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Research paper

Identifying embodied risk and protective factors in mothers with postpartum depression and comorbidities using Parental Embodied Mentalizing Assessment™

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ABSTRACT

Background: Clinically, postpartum depression (PPD) is frequently diagnosed with maternal comorbid mental disorders (postpartum anxiety, PPA; personality disorders, PDs) in mothers. Its association with impaired Parental Embodied Mentalizing (PEM) remains unclear. This study aims to investigate embodied risk and protective factors of parental mentalizing in PPD-mothers. More risk factors and fewer protective factors were hypothesized as a function of comorbidities.

Method: Sixty-eight mothers with infants aged 3–10 months were examined using the Parental Embodied Mentalizing Assessment™ (PEMA™) on a 5-minute videotaped free-play interaction. Six subgroups were compared according to DSM-IV diagnoses: PPD; PPD and PPA; PPD and Borderline PD (BPD); PPD, PPA, and BPD; PPD and other PDs; and PPD, PPA, and other PDs.

Results: Overall, variable subgroup differences were observed (d = 0.9–1.09): PPD-mothers demonstrated the highest and PPD-mothers with BPD the lowest protective factors, in particular *Sustained Presence*. PPD-mothers with PPA and other PDs showed the lowest interactive *Repair*, and PPD-mothers with other PDs the highest *Connectivity*. There were no substantial group differences in risk factors. However, PPD-mothers with BPD displayed the highest *Teasing* and *Objectification*, i.e., treating the infant as an inanimate object.

Conclusion: In the case of PPD, comorbidities must be taken into account, as they primarily impact the protective character of the mother's embodied communication during infancy. Comorbid BPD is associated with fewer protective and more risk factors, whereas comorbid PPA and/or other PDs are associated with increased overcontrol. Further research is needed to validate the PEMA™ factors, including a non-clinical control group.

1. Introduction

Postpartum depression (PPD) is one of the most prevalent mental disorders within the year after childbirth (Howard et al., 2014; Reck et al., 2008; Shorey et al., 2018). It is defined by a broad range of symptoms of a major depressive episode (Radoš et al., 2024), including a depressed mood, loss of interest and pleasure, fatigue, decreased concentration, feeling worthless or excessive/inappropriate guilt, thoughts of death/suicide, psychomotor agitation or retardation, insomnia or hypersomnia (American Psychiatric Association, 1994). While PPD has been extensively studied in scientific research, limited attention has been given to its frequent association with comorbid mental disorders. For example, postpartum anxiety disorders (PPA) are more prevalent than PPD, characterized by symptoms such as irritability

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or excessive concern for the infant's well-being, often manifested in vegetative symptoms including restlessness, sleep disorders, and feelings of panic (Byrnes, 2019; Fairbrother et al., 2016). Moreover, approximately two-thirds of affected women exhibit a premorbid personality disorder (PD; Akman et al., 2007; Apter et al., 2012). In a clinical context, this primarily concerns borderline personality disorder (BPD) with the core symptoms of emotional instability, impulsivity, and fear of abandonment (Prasad et al., 2022). The fact that PPD and/or PPA may occur more frequently in the context of premorbid PDs may have significant implications on both for new mother and her child (Downey and Coyne, 1990; Goodman et al., 2011; Lovejoy et al., 2000). However, this association has not been sufficiently addressed in the context of PPD and its impact on the mother's caregiving behavior towards the infant. One aspect that may be of relevance is the extent to which maternal mentalizing capacity affects the mother-infant interaction in the context of PPD.

By definition, parental mentalizing refers to the parent's capacity to appreciate the child's mental states in the present relationship and to treat the infant like an intentional agent (Fonagy et al., 2002; Sharp and Fonagy, 2008; Slade, 2002). In communicating with the child, the parent's task is to read and interpret the child's needs, desires, affects, and intentions and to respond appropriately (Gergely and Watson, 1996). If this is successful, it contributes significantly to the development of the child's ability to mentalize and to the healthy development of their personality and attachment security (Fonagy et al., 2007).

Recent meta-analyses and systematic reviews have confirmed that impairments in mentalizing associated with PPD are strongly linked to PPD symptom severity and comorbid maternal psychopathology (Georg et al., 2023; Stuhrmann et al., 2022). Studies further indicate that maternal mentalizing capacity is limited or absent in the context of PPD and/or comorbid PPA (Krink and Ramsauer, 2021). This can lead to maternal interaction patterns characterized by under- or over-responsiveness to the child's signals (Diego et al., 2006; Luyten et al., 2012; Reck et al., 2004). In cases of comorbid PDs, particularly BPD, mothers also exhibit reduced or distorted mentalizing abilities (Marcoux et al., 2017; Schacht et al., 2013). At the same time, mentalizing emerges as a multidimensional concept with its various components being differentially affected by psychopathology (Luyten et al., 2020). In the context of parental mentalizing, certain concepts also appear to be more affected by postpartum symptoms than others (Georg et al., 2023; Stuhrmann et al., 2022).

In previous research parental mentalizing has mainly been studied with concepts such as "Mind-Mindedness" (MM; Meins, 1997; Meins and Fernyhough, 2006), "Parental Reflective Functioning" (PRF; Aber et al., 1985; Luyten et al., 2017; Slade, 2005), or "Parental Insightfulness" (PI; Koren-Karie et al., 2002; Oppenheim and Koren-Karie, 2013). They are operationalized using language-based, declarative survey methods in the form of self-report questionnaires (e.g., Luyten et al., 2009) and semi-structured interviews (e.g., Aber et al., 1985). These methods are based on objective coding categories linked to observed parenting behavior (Grienenberger et al., 2005). While these approaches address different aspects of parental mentalization, they still rely on the parent's reflective properties (Camoirano, 2017; Zeegers et al., 2017). Nonverbal, more automatic, i.e., implicit aspects of mentalizing, such as body movement and postures, often remain unconsidered. This is remarkable when considering that the mother-infant communication in the first year of a child's life is primarily regulated through pre-linguistic and implicit affective-behavioral organization, which can be seen as the earliest trace of parental mentalizing. In this context, Shai and colleagues introduced the concept of "Parental Embodied Mentalizing" (PEM; Shai and Belsky, 2011a, 2011b; Shai and Fonagy, 2014). PEM is defined as "the parent's capacity to (a) implicitly conceive, comprehend, and extrapolate the infant's mental states … from the infant's whole-body kinesthetic expressions, and (b) adjust [their] kinesthetic patterns accordingly" (Shai and Belsky, 2011b, p. 175). The conceptual framework of PEM and its systematic assessment is comprehensive and novel in recognizing that parental mentalizing cannot be narrowed solely to verbal channels but can be experienced and observed on the embodied nonverbal level. Therefore, PEM involves assessing whole-body kinesthetic expressions, rather than facial expressions and gaze patterns. It analyses the degree to which the parent is kinesthetically responsive to the infant's kinesthetically manifested mental states as they unfold in the nonverbal interactive encounter. This nonverbal exchange is described through six dimensions of temporal and spatial movement qualities, e.g., tempo, directionality, and space (Shai and Belsky, 2017).

So far, studies on the PEM coding system have shown that it is predictive of secure infant attachment, as well as socio-emotional and cognitive developmental outcomes at preschool age (Shai and Belsky, 2017; Shai and Meins, 2018). Recent studies on subclinical samples provided preliminary evidence that the quality of PEM is associated with a certain degree of severity and duration of depressive symptoms beyond a certain threshold (Garset-Zamani et al., 2020), as well as with anxiety symptoms (Gagné et al., 2023; Ierardi et al., 2022). However, these findings have not been consistently confirmed as in other studies depressive symptoms in mothers did not affect PEM negatively but indicated a less emotion-focused and flexible embodied behavior towards the infant (Væver et al., 2022). These studies did not address comorbidity.

In a clinical context, this fine-grained PEM coding system is also less economical in terms of application and interpretation. To address this, Shai and colleagues recently revised the PEM coding instrument, resulting in the development of the Parental Embodied Mentalizing Assessment™ (PEMA™; Shai, 2020). Drawing upon the findings on PEM, PEMA™ allows the systematic capture of specific kinesthetic movement patterns previously identified "as marked and pronounced high and low PEM capacities during mother-infant interaction" (D. Shai, personal interview, February 21, 2022). These parental kinesthetic behaviors in relation to the infant's mind are categorized into twelve ad-hoc defined PEMA™ factors. Four of these factors are defined as PEMA™ protective factors, whereby the parent is actively prioritizing and holding the infant's mind in their mind, resulting in flexible and dynamic responses to the infant's needs. Eight factors are PEMA™ risk factors of parental embodied communication, representing considerable lapses in mentalizing the infant's mind (Shai, 2020). Clinically, it seems important to identify protective and risk factors of maternal embodied communication at an early stage to enable preventive interventions.

So far, the PEMA™ has not been evaluated within a clinical population. The aim of the current study is to apply the PEMA™ for the first time to investigate protective and risk factors of embodied communication in a clinical sample of mothers with PPD and comorbidities as objective cues of PEM. For this purpose, six subgroups in the sample are divided depending on the comorbidities: PPD; PPD and PPA; PPD and BPD; PPD, PPA, and BPD; PPD and other PDs; and PPD, PPA and other PDs.

It was hypothesized that (1) Mothers with PPD compared to mothers with PPD and comorbid PPA show significantly higher PEMA™ protective factors and lower PEMA™ risk factors; (2) Mothers with PPD/with or without PPA compared to mothers with PPD/with or without PPA and with or without comorbid PDs show significantly higher PEMA™ protective factors and lower PEMA™ risk factors. (3) Mothers with comorbid BPD compared to mothers with comorbid other PDs show significantly lower PEMA™ protective factors and higher PEMA™ risk factors.

2. Methods

2.1. Participants

The present sample of mother-infant dyads had been recruited at the outpatient unit at the Department of Child and Adolescent Psychiatry, Psychotherapy, and Psychosomatics at the University Medical Center

Hamburg-Eppendorf (UKE) as part of a larger RCT trial evaluating mother-infant treatment (Ramsauer et al., 2014). The study was approved by the local ethics committee of the Hamburg Medical Association in August 2009 (reference number PV3269). Inclusion criteria were mothers with a current DSM-IV diagnosis of a DSM-IV-Axis-I mood disorder (e.g., major depression), fluent German language skills, and infants aged 3 to 10 months. Exclusion criteria were a primary DSM-IV diagnosis of substance abuse, schizophrenia or other psychotic disorders, intellectual impairment or acute suicidality in the mother, or mental retardation in the child. Written informed consent was obtained from both custodial parents. In this study, baseline data were used, including a clinical diagnostic interview, sociodemographic questionnaires, and a videotaped five-minute free-play interaction between the mother and the infant.

2.2. Measures

2.2.1. SCID-I and –II

The German Version of the Structured Clinical Interview (SCID; Wittchen et al., 1997) for DSM-IV (American Psychiatric Association, 1994) was used to assess the mother's Axis-I and Axis-II diagnoses; a well-established method with satisfactory reliability and validity (Gorman et al., 2004; Lobbestael et al., 2011; Maffei et al., 1997).

2.2.2. PEMA™

The PEMA™ (version 2020, clinical training October 2020; Shai, 2020) as a 12-point observational assessment was used to assess PEM during a videotaped five-minute free-play interaction between mother and infant. For coding, the videos are muted to exclude any verbal communication cues and to allow focus on the nonverbal kinesthetic movement qualities and interactive patterns. The videos are played at normal speed, pausing and repeated viewing are necessary to carefully observe the interactive process between parent and infant. The parent's quality of his or her embodied mentalizing capacities is determined not by the observer's assessment and judgement but is drawn from the infant's response to the parent.

The PEMA™ procedure is conducted in four stages (Shai, 2020).

First, incidents are identified as analysis units of PEMA™ protective and PEMA™ risk factors. The four PEMA™ protective factors include (1) *Sustained Presence* whereby the parent is actively holding back to explore open and curious about what the infant is initiating; (2) *Connectivity*, which captures an affective dyadic moment of feeling close as the parent delights in the infant and the infant enjoying that; (3) *Repair* as an error response of the parent to modify their kinesthetic patterns more accurately to the infant's signals; and (4) *Creativity*, depicting fun and playful explorations as the parent and infant offer something unique to the interaction resulting in something unexpected and novel (Shai, 2020). The eight PEMA™ risk factors comprise (1) *Developmental Inadequacy* of physical support and the parent expecting too much from the infant in relation to their developmental capacity, (2) *Objectification* of the infant as an "inanimate being" without a mind, (3) *Disembodiment* in either the parent or infant, as the decoupling from the body and mind; (4) *Hostility*, as overt expression of aggression and attack on the infant's mind or (5) *Teasing* as a form of covert hostility delivered in the guise of pretense, fun, playing seductive manner; (6) *Control*, whereby the parent dominates and forces their mind and body on the infant in a concrete inflexible approach; (7) *Obstructing Self-Regulation* of the infant's attempts of self-soothing actions; or (8) *Premature Termination* of the infant's expressions of interest and exploration (Shai, 2020).

Second, each incident is described by the following six dimensions of kinesthetic qualities: (a) *directionality* towards the body center; (b) *pacing* as the velocity of movement changes (c) *tempo*, referring to the speed of the movement sequence; (d) *space* to the infant's body; (e) *pathway* as the "shape of the movement"; (f) *tension flow*, which indicates the level of muscular tone (Shai, 2020; Shai and Belsky, 2017).

In the third coding step, the quality of each PEMA™ factor is rated on a Likert scale ranging from 1 (mundane interactions) to 4 (striking extent). Anchor examples of each score are presented in the coding manual (Shai, 2020).

In the fourth step, a total score of quality and frequency of all PEMA™ protective and risk factor incidents are calculated to provide a global PEMA™ score. Per definition, high parental embodied communication is indicated by high PEMA™ protective factors quality scores and frequencies; poor parental embodied communication is indicated by high PEMA™ risk quality scores and frequencies (Shai, 2020).

PEMA™ is manualized (Shai, 2020) and coders are required to attend training and complete reliability to be authorized to use in clinical or research practice. The first author (V. Simon) was trained and certified as reliable in coding PEMA™, coding the sample of $N = 68$ mother-infant dyads. Inter-rater reliability was completed on a randomly selected subsample of $n = 15$ mother-infant dyads, coded by a second coder (R. Spencer). Both coders were blind to participant characteristics at the time of coding. Intraclass correlation coefficients (ICC) were calculated based on a two-way random effects model, single measure, and absolute agreement (Shrout and Fleiss, 1979). ICC estimates ranging from 0.88 to 0.98 indicated excellent reliability ($p < .001$; Table 1).

2.3. Statistical analysis

Based on an a priori power analysis for the general linear model using G*Power Version 3.1 (Faul et al., 2009), a sample size of $N = 55$ mother-infant dyads was estimated to achieve 80 % power to detect a medium effect size ($f^2 > 0.15$; Cohen, 1988; Georg et al., 2023; Ierardi et al., 2022), with a significance level of 0.05 and one predictor coded by five dummy variables. Data were analyzed using the Statistical Package for the Social Science (IBM Corp., SPSS Statistics, version 28). First, descriptive analyses of the PEMA™ factors for the overall sample and each comorbidity-related subgroup were conducted. Before hypothesis testing, data were checked for assumption violations of multiple regression analysis. Accordingly, the PEMA™ protective total quality and total frequency data, as well as each risk and protective factor (quality/frequency) were log-transformed to address positive skewness and approximate a normal distribution. Applying forced entry regression methodology, the PEMA™ protective factor (total quality/total frequency) and risk factor (total quality/total frequency), as well as each protective and risk factor (quality/frequency) were defined as criteria and maternal DSM-IV-diagnoses (Axis-I: PPD only, comorbid PPA; Axis-II: comorbid BPD, other PDs) as the predictor. Maternal group status based on DSM-IV diagnoses was dummy-coded in five variables, and the sixth group was alternated as the reference group for pairwise comparison in multiple regression models.

3. Results

3.1. Sample characteristics and comorbidities

Overall, $N = 68$ Caucasian mothers from a predominantly upper-middle-class urban area were diagnosed with a DSM-IV Axis-I mood

Table 1
Characteristics of interrater reliability tests ($n = 15$).

Single measures	ICC	*p*
PEMA™ protective factors total quality	0.980	0.000**
PEMA™ protective factors total frequency	0.905	0.000**
PEMA™ risk factors total quality	0.946	0.000**
PEMA™ risk factors total frequency	0.893	0.000**

Notes. Protective total quality = sum of the quality of all protective factors; protective total frequency = sum of the incidents of all protective factors; risk factors total quality = sum of the quality of all risk factors; risk factors total frequency = sum of the incidents of all risk factors.

disorder (PPD) at the time of study inclusion (Table 2). Approximately a quarter (26.5 %) of the mothers showed no comorbid diagnoses beyond PPD, while about 16.2 % suffered from an additional DSM-IV Axis-I anxiety disorder (PPA). More than half of the mothers (57.4 %) were diagnosed with DSM-IV Axis-II PD (29.4 % BPD, 27.9 % other PDs). To take these comorbidities into account, the mothers were assigned into six subgroups: PPD ($n = 18$), PPD and PPA ($n = 11$), PPD and BPD ($n = 12$), PPD, PPA and BPD ($n = 8$), PPD and other PDs ($n = 8$), and PPD, PPA and other PDs ($n = 11$).

3.2. Descriptive analysis of PEMA™ risk and protective factors

Across all subgroups, substantially fewer protective (quality: $M = 2.9$, $SD = 4.12$; frequency: $M = 1.8$, $SD = 2.17$) than risk factors (quality: $M = 35.7$, $SD = 16.45$; frequency: $M = 14.0$, $SD = 5.92$) were observed ($r_s = -0.543$, $p = .000$). *Sustained Presence* (quality: $M = 1.1$, $SD = 2.43$; frequency: $M = 0.7$, $SD = 1.29$), and *Repair* (quality: $M = 1.0$, $SD = 1.76$; frequency: $M = 0.7$, $SD = 1.04$) were found as the most common PEMA™ protective factors; *Teasing* (quality: $M = 6.1$, $SD = 6.56$; frequency: $M = 2.3$, $SD = 2.29$), *Objectification* (quality: $M = 6.9$, $SD = 6.32$; frequency: $M = 2.9$, $SD = 2.48$), and *Control* (quality: $M = 7.2$, $SD = 7.39$; frequency: $M = 3.1$, $SD = 2.79$) as the most common PEMA™ risk factors.

Subgroup comparisons showed that in protective factors, PPD-mothers exhibited the highest total quality and frequency followed by PPD-mothers with other PDs. Regarding risk factors, PPD-mothers with PPA and BPD showed the highest total quality and frequency, followed by PPD-mothers with BPD (Table 3). Differences between subgroups according to protective and risk factors were found (Figs. 1 and 2).

3.3. Group effects of risk and protective factors

Multiple regression analysis showed that maternal group status did neither significantly explain variance in protective factors (total quality: $F(62,5) = 1.45$, $p = .220$; total frequency: $F(62,5) = 1.56$, $p = .185$) nor in risk factors (total quality: $F(62,5) = 0.73$, $p = .604$; Total Frequency: $F(62,5) = 0.97$, $p = .442$). However, pairwise differences in protective factors were identified between the subgroups (Table 4). Significant negative differences in mean values with large effect sizes were found between the subgroup of PPD-mothers with BPD and the reference groups of PPD-mothers (total quality/frequency), PPD-mothers with PPA (total frequency), and PPD-mothers with other PDs (total quality/frequency).

Maternal group status did not significantly explain variance in the risk and protective factors (quality/frequency). However, regarding protective factors, there was a significant negative difference in mean values with a large effect size of *Sustained Presence* between the subgroup of PPD-mothers with BPD and the reference group of PPD-mothers (quality: $t(62) = -2.63$, $p = .011$, $d = -1.00$; frequency: $t(62) = -2.66$, $p = .010$, $d = -1.01$). Significant positive differences in mean values with large effect sizes were identified for *Connectivity* between subgroup of PPD-mothers with other PDs and the reference groups of PPD-mothers (quality: $t(62) = 2.482$, $p = .016$, $d = 0.86$; frequency: $t(62) = 2.93$, $p = .005$, $d = 0.87$), PPD-mothers with PPA (quality: $t(62) = 2.11$, $p = .039$, $d = 0.78$; frequency: $t(62) = 2.55$, $p = .013$, $d = 0.85$), and PPD-mothers with BPD (quality: $t(62) = 2.43$, $p = .018$, $d = 0.92$; frequency: $t(62) = 2.93$, $p = .005$, $d = 0.96$). For *Repair*, a significant positive difference in mean values with a medium effect size was found between the subgroup of PPD-mothers and the reference group of PPD-mothers with PPA and other PDs (quality: $t(62) = 2.18$, $p = .033$, $d = -0.72$). Regarding risk factors, there was a significant positive difference in mean values with a large effect size of *Teasing* between the subgroup of PPD-mothers with BPD and the reference group of PPD-mothers (quality: $t(62) = 2.32$, $p = .024$, $d = -0.94$; frequency: $t(62) = 2.20$, $p = .031$, $d = -0.87$), and of *Objectification* between the subgroup of PPD-mothers with BPD and the reference group of PPD-

Table 2
Subsample characteristics.

	$N = 68$			PPD ($n = 18$)				PPA ($n = 11$)				BPD ($n = 12$)				PPA and BPD ($n = 8$)				Other PDs ($n = 8$)				PPA and other PDs ($n = 11$)			
	M	*SD*	Range	*f*	%	*M*	*SD*	*f*	%	*M*	*SD*	*f*	%	*M*	*SD*	*f*	%	*M*	*SD*	*f*	%	*M*	*SD*	*f*	%
Infant age (months)	6.4	1.78	3.8–10.4	6.6	1.57	4.1–8.8	6.1	1.08	4.7–8.5	5.8	2.05	3.8–9.8	6.9	2.23	3.8–9.9	6.8	2.61	4.0–10.4	6.5	1.99	4.0–10.4				
Maternal age (years)	32.0	5.71	18.4–44.3	31.2	5.00	21.3–38.5	34.1	4.02	26.3–42.1	28.9	5.85	18.4–38.5	30.49	9.31	19.8–43.3	34.9	5.13	28.0–44.3	34.2	4.31	27.1–44.3				
Maternal education (years)	11.6	1.57	9–13	11.5	1.76	9–13	11.9	1.30	10–13	11.5	1.88	9–13	10.88	1.55	9–13	11.9	1.55	10–13	11.9	1.37	10–13				
Infant gender																									
Male				41	59.4			6	54.5			9	58.3			4	50.0			5	62.5			52.6	
Female				27	39.1			5	45.5			3	41.7			4	50.0			3	37.5			47.4	
Monthly household income (Euro)[a]																									
<1500				15	21.7			0	0			7	58.3			2	25.0			1	12.5			15.8	
1500–3000				33	47.8			6	54.5			5	41.7			5	62.5			1	12.5			36.8	
>3000				17	24.6			5	45.5			9	75.0			1	12.5			4	50.0			36.8	

Notes. PPD Postpartum Depression only, *PPA* PPD with comorbid Postpartum Anxiety Disorder, *BPD* PPD with comorbid borderline personality disorder, *PPA and BPD* PPD with comorbid PPA and BPD, *other PD* PPD with comorbid other personality disorder, *PPA and other PD* PPD with comorbid PPA and other PD.

[a] $n = 65$.

Table 3
Matched descriptive PEMA™-Characteristics.

		PPD ($n = 18$)			PPA ($n = 11$)			BPD ($n = 12$)			PPA and BPD ($n = 8$)			other PDs ($n = 8$)			PPA and other PDs ($n = 11$)		
		M	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range
Protective Factors	Total Quality	4.2	5.47	0–18	2.8	3.55	0–12	1.0	2.00	0–6	3.1	4.73	0–12	4.4	4.93	0–14	1.7	1.68	0–5
	Total Frequency	2.4	2.85	0–9	2.0	2.42	0–7	0.6	1.17	0–3	1.9	2.36	0–6	2.3	2.05	0–6	1.3	1.10	0–3
Sustained Presence	Quality	2.3	3.95	0–14	1.2	1.78	0–5	0	0	0	1.0	1.77	0–5	0.8	1.17	0–3	0.6	1.50	0–5
	Frequency	1.3	1.99	0–6	0.7	1.01	0–3	0	0	0	0.6	1.06	0–3	0.5	0.76	0–2	0.5	0.93	0–3
Connectivity	Quality	0.2	0.65	0–2	0.3	0.65	0–2	0.2	0.58	0–2	1.5	4.24	0–12	2.0	3.42	0–10	0.5	1.04	0–3
	Frequency	0.2	0.51	0–2	0.2	0.41	0–1	0.4	2.93	0–1	0.8	2.12	0–6	1.9	3.40	0–10	0.3	0.65	0–2
Repair	Quality	1.6	2.06	0–7	1.3	2.05	0–7	0.7	1.78	0–6	0.8	1.39	0–4	1.1	1.81	0–4	0.5	0.93	0–3
	Frequency	0.9	1.11	0–3	0.8	0.98	0–3	0.5	1.02	0–3	0.5	0.76	0–2	0.9	1.46	0–4	0.5	0.93	0–3
Creativity	Quality	0.1	0.24	0–1	0.1	0.30	0–1	0.2	5.82	0–2	0.4	1.06	0–3	0	0	0	0	0	0
	Frequency	0.1	0.24	0–1	0.1	0.30	0–1	0.1	0.29	0–1	0.1	0.35	0–1	0	0	0	0	0	0
Risk Factors	Total Quality	33.5	15.26	2–58	31.6	12.76	17–55	39.3	18.27	14–72	43.8	22.47	17–84	32.8	16.73	4–59	35.6	15.41	18–72
	Total Frequency	13.4	4.83	2–21	13.2	4.12	8–21	15.3	6.76	9–31	17.4	8.55	6–28	12.4	4.84	4–19	13.3	4.45	7–22
Hostility	Quality	0.7	1.97	0–8	0.4	0.81	0–2	1.4	2.78	0–8	1.1	1.64	0–4	0.9	1.46	0–4	0.6	1.21	0–3
	Frequency	0.2	0.55	0–2	0.2	0.41	0–1	0.6	1.24	0–4	0.5	0.76	0–2	0.4	0.51	0–1	0.3	0.52	0–2
Teasing	Quality	5.1	6.99	0–22	6.2	7.36	0–19	8.6	5.52	1–18	8.4	9.75	2–31	3.8	3.37	0–9	5.0	4.88	0–14
	Frequency	0.7	0.97	0–10	2.3	2.61	0–7	3.2	1.95	1–6	3.0	2.73	0–9	1.5	1.41	0–4	2.0	5.02	0–5
Obstructing Self-Regulation	Quality	1.6	2.41	0–6	1.1	2.47	0–8	2.7	3.53	0–12	0.9	1.25	0–3	2.4	2.88	0–7	1.9	2.51	0–7
	Frequency	1.2	1.76	0–3	0.4	0.67	0–2	1.3	1.55	0–5	0.4	0.52	0–1	0.8	0.89	0–2	0.6	1.92	0–2
Developmental Inadequacy	Quality	3.4	5.84	0–20	2.8	4.36	0–11	3.3	3.31	0–11	4.0	7.03	0–21	1.3	3.15	0–9	4.2	4.17	0–12
	Frequency	2.4	1.82	0–6	1.1	1.58	0–4	1.1	0.91	0–3	1.5	3.07	0–9	0.5	1.07	0–3	1.5	4.22	0–4
Objectification	Quality	6.1	5.23	0–19	4.0	5.22	0–17	10.8	7.35	0–23	8.0	7.07	0–21	7.6	6.05	0–15	5.7	6.53	0–19
	Frequency	2.5	3.50	0–6	1.8	2.31	0–8	4.0	2.70	0–8	3.4	2.72	0–8	3.1	2.30	0–6	3.2	5.71	0–8
Disembodiment	Quality	7.4	10.20	0–29	4.8	6.71	0–21	4.3	6.62	0–21	9.4	10.07	0–32	4.5	7.21	0–21	3.1	3.53	0–11
	Frequency	2.5	2.15	0–10	2.4	3.44	0–11	1.7	2.31	0–7	3.4	3.20	0–10	1.5	2.33	0–7	1.3	3.13	0–4
Control	Quality	5.2	5.20	0–18	9.0	7.01	0–21	6.7	5.99	0–20	6.1	6.90	0–21	8.4	12.66	0–37	9.4	8.13	0–22
	Frequency	2.1	1.88	0–6	4.2	0.86	0–8	2.9	2.39	0–9	2.9	3.36	0–10	3.1	4.09	0–12	3.4	9.41	0–7
Premature Termination	Quality	4.7	4.38	0–14	2.5	2.58	0–7	2.0	3.64	0–12	5.9	9.31	0–27	4.1	5.77	0–14	2.8	2.86	0–8
	Frequency	2.1	1.88	0–6	0.9	0.83	0–2	1.0	1.71	0–5	2.5	4.14	0–12	1.6	2.20	0–5	1.1	2.81	0–3

Notes. *PPD* Postpartum Depression only, *PPA* PPD with comorbid Postpartum Anxiety Disorder, *BPD* PPD with comorbid borderline personality disorder, *PPA and BPD* PPD with comorbid PPA and BPD, *other PD* PPD with comorbid other personality disorder, *PPA and other PD* PPD with comorbid PPA and other PD.

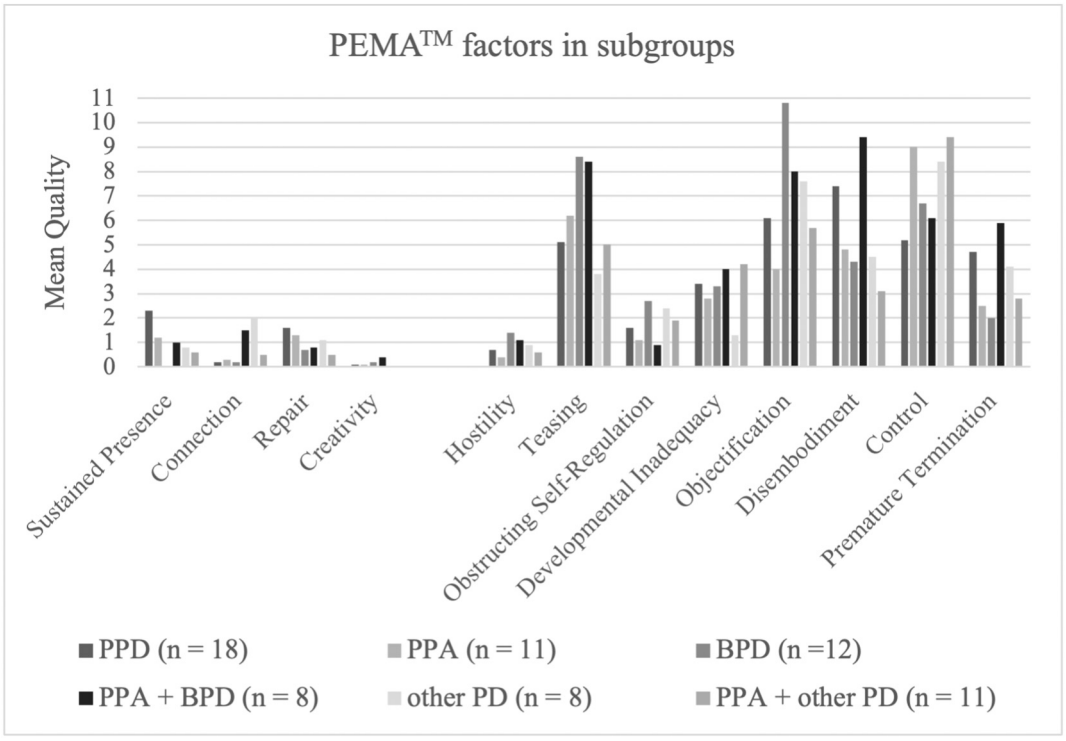

Fig. 1. PEMA™ protective and risk factor mean quality in subgroups. PPD = Postpartum Depression only, PPA = PPD with comorbid Postpartum Anxiety Disorder, BPD = PPD with comorbid borderline personality disorder, PPA + BPD = PPD with comorbid PPA and BPD, other PD = PPD with comorbid other personality disorder, PPA+ other PD = PPD with comorbid PPA and other PD.

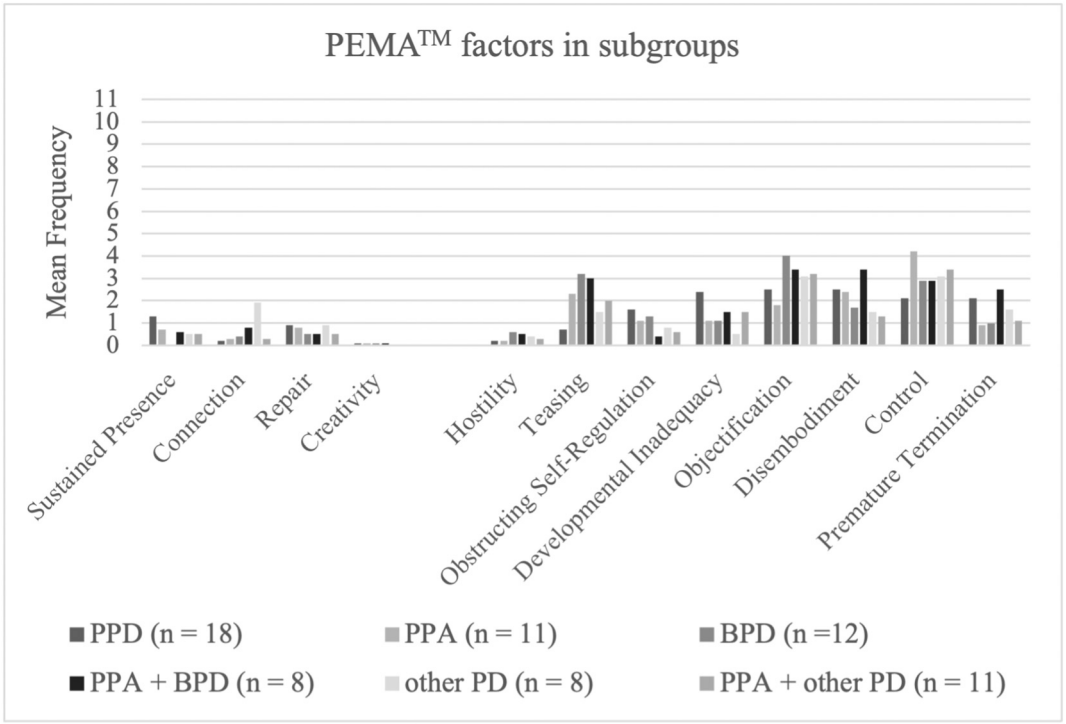

Fig. 2. PEMA™ protective and risk factor mean frequency in subgroups. PPD = Postpartum Depression only, PPA = PPD with comorbid Postpartum Anxiety Disorder, BPD = PPD with comorbid borderline personality disorder, PPA + BPD = PPD with comorbid PPA and BPD, other PD = PPD with comorbid other personality disorder, PPA+ other PD = PPD with comorbid PPA and other PD.

Table 4
Multiple linear regression of PEMA™ factors with predictor (forced entry).

	Protective factor total quality*						Protective factor total frequency*						Risk factor total quality					Risk factor total frequency				
	b	*SE b*[1]	β	*t*	*p*	d^2	*b*	*SE b*[1]	β	*t*	*p*	d^2	*b*	*SE b*[1]	β	*t*	*p*	*b*	*SE b*[1]	β	*t*	*p*
Model 1																						
Constant	0.51	0.06					0.41	0.07					33.50	3.92				13.44	1.32			
PPA	−0.07	0.15	−0.07	−0.44	0.660		−0.03	0.12	−0.03	−0.247	0.806		−1.86	6.36	−0.04	−0.29	0.771	−0.26	2.14	−0.02	−0.12	0.903
BPD	−0.34	0.14	−0.33	−2.36	**0.022***	−0.90	−0.28	0.11	−0.35	−2.49	**0.015***	−0.94	5.75	6.19	0.13	0.03	0.357	1.89	2.09	0.13	0.91	0.369
PPA and BPD	−0.13	0.16	−0.11	−0.80	0.429		−0.07	0.13	−0.07	−0.52	0.602		10.25	7.06	0.20	1.45	0.152	3.93	2.38	0.23	1.65	0.103
Other PDs	−0.15	0.15	−0.14	−1.02	0.314		−0.10	0.12	−0.12	−0.86	0.393		−0.75	7.06	−0.02	−0.11	0.916	−1.07	2.38	−0.06	−0.45	0.655
PPA and other PDs	0.04	0.16	0.04	0.27	0.790		0.02	0.13	0.02	0.16	0.874		2.14	6.36	0.05	0.34	0.738	−0.17	2.14	−0.01	−0.08	0.936
Model 2																						
Constant	0.44	0.12					0.38	0.09					31.64	5.01				13.18	1.69			
PPD	0.07	0.15	0.07	0.44	0.660		0.03	0.12	0.04	0.25	0.806		1.86	6.36	0.05	0.29	0.771	0.26	2.14	0.02	0.12	0.903
BPD	−0.27	0.16	−0.27	−1.70	0.094		−0.25	0.13	−0.31	−1.99	**0.050***	−0.91	7.62	6.94	0.18	1.10	0.277	2.15	2.34	0.15	0.92	0.361
PPA and BPD	−0.07	0.18	−0.05	−0.36	0.717		−0.04	0.14	−0.04	−0.28	0.783		12.11	7.72	0.24	1.57	0.122	4.19	2.60	0.24	1.61	0.112
Other PDs	0.11	0.18	0.09	0.61	0.545		0.05	0.14	0.05	0.35	0.728		1.11	7.72	0.22	0.14	0.886	−0.81	2.60	−0.05	−31	0.757
PPA and other PDs	−0.09	0.17	−0.05	−0.36	0.717		−0.07	0.13	−0.09	−0.55	0.583		4.00	7.09	0.90	0.56	0.575	0.09	2.39	0.01	0.04	0.970
Model 3																						
Constant	0.17	0.11					0.13	0.09					39.25	4.80				15.33	1.62			
PPD	0.34	0.14	0.38	2.36	**0.022***	0.90	0.28	0.11	0.40	2.49	**0.015***	0.94	−5.75	6.19	−0.16	−0.93	0.357	−1.89	2.09	−0.15	−0.91	0.369
PPA	0.27	0.16	0.26	1.70	0.094		0.25	0.13	0.30	2.00	**0.050***	0.91	−7.61	6.94	−0.17	−1.10	0.277	−2.15	2.34	−0.14	−0.92	0.361
PPA and BPD	0.21	0.18	0.17	1.18	0.241		0.21	0.14	0.22	1.55	0.127		4.50	7.59	0.09	0.59	0.555	2.04	2.56	0.12	0.80	0.427
Other PDs	0.38	0.18	0.32	2.18	**0.033***	0.99	0.30	0.14	0.32	2.18	**0.033***	1.09	−6.50	7.59	−0.13	−0.86	0.395	−0.296	2.56	−0.17	−1.16	0.251
PPA and other PDs	0.19	0.16	0.18	1.18	0.244		0.18	0.13	0.22	1.44	0.156		−3.61	6.94	−0.08	−0.52	0.604	−2.06	2.34	−1.4	−0.88	0.381
Model 4																						
Constant	0.38	0.14					0.34	0.11					43.75	5.88				17.38	1.98			
PPD	0.13	0.16	0.15	0.80	0.429		0.07	0.13	0.10	0.52	0.602		−10.25	7.06	−0.28	−1.45	0.152	−3.93	2.38	−0.31	−1.65	0.103
PPA	0.07	0.18	0.06	0.36	0.717		0.04	0.14	0.05	0.28	0.783		−12.11	7.72	−0.27	−1.57	1.22	−4.19	2.60	−0.28	−1.61	0.112
BPD	−0.21	0.18	−0.20	−1.2	0.241		−0.21	0.14	−0.27	−1.55	0.127		−4.50	7.59	−1.1	−0.59	0.555	−2.04	2.56	−0.14	−0.80	0.427
Other PDs	0.18	0.19	0.14	0.90	0.369		0.09	0.15	0.09	0.58	0.563		−11.00	8.31	−0.22	−1.32	0.190	−5.00	2.80	−0.29	−1.79	0.079
PPA and other PDs	−0.02	0.18	−0.02	−0.11	0.915		−0.03	0.14	−0.04	−0.23	0.819		−8.11	7.72	−0.18	−1.05	0.298	−4.10	2.60	−0.27	−1.58	0.120
Model 5																						
Constant	0.55	0.14					0.43	0.11					32.75	5.88				12.38	1.98			
PPD	−0.04	0.16	−0.05	−0.27	0.790		−0.02	0.13	−0.03	−0.16	0.874		0.75	7.06	0.02	0.11	0.916	1.07	2.38	0.9	0.45	0.655
PPA	−0.11	0.18	−0.10	−0.61	0.545		−0.05	0.14	−0.06	−0.35	0.728		−1.11	7.72	−0.03	−0.14	0.886	0.81	2.60	0.05	0.31	0.757
BPD	−0.38	0.18	−0.38	−2.18	**0.033***	−0.99	−0.30	0.14	−0.38	−2.18	**0.033***	−1.09	6.50	7.59	0.15	0.86	0.395	2.96	2.56	0.20	1.16	0.251
PPA and BPD	−0.18	0.19	−0.14	−0.90	0.369		−0.09	0.15	−0.09	−0.58	0.563		11.00	8.31	0.22	1.32	0.190	5.00	2.80	0.29	1.79	0.079
PPA and other PDs	−0.19	0.18	−0.18	−1.08	0.284		−0.12	0.14	−0.14	−0.85	0.396		2.89	7.72	0.065	0.37	0.710	0.90	2.60	0.06	0.35	0.731
Model 6																						
Constant	0.36	0.12					0.31	0.09					35.63	5.01				13.27	1.69			
PPD	0.15	0.15	0.17	1.02	0.314		0.10	0.16	0.14	0.86	0.393		−2.14	6.36	−0.06	−0.34	0.738	0.17	2.14	0.01	0.80	0.936
PPA	0.09	0.16	0.08	0.51	0.609		0.07	0.13	0.09	0.55	0.583		−4.00	7.09	−0.09	−0.56	0.575	−0.09	2.39	−0.01	−0.04	0.970

(*continued on next page*)

Table 4 (*continued*)

	Protective factor total quality*						Protective factor total frequency*						Risk factor total quality					Risk factor total frequency				
	b	*SE* b^1	β	*t*	*p*	d^2	*b*	*SE* b^1	β	*t*	*p*	d^2	*b*	*SE* b^1	β	*t*	*p*	*b*	*SE* b^1	β	*t*	*p*
BPD	−0.19	0.16	−0.19	−1.18	0.244		−0.18	0.13	−0.23	−1.44	0.156		3.61	6.94	0.08	0.52	0.604	2.06	2.34	0.14	0.88	0.381
PPA and BPD	0.02	0.18	0.02	0.11	0.915		0.03	0.14	0.03	0.23	0.819		8.11	7.72	0.16	1.05	0.298	4.10	2.60	0.24	1.58	0.120
Other PDs	0.19	0.18	0.16	1.08	0.284		0.12	0.14	0.13	0.86	0.396		−2.89	7.72	−0.06	−0.37	0.710	−0.90	2.60	−0.05	−0.35	0.731

Notes. Model 1: reference group PPD. Model 2: reference group PPA. Model 3: reference group BPD. Model 4: reference group PPA and BPD, Model 5: reference group other PDs. Model 6: reference group PPA and other PDs.

PPA and BPD Postpartum Depression with comorbid Postpartum Anxiety disorder and Borderline Personality Disorder, *BPD* PPD with comorbid BPD, *PPA and other PD* PPD with comorbid PPA and other personality disorder, *other PD* PPD with comorbid other PD, *PPA* PPD with comorbid PPA.

SE b^1 standard error for unstandardized regression-coefficient. d^2 Cohen's *d* effect size. Protective factor total quality: $R^2 = 0.105$ ($p = .220$), adjusted $R^2 = 0.032$; protective factor total frequency: $R^2 = 0.112$ ($p = .185$), adjusted $R^2 = 0.040$; risk factor total quality: $R^2 = 0.056$ ($p = .604$), adjusted $R^2 = -0.021$; risk factor total frequency: $R^2 = 0.073$ ($p = .442$), adjusted $R^2 = -0.002$.

* Log-transformed data.

mothers with PPA (quality: t (62) = 2.25, p = .028, d = −1.05; frequency: t (62) = 2.07, p = .042, d = −0.96).

4. Discussion

This is the first clinically informed study to examine PEM in mothers with PPD using the PEMA™. The PEMA™ was developed for clinical purposes and allows the categorization of the mother's embodied communication into protective and risk factors by assessing their quality and frequency of occurrence (Shai and Belsky, 2011a, 2011b; Shai and Fonagy, 2014).

The present study acknowledges that in a clinical context, PPD is frequently associated with comorbid mental disorders, particularly PPA and PDs, which was also confirmed in this sample. The latter group was further specified by distinguishing BPD from other PDs. Consequently, the mothers with PPD as the primary diagnosis were divided into six subgroups according to their comorbidities. It was assumed that significant differences in the quality and frequency of the PEMA™ protective and risk factors would emerge based on the mothers' comorbidity status.

With regard to PEMA™ protective factors and consistent with the hypotheses of this study, PPD-mothers with BPD showed the lowest protective factors, compared to PPD-mothers, PPD-mothers with PPA, and PPD-mothers with other PDs.

PPD-mothers with BPD exhibited pronounced difficulties in *Sustained Presence* as compared to PPD-mothers. *Sustained Presence* is defined as the capability of the mother to follow and engage with the infant in a flexible kinesthetic manner while actively providing time and space (Shai, 2020). Considering previous studies that have shown a lack of emotional availability, sensitivity, and responsiveness, as well as pronounced passivity in mothers with PPD (Reck et al., 2004; Stanley et al., 2004), these findings highlight the importance of recognizing and considering comorbid mental disorders in PPD. In comorbid PDs, the associated structural disorder must be considered as the impaired intrapsychic interpersonal mental functioning, which affects perception, regulation, defense mechanisms and attachment (OPD Task Force, 2008). Mothers with PPD tend to show anxious-insecure attachment patterns, often with emotion-focused defense mechanisms (Bifulco et al., 2004; McMahon et al., 2005). BPD is most frequently assigned to anxious-ambivalent or disorganized/unresolved attachment styles with hyper- or deactivating strategies (Lorenzini and Fonagy, 2013; Luyten et al., 2020; Steele and Siever, 2010). This, in turn, has been shown to inhibit the mentalizing capacity in BPD (Fonagy et al., 2002), potentially resulting in a deficiency of PEMA™ protective factors in PPD-mothers with BPD.

Unlike PPD-mothers with BPD, PPD-mothers with other PDs showed the highest *Connectivity*. This difference was also significant in comparison to PPD-mothers, PPD-mothers with PPA, and PPD-mothers with PPA and other PDs. *Connectivity* is described as "finding delight in discovering and supporting the infant's mind" and is inherently considered a protective factor (Shai, 2020). According to the "optimal midrange model of self- and interactive regulation,"(Jaffe et al., 2001; Lotzin et al., 2015), it can be argued that too much as well as too little *Connectivity* may be less beneficial.

In the subgroup of PPD-mothers with other PDs, obsessive-compulsive personality disorder (OCPD) was mostly represented (n = 12; 17.65 %). OCPD is more strongly linked to attachment anxiety, which is characterized by specific behavior (Aaronson et al., 2006; Hodny et al., 2021). Consequently, increased *Connectivity* may be observed in mothers who display vigilance, attentiveness, or control over the infant. In contrast, a decreased *Connectivity* may be evident when the mother is preoccupied or exhibiting avoidance behaviors, particularly in cases of anxious OCPD (Pinto et al., 2022). These behaviors can negatively affect treatment outcomes for mood or anxiety disorders and may also affect the infant's ability to establish secure attachment (Challacombe et al., 2016; Pinto et al., 2022).

Furthermore, PPD-mothers with PPA and other PDs were found to

show the lowest quality of *Repair* of interactive errors compared to all other subgroups, particularly in contrast to PPD-mothers. The frequency of *Repair* as the attempt to modify kinesthetic behavior in response to the infant's needs remained unaffected. A prolonged time of repair of miscoordination in PPD-mothers with PPA was shown by Reck et al. (2011). Thus, comorbid anxiety seems to have a distinct impact on maternal embodied communication. Individuals diagnosed with OCPD, particularly those exhibiting anxious tendencies, are often characterized by submissiveness, indecisiveness, procrastination, self-criticism, and a proclivity for avoiding conflicts (Pinto et al., 2022). Additionally, research has indicated that mentalizing is impaired in anxiety and stress-related disorders, such as OCPD, due to a focus on one's own anxieties rather than others' mental states (Sloover et al., 2022). Consequently, PPD-mothers with PPA and OCPD may exhibit rigid and insecure interaction patterns that reduce responsiveness to their infant's mental states, particularly in stress-induced attachment behaviors.

Concerning the PEMA™ risk factors, they may be seen as manifestations of common defense mechanisms in BDP, including angry withdrawal and compulsive care-seeking, and may also involve violent attacks on oneself or others (Fonagy et al., 2002; Lorenzini and Fonagy, 2013).

PPD-mothers with BPD exhibited the highest *Teasing* as compared to PPD-mothers. *Teasing* is characterized by behaviors that derive pleasure from "controlling, demanding, or humiliating" the infant (Shai, 2020). As part of insensitive caregiving (Out et al., 2009), the *Teasing* of PPD-mothers with BPD may indicate their limited capacities to progress aggression-related emotions (Florange and Herpertz, 2019).

Furthermore, PPD-mothers with BPD demonstrated the highest *Objectification*, significantly differing from PPD-mothers with PPA. It has been observed that mothers with BPD tend to interact with their infants in a kinesthetic manner as if they were inanimate objects with no separate identity or feelings. This behavior may reflect the fundamental implicit-procedural ideas about self and others that are characteristic of BPD (Ermann, 2024; Fonagy et al., 2002).

Our results showed that PPD-mothers with BPD face the most difficulties in PEM across all subgroups. This result could be directly linked to the origins of mentalization theory, closely associated with BPD (Bateman and Fonagy, 2004). Accordingly, low *Sustained Presence* and high *Teasing* and *Objectification* could be seen as an embodied derivate of hypomentalization (Bateman and Fonagy, 2012, 2015; Katznelson, 2014). In contrast, PPD-mothers with PPA and/or other PDs, namely OCPD, showed the highest *Connectivity* and lowest quality of *Repair*, which might indicate the mother's embodied manifestation of hypermentalizing.

As a next step, these findings need to be validated in association with verbal concepts of parental mentalizing, such as PRF and MM and with child developmental outcomes such as attachment quality or theory of mind. As has already been established with the PEM coding system (Gagné et al., 2021; Shai et al., 2017; Shai and Meins, 2018), the extent to which the PEMA™ factors have a predictive effect on child development needs to be clarified, and thus the clinical validation of the twelve PEMA™ factors.

4.1. Limitations

This study has strengths and limitations that should be considered when interpreting the results of this first clinical validation study of the PEMA™. The verified clinical DSM-IV diagnoses in this study acknowledge the importance of considering comorbidities in clinical populations and strengthen the validity of the results. Excellent inter-rater reliability was achieved, providing consistent and reliable first-time coding of the PEMA™. However, violation of the normality and linearity assumptions despite log transformation might diminish the generalizability of the results (Field, 2013).

Post-hoc power analyses revealed that our clinical sample may have been underpowered to detect the effects of the risk factors (total quality/frequency). Further studies with larger sample sizes should include a non-clinical control group of mentally healthy mothers to expand the generalizability of our findings. Some PEMA™ factors, i.e., *Control*, did not find conclusive evidence in our clinical subgroups and therefore need further investigation.

Overall, replication studies are needed to test the construct validity and criterion validity of the PEMA™ within the mentalization framework (e.g., RF, PRF). A prospective study design is needed to test the predictive validity of the PEMA™ protective and risk factors in quality and frequency on child outcomes. Potential cultural influences on PEM necessitate cross-cultural comparative (clinical) studies. The impact of the father's embodied communication on child development has not yet been explored either.

4.2. Conclusion

In this clinical sample of mothers with PPD and comorbidities, significantly more PEMA™ risk than protective factors were found, with certain subgroup-specific factors revealed: PPD-mothers with BPD demonstrated embodied communication that was characterized by a diminished *Sustained Presence*, and increased *Teasing* and *Objectification*. PPD-mothers with other PDs showed the highest *Connectivity*; an additional PPA seemed to decrease the mothers' embodied ability to *Repair*.

These findings suggest the necessity of raising awareness of comorbid PDs, as such behaviors may serve as manifestations of underlying structural disorders. They highlight the critical importance for interventions with at-risk parenting. Further validation of the protective and risky nature of parental embodied communication for child development is needed.

CRediT authorship contribution statement

Virginia Simon: Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Rose Spencer:** Writing – review & editing, Validation. **Steffen Zitzmann:** Methodology, Formal analysis. **Dana Shai:** Writing – review & editing. **Frank Vitinius:** Writing – review & editing, Resources. **Brigitte Ramsauer:** Writing – review & editing, Resources, Project administration, Methodology, Investigation, Conceptualization.

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Declaration of competing interest

The authors declare that they have no conflict of interest.

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Glossary

BPD: Borderline Personality Disorder with core symptoms of emotional instability, impulsivity, and fear of abandonment
DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, 4th edition according to the American Psychiatric Association
PEM: Parental Embodied Mentalizing as the nonverbal assessment of parental mentalizing capacity
PEMA™: Parental Embodied Mentalizing Assessment™ as the clinical adaption of the PEM to assess the embodied risk and protective factors of parental embodied mentalizing
PD: Personality Disorder
PPA: Postpartum Anxiety, maternal anxiety disorder within the year after child birth
MM: Mind-Mindedness, verbal assessment of parental mentalizing
OCPD: Obsessive-Compulsive Personality Disorder with core symptoms of excessive order, perfection, and striving for control
PI: Parental Insightfulness, a verbal assessment tool for parental mentalizing
PPD: Postpartum Depression, maternal mood disorder within the year after child birth
PRF: Parental Reflective Functioning, another verbal assessment tool for parental mentalizing
SCID: Structured Clinical Interview for diagnoses of DSM-IV Axis I- and -II mental disorders
UKE: University Medical Center Hamburg-Eppendorf, Germany