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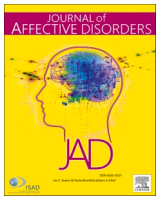

Research paper

Adverse Childhood Experiences (ACEs) and childbearing and perinatal mental health outcomes in a clinical sample of women

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ABSTRACT

Adverse Childhood Experiences (ACE) are associated with later life complications, including childbearing outcomes and episodes of mental ill-health. The perinatal period is a timepoint of vulnerability to the impacts of early life adversity, such as ACEs. We explored the association between maternal exposure to ACEs, entering parenthood, and episodes of mental ill-health during the perinatal period in a clinical sample with a mental health diagnosis to determine the increased vulnerability the perinatal period brings. Participants ($N = 1494$) were recruited across the UK, were aged 18 years or over, and female. Standardised self-report questionnaires ascertained demographic, parenthood, mental health, and ACE related information. Within this clinical sample, ($N = 1010$) women had given birth, and episodes of perinatal mental ill-health were assessed. Maternal childhood physical abuse was associated with an increased likelihood of having children, yet having divorced parents reduced this likelihood. In a clinical sub-sample of women who had children, physical abuse predicted a perinatal episode of bipolar disorder, sexual abuse a perinatal episode of anxiety disorders, and emotional neglect a perinatal episode of depressive disorders.

Conclusions: Specific ACE exposure is associated with entering parenthood and episodes of mental ill-health during the perinatal period. This highlights a moment in the human lifespan when women who have experienced early adversity may be particularly vulnerable; the findings therefore have potential implications for the resourcing of specialist clinical services.

1. Introduction

Adverse Childhood Experiences (ACEs) are associated with poorer perinatal outcomes (Souch et al., 2022) and can be more influential than exposure to traumatic events that occur later in the life course (Dunn et al., 2017; McCutcheon et al., 2010). The dimensional model of adversity and psychopathology (McLaughlin et al., 2014) highlights how maltreatment-based ACEs (sexual, emotional, and physical abuse, and both emotional and physical neglect) confer a particularly high risk to physical and mental health. Due to the differing prevalence and impact of each ACE type on a range of adverse physical and mental health outcomes in adulthood (Madigan et al., 2023), it is vital to explore the effects of ACEs at the individual level. Whilst a growing body of research has documented an association between mothers ACE exposure and poorer maternal and child outcomes in the perinatal period (Ångerud et al., 2018; Plant et al., 2013; Souch et al., 2022), fewer studies have examined the impact of ACEs on entry to parenthood and perinatal mental health outcomes in a clinical sample of women.

In non-perinatal populations, ACEs are associated with the incidence and severity of psychiatric diagnoses to a greater extent than exposure to traumatic events later in the life course (Dunn et al., 2017; McCutcheon et al., 2010). Specifically, maltreatment-based ACEs are associated with greater symptom severity than other ACE types (e.g. indices of household dysfunction such as parental divorce, incarceration and substance abuse) in bipolar and psychotic disorders (Carbone et al., 2019; Perry et al., 2020). Maltreatment based ACEs have been shown to increase the likelihood of poorer mental health outcomes in adulthood (Manyema et al., 2018) and are associated with elevated symptom severity following exposure to stressors in later life (Karatekin, 2018; McElroy and Hevey, 2014).

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Episodes of mental ill-health during the perinatal period can negatively impact infant and longer-term child development (Dean et al., 2018; Durkan et al., 2015; Gelaye et al., 2016; Martini et al., 2017; Maselko et al., 2020; Stein et al., 2014; Waters et al., 2014). Given that exposure to ACEs predicts poorer coping with stressful life events and elevated rates of mental health conditions in non-perinatal populations (Karatekin, 2018; Manyema et al., 2018; McElroy and Hevey, 2014; Sheffler et al., 2020), greater consideration needs be given to the impact of ACEs on entry to parenthood and mental health during the perinatal period. Exposure to maltreatment ACEs has been associated with episodes of depression during pregnancy (Ångerud et al., 2018; Plant et al., 2013) and the first postnatal year (Plant et al., 2017; Silverman and Loudon, 2010), as well as poorer mother-infant bonding (Farré-Sender et al., 2018; Muzik et al., 2013). A recent systematic review highlighted that much of the research on ACE exposure and maternal mental health focusses on depression (Souch et al., 2022). As such, greater consideration of the impact of ACEs on entering parenthood and mental health during the perinatal period across a range of conditions is warranted. Using a clinical sample allows for the assessment of risk during the perinatal period, above and beyond other time points in a woman's life.

1.1. Aims

We explored the association between women's exposure to ACEs, entry to parenthood, and episodes of mental ill-health during the perinatal period in a large sample of adult women diagnosed with a mental health condition. Our first aim was to examine the association between ACE exposure and whether women entered parenthood or not. Our second aim was to examine the association between ACE exposure and episodes of mental ill-health during the perinatal period after controlling for established social-demographic risk factors including education level, ethnicity, employment status, age at first birth and income level. We hypothesised that maltreatment ACEs would be associated with an increased likelihood of an episode of mental ill-health during the perinatal period in line with the dimensional model of adversity and psychopathology (McLaughlin et al., 2014).

2. Materials & methods

2.1. Sample

Participants were recruited in the UK via the National Centre for Mental Health (NCMH) research centre, a Health and Care Research Wales and Welsh Government funded research collaboration. Participants were volunteers diagnosed with a mental health condition, who were recruited via both systematic (within health care services), and non-systematic (online and localised advertising campaigns) approaches.

2.2. Procedure

Participants completed an in-person clinical interview and standardised questionnaire measures with a trained research assistant. This assessment collected demographic and childbearing information, and questions about participants own and their family's physical and mental health history. Inclusion criteria for this study required participants to be female, aged 18 and over, and to have been diagnosed with a mental health condition by a healthcare professional.

2.3. Measures

2.3.1. Sociodemographic risk factors

Sociodemographic risk factors included ethnicity (coded as identifying as white and non-white, due to small numbers of non-white participants); education (7 categories ranging from no formal education to post graduate degree or higher); employment (coded as a binary outcome of currently working/volunteering/studying, or not); household income (scored in 7 graded £10,000 categories) and maternal age at first birth.

2.3.2. Childbearing

Entry to parenthood was defined as whether women self-reported giving birth to at least one live child. Women also reported the number of live children that they had given birth to.

2.3.3. Mental health diagnoses

Primary diagnoses of a mental health condition by a healthcare professional were reported at interview. Diagnoses were verified with clinical services when there was uncertainty around the primary diagnosis and when consent was provided. Categorisation was devised by the project team in line with ICD (World Health Organization, 2022) and DSM (American Psychiatric Association, 2013) classifications. Diagnoses were categorised into five broader groups: depressive, anxiety, psychotic, bipolar, and post-traumatic stress disorders, which allowed for categorisation of all primary diagnoses reported at interview. During the interview, participants reported whether they had experienced an episode of mental ill-health during the perinatal period (defined as during pregnancy or the first year postpartum) following a live birth.

2.3.4. Adverse childhood experiences

Early life adversity was captured via the Adverse Childhood Experience (ACE) Questionnaire (Felitti et al., 1998). A 10-item self-report scale that assesses exposure before the age of 18 to maltreatment e.g. threat-based (emotional, physical, or sexual abuse) and/or deprivation-based emotional or physical neglect; or household dysfunction (HD), e.g., parental separation or divorce, having an abused mother, parental mental illness, having a parent who abused substances, or parent who has been imprisoned, (Chapman et al., 2004). Each ACE item is recorded as a binary yes/no answer. Cumulative maltreatment ACEs are calculated by summing the number of yes's out of the five maltreatment ACEs (range 0–5). Cumulative HD ACEs are calculated by summing the number of yes's out of the five HD ACEs (range 0–5).

2.4. Statistical analysis

Analyses tested associations between, cumulative maltreatment and HD ACEs, individual ACEs, and childbearing and mental health outcomes. Covariates of education, ethnicity, employment, income, mothers age at entry to parenthood and number of children were assessed for association and included within analyses accordingly. Binary logistic regression was used to compare the association between ACEs and entry to parenthood. Additionally, binary logistic regression was used to compare the association between ACEs and an episode of mental ill-health during the perinatal period. Separate regressions were run for each category of mental health diagnoses, with the predictor variable of ACE exposure and the outcome variable being whether or not the participant experienced an episode of mental ill-health of that diagnostic category during the perinatal period.

3. Results

3.1. Sociodemographic characteristics and ACE exposure

The characteristics of the sample are presented in Table 1. Overall, the majority of the sample was white and with 46.2 % currently employed, volunteering or in education. Over a third of the sample had obtained an undergraduate degree or higher, with 88.4 % having obtained at least GCSE level education and 11.6 % having no educational qualifications. This sample is reflective of current educational rates in England and Wales where 34.4 % of the population hold an undergraduate degree level educational attainment (or equivalent) or above (NOMIS, 2021), but over representative of white ethnicity compared to

Table 1
Socio-demographic characteristics of the sample.

		Whole sample (N = 1494)
Ethnicity	White	1448 (97.4 %)
	Non-white	46 (2.6 %)
Highest Educational Attainment	None	173 (11.6 %)
	GCSEs	215 (14.4 %)
	Other	41 (2.7 %)
	Apprenticeship	5 (0.3 %)
	A-Levels	503 (33.7 %)
	Undergraduate Degree	493 (33.0 %)
	Post Graduate Degree	64 (4.3 %)
Current Employment	Currently employed, volunteering, or studying	700 (46.2 %)
	Not currently employed, volunteering, or studying	794 (53.2 %)
Household Annual Income	Benefits and up to £10 k	599 (40.1 %)
	£10 k - £20 k	372 (24.9 %)
	£20 k - £30 k	252 (16.9 %)
	£30 k - £40 k	117 (7.8 %)
	£40 k - £50 k	72 (4.8 %)
	£50 k - £60 k	34 (2.3 %)
	£60 k plus	48 (3.2 %)

the 81.7 % England and Wales rate (ONS, 2021). All of the women in the sample had been diagnosed with a mental health condition, with primary diagnoses including Depressive Disorders, Bipolar Disorder, Post-Traumatic Stress Disorder (PTSD), Anxiety Disorders (e.g., Generalised Anxiety Disorder and Social Anxiety Disorder) and Psychotic Disorders.

The majority of the sample had been exposed to at least one maltreatment ACE ($N = 939$, 62.9 %) comprising emotional abuse ($N = 642$, 43.0 %), physical abuse ($N = 445$, 29.8 %), sexual abuse ($N = 418$, 28.0 %), emotional neglect ($N = 666$, 44.6 %), and physical neglect ($N = 177$, 11.8 %). Similarly, the majority of the sample had been exposed to at least 1 HD ACE, $N = 953$ (63.8 %), comprising parental imprisonment ($N = 94$, 6.3 %), parental divorce ($N = 454$, 30.4 %), parental substance abuse ($N = 335$, 22.4 %), parental mental illness ($N = 679$, 45.4 %), and exposure to domestic violence ($N = 218$, 14.6 %). Participants experienced a mean of 2.76 ACEs, a median of 2 ACEs, and a range of 0–10. Broken down into the broad ACE categories, women had been exposed to a mean of 1.51 maltreatment ACEs (median = 1, range = 0–5) and a mean of 1.19 HD ACEs (median = 1, range = 0–5.

3.2. Entry to parenthood

Among this sample of women with a diagnosed mental health condition, two thirds had entered parenthood (N = 1010; 67.5 %). In a general UK population, 84 % of women have entered parenthood (ONS, 2024). Of the $N = 1010$ women who entered parenthood, women reported a median number of 2 children and a mean age of 25.43 when they entered parenthood. The association between exposure to each individual ACE and entry to parenthood is reported in Table 2. Neither cumulative maltreatment nor cumulative HD ACEs were significant predictors of entry to parenthood. At the individual level, exposure to physical abuse significantly predicted an increased likelihood of entry to parenthood, whereas having divorced parents significantly predicted a reduced likelihood of entering parenthood. Lower educational attainment was a significant covariate and predicted an increased likelihood of entering parenthood. Subsequent analyses will focus on the subsample of women who entered parenthood and were at risk of experiencing an episode of mental ill-health during the perinatal period.

3.3. Perinatal episodes of mental ill-health

Just over half of the sample (51.8 %) had a primary diagnosis of a depressive disorder. Of the women with a depressive disorder, 273 of 523 (52.2 %) experienced an episode of mental ill-health during perinatal period. Just over 1 in 5 women (21.5 %) had a primary diagnosis of bipolar disorder. Of the women with bipolar disorder, 119 of 217 (54.8 %) experienced an episode of mental ill-health during the perinatal period. Diagnoses of PTSD (8.6 %) and psychotic disorders (5 %) were less prevalent in the current sample. Of the women with PTSD, 49 of 87 (56.3 %) experienced an episode of mental ill-health during the perinatal period. For women with a primary diagnosis of a psychotic condition, 21 of 51 (41.2 %) experienced an episode of mental ill-health during the perinatal period. Finally in the current sample, 132 women (13.1 %) had a primary diagnosis of an anxiety disorder. Of these 132 women, 53 (40.2 %) experienced an episode of mental ill-health during the perinatal period.

Table 2
Exposure to adverse childhood experiences and entry to parenthood.

		Entry to parenthood		Multivariate Analysis		
		Yes	No	Wald	*P* Value	Exp (β) (95 % C.I.)
Emotional Abuse	Yes	435 (67.8 %)	207 (32.2 %)	3.790	0.052	0.666 (0.442–1.003)
	No	575 (67.7 %)	374 (32.3 %)			
Physical Abuse	Yes	326 (73.3 %)	119 (26.7 %)	11.210	≤0.001*	2.154 (1.375–3.376)
	No	682 (65.3 %)	362 (34.7 %)			
Sexual Abuse	Yes	284 (67.9 %)	134 (32.1 %)	0.010	0.920	0.983 (0.697–1.386)
	No	714 (67.7 %)	341 (32.3 %)			
Emotional Neglect	Yes	453 (68.1 %)	212 (31.9 %)	0.367	0.544	1.121 (0.775–1.623)
	No	552 (67.2 %)	270 (32.8 %)			
Physical Neglect	Yes	127 (71.8 %)	50 (28.2 %)	0.355	0.552	0.845 (0.486–1.470)
	No	881 (67.1 %)	431 (32.9 %)			
Mother Abused	Yes	155 (71.1 %)	63 (28.9 %)	0.191	0.662	1.115 (0.685–1.814)
	No	849 (67.1 %)	416 (32.9 %)			
Parent's Divorced	Yes	278 (61.4 %)	175 (38.6 %)	10.490	0.001*	0.573 (0.409–0.803)
	No	716 (70.3 %)	303 (29.7 %)			
Parental Substance Abuse	Yes	233 (69.6 %)	102 (30.4 %)	1.075	0.300	1.240 (0.826–1.863)
	No	774 (67.1 %)	380 (32.9 %)			
Parental Mental Illness	Yes	447 (65.9 %)	231 (34.1 %)	0.103	0.748	0.950 (0.693–1.302)
	No	557 (69.0 %)	250 (31.0 %)			
Parental Imprisonment	Yes	66 (70.2 %)	28 (29.8 %)	0.545	0.460	1.318 (0.633–2.745)
	No	943 (67.5 %)	454 (32.5 %)			
Education				10.722	0.001*	0.845 (0.764–0.935)
Model				90.005	≤0.001*	2.000 (1.341–2.118)

Tables 3 and 4 show the relationship between ACEs (cumulative in Table 3 and individual in Table 4), and the likelihood of experiencing an episode of mental ill-health during the perinatal period among the women diagnosed with the different mental health conditions. Cumulative HD ACEs predicted an episode of mental ill-health during the perinatal period for women with anxiety disorders. Both exposure to cumulative maltreatment ACEs and cumulative HD ACEs predicted an episode of mental ill-health during the perinatal period for women with PTSD. Regarding individual ACEs, for women with depressive disorders, those exposed to emotional neglect during childhood were at a two-fold greater risk of experiencing an episode of mental ill-health during the perinatal period. For women with a primary diagnosis of bipolar disorder, those exposed to physical abuse during childhood were at a three times greater risk of experiencing an episode of mental ill-health during the perinatal period. Individual ACEs were not associated with perinatal episodes of psychosis for women with a primary diagnosis of a psychotic disorder. For women with a primary diagnosis of an anxiety disorder, exposure to sexual abuse was associated with a twelve times greater risk of experiencing an episode of mental ill-health during the perinatal period. Individual ACEs did not predict an increased likelihood of an episode of mental ill-health during the perinatal period for women with PTSD. None of the covariates significantly predicted of an episode of mental ill health during the perinatal period for any diagnostic category (Table 4).

4. Discussion

To our knowledge, this is the first study to explore individual ACEs in relation to the childbearing outcome of entry to parenthood, as well as episodes of mental ill-health during the perinatal period for women with a range of mental health conditions. The use of a clinical sample allows for an exploration of particular vulnerability during the perinatal period in relation to ACE exposure among women with a range of mental health conditions. In our sample, physical abuse and parental divorce predicted the likelihood of women having children but in opposing directions. Whereby exposure to parental divorce decreased and physical abuse increased the likelihood of entering parenthood.

Entry to parenthood rates of 67.5 % in the current sample are lower than UK population norms of 84 % (ONS, 2024). This may in part be explained by the cross-sectional nature of the study, as some of the non-childbearing women at assessment may have subsequently given birth to a live child. Longitudinal studies that follow a cohort of women throughout the childbearing years are needed to control for this potential confound. Nevertheless, within this clinical sample, relationships between ACE exposure and entry to parenthood were observed. Physical abuse significantly predicted an increased likelihood of entry to parenthood, whereas having divorced parents significantly predicted a reduced likelihood of entering parenthood.

Experiencing the divorce of parents has been associated with an increased likelihood of divorce and poorer relationship quality in the next generation (Lee, 2018; Mustonen et al., 2011). Poorer relationship quality and communication issues (Cui et al., 2011; Rhoades et al., 2012; Roper et al., 2020) can decrease the longevity of close romantic relationships, and in turn, reduce the likelihood of entering parenthood. Childhood physical abuse has been associated with an increased likelihood of teenage pregnancy (Madigan et al., 2014), and accelerated pubertal development and cellular aging, (Colich et al., 2020; Lawn et al., 2018; Marini et al., 2020; McLaughlin et al., 2020; Simons et al., 2016; Sumner et al., 2019), factors that could influence entry to parenthood in the current study. There are specific intergenerational impacts of maltreatment ACE exposure unique to the perinatal period including, pre-term birth (Bublitz et al., 2020; Souch et al., 2022), infant emotion regulation difficulties (Agrati et al., 2015; Lang et al., 2010), and poorer mother-infant bonding (Fuchs et al., 2015; Morelen et al., 2016). Our findings indicate that for women with a mental health condition, ACE exposure differentially predicts entry to parenthood.

Table 3
Cumulative maltreatment and household dysfunction ACEs and perinatal episodes of mental ill-health.

	Depressive			Bipolar			Psychosis			Anxiety			PTSD		
	Wald	*P* Value	Exp (β) (95 % C.I.)	Wald	P Value	Exp (β) (95 % C.I.)	Wald	P Value	Exp (β) (95 % C.I.)	Wald	P Value	Exp (β) (95 % C.I.)	Wald	P Value	Exp (β) (95 % C.I.)
Cumulative Maltreatment	0.682	0.391	1.135 (0.892–1.242)	0.002	0.965	0.989 (0.736–1.314)	3.224	0.073	1.701 (0.910–2.613)	0.904	0.316	0.729 (0.489–1.088)	2.41	0.031*	1.602 (0.925–2.315)
Cumulative HD	0.098	0.776	0.841 (0.311–2.009)	2.711	0.097	0.061 (0.002 to 1.939)	0.611	0.489	1.012 (0.715–1.688)	4.558	0.031*	1.484 (1.002–2.411)	3.801	0.019*	1.589 (0.998–2.792)
Model	17.007	≤0.001*	1.515 (1.104–1.811)	5.211	0.018*	6.011 (3.812–7.104)	4.889	0.036*	3.923 (1.267–4.813)	4.902	0.027*	3.337 (1.978–5.662)	3.499	0.038*	3.248 (2.199–4.363)

Covariates included in the models are education, ethnicity, employment, income, mothers age at entry to parenthood and number of children.

Table 4
Exposure to each individual ACE and the risk of an episode of mental ill-health during the perinatal period.

	Depressive			Bipolar			Psychosis			Anxiety			PTSD		
	Wald	P Value	Exp (β) (95 % C.I.)	Wald	P Value	Exp (β) (95 % C.I.)	Wald	P Value	Exp (β) (95 % C.I.)	Wald	P Value	Exp (β) (95 % C.I.)	Wald	P Value	Exp (β) (95 % C.I.)
Emotional Abuse	0.402	0.498	1.02 (0.587 to 1.726)	0.052	0.875	0.902 (0.313–2.927)	0.000	0.998	0.000 (0.000 - N/A)	0.089	0.782	1.278 (0.189–8.619)	0.097	0.379	0.172 (0.001–6.208)
Physical Abuse	0.822	0.352	0.698 (0.414 to 1.562)	4.011	0.031*	4.189 (0.822–14.964)	0.000	0.998	0.000 (0.000 - N/A)	0.133	0.754	1.682 (0.103–13.742)	2.684	0.102	21.898 (0.156–134.524)
Sexual Abuse	1.997	0.201	1.624 (1.003 to 2.709)	0.444	0.512	1.337 (0.478–4.587)	0.000	0.997	0.000 (0.000 - N/A)	8.825	0.003*	15.177 (3.254–72.368)	0.585	0.522	1.721 (0.557–7.579)
Emotional Neglect	10.002	0.001*	2.489 (1.881 to 3.523)	0.048	0.875	0.821 (0.496–2.115)	0.000	0.997	0.000 (0.000 - N/A)	0.298	0.587	1.796 (0.197–14.232)	2.534	0.129	0.221 (0.009–2.134)
Physical Neglect	3.441	0.067	0.499 (0.236 to 1.142)	1.221	0.261	5.105 (0.299 to 49.136)	0.000	0.999	0.000 (0.000 - N/A)	0.098	0.779	0.512 (0.008–7.976)	0.221	0.678	0.665 (0.128–3.962)
Abused Mother	0.019	0.902	1.002 (0.198 to 3.218)	1.997	0.199	14.543 (0.332 to 39.628)	0.000	0.998	0.000 (0.000 - N/A)	0.000	0.999	0.000 (0.000 to N/A)	0.687	0.415	9.256 (0.024–701.461)
Parental Divorced	0.453	0.498	1.662 (0.612 to 3.878)	1.066	0.324	6.875 (0.354 to 16.013)	0.000	0.998	0.000 (0.000 - N/A)	1.965	0.277	0.262 (0.076–1.579)	1.336	0.258	25.724 (0.085–57.932)
Parental Substance Abuse	0.978	0.401	2.212 (0.872 to 5.165)	2.714	0.102	1.443 (0.398 to 4.343)	0.000	0.999	0.000 (0.000 - N/A)	1.336	0.208	4.122 (0.604 to 21.775)	0.254	0.613	4.378 (0.022–28.443)
Parental Mental Illness	0.225	0.675	1.116 (0.502 to 2.886)	2.447	0.131	1.442 (0.309 to 4.778)	0.000	0.999	0.000 (0.000 - N/A)	0.415	0.524	1.558 (0.242–5.116)	2.054	0.164	38.856 (0.001–105.486)
Parental Imprisonment	0.048	0.897	0.962 (0.253 to 2.798)	1.552	0.267	0.155 (0.002 to 3.997)	0.000	0.999	0.000 (0.000 - N/A)	0.000	0.999	0.000 (0.000 - N/A)	1.886	0.243	0.000 (0.000 - N/A)
Model	17.824	<0.001*	1.515 (1.120–1.819)	4.445	0.027*	4.725 (2.199–6.996)	4.111	0.044*	2.487 (0.967–3.884)	4.115	0.030*	3.008 (1.527–6.285)	3.003	0.039*	1.897 (0.022–3.997)

Covariates included in the models are education, ethnicity, employment, income, mothers age at entry to parenthood and number of children.

We found that exposure to specific maltreatment ACEs was particularly associated with episodes of mental ill-health during the perinatal period. Emotional neglect predicted an increased likelihood of a perinatal episode of a depressive disorder, physical abuse a perinatal episode of bipolar disorder, and sexual abuse a perinatal episode of an anxiety disorder. Cumulative maltreatment and HD ACEs predicted an episode of mental ill-health during the perinatal period for women with PTSD. Associations between emotional neglect and lifetime depressive episodes have been documented in the wider literature (Cohen et al., 2017; Humphreys et al., 2020), and our findings suggest that the perinatal period appears to be a time of particular vulnerability for women with depressive disorders who experienced emotional neglect during childhood.

In a general population, childhood sexual abuse has been associated with anxiety disorders in adulthood (Maniglio, 2013), with the perinatal period carrying particular risk (Akinbode et al., 2021). Pregnancy and childbirth related healthcare assessments and changes in body shape and boundaries are prominent in terms of their anxiety provoking nature for victims of childhood sexual abuse (Byrne et al., 2017; Leeners et al., 2007; Talmon and Ginzburg, 2019). Additionally, women exposed to childhood sexual abuse experience higher rates of health problems, fear of childbirth and increased difficulties with delivery compared to women without such early life adversity (Brunton and Dryer, 2021). These factors potentially account for the vulnerability for episodes of mental ill-health during the perinatal period specifically, for women with anxiety disorders.

Our findings regarding the association between childhood physical abuse and an episode of mental ill-health during the perinatal period for women with bipolar disorder is consistent with the wider bipolar literature. For example, exposure to childhood physical abuse has been shown to predict an increased symptom severity (Leverich et al., 2002; Pascual et al., 2020; Romero et al., 2009), increased sensitivity to stressors (McCraw and Parker, 2017), and reduced treatment efficacy (Etain et al., 2017) for individuals with a lifetime diagnosis of bipolar disorder. Episodes of mental ill-health during the perinatal period are associated with negative outcomes for both the mother and infant, including preterm birth, lower birth weight and an increased likelihood of offspring developing mental ill-health later in life (Goodman, 2019; Grigoriadis et al., 2013; Hakanen et al., 2019; Hazell Raine et al., 2020; Hoffman et al., 2017; Pawlby et al., 2009; Rossen et al., 2016; Smith et al., 2011; Verbeek et al., 2012). Our findings indicate that the perinatal period carries particular risk for episodes of mental ill-health in the context of exposure to adversity in childhood above beyond the risk carried at other timepoints in a woman's life course.

The earlier episodes of mental ill-health are detected during the perinatal period the more successful treatment is likely to be (Cox et al., 2016). Our findings suggest that the identification of ACEs could therefore aid screening, detection, and early intervention during the perinatal period for women at risk of recurrent episodes of depression, anxiety, PTSD, and bipolar disorder. Mother and infant outcomes such as parenting adjustment, sense of competence, mother-infant bonding, and children's developmental outcomes can be adversely affected by episodes of mental ill-health during the perinatal period (Souch et al., 2022). Prompt access to interventions including Interpersonal Psychotherapy, Cognitive Behavioural Therapy, Maternal-Child Interaction Guidance, and Psychotherapeutic Group Support (Beeber et al., 2013; Bilszta et al., 2012; Letourneau et al., 2017; Milgrom et al., 2015; Mulcahy et al., 2010; Perry et al., 2011; Reay et al., 2012) can improve perinatal outcomes for both mother and child, highlighting the importance of early detection and intervention.

A limitation of the current study is that ACEs, by their very nature, tend to co-occur, which can make it difficult to determine the extent of the impact of each individual ACE. Due to the large sample size in the current study, we were able to examine associations between each individual ACE whilst controlling for the impact of the other ACEs. Nevertheless, it is likely that ACEs are underreported, despite their high

prevalence, particularly because perpetrators are often people close to the individual, such as a parent or friend (ONS, 2016). It is not known in our sample whether those who did not enter parenthood have done so through choice or whether they are unable to have children. Prior research has found that increased ACE exposure decreases fertility (Jacobs et al., 2015), meaning participants in our sample may have wanted children but were unable to. Data on miscarriages and terminations was not collected in the current study, and it is possible that pregnancy rates differ from the outcome of a live birth that was examined in the current study. Future research would benefit from collecting more detailed fertility history data including pregnancies, miscarriages, terminations and fertility treatment.

Additional limitations of the current study are related to the cross-sectional design and the inclusion of participants aged 18 or over. For example, it is possible that some participants may have chosen to have children after our assessment had taken place. Mental health diagnoses and perinatal episodes of mental ill-health were obtained through self-report and corroborated with primary care teams where possible. Furthermore, categorisation of the mental health condition was based on the primary diagnosis. This means that we were unable to account for comorbidity in our analyses. With regards to bipolar disorder, it is not known whether perinatal episodes were of a depressive or a manic nature; future research should explore the effects of ACEs on the specific nature of perinatal episodes of bipolar disorder. Additionally, the number of participants in the current study with a primary diagnosis of a psychotic disorder was small, and therefore the findings are unreliable. Future research with larger samples of participants with psychotic disorders are needed to more convincingly answer the research question for women with psychotic conditions. Finally, the perinatal period was defined as pregnancy and the first postnatal year. Therefore, we could not disentangle associations between ACE exposure and pregnancy versus postnatal effects in the current study.

5. Conclusion

Exposure to ACEs predicts the likelihood of entering parenthood and the risk of experiencing an episode of mental ill-health during the perinatal period for women diagnosed with depressive, bipolar, PTSD and anxiety disorders. Our findings indicate that maltreatment ACEs carry the greatest risk for adverse perinatal mental health outcomes. Specifically, emotional neglect predicted an increased likelihood of a perinatal episode of a depressive disorder, physical abuse a perinatal episode of bipolar disorder, and sexual abuse a perinatal episode of an anxiety disorder. The identification of ACEs could aid screening, detection, and early intervention during the perinatal period for women at risk of recurrent episodes of depression, anxiety, PTSD, and bipolar disorder.

CRediT authorship contribution statement

Alistair J. Souch: Writing – original draft, Methodology, Formal analysis, Conceptualization. **Ian R. Jones:** Writing – review & editing, Methodology, Investigation. **Katherine H. Shelton:** Writing – review & editing, Validation. **Cerith S. Waters:** Writing – review & editing, Supervision, Methodology, Conceptualization.

Declaration of competing interest

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References

Agrati, D., Browne, D., Jonas, W., Meaney, M., Atkinson, L., Steiner, M., Fleming, A.S., MAVAN Research Team, 2015. Maternal anxiety from pregnancy to 2 years postpartum: transactional patterns of maternal early adversity and child temperament. Arch. Womens Ment. Health 18, 693–705.

Akinbode, T.D., Pedersen, C., Lara-Cinisomo, S., 2021. The price of pre-adolescent abuse: effects of sexual abuse on perinatal depression and anxiety. Matern. Child Health J. 25, 1083–1093.

American Psychiatric Association, 2013. Diagnostic and Statistical Manual of Mental Disorders, 5th ed. American Psychiatric Association, Arlington.

Ångerud, K., Annerbäck, E.M., Tydén, T., Boddeti, S., Kristiansson, P., 2018. Adverse childhood experiences and depressive symptomatology among pregnant women. Acta Obstet. Gynecol. Scand. 97 (6), 701–708.

Beeber, L.S., Schwartz, T.A., Holditch-Davis, D., Canuso, R., Lewis, V., Hall, H.W., 2013. Parenting enhancement, interpersonal psychotherapy to reduce depression in low-income mothers of infants and toddlers: a randomized trial. Nurs. Res. 62 (2), 82.

Bilszta, J.L., Buist, A.E., Wang, F., Zulkefli, N.R., 2012. Use of video feedback intervention in an inpatient perinatal psychiatric setting to improve maternal parenting. Arch. Womens Ment. Health 15 (4), 249–257.

Brunton, R., Dryer, R., 2021. Child sexual abuse and pregnancy: a systematic review of the literature. Child Abuse Negl. 111, 104802.

Bublitz, M.H., Ward, L.G., Simoes, M., Stroud, L.R., Salameh, M., Bourjeily, G., 2020. Maternal history of adverse childhood experiences and ambulatory blood pressure in pregnancy. Psychosom. Med. 82 (8), 757–763.

Byrne, J., Smart, C., Watson, G., 2017. "I felt like I was being abused all over again": how survivors of child sexual abuse make sense of the perinatal period through their narratives. J. Child Sex. Abus. 26 (4), 465–486.

Carbone, E.A., Pugliese, V., Bruni, A., Aloi, M., Calabrò, G., Jaén-Moreno, M.J., Segura-Garcia, C., De Fazio, P., 2019. Adverse childhood experiences and clinical severity in bipolar disorder and schizophrenia: a transdiagnostic two-step cluster analysis. J. Affect. Disord. 259, 104–111.

Chapman, D.P., Whitfield, C.L., Felitti, V.J., Dube, S.R., Edwards, V.J., Anda, R.F., 2004. Adverse childhood experiences and the risk of depressive disorders in adulthood. J. Affect. Disord. 82, 217–225.

Cohen, J.R., Menon, S.V., Shorey, R.C., Le, V.D., Temple, J.R., 2017. The distal consequences of physical and emotional neglect in emerging adults: a person-centered, multi-wave, longitudinal study. Child Abuse Negl. 63, 151–161.

Colich, N.L., Rosen, M.L., Williams, E.S., McLaughlin, K.A., 2020. Biological aging in childhood and adolescence following experiences of threat and deprivation: a systematic review and meta-analysis. Psychol. Bull. 146 (9), 721.

Cox, E.Q., Sowa, N.A., Meltzer-Brody, S.E., Gaynes, B.N., 2016. The perinatal depression treatment cascade: baby steps toward improving outcomes. J. Clin. Psychiatry 77 (9), 1189–1200.

Cui, M., Fincham, F.D., Durtschi, J.A., 2011. The effect of parental divorce on young adults' romantic relationship dissolution: what makes a difference? Pers. Relat. 18 (3), 410–426.

Dean, D.C., Planalp, E.M., Wooten, W., Kecskemeti, S.R., Adluru, N., Schmidt, C.K., Frye, C., Birn, R.M., Burghy, C.A., Schmidy, N.L., Styner, M.A., Short, S.J., Kalin, N. H., Goldsmith, H.H., Alexander, A.L., Davidson, R.J., 2018. Association of prenatal maternal depression and anxiety symptoms with infant white matter microstructure. JAMA Pediatr. 172 (10), 973–981.

Dunn, E.C., Nishimi, K., Powers, A., Bradley, B., 2017. Is developmental timing of trauma exposure associated with depressive and post-traumatic stress disorder symptoms in adulthood? J. Psychiatr. Res. 84, 119–127.

Durkan, M., Field, F., Lamb, N., Loughton, T., 2015. The 1001 critical days: the importance of the conception to age two period. A Cross-Party Manifesto Prepared by Four Members of the UK Parliament. https://www.nspcc.org.uk/globalassets/documents/news/critical-days-manifesto.pdf.

Etain, B., Lajnef, M., Henry, C., Aubin, V., Azorin, J.M., Bellivier, F., Bougerol, T., Courtet, P., Gard, S., Kahn, J.P., Passerieux, C., Leboyer, M., Passerieux, C., 2017. Childhood trauma, dimensions of psychopathology and the clinical expression of bipolar disorders: a pathway analysis. J. Psychiatr. Res. 95, 37–45.

Farré-Sender, B., Torres, A., Gelabert, E., Andrés, S., Roca, A., Lasheras, G., Valdes, M., Garcia-Esteve, L., 2018. Mother–infant bonding in the postpartum period: assessment of the impact of pre-delivery factors in a clinical sample. Arch. Womens Ment. Health 21 (3), 287–297.

Felitti, V.J., Anda, R.F., Nordenberg, D., Williamson, D.F., Spitz, A.M., Edwards, V., Marks, J.S., 1998. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: the Adverse Childhood Experiences (ACE) study. Am. J. Prev. Med. 14 (4), 245–258.

Fuchs, A., Möhler, E., Resch, F., Kaess, M., 2015. Impact of a maternal history of childhood abuse on the development of mother–infant interaction during the first year of life. Child Abuse Negl. 48, 179–189.

Gelaye, B., Rondon, M.B., Araya, R., Williams, M.A., 2016. Epidemiology of maternal depression, risk factors, and child outcomes in low-income and middle-income countries. Lancet Psychiatry 3 (10), 973–982.

Goodman, J.H., 2019. Perinatal depression and infant mental health. Arch. Psychiatr. Nurs. 33 (3), 217–224.

Grigoriadis, S., VonderPorten, E.H., Mamisashvili, L., Tomlinson, G., Dennis, C.L., Koren, G., Steiner, M., Mousmanis, P., Cheung, A., Radford, K., Martinovic, J., Ross, L.E., 2013. The impact of maternal depression during pregnancy on perinatal outcomes: a systematic review and meta-analysis. J. Clin. Psychiatry 74 (4), 8615.

Hakanen, H., Flykt, M., Sinervä, E., Nolvi, S., Kataja, E.L., Pelto, J., Karlsson, H., Karlssob, L., Korja, R., 2019. How maternal pre-and postnatal symptoms of depression and anxiety affect early mother-infant interaction? J. Affect. Disord. 257, 83–90.

Hazell Raine, K., Nath, S., Howard, L.M., Cockshaw, W., Boyce, P., Sawyer, E., Thorpe, K., 2020. Associations between prenatal maternal mental health indices and mother–infant relationship quality 6 to 18 months' postpartum: a systematic review. Infant Ment. Health J. 41 (1), 24–39.

Hoffman, C., Dunn, D.M., Njoroge, W.F., 2017. Impact of postpartum mental illness upon infant development. Curr. Psychiatry Rep. 19 (12), 100.
Humphreys, K.L., LeMoult, J., Wear, J.G., Piersiak, H.A., Lee, A., Gotlib, I.H., 2020. Child maltreatment and depression: a meta-analysis of studies using the childhood trauma questionnaire. Child Abuse Negl. 102, 104361.
Jacobs, M.B., Boynton-Jarrett, R.D., Harville, E.W., 2015. Adverse childhood event experiences, fertility difficulties and menstrual cycle characteristics. J. Psychosom. Obstet. Gynecol. 36 (2), 46–57.
Karatekin, C., 2018. Adverse childhood experiences (ACEs), stress and mental health in college students. Stress. Health 34 (1), 36–45.
Lang, A.J., Gartstein, M.A., Rodgers, C.S., Lebeck, M.M., 2010. The impact of maternal childhood abuse on parenting and infant temperament. J. Child Adolesc. Psychiatr. Nurs. 23 (2), 100–110.
Lawn, R.B., Anderson, E.L., Suderman, M., Simpkin, A.J., Gaunt, T.R., Teschendorff, A.E., Widschwendter, M., Hardy, R., Kuh, D., Relton, C., Howe, L.D., 2018. Psychosocial adversity and socioeconomic position during childhood and epigenetic age: analysis of two prospective cohort studies. Hum. Mol. Genet. 27 (7), 1301–1308.
Lee, S.A., 2018. Parental divorce, relationships with fathers and mothers, and children's romantic relationships in young adulthood. J. Adult Dev. 25 (2), 121–134.
Leeners, B., Stiller, R., Block, E., Görres, G., Imthurn, B., Rath, W., 2007. Effect of childhood sexual abuse on gynecologic care as an adult. Psychosomatics 48 (5), 385–393.
Letourneau, N.L., Dennis, C.L., Cosic, N., Linder, J., 2017. The effect of perinatal depression treatment for mothers on parenting and child development: a systematic review. Depress. Anxiety 34 (10), 928–966.
Leverich, G.S., McElroy, S.L., Suppes, T., Keck Jr., P.E., Denicoff, K.D., Nolen, W.A., Altshuler, L.L., Rush, A.J., Kupka, R., Frye, M.A., Autio, K.A., Post, R.M., 2002. Early physical and sexual abuse associated with an adverse course of bipolar illness. Biol. Psychiatry 51 (4), 288–297.
Madigan, S., Wade, M., Tarabulsy, G., Jenkins, J.M., Shouldice, M., 2014. Association between abuse history and adolescent pregnancy: a meta-analysis. J. Adolesc. Health 55 (2), 151–159.
Madigan, S., Deneault, A.A., Racine, N., Park, J., Thiemann, R., Zhu, J., Dimitropoulos, G., Williamson, T., Fearon, P., Cenat, J.M., McDonald, S., Devereux, C., Neville, R.D., 2023. Adverse childhood experiences: a meta-analysis of prevalence and moderators among half a million adults in 206 studies. World Psychiatry 22 (3), 463–471.
Maniglio, R., 2013. Child sexual abuse in the etiology of anxiety disorders: a systematic review of reviews. Trauma Violence Abuse 14 (2), 96–112.
Manyema, M., Norris, S.A., Richter, L.M., 2018. Stress begets stress: the association of adverse childhood experiences with psychological distress in the presence of adult life stress. BMC Public Health 18 (1), 835.
Marini, S., Davis, K.A., Soare, T.W., Zhu, Y., Suderman, M.J., Simpkin, A.J., Smith, A.D. A.C., Wolf, E.J., Relton, C.L., Dunn, E.C., 2020. Adversity exposure during sensitive periods predicts accelerated epigenetic aging in children. Psychoneuroendocrinology 113, 104484.
Martini, J., Petzoldt, J., Knappe, S., Garthus-Niegel, S., Asselmann, E., Wittchen, H.U., 2017. Infant, maternal, and familial predictors and correlates of regulatory problems in early infancy: the differential role of infant temperament and maternal anxiety and depression. Early Hum. Dev. 115, 23–31.
Maselko, J., Sikander, S., Turner, E.L., Bates, L.M., Ahmad, I., Atif, N., Baranov, V., Bhalotra, S., Bibi, A., Bibi, T., Bilal, S., Biroli, P., Chung, E., Gallis, J.A., Hagaman, A., Jamil, A., LeMasters, K., O'Donnell, K., Scherer, E., Sharif, M., Waqas, A., Zaidi, A., Zulfiqar, S., Rahman, A., 2020. Effectiveness of a peer-delivered, psychosocial intervention on maternal depression and child development at 3 years postnatal: a cluster randomised trial in Pakistan. Lancet Psychiatry 7 (9), 775–787.
McCraw, S., Parker, G., 2017. The prevalence and outcomes of exposure to potentially traumatic stressful life events compared across patients with bipolar disorder and unipolar depression. Psychiatry Res. 255, 399–404.
McCutcheon, V.V., Sartor, C.E., Pommer, N.E., Bucholz, K.K., Nelson, E.C., Madden, P.A., Heath, A.C., 2010. Age at trauma exposure and PTSD risk in young adult women. J. Trauma. Stress 23 (6), 811–814.
McElroy, S., Hevey, D., 2014. Relationship between adverse early experiences, stressors, psychosocial resources and wellbeing. Child Abuse Negl. 38 (1), 65–75.
McLaughlin, K.A., Sheridan, M.A., Lambert, H.K., 2014. Childhood adversity and neural development: deprivation and threat as distinct dimensions of early experience. Neurosci. Biobehav. Rev. 47, 578–591.
McLaughlin, K.A., Colich, N.L., Rodman, A.M., Weissman, D.G., 2020. Mechanisms linking childhood trauma exposure and psychopathology: a transdiagnostic model of risk and resilience. BMC Med. 18 (1), 1–11.
Milgrom, J., Gemmill, A.W., Ericksen, J., Burrows, G., Buist, A., Reece, J., 2015. Treatment of postnatal depression with cognitive behavioural therapy, sertraline and combination therapy: a randomised controlled trial. Australian & New Zealand Journal of Psychiatry 49 (3), 236–245.
Morelen, D., Menke, R., Rosenblum, K.L., Beeghly, M., Muzik, M., 2016. Understanding bidirectional mother-infant affective displays across contexts: effects of maternal maltreatment history and postpartum depression and PTSD symptoms. Psychopathology 49 (4), 305–314.
Mulcahy, R., Reay, R.E., Wilkinson, R.B., Owen, C., 2010. A randomised control trial for the effectiveness of group interpersonal psychotherapy for postnatal depression. Arch. Womens Ment. Health 13 (2), 125–139.
Mustonen, U., Huurre, T., Kiviruusu, O., Haukkala, A., Aro, H., 2011. Long-term impact of parental divorce on intimate relationship quality in adulthood and the mediating role of psychosocial resources. J. Fam. Psychol. 25 (4), 615.
Muzik, M., Bocknek, E.L., Broderick, A., Richardson, P., Rosenblum, K.L., Thelen, K., Seng, J.S., 2013. Mother–infant bonding impairment across the first 6 months postpartum: the primacy of psychopathology in women with childhood abuse and neglect histories. Arch. Womens Ment. Health 16 (1), 29–38.
NOMIS: Labour Market Profile - Great Britain. Available online at: https://www.nomisweb.co.uk/reports/lmp/gor/2092957698/report.aspx#defs (Accessed on July 15, 2022).
Office for National Statistics, 2024, February 1. Childbearing for women born in different years, England and Wales - Office for National Statistics. Www.ons.gov.uk. https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/bulletins/childbearingforwomenbornindifferentyearsenglandandwales/2021and2022. Accessed 19th July 2025.
Office for National Statistics (ONS), 2021. Released 29 November 2022, ONS Website, Statistical Bulletin, Ethnic Group, England and Wales: Census.
Office for National Statistics (ONS). Abuse during childhood: Findings from the Crime Survey for England and Wales, year ending March 2016. https://www.ons.gov.uk/peoplepopulationandcommunity/crimeandjustice/articles/abuseduringchildhood/findingsfromtheyearendingmarch2016crimesurveyforenglandandwales. Accessed 25 January 2022.
Pascual, M.A., Levenson, J.C., Merranko, J., Gill, M.K., Hower, H., Yen, S., Strober, M., Goldstein, T.R., Goldstein, B.I., Ryan, N.D., Weinstock, L.M., Keller, M.B., Axelson, D., Birmaher, B., 2020. The effect of traumatic events on the longitudinal course and outcomes of youth with bipolar disorder. J. Affect. Disord. 274, 126–135.
Pawlby, S., Hay, D.F., Sharp, D., Waters, C.S., O'Keane, V., 2009. Antenatal depression predicts depression in adolescent offspring: prospective longitudinal community-based study. J. Affect. Disord. 113 (3), 236–243.
Perry, D.F., Ettinger, A.K., Mendelson, T., Le, H.-N., 2011. Prenatal depression predicts postpartum maternal attachment in low-income Latina mothers with infants. Infant Behaviour and Development 34 (2), 339–350.
Perry, A., Gordon-Smith, K., Di Florio, A., Fraser, C., Craddock, N., Jones, L., Jones, I., 2020. Adverse childhood experiences and postpartum depression in bipolar disorder. J. Affect. Disord. 263, 661–666.
Plant, D.T., Barker, E.D., Waters, C.S., Pawlby, S., Pariante, C.M., 2013. Intergenerational transmission of maltreatment and psychopathology: the role of antenatal depression. Psychol. Med. 43 (3), 519–528.
Plant, D.T., Jones, F.W., Pariante, C.M., Pawlby, S., 2017. Association between maternal childhood trauma and offspring childhood psychopathology: mediation analysis from the ALSPAC cohort. Br. J. Psychiatry 211 (3), 144–150.
Reay, R.E., Owen, C., Shadbolt, B., Raphael, B., Mulcahy, R., Wilkinson, R.B., 2012. Trajectories of long-term outcomes for postnatally depressed mothers treated with group interpersonal psychotherapy. Arch. Womens Ment. Health 15 (3), 217–228.
Rhoades, G.K., Stanley, S.M., Markman, H.J., Ragan, E.P., 2012. Parents' marital status, conflict, and role modeling: links with adult romantic relationship quality. J. Divorce Remarriage 53 (5), 348–367.
Romero, S., Birmaher, B., Axelson, D., Goldstein, T., Goldstein, B.I., Gill, M.K., Iosif, A., Strober, M.A., Hunt, J., Esposito-Smythers, C., Ryan, N.D., Leonard, H., Keller, M., 2009. Prevalence and correlates of physical and sexual abuse in children and adolescents with bipolar disorder. J. Affect. Disord. 112 (1–3), 144–150.
Roper, S.W., Fife, S.T., Seedall, R.B., 2020. The intergenerational effects of parental divorce on young adult relationships. Journal of Divorce & Remarriage 61 (4), 249–266.
Rossen, L., Hutchinson, D., Wilson, J., Burns, L., Olsson, C.A., Allsop, S., Elliott, E.J., Jacobs, S., Macdonald, J.A., Mattick, R.P., 2016. Predictors of postnatal mother-infant bonding: the role of antenatal bonding, maternal substance use and mental health. Arch. Womens Ment. Health 19 (4), 609–622.
Sheffler, J.L., Stanley, I., Sachs-Ericsson, N., 2020. ACEs and mental health outcomes. In: Adverse Childhood Experiences. Academic Press, pp. 47–69.
Silverman, M.E., Loudon, H., 2010. Antenatal reports of pre-pregnancy abuse is associated with symptoms of depression in the postpartum period. Arch. Womens Ment. Health 13 (5), 411–415.
Simons, R.L., Lei, M.K., Beach, S.R., Philibert, R.A., Cutrona, C.E., Gibbons, F.X., Barr, A., 2016. Economic hardship and biological weathering: the epigenetics of aging in a US sample of black women. Soc. Sci. Med. 150, 192–200.
Smith, M.V., Shao, L., Howell, H., Lin, H., Yonkers, K.A., 2011. Perinatal depression and birth outcomes in a healthy start project. Matern. Child Health J. 15 (3), 401–409.
Souch, A.J., Jones, I.R., Shelton, K.H., Waters, C.S., 2022. Maternal childhood maltreatment and perinatal outcomes: a systematic review. J. Affect. Disord. 302, 139–159.
Stein, A., Pearson, R.M., Goodman, S.H., Rapa, E., Rahman, A., McCallum, M., Howard, L.M., Pariante, C.M., 2014. Effects of perinatal mental disorders on the fetus and child. Lancet 384 (9956), 1800–1819.
Sumner, J.A., Colich, N.L., Uddin, M., Armstrong, D., McLaughlin, K.A., 2019. Early experiences of threat, but not deprivation, are associated with accelerated biological aging in children and adolescents. Biol. Psychiatry 85 (3), 268–278.
Talmon, A., Ginzburg, K., 2019. Chased by the past: the relation between childhood maltreatment and fear of childbirth. Sex Roles 81 (3), 223–234.
Verbeek, T., Bockting, C.L., van Pampus, M.G., Ormel, J., Meijer, J.L., Hartman, C.A., Burger, H., 2012. Postpartum depression predicts offspring mental health problems in adolescence independently of parental lifetime psychopathology. J. Affect. Disord. 136 (3), 948–954.
Waters, C.S., Hay, D.F., Simmonds, J.R., van Goozen, S.H., 2014. Antenatal depression and children's developmental outcomes: potential mechanisms and treatment options. Eur. Child Adolesc. Psychiatry 23 (10), 957–971.
World Health Organization, 2022. ICD-11: International classification of diseases (11th revision). https://icd.who.int/.