# Child abuse potential in mothers with early life maltreatment, borderline personality disorder and depression

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### Background

Early life maltreatment (ELM), borderline personality disorder (BPD) and major depressive disorder (MDD) have been shown to increase the potential of abuse. Emotion regulation is an identified mediator for the association of ELM and BPD with abuse potential. Until now, there has been no study to account for the co-occurrence of these risk factors in one analysis, although BPD and MDD are known as common sequelae of ELM. This is paired with a lack of studies investigating the effects of abuse potential on child well-being.

### Aims

Our study aims at (a) disentangling the effects of maternal ELM, MDD and BPD on abuse potential; (b) exploring the role of emotion regulation as a mediator; and (c) testing for intergenerational effects of abuse potential on child psychopathology.

### Method

The research design included 114 mothers with/without ELM, BPD and MDD in remission and their children, all of which were between 5 and 12 years of age. A path analysis was conducted to investigate the multiple associations between our variables.

### Results

ELM, MDD and BPD were all associated with abuse potential, with emotion regulation acting as a mediator for BPD and MDD. Furthermore, an elevated abuse potential was related to higher psychopathology in the child.

### Conclusions

History of ELM as well as the common sequelae, BPD and MDD, pose risks for child abuse. Our findings suggest improvement of emotion regulation as a potential target for intervention programs. These programs should also aim at non-substantiated cases because even an elevated abuse potential affected child mental health.

### Declaration of interest

None.

Major depressive disorder (MDD) and borderline personality disorder (BPD) are two common sequelae of early life maltreatment (ELM).[1–3] Intergenerational effects may emerge as mothers with a history of ELM, as well as MDD and BPD, show an increased risk for becoming abusive parents themselves.[4–6] Hiraoka et al.[4] found that the association of BPD features and child abuse potential in parents was partially mediated by difficulties in emotion regulation. Although this study was able to give an important insight into the mechanisms of transmission, it did not focus on the effects of the often co-occurring history of ELM with child abuse potential. This issue has not yet been investigated for MDD, although emotion regulation problems also play a significant role in this type of disorder.[7] In terms of ELM, the findings by Smith et al.[5] similarly suggest a mediating role of emotion regulation difficulties for elevated child abuse potential, but they did not consider co-occurring psychiatric disorders. The mediating effect of emotion regulation difficulties in the association of ELM and abuse potential may play a prominent role in mothers with BPD or MDD, and the link between ELM and emotion regulation may not persist when these disorders are taken into account. Finally, although extensive research has demonstrated the negative effects of child abuse on child well-being[8], there has not been much attention given to the question of whether child abuse potential is linked to child mental health.[9]

As MDD and BPD have high comorbidity,[10] and both disorders are common reactions to ELM,[1,2] we sought to include all three risk factors in one study. We aimed at disentangling their individual contributions to child abuse potential and investigating the mediating role of maternal emotion regulation to promote the understanding of these factors in the intergenerational transmission of abuse and psychopathology. Further, we wanted to determine whether maternal child abuse potential is associated with child psychopathology. Understanding these processes of transmission may provide the starting point for the development of long-term interventions to break the cycle of intergenerational transmission and promote child well-being. All three maternal risk factors (ELM, BPD and MDD) were considered in this study to be exogenous (predictor) variables in a one-path analytic model, emotion regulation may be a mediator between these risk factors and abuse potential, and child psychopathology was chosen as the endogenous (outcome) variable linked with abuse potential (Fig. 1). We hypothesised that (a) maternal MDD, BPD and severity of ELM are associated with higher levels of abuse potential, (b) the effects of BPD and MDD on abuse potential are mediated by emotion regulation difficulties, and (c) there is a positive association between abuse potential and child psychopathology.

## Method

### Participants and procedure

This study was performed within the framework of the Understanding and Breaking the Intergenerational Cycle of Abuse (www.ubica.de) multicentre project that investigates the effects of maternal history of abuse on mother–child interaction and child well-being.[11] This study included 114 mothers and their children aged between 5 and 12 years old (see Table 1). BPD was diagnosed in 19 mothers and MDD in remission (rMDD) was diagnosed in 71 mothers. A total of 64 mothers experienced ELM with at least moderate severity before the age of 17. There was an intended co-
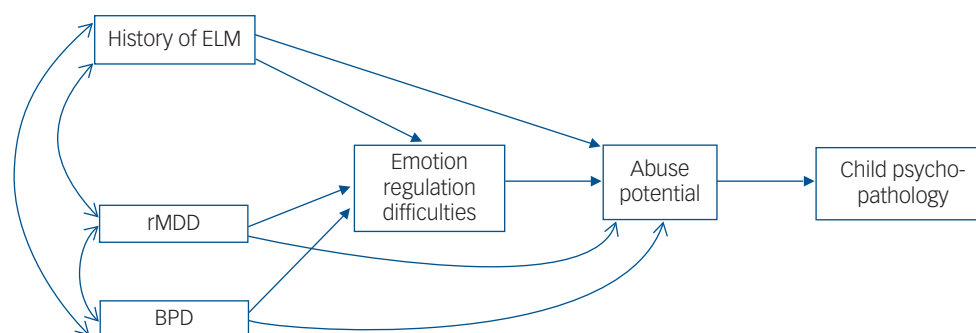
**Fig. 1** Path model for direct and indirect associations of maternal early life maltreatment (ELM), major depressive disorder in remission (rMDD) and borderline personality disorder (BPD) with maternal difficulties in emotion regulation, maternal child abuse potential and child psychopathology. Bidirectional arrows indicate covariance between two variables and one-directional arrows indicate a directional relationship. Covariation between ELM, BPD and rMDD was an intended result of our recruitment strategy which aimed at including considerable numbers of mothers with either zero, one, two or three risk factors. *$P < 0.05$, **$P < 0.01$, ***$P < 0.001$.

occurrence of two or all three risk factors in parts of our sample which consisted of mothers with/without ELM and/or rMDD and/or BPD (see Table 1 for detailed information). A total of 13.1% of mothers did not show any of these risk factors (i.e., no rMDD, no BPD and not even mild forms of ELM). Note that prevalence rates of and correlations (co-occurrence) between our predictor variables are due to our recruitment strategy (we specifically and intentionally recruited mothers with ELM, BPD and/or rMDD) and thus they do not allow conclusions on the general population.

History of ELM was defined as having experienced at least one type of abuse or neglect according to the main scales (sexual, physical and emotional abuse, neglect and parental antipathy) of the Childhood Experience of Care and Abuse Interview (CECA).[12] For our analyses we used a dimensional sum score of all CECA scales. The frequencies of the types of ELM experienced with at least moderate severity are shown in Table 1.

Mother–child dyads were recruited by advertising (flyer or poster) in psychiatric, psychotherapeutic, gynaecological and paediatric out-patient clinics, as well as educational counselling and youth welfare offices. The advertisement indicated that we were searching for healthy mothers as well as mothers with a history of ELM, rMDD and BPD.

Mothers with BPD had to be non-suicidal and stable enough (i.e., not staying in hospital) to participate in the study. Mothers with MDD had to be in the remitted state. In this way we excluded the effects of acute depression, which may override the effects of BPD and ELM. In addition, acute symptoms of MDD may interfere with participation in the study and cause bias in response behaviour. Thus rMDD, with depressive symptoms on a subclinical level, was chosen as a more adequate comparison group than acute MDD, and only mothers with a Hamilton Rating Scale for Depression (HRSD)[13] score of below or equal to seven were included. The exclusion criteria for mothers included conditions that could potentially impair their ability to participate in the study: neurological diseases, lifetime history of schizophrenia, manic episodes, an acute depressive episode and anxious-avoidant or antisocial personality disorder as assessed by the Mini-International Neuropsychiatric Interview (MINI)[14] and the International Personality Disorder Examination (IPDE).[15] Intake of benzodiazepines within the past 6 months was a further exclusion criterion because consumption and withdrawal of these substances may have a particularly strong impact on the response behaviour in the measures used. However, medication consisting of other psychotropic drugs did not represent an exclusion criterion as long as dosages had been stable for at least 2 weeks prior to entering the study. The exclusion criteria of the child participants included previous diagnosis of autistic disorder

and intellectual disability. Mothers and children had to live together because the aim of our project was to investigate the effect of maternal factors on child behaviour. The study was approved by the ethics committee of the Charité – Universitätsmedizin Berlin. Written, informed consent was obtained from all participants after the procedure had been fully explained.

## Measures

### Emotion regulation difficulties

We assessed maternal difficulties in emotion regulation with the Difficulties in Emotion Regulation Scale (DERS),[16] which is a brief self-report questionnaire. High psychometric properties could be demonstrated for the German version.[17] We entered the total (dimensional) score of the instrument in our analysis.

### Abuse potential

We administered the Eltern-Belastungs-Screening zur Kindeswohlgefährdung (EBSK),[18] the German version of the Child Abuse Potential Inventory (CAPI).[19] The EBSK (CAPI) is a self-report questionnaire that screens for the risk of child abuse by assessing multiple adverse factors associated with child abuse and neglect. The CAPI was originally developed to assess the risk for physical abuse. However, studies[18] also demonstrated significantly higher scores in families with other forms of abuse and neglect. Good internal consistency was reported for the German version of this test.[18] The CAPI contains validity indices (random responding and faking), which did not indicate any bias in this study of these instruments.

### Maternal psychopathology

To assess maternal history of depression (and other diagnoses of DSM-IV (1994) axis I disorders), we implemented the MINI,[14] which is a fully structured diagnostic interview for screening DSM-IV axis I disorders. Previous research has shown good inter-rater reliability.[20] We administered the IPDE,[15] which is a structured clinical interview with an established reliability and validity, to assess BPD according to ICD-10 (1992).[15,21] Interviews were conducted by clinical psychologists (holding bachelor's or master's degrees) after they had been trained by experienced users of these instruments.

### Early life maltreatment (ELM)

We conducted the German version[22] of the CECA[12] to assess maternal experiences of ELM. The CECA uses investigator-based ratings to collect retrospective accounts of adverse childhood experiences (up to an age of 17 years) – such as sexual, physical and emotional

**Table 1** Demographic and clinical characteristics

| Mothers | Sample (N = 114) Mean (s.d.) or % |
|---|---|
| Age in years | 39.0 (6.1) |
| Years of education | 17.2 (3.6) |
| Partnership status | |
|   Married/in a relationship with the father of the child | 50.9% |
|   Married/in a relationship with partner that is not the father of the child | 13.2% |
|   Single, separated from partner/husband, divorced or widowed | 36.0% |
| Nationality (German) | 90.4% |
| Mothers with a history of moderate/severe ELM | 56.1% |
|   Sexual abuse | 31.6% |
|   Physical abuse | 56.3% |
|   Emotional abuse | 29.7% |
|   Neglect | 28.1% |
|   Parental antipathy | 62.5% |
| Mothers with diagnosis of rMDD | 62.6% |
|   Age at onset (years) | 27.21 (9.41) |
|   Number of episodes | 2.35 (1.54) |
|   Depression score (HRSD) | 2.77 (2.17) |
|   Any psychiatric admission to hospital | 45.1% |
|   History of moderate/severe ELM | 67.6% |
|   Additional diagnosis of BPD | 19.7% |
|   Other current diagnosis (see below) | 29.6% |
| Mothers with diagnosis of BPD | 16.7% |
|   Age at onset (years) | 27.94 (7.74) |
|   Self-harming behaviour within past 3 months | 31.6% |
|   Any psychiatric admission to hospital | 78.9% |
|   History of moderate/severe ELM | 84.2% |
|   Additional diagnosis of rMDD | 73.7% |
|   Other current diagnosis (see below) | 42.1% |
| Other current diagnoses (additional to rMDD and/or BPD) | 19.3% |
|   Dysthymia | 4.4% |
|   Panic disorder | 2.6% |
|   Obsessive–compulsive disorder | 0.9% |
|   Social phobia | 3.5% |
|   Post-traumatic stress disorder | 1.8% |
|   Alcohol misuse | 0.9% |
|   Eating disorders | 1.8% |
|   Generalised anxiety disorder | 2.6% |
| Emotion regulation difficulties | 89.9 (21.4) |
| Child abuse potential | 180.1 (41.1) |

| Children | Mean (s.d.) or % |
|---|---|
| Age in years | 8.0 (1.8) |
| IQ | 104.9 (13.1) |
| Gender (girls) | 58.8% |
| Mean TRF score (psychopathology) | 49.7 (9.8) |

ELM, early life maltreatment; rMDD, major depressive disorder in remission; HRSD, Hamilton Rating Scale for Depression; BPD, borderline personality disorder; TRF, Teacher Report Form.

abuse, neglect and parental antipathy – in a semi-structured clinical interview. The data were rated according to predetermined criteria and manualised threshold examples using a four-point scale of severity ('severe,' 'moderate,' 'mild' or 'little/none'). Interviews were administered by psychologists (holding bachelor's or master's degrees) who had been trained (3-day training) and approved by the author of the interview, Antonia Bifulco. Originally, lower scores on the four-point scales indicate higher maltreatment severity. We recoded these scores, with higher scores indicating higher severity, to ease interpretation. The sum score of all five CECA dimensions was entered into analysis.

### Child psychopathology

Child psychopathology was assessed using the German version[24] of the Teacher Report Form (TRF),[23] which measures teacher-reported emotional and behavioural problems in children. Previous studies

reported that the German version has good psychometric characteristics.[25] We received official permission by the state's school authority to contact the school teachers of our participants. Mothers signed a release from the pledge of secrecy so that we could contact teachers directly instead of having the questionnaires delivered by the mothers of the children, which could have caused bias.

### Data analytic plan

We conducted a path analysis to investigate the multiple associations of our variables according to our hypotheses. We controlled for age of mother and child, gender of child, mother's years of education and presence of acute DSM-IV axis I disorders (other than MDD) in mothers. To address our research questions, we evaluated the statistical significance of each of the paths of interest and their indirect associations with each other. We started by fitting a full, less-restrictive model (see Fig. 1) to the data to determine which paths were significant and then removed non-significant paths to obtain our final, most parsimonious model. Model fit was evaluated by a combination of fit indices, including a non-significant $\chi^2$ test result ($P < 0.05$) and cut-off values close to 0.06 for the root mean square error of approximation (RMSEA), close to 0.08 for the standardised root mean square residual (SRMR) and 0.95 for the comparative fit index (CFI) as recommended by Hu and Bentler.[26] We applied a maximum likelihood estimator with robust standard errors and a mean- and variance-adjusted test statistic, as implemented in the *lavaan* package, because CAPI scores were not normally distributed (skewness z-score >1.96). Finally, we estimated the relevant indirect effects in the model for significance according to P-values and bootstrapped 95% confidence intervals, adjusting for both bias and skewness in the bootstrap sample's distribution.

This study initially involved 183 mother–child dyads. Because not all teachers returned the TRF forms and a few mothers did not return their questionnaire sets, 114 dyads entered the described analysis. Missing data were unrelated to any of the maternal risk factors evaluated (diagnoses of BPD and rMDD and severity of ELM) in our analysis. We conducted a series of multiple regressions – in which each predictor was regressed on all other predictors – before running our path analyses and we found no signs of multicollinearity.

We addressed issues of sample-size limitations as recommended by Steinmetz[27] and Kieffer *et al.*[28] Following the approach by Muthen and Muthen,[29] we conducted a *post hoc* Monte Carlo simulation (10 000 replications) for sample size estimation in structural equation modeling (SEM) to assess potential bias of parameter estimates and standard errors, and to assess statistical power of the relations in our model. Muthen and Muthen[29] give precise cut-off criteria for parameters and standard error bias (10%), standard error bias for parameters of interest for which power is assessed (5%) and coverage (remaining between 0.91 and 0.98). They also refer to the commonly accepted value for power (0.80). We applied Swain's[30] correction of the maximum likelihood $\chi^2$ statistic for the estimation of CFI and RMSEA, which accounts for the potential negative impact of sample size on fit statistics.

Descriptive analyses were executed in IBM SPSS Statistics version 23. Path analysis, sample size corrections of fit indices and Monte Carlo simulation were realised in The R Project for Statistical Computing (R) software using the packages *lavaan*, *simsem* and the public R function *swain*.

### Results

### Hypothesis 1

The analysis of the original (less-restrictive) path model (Fig. 1) yielded the following results: Maternal history of ELM (sum severity

score) showed a direct effect on abuse potential ($\beta = 0.241$, $P = 0.043$). Diagnoses of maternal BPD and rMDD were not directly associated with abuse potential ($\beta = 0.118$, $P = 0.320$ and $\beta = 0.188$, $P = 0.060$, respectively), but showed an indirect link with abuse potential via emotion regulation difficulties (see *Hypothesis 2*).

### Hypothesis 2

Maternal diagnoses of BPD and rMDD were significantly associated with the severity of maternal emotion regulation difficulties ($\beta = 0.388$, $P = 0.002$ and $\beta = 0.289$, $P = 0.007$), which was significantly associated with abuse potential scores ($\beta = 0.195$, $P = 0.046$). The indirect effects from BPD (unstandardised indirect effect coefficient $B$ (s.e.) = 12.92 (5.70), $\beta = 0.119$, $P = 0.023$, bias-corrected and accelerated (BCa) bootstrap 95% CI [1.76; 24.09]) and rMDD ($B$(s.e.) = 7.55 (3.50), $\beta = 0.090$, $P = 0.031$, BCa 95% CI [0.69; 14.41]) through emotion regulation difficulties on child abuse potential were both significant with $P < 0.05$ and a confidence interval entirely above zero. Severity of maternal ELM was not associated with maternal difficulties in emotion regulation ($\beta = 0.112$, $P = 0.312$). In a supplemental analysis, we tested which subscales of emotion regulation difficulties showed significant correlations with abuse potential. We found significant associations of emotional awareness, emotional clarity, emotion regulation strategies and acceptance of emotional responses with abuse potential (Supplementary Table S1 available at https://doi.org/10.1192/bjp.2018.74).

### Hypothesis 3

We found a significant association between abuse potential and child problem behaviour ($\beta = 0.335$, $P < 0.001$). The indirect effect of severity of ELM by way of child abuse potential on child problem behaviour ($B$(s.e.) = 0.21 (0.11), $\beta = 0.084$, $P = 0.063$, BCa 95% CI [−0.01; 0.43]) showed a trend towards significant with $P < 0.10$. The indirect effects from diagnosis of BPD ($B$(s.e.) = 0.94 (0.49), $\beta = 0.036$, $P = 0.057$, BCa 95% CI [−0.03; 1.91]) and rMDD ($B(SE) = 0.55$ (0.30), $\beta = 0.027$, $P = 0.062$, BCa CI 95% [−0.03; 1.13]) through severity of emotion regulation difficulties and child abuse potential to child problem behaviour were also trend-wise significant.

### Final model

Table 2 shows associations of exogenous (predictor) and endogenous (outcome) variables and demographic control variables in our model. Non-significant paths were removed from the final model (Fig. 2) to obtain the most parsimonious model. Regarding the following fit indices, we conclude that our final model holds good fit according to the recommended cut-offs mentioned above: SRMR = 0.028, RMSEA = 0.059, CFI = 0.951, $\chi^2 = 9.749$, d.f. = 7 and $P (\chi^2) = 0.203$. Swain-corrected indices (for small sample sizes) yielded similar results with RMSEA = 0.056 and CFI = 0.963. A *post hoc* Monte Carlo simulation based on the results in our final path model revealed minimal bias in parameter estimates (between 0% and 2.0%), meeting the standard of <10%.[29] Standard error bias ranged from 0.3% to 2.7%, meeting the standard of <5%. Coverage ranged from 0.92 to 0.94, thus falling into the recommended range of 0.91–0.98. Additionally, we found sufficient power for relevant relations in our final path model with all values >0.80. Therefore, there is little reason to suspect bias in parameter estimates and standard errors, or insufficient statistical power in our model due to small sample size. Our final model accounted for 15.2% of the variance in child problem behaviour, 23.9% of variance in child abuse potential, and 30.8% of variance in emotion regulation difficulties.

## Discussion

The main findings of our study are as follows: First, all three risk factors – i.e. severity of ELM, diagnosis of BPD and diagnosis of rMDD – were directly or indirectly associated with elevated abuse potential scores. Second, the effects of BPD and rMDD on abuse potential were mediated by severity of emotion regulation difficulties. Finally, we found a positive association between abuse potential and child psychopathology. Our study extends existing research[4–6] in that we considered ELM, BPD and rMDD in one study and thus disentangled their individual contributions to abuse potential. We show that the previous finding of emotion regulation as a mediator for ELM and abuse potential seems to be related to co-occurring psychiatric disorders like BPD or MDD. In addition, this is the first study to identify emotion regulation difficulties as a mediator for rMDD and abuse potential. By showing that composite measures of child abuse potential have an impact on child mental health, we extend prior research linking substantiated maltreatment with child psychopathology. The following illuminates these major findings and their implications in more detail.

### Effects on abuse potential and the meditating role of emotion regulation

According to our findings, severity of emotion regulation difficulties mediates the effect of BPD on abuse potential scores. This is in line with results showing that the effect of elevated BPD features on abuse potential was mediated by emotion regulation.[4] In addition, the present work considers ELM which is a frequent precursor of BPD. Deficits in emotion regulation is one of the most prominent features of BPD.[31] Although depression is primarily associated with other characteristics, emotion regulation problems also play a significant role in this type of disorder.[7] In our study, emotion regulation difficulties emerged as a mediator for the association of maternal rMDD with abuse potential. To the best of our knowledge, this is the first study investigating emotion regulation as a pathway from MDD to abuse potential.

Our findings indicate that emotion regulation difficulties partially mediated the effect of ELM severity on abuse potential when excluding BPD and rMDD from the model (Supplementary Figure S1). In a more comprehensive path analytic model (including BPD and rMDD), however, severity of ELM was directly linked to abuse potential, although no association with emotion regulation difficulties emerged. This suggests that the mediation effect previously observed by Smith *et al.*[5] was, at least in part, related to co-occurring psychiatric disorders like BPD or MDD. In our data, there was no indirect effect of ELM on abuse potential via emotion regulation independent of BPD and rMDD.

Future research may address additional factors mediating the severity of ELM and abuse potential, including maternal knowledge of child development and behaviour, which has previously been associated with abuse potential.[32] Attitude towards parenting will also be of interest in the future, as attitude was found to influence the effect of parenting stress on abuse potential.[33]

Emotion regulation may be a target of intervention in prevention programs for mothers with BPD and MDD. The highest associations of abuse potential with emotion regulation difficulties were found in the areas of emotional awareness, emotional clarity, emotion regulation strategies and acceptance of emotional responses (Supplementary Table 1). These aspects of emotion regulation could be targeted in special interventions catering to parents. Mothers with a history of ELM may benefit from such interventions when they also show signs of BPD and MDD. However, there appear to be other aspects that mediate effects of ELM on child abuse potential that remain to be explored.

**Table 2** Intercorrelations among key study variables and demographic variables

| | History of ELM | rMDD | BPD | Emotion regulation difficulties | Abuse potential | Child psychopathology |
|---|---|---|---|---|---|---|
| History of ELM | 1 | | | | | |
| rMDD | 0.252**[a] | 1 | | | | |
| BPD | 0.225*[a] | 0.105[b] | 1 | | | |
| Emotion regulation difficulties | 0.262**[c] | 0.348***[a] | 0.452***[a] | 1 | | |
| Abuse potential | 0.364***[c] | 0.321***[a] | 0.306**[a] | 0.382***[c] | 1 | |
| Child psychopathology | 0.234*[c] | 0.066[a] | 0.230*[a] | 0.081[c] | 0.349***[c] | 1 |
| Age of child | −0.039[c] | 0.044[a] | 0.045[a] | 0.020[c] | 0.072[c] | 0.113[c] |
| Gender of child | 0.034[a] | 0.047[b] | −0.104[b] | −0.086[a] | −0.094[a] | −0.094[a] |
| Age of mother | −0.039[c] | −0.048[a] | −0.280**[a] | −0.163[c] | −0.110[c] | −0.132[c] |
| Mother's years of education | −0.144[c] | −0.152[a] | −0.242**[a] | −0.079[c] | −0.203*[c] | −0.188*[c] |

ELM, early life maltreatment; rMDD, major depressive disorder in remission; BPD, borderline personality disorder.
a. Point-biserial correlation coefficient.
b. Phi coefficient.
c. Pearson's *r* correlation coefficient.
*$P < 0.05$, **$P < 0.01$, ***$P < 0.001$.

## Maternal abuse potential and child mental health

Our finding that maternal abuse potential scores predicted child psychopathology confirms the final hypothesis, extending the existing literature on the association of child abuse and impaired child mental health.[8,9] Haskett *et al.*[9] studied samples of parents who had either been identified as high risk for abuse or had substantiated cases of physical abuse. Substantiated maltreatment rates and assessment of abuse potential are the two methodological approaches applied most often when exploring the risk for child abuse in parents. Substantiated cases of maltreatment may reflect only a proportion of maltreating parents as an underreporting of these problems is expected.[34] The risk measures of child abuse attempt to sidestep this distortion of data: the parental risk of maltreating their offspring is measured by assessing psychosocial characteristics associated with violence against children, as for example with the CAPI.[19] Haskett *et al.*[9] found an association of abuse potential and child psychopathology measured with a parent rating questionnaire, but no association with child psychopathology in a teacher rating was found. Ratings of child psychopathology by parents with high risk for abuse may be biased, however, and the investigation's sample was small ($n = 41$), focusing on substantiated cases of abuse ($n = 25$). Our findings regarding a teacher rating of child psychopathology underline the relevance of abuse risk measures for child mental health. The CAPI includes multiple parental aspects that have been found to predict child abuse, including global distress, rigidity (parenting and expectation to child), perception of the child as a 'problematic child,' restricted physical health, unhappiness with one's own life and interpersonal relationships, problems with family, problems with self, emotional lability, lack of social support and feelings of loneliness. Such familial or parental distress may impair child well-being even though actual acts of abuse do not take place.

Indirect effects leading from BPD and rMDD diagnoses to child psychopathology via emotion regulation and abuse potential showed a trend towards significance. Likewise, an indirect effect of ELM severity via abuse potential on child psychopathology was found to have a trend towards significance. These results indicate that the pathways studied here may be relevant for intergenerational processes of transmission.

## Limitations

This study has limitations: First, we only studied mothers even though paternal factors may also play an important role for child abuse potential. Second, we did not directly assess substantiated cases of child abuse. However, solely studying substantiated cases of child abuse might lead to underreporting problems, as not all abusive behaviours are reported to officials.[34] Third, MDD and BPD are common reactions to ELM experiences, but they may only represent a limited range of psychiatric disorders associated with ELM. Fourth, the results reported are based on a cross-sectional study design and thus a causal conclusion cannot be made. Fifth, there might be other important factors, like family and child characteristics, affecting child mental health that we could not consider in our model. These factors could be realised in studies with very large sample sizes. Sixth, we used a teacher
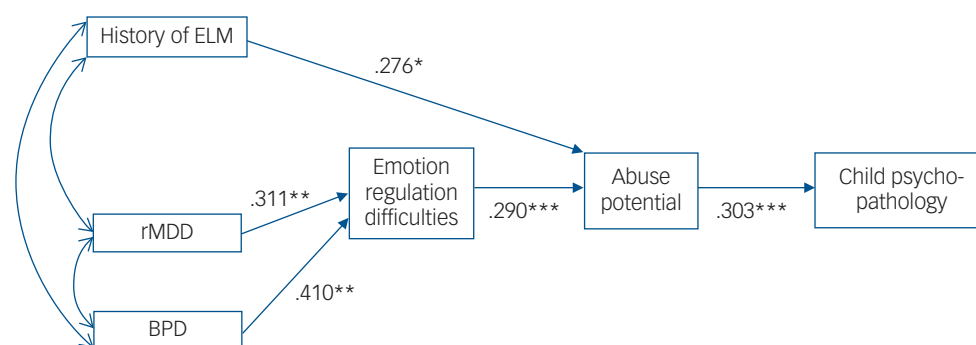


**Fig. 2** Standardised path coefficients for tested paths of the final model. Only significant paths are displayed. Controlled for maternal and child age, gender of child, mother's years of education and mother's acute axis I disorders. Bidirectional arrows indicate covariance between two variables and one-directional arrows indicate a directional relationship. Covariation between early life maltreatment (ELM), bipolar disorder (BPD) and major depressive disorder in remission (rMDD) was an intended result of our recruitment strategy which aimed at including considerable numbers of mothers with either zero, one, two or three risk factors. *$P < 0.05$, **$P < 0.01$, ***$P < 0.001$.

rating of child mental health, in contrast to a parent rating, to reduce the issue of common-method variance. However, teachers might have a different or even reduced picture of child behaviour. Fifth, although the proportion of mothers with at least moderate ELM and rMDD was balanced, it is acknowledged that the number of mothers with BPD was relatively low. Thus, the effects of maternal BPD need to be replicated in larger samples in future studies. Sixth, we did not test inter-rater reliability of the IPDE (diagnostic interview) within our study team. Finally, our sample size was limited for path analytic modelling. Potential issues with smaller sample sizes in SEM of path analysis include limitations in statistical power, bias in parameter estimates, standard errors and goodness-of-fit statistics.[28,29] To cope with this limitation, we performed a *post hoc* Monte Carlo simulation[29] and applied Swain's[30] correction of the maximum likelihood $\chi^2$ statistic.

We conclude that ELM directly affects risk for child abuse and child well-being, although MDD and BPD indirectly affect these factors via emotion regulation. Prevention and intervention programs could address emotion regulation issues for mothers diagnosed with BPD or MDD. Further research is needed to identify other transmitting factors, especially in mothers with ELM who do not have BPD or MDD.

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EXTRA CONTENT ONLINE

## psychiatry in history

# Acute delirium of Pope Boniface VIII

**Luca Cambioli, Giovanni De Vito and Michele Augusto Riva**

Boniface VIII (Benedetto Caetani, c. 1230–1303) is considered one of the most famous popes of the Middle Ages. He is mainly known for the celebration of the first Catholic Jubilee (1300) and for his disputes with the French King Philip IV the Fair (1268–1314) on papal supremacy that resulted first in the writing of the bull *Unam Sanctam* (1302), declaring the supremacy of spiritual power over temporal power, and then in a French kidnapping of Boniface. After a long exchange of reciprocal accusations and excommunications, on 7 September 1303, a French army guided by Guillaume de Nogaret (1260–1313) and Giacomo Colonna (1270–1329) attacked the palace of Boniface VIII in Anagni and imprisoned the pope, demanding his resignation. He was allegedly beaten and humiliated; even though there is no evidence of the pope being slapped, this episode is commonly known as the *Schiaffo di Anagni* (Anagni's Slap). After 3 days of captivity, he was released following the uprising of his hometown Anagni against the captors. This episode caused a stir even among the strenuous opponents of the pope. For example, the Italian poet Dante Alighieri (1265–1321), who was openly in contrast with Boniface's abuse of temporal power, criticised the Anagni incident in his masterpiece 'Divine Comedy'.

Now 73 years old, Boniface VIII never recovered and died within a few weeks on 11 October. In the last days of life, the pope suffered from an acute confusional state (*extra mentem cordis positus*); he allegedly appeared disoriented, possibly suffering from seizures and perceptual disturbances, particularly visual and auditory hallucinations. Boniface floated from a hyperactive to a hypoactive state. He showed aggressive behaviour towards other people as well as himself – he allegedly bit his own arms and hands – or depressed and drowsy, so dying angry and desperate (*papa Bonifatius obiit non bono modo, sed rabiosus et desperatus de Deo*).

The detailed description of the terminal symptoms of Boniface VIII suggest that he may have been affected by acute delirium. According to customary definitions of delirium this condition requires a fluctuating and acutely developed disturbance in attention and awareness, an additional cognitive disturbance and evidence of one or more underlying organic causes. Older age, dementia, functional disabilities and a high burden of coexisting conditions are common predisposing factors. High pain levels, anaemia, infections, acute illness and acute exacerbation of chronic illness are some of the most commonly reported precipitating factors.

In Boniface's case, delirium may have been a consequence of brain injuries resulting from the brutal beatings. A cerebrovascular accident may have resulted in a similar confusional state as well. Finally, since the pope suffered from kidney stones over several decades, it may also be hypothesised that delirium was caused by end-stage kidney disease. Whatever the disease that brought the pope to death, his last days of agony represent one of the most ancient accurate descriptions of acute delirium in an elderly person.