. A small effect was found for the association between parental BPD and negative child outcomes ($r = .175, p < .001, 95\% \text{ CI } [0.099, 0.252]$). In the parental BPD groups negative child outcomes were reported more frequently than in the control groups with a medium effect ($g = 0.651, p < .001, 95\% \text{ CI } [0.428, 0.873]$). The subgroup analyses yielded similar effects, but variability in the magnitude of effect sizes should be considered in interpretation. There was some evidence for effect inflation, possibly indicating publication bias. This first meta-analysis on this topic confirms the theoretical assumptions that parental BPD has a negative impact on a wide range of child outcomes. It underscores the importance of considering the parent-child dyad in the treatment of parents diagnosed with BPD. We would like to emphasize the importance of future research on specific interventions for parents with BPD and especially early interventions for children of parents with BPD.

Key Words: meta-analysis, systematic review, parental borderline personality disorder, negative child outcomes

Author Note: The translation of the abstract into German is provided in Appendix A.

Introduction

Borderline Personality Disorder (BPD) is a personality disorder that is described as a pervasive pattern of instability of interpersonal relationships, self-image, affect, and impulsive behaviour (American Psychiatric Association [APA], 2013). People with BPD frequently experience interpersonal hostility, rejection hypersensitivity, and lack of trust (Gunderson et al., 2018). They often show reduced empathy and have difficulties understanding other people's emotions (APA, 2013; Eizirik & Fonagy, 2009). They also often engage in self-destructive and suicidal behaviour (Gunderson et al., 2018). The rates of comorbidity with other DSM-V Axis 1 disorders are high (e.g., mood disorders, 96.9%, anxiety disorders, 89.0%; Zanarini et al., 2004). Epidemiological studies in the general population have described point prevalence estimates about 0.5% and lifetime prevalence estimates about 5.9% (Ellison et al., 2018; Grant et al., 2008; mainly collected in the US, but also Norway, UK, the Netherlands).

However, it is well known, that mental illnesses are not only affecting individuals themselves, but also have a large impact on the children of those affected. (e.g., Dutton et al. 2011, Leijdesdorff et al. 2017). Above all, the instability of interpersonal relationships poses a high risk for children, as they are particularly dependent on their parents. Moreover, parents with BPD report many challenges such as increased stress, difficulties with discipline and education, disruption to empathic responding, poor self-efficacy, and difficulties with maintaining a stable environment (Bartsch et al., 2016). Parents with BPD also report that there are not many treatment options for people with BPD that specifically address the role of parenting (e.g., help with education of children, techniques to stay calm in stressful parenting situations; Stepp et al., 2012).

Seventy-five percent of parents with BPD are women (Skodol & Bender, 2003), who report greater level of disability in comparison to men (Grant et al., 2008) and are often the primary caregiver. According to attachment theory (Ainsworth, 1982; Bowlby, 1982/1969) the first relationship(s) with the primary caregiver(s) is (are) fundamental for later relationships and resilience factors (Zemp, 2018). Secure attachments are positively associated with social competence, and negatively with externalizing and internalizing symptomatology and with negative temperament (Groh et al., 2017). Originally developed by Bowlby (1982/1969), expanded e.g., by Ainsworth (1982) and substantiated by recent studies (Groh et al., 2017) attachment theory states, that these mechanisms may play an important role for a secure attachment: prompt responding, empathic behaviour, availability especially

in stressful situations, and consistency/stability. Some of these mechanisms may be particularly challenging for parents with BPD.

Parents with BPD are also more socially disadvantaged: they tend to have lower SES, are more likely to be single parents or in a deconstructive partnership (Barnow et al., 2006; Cohen et al., 2008). Furthermore, parents with BPD have more often experienced maltreatment in their childhood (Ibrahim et al., 2018). Having a parent who was maltreated as a child is another risk factor for child maltreatment (Gilbert & Lacey, 2021). Genetic transmission may also play a role: With an estimated heritability of over 40%, familial and twin studies support the possibility of a genetic susceptibility as a root cause of BPD (Amad et al., 2014).

Many of these obstacles are also present for parents with mental illnesses in general. Nevertheless, mothers with BPD could need increased assistance, even compared to mothers with other disorders (Bartsch et al., 2016; Petfield et al., 2015). For example, the affective instability experienced by people with BPD is quite specific to this disorder (Florange & Herpertz, 2019; Stepp et al., 2012). Parents with BPD often oscillate between mood states and show inconsistencies in emotional availability and expression. On the one hand, this can lead to the child not knowing how to express their feelings and denying their emotional responses, increasing the potential for emotional vulnerability and invalidation. On the other hand, irregular parenting styles can be a result (Stepp et al., 2012).

Mothers with BPD show reduced sensitivity, emotion recognition, parenting satisfaction and efficacy, as well as higher intrusiveness, over-protection, hostility, and parenting stress compared with mothers with depressive disorders, other personality disorders, or healthy controls (Elliot et al., 2014; Frankel-Waldheter et al., 2015; Newman et al., 2007). Children of mothers with BPD had higher emotional and behavioural issues than children of mothers with depression alone, children of mothers without a mental illness, or children of mothers with cluster C personality disorders (Barnow et al., 2006).

This topic was reviewed before (Eyden et al., 2016; Florange & Herpertz, 2019; Petfield et al., 2015; Stepp et al., 2012). Although narrative/systematic reviews are valuable research tools, they are subjective in nature. Further, non-quantitative reviews do not allow to test for publication bias although there is evidence that studies whose results do not support the study hypotheses are less likely to be published (Blumenthal et al., 1997; Ioannidis, 1998). Quantitative evidence is needed to provide an objective and more precise estimate of the effect. Thus, this is the first meta-analysis to examine the impact of parental BPD on child outcomes. In addition, unlike previous systematic reviews, we included fathers as well.

Methods

We adhered to the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA; Moher et al., 2009) guidelines throughout this systematic review and meta-analysis. We pre-registered this project prior to creation of data on OSF, see <https://osf.io/gpy82>. Analyses not reported in the preregistration are marked as exploratory. All deviations from pre-registration are documented on OSF (URL: <https://osf.io/ap5se/>).

Literature search

Studies were identified through systematic literature searches in seven electronic databases (PsycINFO, Scopus, ISI Web of Science, MEDLINE/PubMed, Cochrane library, Google Scholar, and OATD). Search terms relating to BPD were combined with synonyms for children and parents. The exact search term is in Appendix B. Where possible, appropriate MeSH terms were used to enhance the database search. M.P. screened reference lists of previous reviews to identify additional relevant articles.

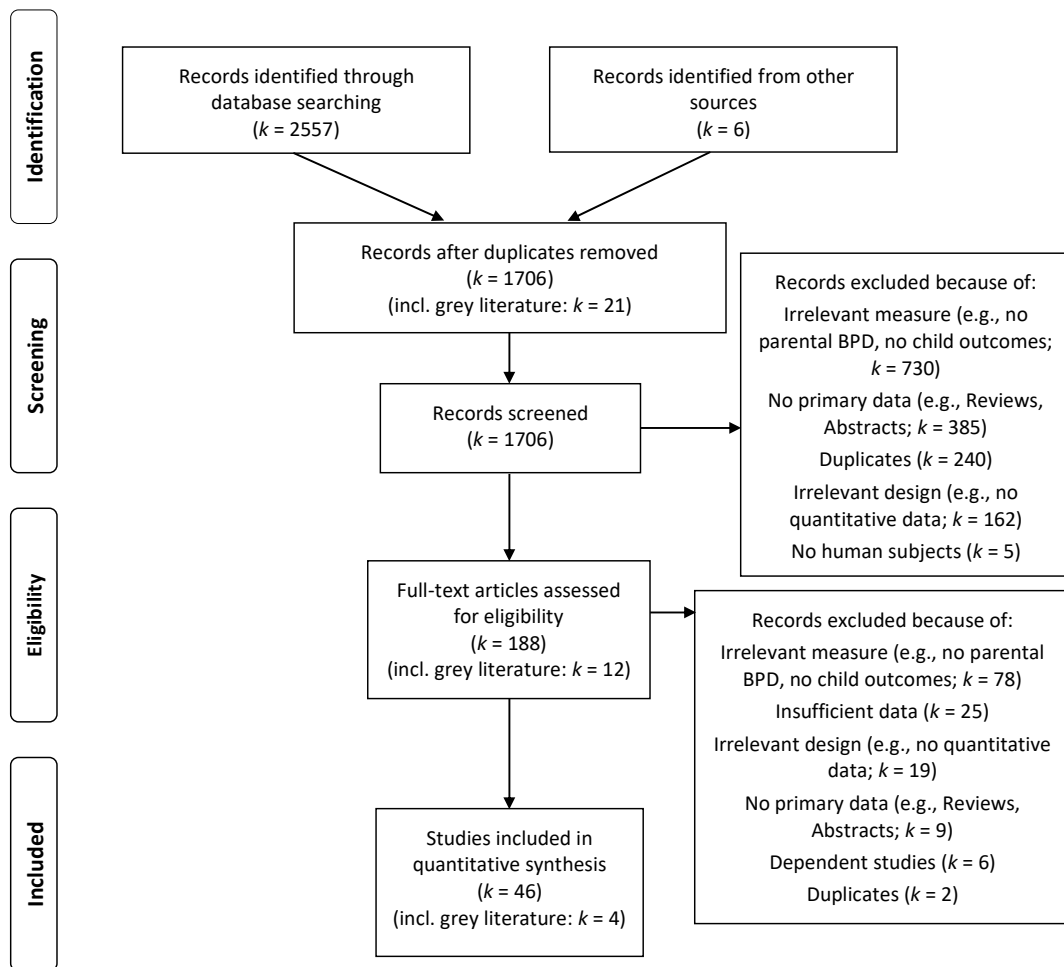
Inclusion criteria

According to the Cochrane handbook for systematic reviews of interventions we used the PICO framework to develop the search strategy (Eriksen & Frandsen, 2018). Five criteria were used to determine whether primary studies were eligible for inclusion in the meta-analysis. First, the respective study had to examine at least one parent with diagnosed BPD or BPD symptoms and/or children of parents with BPD or BPD symptoms. Second, the BPD diagnosis had to be assessed via standardized measures according to the Diagnostic and Statistical Manual of Mental Disorders (DSM) or International Classification of Diseases (ICD), and measurements of both BPD diagnosis and symptoms had to be full scale. Third, the respective study had to report at least one measure of child outcome. Fourth, case-control studies were required to have at least one non-clinical or clinical control group. Fifth, at least one effect size had to be reported, or sufficient numerical information had to be available to calculate at least one effect size for the impact of parental BPD on child outcomes.

Published and unpublished studies were eligible. The study selection process is displayed in a PRISMA Flowchart (see Figure 1; Moher et al., 2009). Studies not published in English or German were translated using the translation platform [deepl.com](https://www.deepl.com). A list of excluded studies along with exclusion reasons is available online on OSF (URL: <https://osf.io/ehpzc/>).

Coding

Results were deduplicated in the reference management software Endnote (Clarivate Analytics, 2021). Titles and abstracts from the initial search were screened by M.P. according to the prespecified inclusion criteria to identify articles for full text retrieval. Data extraction

Figure 1*PRISMA Flowchart of study inclusion*

from the full texts was performed twice by M.P. to ensure the accuracy of the coded variables. A standardized data extraction form was used following the PRISMA and Cochrane Standards (Higgins et al., 2022; Moher et al., 2009).

We extracted publication and study information, including publication year, publication type, study type, time span, and country of data collection. In addition, we coded information about predictors and outcomes, such as their metrics, the type and name of the measure, and the statistics needed to calculate effect sizes. The following demographics were also retrieved: education parent, parent sex, child sex, ethnicity child, age parent, age child, parental stress, partnership status, and the percentage of parents with comorbidities.

For the two main meta-analyses we had to categorize the outcomes after valence (negative, positive, neutral). When authors did not provide any information on the valence in their papers, we extracted it from the original publication of the measure. When the authors described the outcome as neutral or the information was ambiguous (e.g., no linear

relationship between the scale and the valence), the results were coded as neutral and were further not included in the analyses.

The samples were divided into community, community (high-risk), clinical, and mixed sample types. High-risk community samples were recruited either in high-risk settings (e.g., in psychiatric facilities, in very poor areas), due to specific current symptoms (e.g., parents with borderline/depressive characteristics, children with behavioural problems), or families were accompanied by youth protection services.

When outcomes were dependent, following decision rules were applied: Continuous scales were preferred over dichotomous scales, full scales were preferred over subscales, mothers were preferred over fathers, baseline was preferred over later timepoints, and self-assessment was preferred over external assessment.

Data analysis

Random effects meta-analyses using the restricted (residual) maximum-likelihood estimator (REML) to estimate between-study heterogeneity were conducted (Borenstein et al., 2009). We expected heterogeneity between study outcomes, so we chose a random-effects model. Due to the dependency between effect sizes, we conducted a three-level meta-analysis (Cheung, 2019). Separate analyses were conducted on studies with either correlational or group comparison study design. For studies with a group comparison study design, we calculated the standardized mean difference according to standard formulas (e.g., Borenstein et al., 2009; Cooper et al., 2019). Because Cohens d has a small bias, tending to overestimate the absolute value of the population in small samples, we calculated Hedges g . For dichotomous outcomes we had to calculate $\log ORs$ before transforming them into Cohens d and further into Hedges g . We assumed a logistic distribution for the transformation because it is more conservative. For studies with a correlational study design, we used the correlation coefficient r . The correlations were converted to Fisher z according to standard formulas (e.g., Borenstein et al., 2009; Cooper et al., 2019) prior to meta-analytic calculations and, for better comprehension, back to r afterwards.

The calculations and transformations of the effect sizes, subsequent meta-analyses, subgroup analyses, and publication bias analyses were conducted by using following packages in R (version 4.1.2): metafor (Viechtbauer, 2010), dmetar (Harrer et al., 2019), meta (Balduzzi et al., 2019), metaSEM (Cheung, 2015), esc (Lüdtke, 2018), ggplot2 (Wickham, 2016), and the App MetaShine (Siegel et al., 2020). The R Code of Fernández-Castilla et al. (2020) was used to graphically present the three-level meta-analyses. Our R Code is available online on OSF.

Table 1

Study characteristics for studies reporting the effect of parental BPD on child outcomes – for group comparison study design

Study characteristics				BPD group characteristics			Control group characteristics			Outcome characteristics			g
Authors (year)	Country	Publ. type	Study type	BPD assessment	Sample type	n children	Sample type	n children	Mean age child.	Metric	Assessment	Outcomes	
Abela et al. (2005)	Canada	JA	Case	SCID-II	Comm.	20	Comm.	119	10.00	dich.	K-SADS	major depression	1.09
Apter et al. (2017)	France	JA	Case	SIDP-IV	Clinical	19	Comm.	41	0.23	cont.	FFSF	look at object ⁺	0.03
/			Control						/			pos. vocalization ⁺	-0.49
Garez et al. (2014)*									0.25			neg. vocalization	-0.11
												smile ⁺	0.00
										dich.	FFSF	time spent looking at mother ⁺	0.19
												self-regulation ⁺	-0.71
Barnow et al. (2006)	Germany	JA	Cohort	SCID-II	Comm.	23	Comm.	156	15.06	cont.	TCI	novelty-seeking ⁰	-0.10
												harm avoidance ⁰	0.70
												reward dependence ⁰	0.01
											YSR	behavioural problems	0.52
												emotional problems	0.94
											SSAGA	alcohol consumption	-0.20
										dich.	RSWS	self-esteem ⁺	-1.27
											REP	death wish	0.59
												suicidal ideas/plans	0.79
												attempted suicide	0.87
Blankley et al. (2015)	Australia	JA	Case	DSM-IV crit.	Clinical	42	Comm.	14,313	<0.01	dich.	COUNT	low birth weight	0.55
Crandell et al. (2003)	UK	JA	Case	SCID-II	Comm.	8	Comm.	12	0.18	cont.	COUNT	birth weight ⁺	-0.82
Delavenne et al. (2008)	France	JA	Case	SIDP-IV	Clinical	17	Comm.	17	0.24	cont.	COUNT	time spent looking at mother ⁺	-0.33
Feldman et al. (1995)	Canada	JA	Case	DIB-R	Clinical	21	Clinical	23	9.60	cont.	FTRI	amount vocalization ⁺	-1.69
/			Control						/		K-SADS	time vocalization ⁺	-0.36
Weiss et al. (1996)*									9.50			changes of school	0.75
												mean no. of diagnosis	0.67
											CDIP	BPD	0.64
										dich.	FTRI	chronic separation	0.17
												exposure to drug or alcohol	0.83
												abusing parent	
												awareness of maternal suicide attempts	0.92
												awareness of paternal suicide attempts	1.18
												witnessed maternal suicide	0.64

Study characteristics				BPD group characteristics			Control group characteristics			Outcome characteristics			<i>g</i>		
Authors (year)	Country	Publ. type	Study type	BPD assessment	Sample type	<i>n</i> children	Sample type	<i>n</i> children	Mean age child.	Metric	Assessment	Outcomes			
Genet et al. (2018)	France	JA	Case Control	SIDP-IV	Clinical	12	Comm.	12	1.10	dich.	COUNT FES	attempt	1.36		
												witnessed paternal suicide attempt	-0.21		
												witnessed domestic violence	0.20		
												YPS placed child in any placement	0.31		
												sexual abuse	-0.61		
												physical abuse	0.19		
												neglect	1.42		
												living apart from mother	-0.15		
												cohesion ⁺	-0.18		
												expressiveness ⁺	-0.19		
												conflict	-0.24		
												independence ⁺	-0.49		
												achievement orientation ⁺	-0.08		
												intellectual-cultural orientation ⁺	-0.39		
												active-recreational orientation ⁺	-0.47		
												moral religious emphasis ⁺	-0.22		
												organization ⁺	-0.56		
												control ⁺	-0.08		
												family satisfaction ⁺	0.87		
												FSS	ADHD	0.71	
K-SADS	disruptive behaviour disorder	0.95													
SS	A attachment	-2.36													
	B attachment ⁺	0.62													
	C attachment	1.39													
	D attachment	0.08													
Gratz et al. (2014)	USA	JA	Case Control	BEST	Comm. (hr)	23	Comm. (hr)	78	1.35	cont.	Lab-TAB	self-focused ER - fear	-0.34		
/						/		/				caregiver-focused ER - fear	-0.31		
/						22		77	1.36			caregiver-focused ER - anger	-0.06		
Kiel et al. (2011)*			Cross Sectional		Comm.							emotion expression - fear	-0.01		
													emotion expression - anger	-0.22	
													SS	<u>infant distress:</u>	
														latency	-0.12
														duration	0.00
													frequency	0.18	

Study characteristics			BPD group characteristics			Control group characteristics			Outcome characteristics			<i>g</i>	
Authors (year)	Country	Publ. type	Study type	BPD assessment	Sample type	<i>n</i> children	Sample type	<i>n</i> children	Mean age child.	Metric	Assessment	Outcomes	
										dich.	SS	A attachment	0.53
												B attachment ⁺	-0.41
												C attachment	0.13
Hiraoka et al. (2016)	USA	JA	Cross Sectional	MSI-BPD	Comm. (hr)	15	Comm.	91	-	cont.	CAP	abuse potential	1.12
Hobson et al. (2005)	UK	JA	Case Control	SCID-II	Comm.	10	Comm. /	22	1.06 /	cont.	COUNT	birth weight ⁺	-0.87
/							Comm.		4.60		RISE	disinhibited behavior	1.38
Lyons-Ruth et al. (2019)*							(hr)				MSS	availability for pos. engagement ⁺	-0.97
												behavioral organization and mood state ⁺	-0.78
												amount looks ⁺	0.17
												pos. looks ⁺	-0.95
										dich.	MSS	give and take ⁺	0.40
											SS	A attachment	-0.24
												B attachment ⁺	-1.10
												C attachment	-0.24
												D attachment	1.28
Jellinek et al. (1991)	USA	JA	Cross Sectional	DSM-IV crit.	Clinical	6	Clinical	83	9.80	dich.	PSC	psychosocial dysfunction	1.76
Kueng et al. (2019)	Switzerland	JA	Case Control	SCID-II	Clinical	22	Comm.	23	20.00	dich.	K-SADS	total substance misuse	1.15
											K-SADS, DIGS	major depression	1.48
												bipolar disorder	0.64
												anxiety disorder	1.27
												ADHD	1.79
												eating disorder	0.01
												disorder of any type	1.82
											DSM-IV	BPD	1.38
Kurdziel et al. (2018)	USA	JA	Case Control	SCID-II	mixed	28	Comm.	28	15.70	cont.	PAI-BOR	BPD	1.05
Laporte et al. (2018)	Canada	JA	Cross Sectional	DIB-R	Comm. (hr)	466	Comm. (hr)	846	11.10	dich.	MCS	maltreatment	1.16
										dich.	COUNT	referred to YPS at birth	0.22
												<u>reason for referral to YPS:</u>	
												neglect	-0.12
												emotional abuse	0.09
												sexual abuse	-0.13
												physical abuse	-0.04
												abandonment	-0.16
												conduct disorder	-0.42
												YPS placed child in any placement	0.46

Study characteristics			BPD group characteristics			Control group characteristics			Outcome characteristics			<i>g</i>	
Authors (year)	Country	Publ. type	Study type	BPD assessment	Sample type	<i>n</i> children	Sample type	<i>n</i> children	Mean age child.	Metric	Assessment	Outcomes	
Laulik et al. (2016)	GB	JA	Case Control	RETR	Clinical	13	Comm. (hr)	18	-	dich.	RETR	sexual abuse	0.15
												physical abuse	1.87
												neglect	-0.85
Macfie & Kurdziel (2020)	USA	JA	Cross Sectional	SCID-II	mixed	36	Comm.	34	5.40	cont.	MCMI	maltreatment	1.16
		/	/			/	/	/	/			sexual abuse	0.62
		JA	/			30	Comm.	30	5.49			physical abuse	0.53
		/	Case			/	(hr)	/	/			neglect	1.25
Macfie & Swan (2009)		JA	Control			36	/	34	5.40		PPVT	verbal ability ⁺	-0.36
		/	/			/	Comm.	/	/		ASCT,	<u>caregiver-child relationship</u>	
		Diss	Cross			36	/	34	5.40		MSSB	<u>representation:</u>	
Mena et al. (2017)			Sectional				Comm.					role reversal	0.62
			/									fear of abandonment	0.87
			Cross									mother-child relationship	-0.70
Trupe (2013)*			Sectional									expectation ⁺	
												father-child relationship	-0.63
												expectation ⁺	
												<u>self-representation:</u>	
												negative child	0.44
												incongruent child	0.68
												shameful child	0.62
												<u>emotion regulation:</u>	
												reality/fantasy confusion	0.50
												self/fantasy confusion	0.78
												fantasy proneness	0.63
												intrusion of traumatic material	0.43
												narrative coherence ⁺	-0.63
											CBQ	neg. affectivity (anger)	0.71
												neg. affectivity (fear)	0.71
												inhibitory control ⁺	-0.63
												attentional focusing ⁺	-0.65
											EAS	responsiveness ⁺	-0.31
												involvement ⁺	-0.34
Nagel et al. (2021)	Australia	JA	Cross Sectional	DSM-IV crit.	Clinical	32	Clinical	224	0.00	dich.	COUNT	CSS involvement	1.53
Newman et al. (2007)	Australia	JA	Case Control	DIB-R	Clinical	14	Comm.	20	1.30	cont.	EAS	responsiveness ⁺	-0.76
												involvement ⁺	-1.29

Study characteristics			BPD group characteristics			Control group characteristics			Outcome characteristics			g	
Authors (year)	Country	Publ. type	Study type	BPD assessment	Sample type	<i>n</i> children	Sample type	<i>n</i> children	Mean age child.	Metric	Assessment	Outcomes	
Pare-Miron et al. (2016)	USA	JA	Cohort	RETR	Comm.	989	Comm.	8,486,903	0.00	dich.	RETR	<u>neonatal complications:</u> preterm birth (<37 weeks) IUFD small-for-gestational age	0.50 0.43 0.47
White et al. (2011)	USA	JA	Cross Sectional	SCID-IV, DIB-R	Clinical	17	Comm.	25	0.27	cont.	IBQ-R	activity level ⁺ distress to limitations neg. affect (fear) duration of orienting ⁺ smiling and laughter ⁺ high intensity pleasure ⁺ low intensity pleasure ⁺ soothability ⁺ falling reactivity ⁺ cuddliness ⁺ perceptual sensitivity ⁺ sadness approach ⁺ vocal reactivity ⁺ smiling ⁺ vocalization ⁺ motor activity ⁺ gaze aversion crying	0.05 -0.20 3.31 0.46 0.58 0.92 0.44 -1.93 0.01 -0.82 0.09 -0.55 1.00 -0.36 -0.91 -0.55 -0.03 0.13 0.20
										dich.	FF		

Note. Dependent data were separated with a slash (/). For the 2 main three-level meta-analyses positive outcomes were reversed and neutral outcomes were excluded. Unmarked outcomes were negative. BPD = borderline personality disorder; Publ. = published; child. = children; JA = journal article; Diss. = dissertation; Comm. = community; Comm. (hr) = community (high-risk); dich. = dichotomous; cont. = continuous.

Parental BPD assessments: SCID = Structured Clinical Interview for DSM; PAI-BOR = Personality Assessment Inventory - Borderline Features Scale; BSL-23 = Borderline Symptom List-23;

MCMI = The Millon Clinical Multiaxial Inventory; BSI = Borderline Symptom Inventory; IPDE = International Personality Disorder Examination; MBPS = Minnesota Borderline Personality Scale;

MSI-BPD = McLean Screening Instrument for Borderline Personality Disorder; BEST = Borderline Evaluation of Severity over Time.

Children outcome assessments: K-SADS = Schedule for Affective Disorders and Schizophrenia for School-Age Children; CASQ = Childrens Attributional Style Questionnaire; SEQ = Childrens

Self-Esteem Questionnaire; CDAS-R = Childrens Dysfunctional Attitudes Scale-Revised; CDEQ = Childrens Depressive Experiences Questionnaire; IPPA = Inventory of Parent and Peer

Attachment; RSSC = Reassurance-Seeking Scale for Children; CBCL = Child Behavior Checklist; DESPD = Diagnostic Expert System for Psychiatric Disorders; SDQ = Strengths and Difficulties Questionnaire; YSR = Youth Self Report; ASR = Adult Self Report; EDI = Eating Disorder Inventory; UCLA LSI = Life Stress Interview; TRF = Teacher Report of Youth Interpersonal Functioning; CAP = Child Abuse Potential Inventory; PBYA = Personality Booklet Youth-Abbreviated; EAS = Emotional Availability Scale; HAR = Harter Self-Perception; ATT = Bartholomew Attachment; TBAQ = Toddler Behavior Assessment Questionnaire; SSRS = Social Skills Rating System; IUFD = Intrauterine fetal demise.

* Dependent studies. ⁺ Positive outcomes. ⁰ Neutral outcomes. - Data was not reported.

Table 2*Study characteristics for studies reporting the effect of parental BPD on child outcomes – for correlational study design*

Study characteristics					Parents charact.		Children charact.		Outcome characteristics			<i>r</i>
Authors (year)	Country	Publ. type	Study type	Sample type	BPD assessment	<i>n</i>	<i>n</i>	Mean age	Metric	Assessment	Outcomes	
Abela et al. (2005)	Canada	JA	Case Control	Comm. (hr)	SCID-II	102	140	10.0	cont.	K-SADS	major depression	.40
										CASQ	depressogenic attributional style	.24
										CRSQ	rumination	.26
										SEQ	low self esteem	.12
										CDAS-R	dysfunctional attitudes	.22
										CDEQ	dependency	.12
											self-criticism	.22
										IPPA	insecure attachment	.24
										RSSC	reassurance seeking	.20
Barends (2008)	USA	Diss	Cross Sectional	mixed	PAI-BOR	75	75	2.8	cont.	-	pos. child behavior ⁺	.07
										-	neg. child behavior	.11
Barnow et al. (2013)	Germany	JA	Cohort	Comm.	SCID-II	132	165	15.1	cont.	CBCL	behavioral problems	.51
Bartsch (2019)	Australia	Diss	Cross Sectional	Comm.	BSL-23	64	64	9.9	cont.	DESPD	BPD symptoms	.22
										SDQ	psychopathology	.17
											internalizing symptoms	.15
											externalizing symptoms	.12
Bertino et al. (2012)	Australia	JA	Cross Sectional	Clinical	MCMI-III	59	59	10.8	cont.	CBCL, YSR, ASR	internalizing disorder	.06
Breaux et al. (2016)	USA	JA	Cohort	Comm. (hr)	MCMI-III	109	109	3.7	cont.	-	externalizing disorder	.28
Brunton et al. (2005)	GB	JA	Cross Sectional	Comm.	BSI	15	15	20.1	cont.	EDI	neg. affect	.25
											drive for thinness	.02
											bulimia	-.06
											body dissatisfaction	-.09
Conway et al. (2015)	Australia	JA	Cohort	Comm. (hr)	SCID-Q	812	812	15.2	cont.	K-SADS	internalizing disorder	.09
/			/			/	/	/			externalizing disorder	.14
Herr et al. (2008)*			Cross Sectional			815	815	15.0		UCLA LSI	close friendship stress	.07
											romantic relationship stress	.02
											peer relationship stress	.07
											family relationship stress	.14
											academic performance stress	.07
											school behavior stress	.10
											acute stressful life events	.02
										HAR	self-perception - close friendship ⁺	-.12
											self-perception - social acceptance ⁺	-.13

Study characteristics					Parents charact.		Children charact.		Outcome characteristics			<i>r</i>
Authors (year)	Country	Publ. type	Study type	Sample type	BPD assessment	<i>n</i>	<i>n</i>	Mean age	Metric	Assessment	Outcomes	
											popularity ⁺	-.09
										TRF	rejected	.08
										ATT	secure attachment ⁺	-.10
											dismissing attachment	.05
											preoccupied attachment	.05
											fearful attachment	.15
Distel et al. (2009)	Netherlands	JA	Cross Sectional	Comm.	PAI-BOR	3,064	4,953	33.7	cont.	PAI-BOR	BPD symptoms	.13
Dittrich et al. (2018)	Germany	JA	Cross Sectional	Comm. (hr)	IPDE	114	114	8.0	cont.	TRF	psychopathology	.23
Fatimah et al. (2020) – biol.	USA	JA	Cohort	Comm.	MBPS	788	788	14.9	cont.	CAP	abuse potential	.31
Fatimah et al. (2020) – adopt.	USA	JA	Cohort	Comm.	MBPS	409	409	14.9	cont.	PBYA, MBPS	BPD symptoms	.15
Hatzis et al. (2019)	Australia	JA	mixed	mixed	PAI-BOR	51	51	-	cont.	PBYA, MBPS	BPD symptoms	.15
Hiraoka et al. (2016)	USA	JA	Cross Sectional	Comm. (hr)	PAI-BOR	51	51	-	cont.	EAS	responsiveness ⁺	-.19
Kaufman et al. (2020)	USA	JA	Cohort	Comm. (hr)	MSI-BPD	106	106	-	cont.	CAP	abuse potential	.70
/					IPDE	512	512	15.0	cont.	IPDE	BPD symptoms	.02
Zalewski et al. (2014)*										EASTS	neg. emotionality	-.13
Newman-Morris et al. (2020)	Australia	JA	Case Control	mixed	BSL-23	61	61	5.3	cont.	SSRS	lack of self-control	.30
Strimpfel (2017)	USA	Diss	Cross Sectional	Comm.	PAI-BOR	76	76	19.5	cont.	EAS	responsiveness ⁺	-.27
											involvement ⁺	-.21
										PAI-BOR	affective instability	.00
											identity disturbance	.10
											neg. relationships	.17
											self-harm	.11
											BPD symptoms	.11
Trupe (2013)	USA	Diss	Cross Sectional	mixed	PAI-BOR	70	70	5.4	cont.	EAS	responsiveness ⁺	-.27
											involvement ⁺	-.24
Whalen et al. (2015)	USA	JA	Cross Sectional	mixed	BEST	101	101	1.4	cont.	Lab-TAB, TBAQ	emotion expression (fear)	-.03
Wilson & Durbin (2012)	USA	JA	Cross Sectional	Comm.	IPDE	113	113	4.5	cont.	-	emotion expression (anger)	-.12
											social bids ⁰	-.09
											influence bids ⁰	-.05
											responsiveness to bids ⁺	.02

Note. Dependent data were separated with a slash (/). For the 2 main three-level meta-analyses positive outcomes were reversed and neutral outcomes were excluded. Unmarked outcomes were negative. charact. = characteristics; Publ. = published; BPD = borderline personality disorder; JA = journal article; Diss = dissertation; Comm. = community; Comm. (hr) = community (high-risk); cont. = continuous. dich. = dichotomous; biol. = biological children; adopt. = adopted children.

Parental BPD assessments: SCID = Structured Clinical Interview for DSM; PAI-BOR = Personality Assessment Inventory - Borderline Features Scale; BSL-23 = Borderline Symptom List-23; MCMI = The Millon Clinical Multiaxial Inventory; BSI = Borderline Symptom Inventory; IPDE = International Personality Disorder Examination; MBPS = Minnesota Borderline Personality Scale; MSI-BPD = McLean Screening Instrument for Borderline Personality Disorder; BEST = Borderline Evaluation of Severity over Time.

Children outcome assessments: K-SADS = Schedule for Affective Disorders and Schizophrenia for School-Age Children; CASQ = Childrens Attributional Style Questionnaire; SEQ = Childrens Self-Esteem Questionnaire; CDAS-R = Childrens Dysfunctional Attitudes Scale-Revised; CDEQ = Childrens Depressive Experiences Questionnaire; IPPA = Inventory of Parent and Peer Attachment; RSSC = Reassurance-Seeking Scale for Children; CBCL = Child Behavior Checklist; DESPD = Diagnostic Expert System for Psychiatric Disorders; SDQ = Strengths and Difficulties Questionnaire; YSR = Youth Self Report; ASR = Adult Self Report; EDI = Eating Disorder Inventory; UCLA LSI = Life Stress Interview; TRF = Teacher Report of Youth Interpersonal Functioning; CAP = Child Abuse Potential Inventory; PBYA = Personality Booklet Youth-Abbreviated; EAS = Emotional Availability Scale; HAR = Harter Self-Perception; ATT = Bartholomew Attachment; TBAQ = Toddler Behavior Assessment Questionnaire; EASTS = Emotionality, Activity, and Sociability Temperament Survey; SSRS = Social Skills Rating System.

* Dependent studies. ⁺ Positive outcomes. ⁰ Neutral outcomes. - Data was not reported.

We interpreted effect sizes according to well-established conventions (Cohen, 1988; Rosenthal, 1996). For the adjusted standardized mean difference (Hedges g): An effect size of 0.20 to 0.49 will be considered a small effect, 0.50 to 0.79 a moderate effect, 0.80 to 1.29 a large effect, and over 1.30 a very large effect. For correlations (Pearson r): An effect size of 0.10 to 0.29 will be considered a small effect, 0.30 to 0.49 a moderate effect, 0.50 to 0.69 a large effect, and over 0.70 a very large effect.

All p -value-based inferences were made on an alpha level of .05 (two-tailed) excepting Begg & Mazumdar's (1994), Sterne and Egger's (2005), and Ioannidis and Trikalinos' (2007) tests, as well as p -curve and p -uniform where we assumed a one-tailed alpha level of .10.

Because one study accounted for a substantial portion of our N (Pare-Miron et al., 2016; $N = 8,487,892$), we performed a sensitivity analysis without this leverage point. We performed subgroup analyses for different study characteristics such as publication type, study type, child age, type of parental BPD measure, sample type, given comorbidities, metric of the outcome, and whether the study assessed only one child per parent. In addition, we conducted subgroup analyses for child outcomes for which two or more independent effect sizes were available. We combined them into topics and analysed them as well with two-level and three-level REML meta-analyses.

Heterogeneity

Heterogeneity across study outcomes within two-level meta-analyses was assessed using the I^2 statistic, where 0 to 15% might be trivial, 25 to 50% may represent moderate heterogeneity, 50 to 75% may represent substantial heterogeneity, and 75% to 100% represent considerable heterogeneity (Higgins et al., 2022). Because an overall I^2 is not informative for three-level meta-analyses (Harrer et al., 2019), we rather inspect the variance components for the different levels. Level 1 stands for the sampling error variance. Level 2 represents the within cluster heterogeneity, i.e., the variability of effect sizes within dependent studies/study groups. Level 3 reflects the between cluster heterogeneity, i.e., the variability of effect sizes between independent studies/study groups.

Publication bias

There is good evidence that unpublished scientific results may deviate systematically from published results due to selective publishing (Dickersin, 2005; Song et al., 2000). The current scientific reward system encourages the publication of novel, significant, and hypothesis-conforming results (Fanelli, 2012; Ioannidis, 2005a, 2005b). As a result, replicated, non-significant, and non-conforming results sometimes remain unpublished (Cooper et al., 1997).

We used seven tests to detect possible influences of publication bias. Using multiple tests is important because they all have different strengths and weaknesses. First and second, we applied two formal statistical tests for funnel plot asymmetry: Begg and Mazumdar's rank-order correlation (1994) and Egger's regression (Sterne & Egger, 2005). Both methods test for the relationship between the strength of an effect size and its precision. A given relationship usually implies asymmetry in the funnel plot, which in turn may be an indication of publication bias. Third, trim-and-fill analysis was implemented (Duval & Tweedie, 2000a, 2000b). This method aims to adjust the overall effect estimate by estimating potentially missing studies due to publication bias in the funnel plot.

Further, three methods based on *p*-values were used: *p*-curve (Simonsohn et al., 2014a, 2014b), *p*-uniform (van Assen et al., 2015), and *p*-uniform* (van Aert et al., 2016). These methods are based on the statistical assumption that *p*-value distribution as a function of true effect size should be uniform. If the *p*-curve is left-skewed and consists of many *p*-values that are close to the .05 significance level, this could be an indication of *p*-hacking. As an extension of the two very similar methods, *p*-uniform* leads to a more efficient estimator, eliminates effect size overestimation, and allows testing for the presence of between-study variance. Finally, we tested for excess significance following the approach of Ioannidis and Trikalinos (2007). The test can be used to check whether the observed number of significant results is greater than the number of significant results expected given their (average) post-hoc power. An excess of observed significant results may indicate that the results of the included studies are not representative of all studies conducted on this topic.

Final sample

We retrieved 2,562 records: 2,556 from the database search and 6 from Eyden et al. (2016) and Petfield et al. (2015). After screening, a total of 183 studies were identified as potentially relevant for inclusion. However, 131 studies had to be excluded from analysis because of irrelevant independent or dependent variable (e.g., no parental BPD, no child outcomes), insufficiently reported statistical information (e.g., omnibus *F*-values only), irrelevant design (e.g., no primary study, no quantitative data), or dependency. This yields a total number of 46 included studies reporting the results of 36 independent samples and 8,513,136 children. There are fewer independent samples than included studies because multiple dependent studies were included when they reported different outcomes.

From the 46 studies, 17 had a correlational design, 25 a group comparison design, and 4 had both. Studies with correlational design ($k = 21$) had 8,796 subjects, studies with group comparison design ($k = 29$) had 1,832 in the BPD groups and 8,503,087 in the control groups.

We extracted 173 outcomes measured by 53 different assessments. Included studies were conducted over a timespan of 30 years. The first included publication was published in 1991 (Jellinek et al., 1991) and the most recent study in 2021 (Nagel et al., 2021). Study characteristics are shown in Table 1 for studies with correlational design and Table 2 for studies with group comparison design. These tables also present all outcomes along with their effect size, metric, measure, and valence. Though not included in the analyses, neutral outcomes were also displayed for completeness. For even more details see our data set online on OSF.

Results

Parental BPD and negative child outcomes

Analysis of the 21 independent studies with group comparison study design and 145 effect sizes (Hedges g) yielded a moderate effect of $g = 0.651$ ($p < .001$; 95% CI [0.428, 0.873]) in favour of the control group over the parental BPD group. Children from parents with BPD experienced negative child outcomes more often or had higher mean values on negative outcome scales than children from the control group.

Analysis of the 20 independent studies with correlational study design and 61 effect sizes (correlation coefficient r) yielded a small correlation of $r = .175$ ($p < .001$; 95% CI [0.099, 0.252]) between parental BPD and negative child outcomes.

For more statistical information on the two main analyses, see Tables 3 and 4. The two forest plots are presented in Figures 2 and 3.

Subgroup analyses

In addition to the overall results, Tables 3 and 4 also include the results of subgroup analyses for various study characteristics. Across both study designs, published studies and studies with a case control design reported higher effect sizes than unpublished studies ($g = 0.653$ vs. 0.325 ; $r = .177$ vs. $.157$) or studies with cross sectional/cohort design ($g = 0.693$ vs. $0.456/0.580$; $r = .227$ vs. $.175/.099$).

There were also differences between the two study designs: Studies with group comparison design reported higher effect sizes when only index children were included and not siblings ($g = 0.707$ vs. 0.444), which was the other way round for studies with correlational design ($r = .171$ vs. $.186$). When parental BPD was rather assessed with a (semi-) structured clinical diagnostic interview than a self-report questionnaire, effect size was higher ($g = 0.626$ vs. 0.521) than in the overall condition for group comparison studies. This was the other way round for correlational studies ($r = .169$ vs. $.184$). For group comparison studies clinical and mixed sample types had the highest effect sizes (BPD group: clinical

Table 3

Effect sizes and variance components for the effect of parental BPD on child outcomes (three-level REML meta-analyses) overall and split by subgroup (study characteristics) – for group comparison study design

Variable	<i>k</i>	<i>I</i>	Variance components			<i>g</i>	<i>LCI</i>	<i>UCI</i>	<i>p</i>
			Level 1	Level 2	Level 3				
Overall	145	21	15.8	33.1	51.1	0.651	0.428	0.873	<.001
Publication type									
Journal Article	143	21	15.7	33.5	50.8	0.653	0.430	0.876	<.001
Dissertation	2	1	100.0	<.1	<.1	0.325	-1.814	2.465	.304
Study type									
Cross sectional	44	7	6.0	65.2	28.8	0.456	-0.034	0.946	.063
Case Control	91	14	43.4	0.5	56.2	0.693	0.431	0.954	<.001
Cohort	10	2	17.5	82.5	<.1	0.580	-0.931	2.091	.129
Only index children									
Yes	101	17	18.4	37.4	44.3	0.707	0.441	0.972	<.001
No, siblings too	44	4	14.7	31.4	53.9	0.444	-0.180	1.068	.108
Child age									
Children (<18)	137	20	16.5	38.0	45.5	0.596	0.383	0.809	<.001
Adults (≥ 18)	0	0							
Mixed	8	1	100.0	<.1	<.1	1.397	-1.435	4.229	.101
Parental BPD measure ^a									
(Semi-) structured clinical diagnostic Interview	126	15	18.5	40.7	40.8	0.626	0.376	0.876	<.001
Self-report questionnaire	13	2	9.7	<.1	90.3	0.521	-6.630	7.672	.525
Sample type - BPD group									
Community	26	5	6.5	1.4	92.1	0.501	0.177	0.826	.013
Community (high-risk)	22	5	9.7	<.1	90.3	0.495	-0.246	1.236	.137
Clinical	72	10	4.4	<.1	95.6	0.763	0.332	1.194	.003
Mixed	25	2	49.1	<.1	50.9	0.797	-1.916	3.511	.167

Variable	k	I	Variance components			g	LCI	UCI	p
			Level 1	Level 2	Level 3				
Sample type - control group									
Community	82	15	18.5	40.7	40.8	0.631	0.388	0.875	<.001
Community (high-risk)	30	4	9.7	<.1	90.3	0.364	-0.386	1.114	.220
Clinical	33	4	4.4	<.1	95.6	1.023	-0.067	2.113	.058
Mixed	0	0							
Comorbidities BPD group									
Yes	47	6	58.7	28.3	13.0	0.629	0.306	0.952	.004
No (or not given)	98	15	10.1	30.1	59.8	0.659	0.354	0.964	<.001
Metric outcome									
Continuous	82	12	24.7	43.6	31.7	0.495	0.233	0.757	.002
Dichotomous	63	16	13.7	22.0	64.3	0.678	0.413	0.942	<.001

Note. The sum of *I* values in subgroup analyses may differ from the overall *I* due to interdependencies between subgroups. *k* = number of all effect sizes included; *I* = number of independent studies.

^a Six studies had no information about used measurements and therefore were excluded.

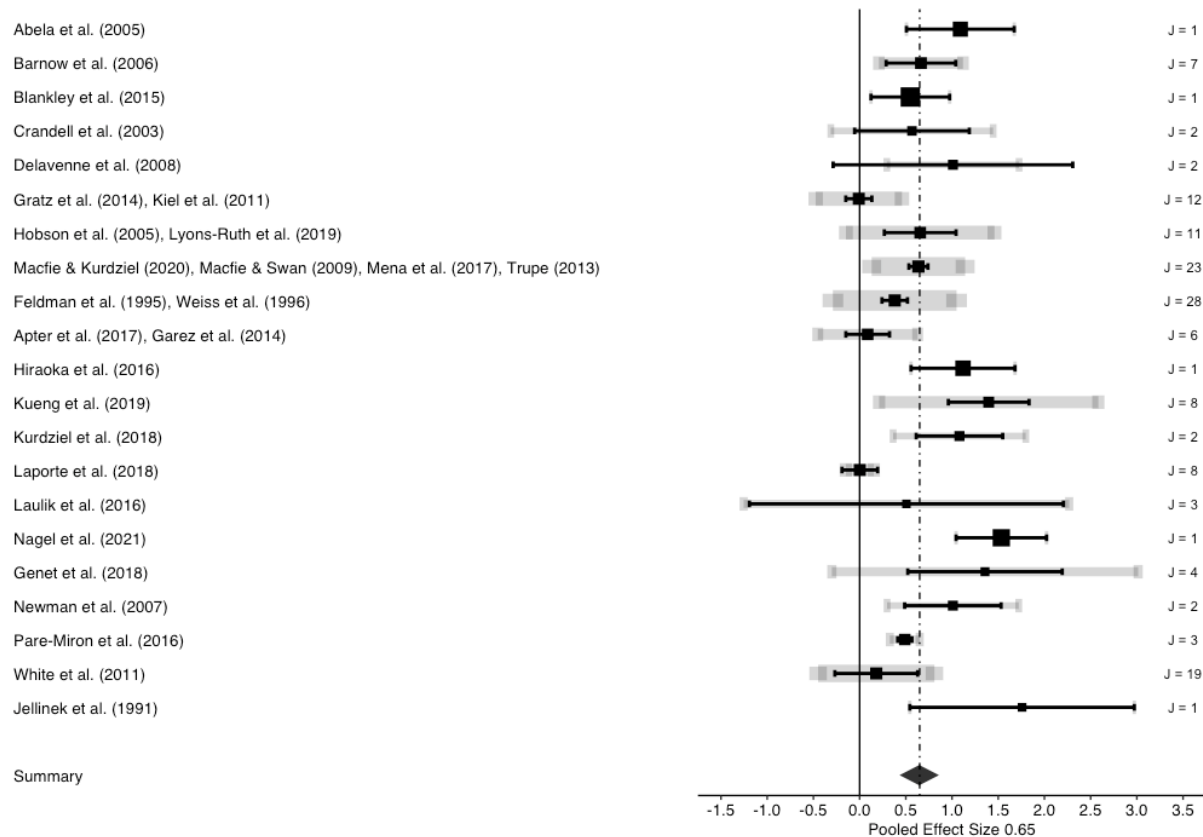
Table 4

Effect sizes and variance components for the effect of parental BPD on child outcomes (three-level REML meta-analyses) overall and split by subgroup (study characteristics) – for correlational study design

Variable	<i>k</i>	<i>I</i>	Variance components			<i>r</i>	<i>LCI</i>	<i>UCI</i>	<i>p</i>
			Level 1	Level 2	Level 3				
Overall	61	20	10.0	18.1	71.9	.175	0.099	0.252	<.001
Publication type									
Journal Article	48	16	6.2	12.0	81.8	.177	0.076	0.273	.002
Dissertation	13	4	60.5	39.5	<.1	.157	0.021	0.286	.035
Study type									
Cross sectional	33	12	5.9	0.5	93.6	.175	0.030	0.312	.023
Case Control	11	2	100.0	<.1	<.1	.227	-0.114	0.521	.075
Cohort	16	6	16.8	83.2	<.1	.099	0.036	0.161	.010
Only index children									
Yes	50	17	8.5	15.5	76.0	.171	0.078	0.262	.001
No, siblings too	11	3	54.7	11.0	34.3	.186	0.022	0.340	.040
Child age									
Children (<18)	52	17	9.0	16.5	74.4	.190	0.102	0.275	<.001
Adults (≥ 18)	9	3	100.0	<.1	<.1	.127	0.068	0.184	.011
Mixed	0	0							
Parental BPD measure									
(Semi-) structured clinical diagnostic Interview	16	5	22.0	58.8	19.3	.169	0.030	0.301	.028
Self-report questionnaire	45	15	6.5	1.4	92.1	.184	0.078	0.287	.002
Sample type									
Community	16	8	100.0	<.1	<.1	.131	0.103	0.159	<.001
Community (high-risk)	33	6	2.6	5.5	91.9	.276	-0.006	0.517	.054
Clinical	2	1	68.9	31.1	<.1	.172	-0.854	0.925	.369
Mixed	10	5	32.0	66.0	2.0	.158	-0.028	0.334	.078

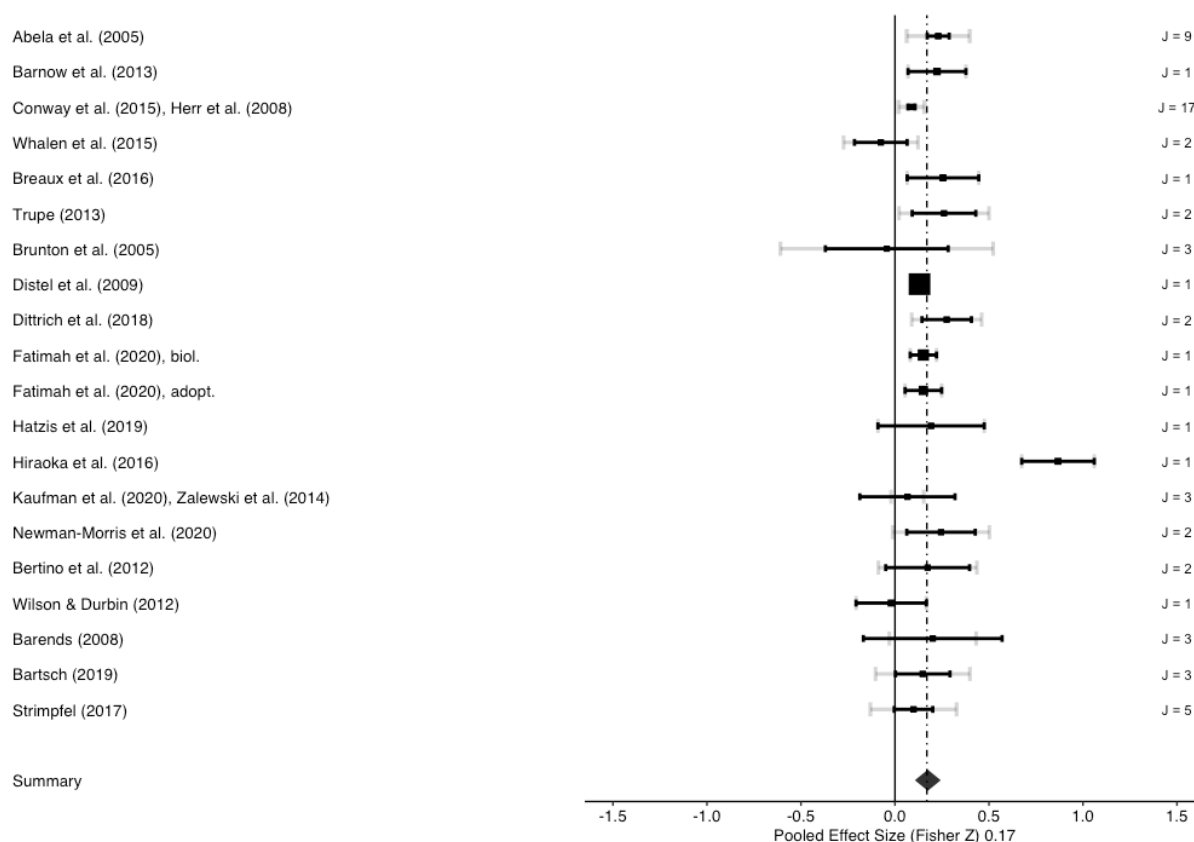
Variable	<i>k</i>	<i>I</i>	Variance components			<i>r</i>	<i>LCI</i>	<i>UCI</i>	<i>p</i>
			Level 1	Level 2	Level 3				
Comorbidities									
Yes	21	10	7.2	33.9	58.9	.171	0.019	0.315	.032
No (or not given)	40	10	24.4	5.1	70.5	.172	0.093	0.249	<.001

Note. All negative and reversed positive child outcomes were included in the analyses. Subgroup analysis for metric outcome in continuous three-level meta-analysis is not meaningful because only one metric is given (continuous). The sum of *I* values in subgroup analyses may differ from the overall *I* due to interdependencies between subgroups. *k* = number of all effect sizes included; *I* = number of independent studies.

Figure 2*Forest plot for overall effect sizes – group comparison study design*

Note. Forest Plot for three-level REML meta-analysis for studies with group comparison study design. Diamond represents summary effect (Hedges g). A positive effect size indicates more negative child outcomes in the BPD group than in the control group. Black lines represent effect size and CIs of individual meta-analyses within the study/-group (per row). The size of the black squares represents the weight of the study/-group within the whole meta-analysis. Grey lines reflect sampling variance (median precision) of individual observed effect sizes within the studies/study-groups. The thickness of the grey lines is proportional to the number of effect sizes reported within studies/study-groups. J = number of dependent effect sizes within each study/-group.

$g = 0.763$, mixed $g = 0.797$; Control group: clinical $g = 1.023$), whereas community (high-risk) was the condition with the highest effect size in correlational studies ($r = .276$). The metric of the outcomes in group comparison studies also played a role: the analysis with dichotomous outcomes (the outcomes which were transformed from Odds Ratio to Hedges g) showed a higher effect than the analysis with continuous outcomes. None of the differences between subgroups were significant.

Figure 3*Forest plot for overall effect sizes – for correlational study design*

Note. Forest Plot for three-level REML meta-analysis for studies with correlational study design. Diamond represents summary effect (Fisher z). Transforming Fisher z back to the correlation coefficient r yields 0.168. A positive effect size indicates a positive correlation between parental BPD and negative child outcomes. Black lines represent effect size and CIs of meta-analyses within the study/-group (per row). The size of the black squares represents the weight of the study/-group within the whole meta-analysis. Grey lines reflect sampling variance (median precision) of individual observed effect sizes within the studies/study-groups. The thickness of the grey lines is proportional to the number of effect sizes reported within studies/study-groups. biol. = biological children; adopt. = adopted children; J = number of dependent effect sizes within each study/-group.

We performed subgroup analyses for each outcome that occurred at least twice in two independent studies. Statistics and heterogeneity parameters are displayed in Tables 5 and 6. In group comparison studies the effect sizes ranged from $g = 0.144$ ('C attachment style') to $g = 1.309$ ('D attachment style') for negative child outcomes and from $g = -1.053$ ('B attachment style') to $g = 0.070$ ('looking at mother') for positive child outcomes. Across all outcomes, the direction of effect sizes indicates that children in the BPD parent group

experience negative outcomes more frequently and positive outcomes less frequently than children in the control group (except for the outcomes ‘looking at mother’ and ‘C attachment style’, where the effect sizes were below the threshold, respectively $g = 0.070$ and $g = 0.144$). In correlational studies the effect sizes ranged from $r = .088$ to $r = .531$ for negative child outcomes and were the same for the two positive child outcomes ($r = -.226$). Only one outcome (‘internalizing disorder’) had an effect size below the threshold ($r = .088$). These results suggest that parental BPD is positively associated with negative child outcomes and negatively associated with positive child outcomes.

The combined meta-analyses were generated in an attempt to organize the many heterogeneous results into superordinate topics. They are intended to provide further insight into the data and do not claim to be complete. Therefore, these analyses are marked as exploratory. Tables 5 and 6 show which results were combined into topics. ICD10-F diagnoses could be meaningfully combined for studies with group comparison and correlational study design. General neglect, substance use, and any YPS/CSS involvement were topics applied only for studies with group comparison design. For ICD10-F diagnoses, general neglect, and any YPS/CSS involvement in studies with group comparison design the effect sizes were higher than in the overall condition ($g = 1.022, 0.710, 0.751$; overall $g = 0.651$). The substance use condition for group comparison design and the ICD10-F diagnoses condition for the correlational design had smaller effect sizes than the overall condition ($g = 0.351, r = .152$; overall $r = .175$). For more information on the statistics of the analyses, see Tables C1, C2, and C3 in Appendix C. To enhance clarity, the 2-level and 3-level analyses were presented in separate tables.

Although differences in effect sizes across subgroups exist, all effect sizes, with only few exceptions, suggest a negative impact of parental BPD on child outcomes.

Sensitivity analyses

We repeated the analysis for group comparison studies without the leverage point Pare-Miron et al. (2016), because this study accounted for a substantial portion of our N ($N = 8,487,892$). The effect size remained almost the same ($k = 142, J = 20, g = 0.666, p < .001$; 95% CI [0.429, 0.903], $Var_{Lv11} = 17.7\%$, $Var_{Lv12} = 32.3\%$, $Var_{Lv13} = 50.0\%$) and the difference was not significant.

Publication bias

We calculated publication bias methods for our biggest meta-analysis with independent data (studies with correlational study design and BPD as outcome; $k = 5$). All other meta-analyses with independent data were too small ($k < 5$) to perform publication bias methods.

Table 5

Effect sizes for subgroup analyses (for independent studies where $k \geq 2$; two-level REML meta-analyses) and superordinate topics – for group comparison study design

Topic and outcome	<i>k</i>	<i>N</i>	<i>I</i> ²	<i>Q</i>	<i>g</i>	<i>LCI</i>	<i>UCI</i>	<i>p</i>	Authors
ICD-10F Diagnoses									
F32 depressive episodes	2	184	<0.1	0.344	1.168	0.645	1.690	<.001	Abela et al. (2005), Kueng et al. (2019)
F60.3 BPD	3	145	<0.1	1.617	0.916	0.533	1.299	<.001	Weiss et al. (1996), Kurdziel et al. (2018), Kueng et al. (2019)
F90 attention deficit disorder	2	89	37.1	1.590	1.224	0.348	2.1	.006	Weiss et al. (1996), Kueng et al. (2019)
Parental abuse/YPS involvement									
Maltreatment	2	126	<0.1	0.000	1.159	0.723	1.595	<.001	Kurdziel et al. (2018), Macfie & Kurdziel (2020)
Sexual abuse	4	1,457	58.5	7.412	0.219	-0.245	0.683	.354	Weiss et al. (1996), Laulik et al. (2016), Laporte et al. (2018), Macfie & Kurdziel (2020)
Physical abuse	4	1,457	91.7	16.475	0.336	-0.551	1.223	.457	Weiss et al. (1996), Laulik et al. (2016), Laporte et al. (2018), Macfie & Kurdziel (2020)
Neglect	4	1,457	88.4	27.668	0.268	-0.511	1.046	.501	Weiss et al. (1996), Laulik et al. (2016), Laporte et al. (2018), Macfie & Kurdziel (2020)
YPS placement	2	1,356	0.0	0.398	0.452	0.3	0.604	<.001	Weiss et al. (1996), Laporte et al. (2018)
Negative Affect									
Anger	2	171	86.5	7.409	0.244	-0.661	1.149	.597	Gratz et al. (2014), Mena et al. (2017)
Fear	3	213	97.1	39.246	1.301	-0.639	3.241	.189	White et al. (2011), Gratz et al. (2014), Mena et al. (2017)
Attachment styles ^a									
A attachment	3	157	<0.1	0.955	0.504	-0.032	1.041	.065	Hobson et al. (2005), Gratz et al. (2014), Genet et al. (2018)
B attachment ⁺	3	157	67.9	5.827	-1.053	-2.031	-0.076	.035	Hobson et al. (2005), Gratz et al. (2014), Genet et al. (2018)
C attachment	3	157	<0.1	0.458	0.144	-0.456	0.745	.638	Hobson et al. (2005), Gratz et al. (2014), Genet et al. (2018)
D attachment	2	56	<0.1	0.013	1.309	0.474	2.144	.002	Hobson et al. (2005), Genet et al. (2018)
Child reaction to conversation									
Responsiveness ⁺	2	104	10.7	1.120	-0.458	-0.873	-0.042	.031	Newman et al. (2007), Trupe (2013)
Involvement ⁺	2	104	78.1	4.564	-0.773	-1.698	0.152	.102	Newman et al. (2007), Trupe (2013)
Smile ⁺	2	102	64.7	2.836	-0.376	-1.251	0.499	.400	White et al. (2011), Apter et al. (2017)
Looking at mother ⁺	3	112	<0.1	1.043	0.070	-0.338	0.477	.737	Crandell et al. (2003), Hobson et al. (2005), Garex et al. (2014)

Topic and outcome	<i>k</i>	<i>N</i>	<i>I</i> ²	<i>Q</i>	<i>g</i>	<i>LCI</i>	<i>UCI</i>	<i>p</i>	Authors
Birth outcomes									
Birth weight ⁺	3	14,407	83.5	14.560	-0.323	-1.288	0.642	.512	Crandell et al. (2003), Hobson et al. (2005), Blankley et al. (2015)

k = number of all effect sizes included; YPS = Youth Protection Service.

^a Attachment styles after Ainsworth (1982). ⁺ positive outcome.

Table 6

Effect sizes for subgroup analyses (for independent studies where $k \geq 2$; two-level REML meta-analyses) and superordinate topics – for correlational study design

Topic and outcome	k	N	I^2	Q	r	LCI	UCI	p	Authors
ICD-10F Diagnoses									
General Psychopathology	2	178	<0.1	0.154	.209	0.063	0.361	.005	Dittrich et al. (2018), Bartsch (2019)
Externalizing Disorders	2	871	11.3	1.128	.156	0.066	0.249	.001	Bertino et al. (2012), Conway et al. (2015)
Internalizing Disorders	2	871	<0.1	0.048	.088	0.022	0.155	.009	Bertino et al. (2012), Conway et al. (2015)
F60.3 BPD	6	6,903	43.5	8.116	.125	0.081	0.171	<.001	Distel et al. (2009), Barnow et al. (2013), Strimpfel (2017), Fatimah et al. (2020), Fatimah et al. (2020), Kaufman et al. (2020)
Child reaction to conversation									
Responsiveness ⁺	4	295	44.5	5.275	-.226	-0.325	-0.005	.043	Wilson & Durbin (2012), Trupe (2013), Hatzis et al. (2019), Newman-Morris et al. (2020)
Involvement ⁺	2	131	<0.1	0.031	-.226	-0.405	-0.055	.010	Trupe (2013), Newman-Morris et al. (2020)
Parental abuse									
Abuse potential	2	220	93.8	16.23	.531	0.051	1.131	.032	Hiraoka et al. (2016), Dittrich et al. (2018)

k = number of all effect sizes included.

⁺ positive outcome.

According to the Cochrane Collaboration (Higgins et al., 2022) it is recommended to include a minimum of 10 studies into the meta-analysis to perform tests for funnel plot asymmetry. When k becomes too small, the power of the tests becomes too low to distinguish chance from true asymmetry (Higgins et al., 2022). Therefore, we will focus on the other methods, especially because regression tests have an advantage over other tests when small meta-analyses are conducted (Lin et al., 2018). We present the different methods for publication bias and their results in Table 7. We also show the funnel plot in Figure 4.

The first binomial test for distribution of significant p -values was non-significant. This means, that the distribution is left skewed and therefore, that large p -values are more numerous than expected. This could be interpreted as evidence of p -hacking - researchers may have attempted to obtain p -values that are just below .05 (Siegel et al., 2020). No indication of bias was found in the other tests.

Discussion

Interpretation and Integration of the findings

Our analyses indicate a negative effect of parental BPD on child outcomes, consistent with previous reviews (Eyden et al., 2016; Florange & Herpertz, 2019; Petfield et al., 2015; Stepp et al., 2012). The two main analyses showed a small (correlational studies) and a moderate (group comparison studies) effect. Excluding one leverage point did not affect the results. The subgroup analyses showed small to large effects, apart from three analyses that showed no effect. Across both study designs, effect sizes were larger when only published studies were included. Additionally, it must be considered that there was some evidence of effect inflation, possibly indicating publication bias. Therefore, the calculated effect size may represent an upper threshold for the true effect.

The analyses demonstrate the negative impact of parental BPD on child outcomes at many stages of child development, which in turn may pose a risk for future psychopathology (Winsper & Wolke, 2014). Fittingly, our subgroup-analyses showed that children with parents with BPD were more likely to have ICD-10F diagnoses at 10, 16, and 20 years than children from the control groups (Abela et al., 2005; Kueng et al., 2019; Kurdziel et al., 2018; Weiss et al., 1996). Both the overall analysis for ICD-10F diagnoses and the individual analyses for depressive episodes, BPD, and attention deficit disorder showed large effect sizes. The correlational studies, which investigated 8- to 33-year-old children, showed effects of parental BPD on child outcomes as well, but the effect sizes were rather small, especially for internalizing disorders. On the one hand, this could indicate that children of parents with BPD are not more likely to develop internalizing disorders than children of parents without BPD.

Table 7*Publication bias methods*

Method (Authors, year)	Results
Begg & Mazumdar's (1994) rank correlation	$p = .483$
Sterne & Egger's (2005) regression	$p = .624$
Trim-and-Fill (Duval & Tweedie, 2000a; 2000b)	17% change
P-curve (Simonsohn et al., 2014a; 2014b)	
Studies contain evidential value:	
Binomial	$p = .063$
Full p-curve	$p < .001$
Half p-curve	$p < .001$
Studies evidential value is inadequate:	
Binomial	$p > .999$
Full p-curve	$p > .999$
Half p-curve	$p > .999$
P-uniform (van Aert et al., 2016; van Assen et al., 2015)	$p = .831$
P-uniform* (van Aert et al., 2016; van Assen et al., 2015)	$p = .418$
Test of Excess Significance (Ioannidis & Trikalinos, 2007)	$p = .899$

Note. Only published studies were used for the analyses ($k = 5$).

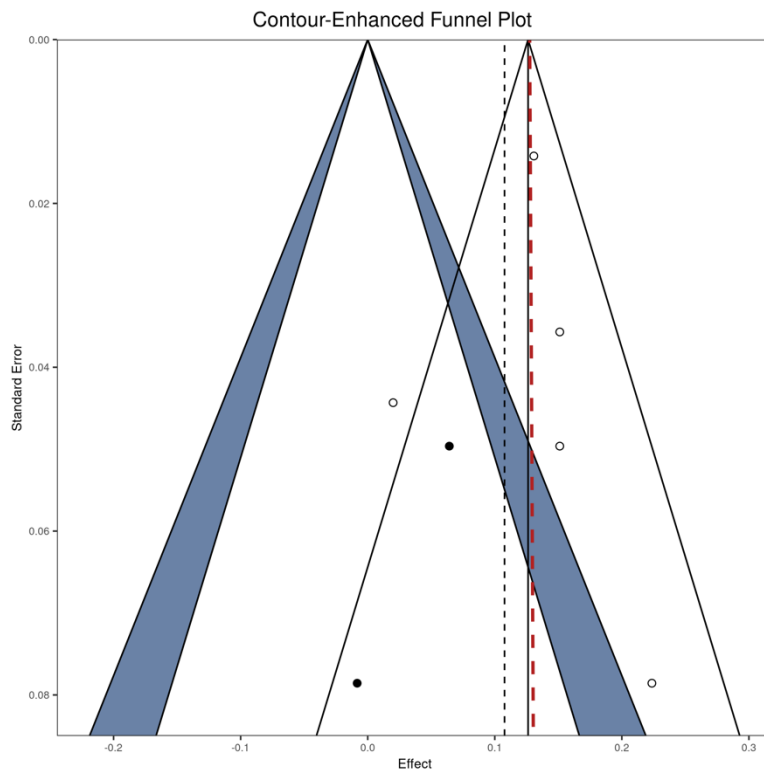
On the other hand, as mentioned, effect sizes were large in the studies with group comparison designs examining depressive episodes, which are also classified as internalizing disorders. Thus, another more appropriate explanation might be that group comparison studies more often compared clinical samples with control groups, where differences are likely to be larger. Correlational studies mostly examined community samples, which in turn may lead to smaller effects. As a result, the difference may be due to an artefact based on the study design.

Although the included studies examined a wide age range of children, infants were the most studied age group with different outcomes. First, children from parents with BPD had a lower birth weight (small effect; e.g., Crandell et al., 2003; Hobson et al., 2005). These findings could be due to lower utilization of prenatal care by mothers with BPD, or more fetal exposure to maternal pregnancy stress or to prescribed drugs, compared to controls (Blankley et al., 2015). Low birth weight can contribute to a range of poor health outcomes. There are associations with fetal and neonatal mortality and morbidity, stunted growth, cognitive development, and noncommunicable diseases later in life (Jornayvaz et al., 2016; Gu et al., 2017).

Second, children (0.3-5 years) from the parental BPD groups showed the insecure attachment styles A and D (after Ainsworth, 1982) more often and a secure attachment style (B attachment style) less often than children from the control groups (e.g., Genet et al., 2018; Hobson et al., 2005). C attachment had an effect size below the threshold but in the same

Figure 4

Funnel Plot for studies investigating the association between parental BPD and BPD in children



Note. The empty circles are the included and the filled circles are the imputed studies from the trim-and-fill analysis. The red dashed line is the Egger's Regression Line.

direction. Especially secure and disorganized (D) attachment styles had large effect sizes. This could be because the disorganized attachment style is the most distinct from the secure attachment style and is also the one most often linked to pathological behaviour (e.g., Nakash-Eisikovits et al., 2002). Abrupt mood changes, intrusive and insensitive parenting behaviour, instability, hostility, and identity disruptions faced by parents with BPD may lead to conflicting feelings in the children. This, in turn, may further explain the more frequent occurrence of D attachment styles and the less frequent occurrence of B attachment styles in children of parents with BPD (e.g., Gunderson et al., 2018; Hobson et al., 2005). There is growing evidence that disorganized attachments in childhood predict difficulties in later childhood and adulthood (e.g., Lyons-Ruth et al., 2009).

Third, children's responses to conversations were more negative in infants of parents with BPD compared with infants from the control groups. They tended to be less responsive, less involved, and smiled less often, with small to moderate effect sizes. Correlational studies also showed small negative associations between parental BPD and child responsiveness, and between parental BPD and child involvement (e.g., Apter et al., 2017; Trupe, 2013). These and

other negative interaction styles are associated with poor infant attachment organization outcomes and thus may have the same explanations as disorganized attachment styles, as discussed above (e.g., affective instability and insensitivity; Lyons-Ruth et al., 2005). One child outcome, ‘looking at mother’, is considered in the literature as a positive child reaction to a conversation and, contrary to assumptions, did not show a substantial effect.

Fourth, young children up to 5 years of age in the parental BPD groups showed higher negative affectivity compared to children from the control groups. The effect sizes ranged from small (‘anger’) to large (‘fear’). These emotion regulation (ER) difficulties in children in the parental BPD group are associated with negative consequences such as development of psychopathology, poorer social competence and adjustment, later behaviour problems, and later BPD symptoms (Carlson et al., 2009; Eisenberg et al., 1996; Liew et al., 2004). The ER strategies of the parents themselves are likely to be an important predictor of the child’s strategies. In parents with BPD, difficulties such as impulsive behaviour and affective instability are present, which could pose a risk to the child’s ER development (e.g., Gratz et al., 2014).

Dyads in the BPD groups were more likely to be involved with youth protection services or child safety services, with a small to moderate effect. Sexual or physical abuse and neglect were reported more often in the parental BPD groups than in the control groups, with a small effect. Children of parents with BPD experienced maltreatment more frequently than controls, as reflected by a large effect size. Additionally, correlational studies reported a large association between parental BPD and abuse potential. All these studies investigated children and adolescents between 5 and 16 years (e.g., Dittrich et al., 2018; Laporte et al., 2018; Macfie & Kurdziel, 2020; Weiss et al., 1996). Maltreatment impairs the development of a secure parent-child attachment and subsequently interferes with the development of other later relationships (e.g., Carlson et al., 1989; Macfie et al., 2001). It also predicts BPD in adulthood (e.g., Widom et al., 2009). Thus, this meta-analysis was able to provide quantitative support for multiple negative effects of parental BPD on child outcomes found in previous studies.

Subgroup analyses with study characteristics also yielded results worthy of discussion. Across both study designs, there was no important difference in effect sizes between studies whose participants had or did not have comorbidities. The category ‘no comorbidities’ also included studies in which no information on comorbidities was provided. Studies that reported comorbidities often examined only a limited number of diagnoses. This, and the fact

that comorbidities are generally high in individuals with BPD (Zanarini et al., 2004), may explain this finding.

In group comparison studies where the control group was clinical, the effect size was large. This means that even though parents with BPD were not compared with controls but with parents with other mental disorders, their children experienced more negative outcomes. The assumption that children of parents with BPD are particularly at risk, even compared to parents with other mental disorders (Bartsch et al., 2016; Petfield et al., 2015), is thus supported.

Limitations

Several limitations should be considered when interpreting the results of the current study. First, although we included parental BPD as explanatory variables and adverse child outcomes as outcome variables in the analyses, the present study does not allow us to draw conclusions about causality because of the nonexperimental nature of the primary studies included. Thus, the associations between parental BPD and negative child outcomes could be bidirectional or determined by a 3rd variable.

Second, our two main analyses and some subgroup analyses revealed a high degree of statistical heterogeneity, largely because of the high variability in child outcomes and their assessments. Heterogeneity within effect sizes may limit interpretation of results and should be considered. Third, the number of included studies in many of the subgroup analyses was very small, implying a low statistical power to detect the true effect. Fourth, we were unable to identify continuous moderators because our data structure did not allow us to run meta-regressions or simple regressions. Therefore, we were unable to account for a few study characteristics, such as child age, parent age, parental education, parental income, parental employment, parental partnership status, and ethnicity. On the other hand, we calculated subgroup analyses, which also give a good overview of possible moderators.

Fifth, although we wanted to expand on previous reviews that examined only mothers, there were very few studies that examined fathers. In the few cases where fathers were studied, they often were separated from the mothers and because of the resulting dependence of the results, we had to prefer the mother sample to the father sample. As a result, we also included only a few fathers in our analyses.

Directions for future research

The presence of several negative outcomes across a wide age range is indicative of the widespread impact of parental BPD on their children. In addition, parents report few interventions specifically targeted to everyday life with children (Stepp et al., 2012). We

would like to emphasize the importance of future research on specific interventions for parents and especially early interventions for children of parents with BPD. To do so, it would for example be important to examine the resources that parents with BPD and their children have that can be further encouraged. For example, Stepp et al. (2012) stated that some mothers with BPD have exceptional parenting skills, which may explain their children's resilience and positive outcomes.

Future research should also examine fathers with BPD more often, especially because they are becoming more and more important primary attachment figures for their children. Additionally, BPD manifests differently in men and women: Men with BPD seem to be more impulsive and aggressive than women with BPD (Hoertel et al., 2014; Sher et al., 2019). Thus, the results found in women with BPD may not be fully applicable to men.

The field would clearly benefit from studies using experimental designs that allow for more causal conclusions. Further, more primary research with a longitudinal design allows for a better assessment of the temporal relation between paternal BPD and different negative child outcomes.

Final Words

This first meta-analytic review on the impact of parental BPD on child outcomes shows that parental BPD is associated with negative child outcomes, and that children of parents with BPD are more likely to show negative child outcomes than children of controls. However, in the absence of longitudinal studies, relatively little is known about the causal impact of parental BPD on child outcomes. Even compared with parents with other mental disorders, parents with BPD encounter unique parenting challenges. Therefore, more investment is needed in this topic to understand why children of parents with BPD develop negative child outcomes and to identify how to reduce harmful effects and develop specific parenting interventions. To achieve this, the findings of this meta-analytic review open up avenues for more targeted research in the future.

Conflict of Interest

The authors declare no conflict of interest.

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Appendix A

Abstract translation into German

Kinder von Eltern mit einer Borderline-Persönlichkeitsstörung (BPS) können mit zahlreichen Schwierigkeiten konfrontiert sein, wie z.B. mit Problemen im Verhalten, in den Emotionen, in der Bindung, bei der Geburt sowie mit psychiatrischen oder familiären Problemen. Das Ziel dieser Meta-Analyse und systematischen Übersichtsarbeit war es, das Ausmaß und die Konsistenz der Auswirkungen der elterlichen BPS auf deren Kindern besser zu verstehen. Eine systematische Literaturrecherche in 7 Datenbanken ergab 46 Studien (mit 8.513.136 Kindern), die in zwei Random-Effects-Meta-Analysen synthetisiert wurden. Es wurden Untergruppen-Analysen für kindliche Probleme mit mindestens zwei unabhängigen Effektgrößen und unterschiedlichen Studienmerkmalen durchgeführt. Die Ergebnisse wurden auch zu Überthemen zusammengefasst und weiter analysiert. Ein kleiner Effekt wurde für den Zusammenhang zwischen elterlicher BPS und kindlichen Problemen gefunden ($r = ,175$; $p < ,001$; 95% KI [0,099; 0,252]). In den Gruppen von Eltern mit BPS wurden kindliche Probleme häufiger berichtet als in den Kontrollgruppen (mittlerer Effekt; $g = 0,651$; $p < ,001$; 95% KI [0,428; 0,873]). Die Untergruppen-Analysen zeigten ähnliche Ergebnisse, jedoch sollten die Schwankungen in der Größenordnung der Effekte bei der Interpretation berücksichtigt werden. Es zeigten sich Hinweise auf eine Effekteinflation, die möglicherweise auf einen Publikationsbias hinweist. Diese erste Meta-Analyse zu diesem Thema bestätigt die theoretische Annahme, dass die elterliche BPS einen Einfluss auf viele unterschiedliche kindliche Probleme hat. Sie unterstreicht, wie wichtig es ist, die Eltern-Kind-Dyade bei der Behandlung von Eltern mit einer diagnostizierten BPS zu berücksichtigen. Wir möchten betonen, wie wichtig künftige Forschungen zu spezifischen Interventionen für Eltern mit BPD und zu frühen Interventionen für Kinder von Eltern mit BPD sind.

Schlüsselwörter: Meta-Analyse, systematische Übersichtsarbeit, elterliche Borderline-Persönlichkeitsstörung, kindliche Probleme

Appendix B

Exact Search Term

TITLE-ABS-KEY (child* OR infant* OR infancy OR offspring OR bab* OR adolescen* OR boy* OR girl* OR teenager* OR youth* OR young* OR toddler* OR daughter* OR son*) AND

TITLE-ABS-KEY ('borderline personality disorder' OR 'borderline disorder' OR 'borderline personality' OR 'borderline pathology' OR 'borderline symptomatology') AND

TITLE-ABS-KEY (mother* OR maternal* OR parent* OR caregiver* OR father* OR paternal*)

In MEDLINE/PubMed also the MeSH-Term 'borderline personality disorder' was used. The search was limited to articles being published from 1980, because BPD was first introduced as a mental disorder in the DSM III at that time (APA, 1980). We consciously excluded the acronym 'BPD' as a key word due to an unreasonably large number of non-eligible records found in a preliminary literature search (e.g., pertaining to bipolar disorder or bronchopulmonary dysplasia). We deem this to be reasonable since authors will most likely use the term 'borderline' in titles, abstracts, or keywords. In Google Scholar and OATD we assessed the first ten pages each, which resulted in 100 hits per search engine. We also considered unpublished data, grey literature (OATD and Google Scholar) and translated studies using deepl.com if they were not published in English or German. We also considered literature that Eyden et al. (2016) and Petfield et al. (2015) included in their systematic reviews.

Appendix C

Table C1

Effect sizes and variance components for child outcomes combined to topics (three-level REML meta-analyses) – for group comparison study design

Topic	<i>k</i>	<i>I</i>	<i>N</i>	Variance components			<i>g</i>	<i>LCI</i>	<i>UCI</i>	<i>p</i>	Authors (year)
				Lvl. 1	Lvl. 2	Lvl. 3					
ICD10 – F diagnoses	6	4	284	73.1	0.0	26.9	1.022	0.457	1.587	0.010	Weiss et al. (1996), Abela et al. (2005), Kurdziel et al. (2018), Kueng et al. (2019)
General neglect	22	7	1,875	5.1	18.0	76.9	0.710	0.125	1.295	0.025	Weiss et al. (1996), Hiraoka et al. (2016), Laulik et al. (2016), Kurdziel et al. (2018), Laporte et al. (2018), Macfie & Kurdziel (2020), Nagel et al. (2021)

k = number of all effect sizes included; *I* = number of independent studies; Lvl. = level.

Table C2

Effect sizes and variance components for child outcomes combined to topics (three-level REML meta-analysis) – for correlational study design

Topic	<i>k</i>	<i>I</i>	<i>N</i>	Variance components			<i>r</i>	<i>LCI</i>	<i>UCI</i>	<i>p</i>	Authors (year)
				Lvl. 1	Lvl. 2	Lvl. 3					
ICD 10 – F diagnoses	14	12	8,107	35.9	5.8	58.2	.152	0.094	0.209	<0.001	Abela et al. (2005), Brunton et al. (2005), Distel et al. (2009), Bertino et al. (2012), Barnow et al. (2013), Conway et al. (2015), Strimpfel (2017), Dittrich et al. (2018), Bartsch (2019), Fatimah et al. (2020), Kaufman et al. (2020)

k = number of all effect sizes included; *I* = number of independent studies; Lvl. = level.

Table C3

Effect sizes for independent child outcomes exploratory combined to topics (two-level REML meta-analyses) – for group comparison study design

Topic	<i>k</i>	<i>N</i>	<i>I</i> ²	<i>Q</i>	<i>g</i>	<i>LCI</i>	<i>UCI</i>	<i>p</i>	Authors
Substance use	2	224	76.8	4.305	0.351	-0.952	1.653	0.598	Barnow et al. (2006), Kueng et al. (2019)
Any YPS/CSS involvement	3	1,612	89.1	17.493	0.751	-0.033	1.536	0.060	Weiss et al. (1996), Laporte et al. (2018), Nagel et al. (2021)

Note. There was no data for studies with correlational group design. *k* = number of all effect sizes included.