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Understanding the relationship between childhood emotional abuse and neglect and psychological distress in pregnant women: the role of prenatal attachment

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Abstract

Background Childhood abuse and neglect pose important risk factors for the development of psychopathology during pregnancy. However, only a few studies have assessed the effects of a specific type of abuse during the perinatal period, namely, psychological maltreatment, which includes emotional abuse and neglect. These studies have found that women who have experienced psychological maltreatment exhibit higher levels of antenatal depressive symptoms and greater difficulties forming attachment with their babies than women who have not experienced this kind of adversity. The aim of this study was to examine how emotional abuse and neglect experiences may favor the occurrence of psychological distress in pregnant women, and whether prenatal attachment might explain this association.

Methods Participants comprised 128 Italian pregnant women ranging in age from 21 to 46 years ($M_{\text{age}} = 33.4$; $SD = 6.10$). Women responded to the following self-report instruments: CECA-Q and CTQ-SF, for the assessment of psychological maltreatment experiences; MAAS, for the evaluation of prenatal attachment; and PAMA, for the assessment of perinatal psychological distress.

Results Pearson correlations revealed a positive association between childhood neglect and perinatal psychological distress and a negative association between childhood neglect and prenatal attachment scores. No significant correlations were found for emotional abuse. Perinatal psychological distress was negatively associated with prenatal attachment. Mediation analyses showed significant associations between childhood neglect and the dimensions of perinatal affectivity and prenatal maternal attachment. Prenatal maternal attachment mediated the relationship between neglect and perinatal psychological distress.

Conclusions The transition to motherhood is a sensitive period, particularly for women who have experienced abuse and neglect during childhood. These experiences may negatively impact a woman's disposition to emotionally

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and behaviorally engage in the formation of a bond with their unborn baby. These results may have important prevention and clinical implications and thus warrant further exploration.

Keywords Pregnancy, Perinatal period, Childhood psychological maltreatment, Emotional abuse, Neglect, Prenatal Attachment, Maternal psychological distress

Background

Pregnancy is a vulnerable period in which the negative consequences of adverse previous experiences may occur, as becoming a mother can activate emotional responses related to childhood experiences of abuse and neglect [67]. Literature has shown that women with histories of childhood trauma reported higher levels of depression [23], post-traumatic stress disorder, personality disorders, and dissociation during pregnancy [11] and postpartum [52] compared to non-exposed women. However, these studies have focused mainly on cumulative childhood maltreatment, and research on the effects of childhood maltreatment in the perinatal period has centered on sexual and physical abuse, and not specifically on psychological maltreatment, which includes emotional abuse (EA) and/or neglect.

EA refers to the inability to provide children with an emotional environment that adequately supports their psychological and physical development [24]. It is characterized by the parents' hostility and intention to scare and humiliate the child, constantly disapproving, reprimanding, and yelling at him, suggesting that he is without value [15]. Neglect, in contrast, is commonly described as an omissive abuse in which the environment neither confirms nor meets the child's basic needs (emotional and/or developmental) and is not capable of providing emotional support or warmth to the child [56]. Bifulco [13] adds and specifies that neglect also includes parents' disinterest in their child's material care, health, social functions, and schoolwork.

EA and neglect are particular forms of maltreatment that rather than being point-like as physical and sexual abuse, represent relational modes of a chronically dysfunctional family atmosphere characterized by episodes of abuse or omission, which are pervasive, occur daily, and contribute to structuring the quality of the relationship. EA and neglect create a chronically dysfunctional family atmosphere that negatively impacts the construction and representation of themselves and significant others.

Having a history of childhood neglect and EA exposes women to psychological distress during pregnancy [46] and the postpartum period [14], possibly affecting their emotional and caregiving abilities as mothers [57]. Perinatal psychological distress is a condition that arises from a maladaptive response to stressors related to the

transition to motherhood [18]. It is a state of maternal emotional suffering that encompasses a wide range of psychological dimensions, such as anxiety, depressive symptoms, anger, stress, and somatization [4]. Although this condition is not among the recognized mental disorders, it may expose a woman to several negative psychopathological outcomes during the postpartum period [55].

Regarding the association between adverse childhood experiences and psychological distress, the literature has mostly focused on perinatal depressive symptoms. For instance, findings from a longitudinal study conducted by Li [46] revealed that women who had encountered neglect or EA demonstrated significantly elevated symptoms of antenatal depression in comparison to women with no history of physical or emotional neglect.

Experiences of neglect in childhood have also been linked to mothers experiencing significantly greater difficulties in bonding with their children compared to women who have not experienced maltreatment [54]. A recent longitudinal study [68] confirmed that exposure to childhood neglect, in particular, has an important influence on women's experiences of attachment to their babies and that these maternal difficulties predict postpartum depression.

Attachment between mother and infant starts during pregnancy and continues to increase daily after birth. Although most literature has examined this bond after the infant's birth, recent studies have revealed that this bond starts during pregnancy when women begin to develop both a cognitive and affective mental representation of their unborn children [21]. Prenatal attachment refers to this specific bond between the mother and her fetus [25]. The concept of prenatal attachment originally focused on maternal behavior during pregnancy. Cranley [27], however, was the first to define this concept as the mother's interest in establishing a relationship with her unborn child, which manifests through behaviors that demonstrate emotional investment and bonding. Later, some authors also emphasized the emotional aspect [26], and Doan and Zimmerman [31] focused on both components of the concept, redefining prenatal attachment as the emotional bond between a parent and fetus that is connected to the cognitive and emotional capacity to understand and connect with another person. This bond evolves within a larger environmental context.

Recent studies have consistently shown that the quality of prenatal attachment is closely and positively related to the quality of postnatal mother–child attachment [64]. Specifically, evidence suggests that a suboptimal prenatal attachment is associated with a lack in a mother’s care of herself and her baby during pregnancy, which can result in potential complications and risks during pregnancy and delivery [47]. These findings align with literature reporting that the quality of prenatal attachment is also strongly correlated with the quality of maternal adult attachment. Indeed, mothers that demonstrate a secure adult state of mind with respect to their childhood experiences with their caregivers have a better and early occurring prenatal attachment during pregnancy [30]. Notably, maternal attachment security has also been strongly correlated with maternal distress [53], sensitive parenting [40], and improved developmental outcomes in children [2]. In light of this literature, it might be hypothesized that prenatal attachment could act as a pivotal protective factor for several maternal and dyadic unfavorable outcomes, thus warranting further investigation.

In this framework, it is not surprising that a suboptimal prenatal attachment is also linked with maternal psychological distress, particularly prenatal depressive symptoms [38, 50, 63]. However, the direction of this link between prenatal depressive symptoms and prenatal attachment remains unclear. Studies have suggested that prenatal depressive symptoms may constitute a risk factor for a lack of maternal attachment and depressive symptoms during the postpartum period [32, 38]. The direction of this relationship might also be reversed, especially if symptoms are measured prenatally. Indeed, insecure adult attachment representations, whether attachment is measured prenatally or not, derive from the perceived quality of childhood experiences [49]. In the context of childhood trauma, the literature has shown that specific memories of inadequate parenting as well as rejection, violence, and neglect, may result in the mother fearing the repeating of a painful past and a perception of the “child-as-threat” [62]. These feelings, in turn, might potentially be associated with feelings of inadequate parenting abilities, low self-esteem and, ultimately, reduced psychological well-being.

Models of the relationship between childhood trauma, prenatal attachment, and psychological distress have been proposed. Berthelot et al. [11] proposed that mental health levels could buffer the relationship between childhood abuse and neglect experiences of future mothers and the quality of their prenatal attachment. Although they did not find a direct relationship between childhood maltreatment and prenatal attachment, they did find pairwise associations between poor mental health and

childhood maltreatment or between poor mental health and prenatal attachment.

Given:

- that this hypothesis-driven model does not support the existence of a mediation role of mental health between childhood trauma and prenatal attachment;
- the paucity of literature on prenatal attachment;
- the unclear direction of the relationship between mental health and prenatal attachment;
- that childhood trauma has been rarely investigated in its sub-dimensions;

Building on extant literature (Bertherlot et al., 2019), the aim of the present study was to test complementary models of the relationship between childhood trauma, psychological distress, and prenatal attachment by investigating (i) the relationship between two specific and diverse childhood trauma experiences (namely, EA and neglect) and the presence of psychological distress in pregnant women, and (ii) whether prenatal attachment might act as a potential protective factor within this relationship. We hypothesized the following:

1. Pregnant women’s childhood experiences of EA and neglect are positively associated with prenatal psychological distress.
2. Pregnant women’s childhood experiences of EA and neglect are negatively associated with prenatal maternal attachment.
3. Prenatal maternal attachment is negatively associated with prenatal psychological distress.
4. Antenatal maternal attachment mediates the relationship between EA and neglect and psychological distress.

Methods

Participants

A total of 128 pregnant women ranging between 21 and 46 years of age ($M=33.4$; $SD=6.10$) participated in the study. The participants were recruited at the ARNAS Civico Hospital of Palermo, thanks to a research agreement protocol with the Department of Psychology, Educational Science and Human Movement, University of Palermo, Italy. The participants completed the questionnaires during their first hospital visit. The visits involved routine check-ups or pregnancy traces. In this hospital, psychological distress evaluation, conducted by trained psychologists, was a standard component of a comprehensive assessment of general women’s health during pregnancy. Data for this study were collected from November 2023 to February 2024.

Inclusion criteria were: a) being pregnant; b) being at least age 18; and c) able to understand and speak the Italian language. Participation in the research was voluntary, and all participants gave informed consent prior to inclusion in the study. Participants completed self-report questionnaires on either their smartphone, computer, or tablet.

A total of 91.4% of participants had a romantic relationship and lived with a partner. Most participants (64.1%) were in the third trimester of pregnancy, had no other children (78%), and had planned the currently pregnancy (80.3%). Detailed information on demographic and clinical characteristics is reported in Table 1.

Ethical approval for this study was obtained from the Bioethics Committee at the University of Palermo (prot.n.153791–2023 of 26/10/2023), and the procedures used adhere to the principles of the Declarations of Helsinki.

Measures

Participants underwent a psychological assessment consisting of the following instruments:

Questionnaire on sociodemographic characteristics and pregnancy-related variables

This questionnaire is suitable for gathering sample information such as age, educational and economic status, marital status, and pregnancy details such as primiparity, month of pregnancy, and single versus twin pregnancy.

Childhood Experience of Care and Abuse Questionnaire (CECA.Q) [12]

This is a self-report measure whose purpose is to collect objective information relating to adverse experience in childhood, before age 17. More specifically, CECA.Q assesses antipathy (defined as coldness, rejection, or hostility) and neglect (defined in terms of parents’ disinterest in material care, health, friendships, and schoolwork) expressed by parents toward the child, parental physical abuse, sexual abuse by any adult. In this study, we considered only the subscales antipathy (8 items) and neglect (8 items), assessed using a 5-point Likert scale ranging from (1) ‘yes definitely’ to (5) ‘no, not at all’. We considered the antipathy and neglect scores of both parents, which were input into the calculation of an overall emotional abuse and neglect score, as described below. The questionnaire shows high reliability and validity, achieving satisfactory internal scale consistency for the antipathy ($\alpha=0.81$) and neglect ($\alpha=0.80$) scales.

Childhood Trauma Questionnaire-Short Form (CTQ-SF) [10, 58]

Table 1 Characteristics of the study population (N= 128)

Variable	n	%
Age		
< 29 years old	36	28.12
36–30 years old	70	54.69
45–37 years old	22	17.19
Education		
Primary School	3	2.34
Hight School	40	31.25
University degree	47	36.72
Post-degree	38	29.69
Employment status		
Unemployed	8	6.25
Housewife	8	6.25
Student	3	2.34
Precarious employment	27	21.1
Stable employment	82	64.06
Marital status		
Single	11	8.59
Married/Cohabitant	117	91.41
Economic status		
Low	18	14.06
Middle	71	55.47
Medium–high	39	30.47
Gestational age		
First trimester	9	7.03
Second trimester	42	32.81
Third trimester	77	60.16
Pregnancy		
Planned pregnancy	102	80.31
Unplanned pregnancy	25	19.69
First pregnancy		
Yes	59	46.46
No	68	53.54
Other children		
Yes	28	22.05
No	99	77.95
High-risk pregnancy		
Yes	37	28.91
No	91	71.09
Medically Assisted Procreation		
Yes	9	7.09
No	118	92.91
Psychopharmacological treatment		
Yes	0	0
No	128	100

This 28-item self-report questionnaire on childhood trauma was developed to assess five types of early maltreatment experiences [10]. The five type of abuse are emotional abuse, physical abuse, emotional neglect, physical neglect, and sexual abuse [9]. Each type corresponds to a subscale, and each subscale is composed of five questions that are rated on a 5-point Likert Scale (from 1 = Never true to 5 = Very often true). The total possible score is 125, with cutoff points suggested by Aas et al. [1] of ≥ 10 for physical abuse, ≥ 8 for sexual abuse, ≥ 13 for emotional abuse, ≥ 15 for emotional neglect, and ≥ 10 for physical neglect. High scores suggest more severe abuse experiences. The emotional abuse and neglect subscale scores obtained from this instrument were entered into the calculation of an overall emotional abuse and neglect score, described below. The Italian version of the CTQ-SF questionnaire has adequate psychometrics properties. Internal consistence is excellent in each subscale: emotional abuse ($\alpha=0.88$), physical abuse ($\alpha=0.95$), emotional neglect ($\alpha=0.91$), physical neglect ($\alpha=0.87$), and sexual abuse ($\alpha=0.96$) [58].

Maternal Antenatal Attachment Scale (MAAS) [17, 25]

This self-report questionnaire assesses maternal prenatal attachment. It is a 19-item questionnaire that uses a 5-point Likert Scale to analyze what the mother felt and thought about her unborn child and her daily behaviors towards the child/fetus. The total possible score is 95 and the minimum possible score is 19. Higher scores suggest a stronger bonding. The MAAS has two subscales that assess the intensity and quality of attachment. Specifically, the Quality of Attachment subscale measures the mother’s emotional experiences toward the fetus (i.e., closeness, pleasure, tenderness, and distress over imagined loss), while the Intensity of Concern subscale measures the extent of time spent dreaming about, talking to, or palpating the fetus. We used the Italian version of the questionnaire, which demonstrated good internal consistency for the scale of MAAS total score ($\alpha=0.71$) and Intensity of Concern subscale ($\alpha=0.62$). The Quality of Attachment subscale, however, exhibited poor internal consistency, with an α of 0.57 [17]. In this study we used both the scores of Quality of Attachment (MAAS-QA) and Intensity of Concern (MAAS-IC), and the overall score (MAAS-TOT), obtained by summing the MAAS-QA and MAAS-IC scores.

The Perinatal Assessment of Maternal Affectivity (PAMA) [4]

PAMA is an 11-item self-reported screening measure that assesses perinatal maternal distress. The first eight items correspond to eight subscales. These eight

subscales correspond to a dimension: anxiety, depression, perceived stress, irritability/anger (excitability, anger attacks, disputes with others), relationship problems, psychosomatic reaction, physiological problems (with sleeping or eating), addictions (smoking, taking drugs, drinking alcohol), and other risky behaviors (such as driving fast after drinking alcohol). The last three items are open-ended questions relating to motherhood and cultural factors. The PAMA scores range from 0 to 3. The higher scores indicate a greater risk of developing symptoms related to psychological distress. In this study we used the total score (PAMA_TOT), given by the sum of the subscale scores, which allows a global assessment of maternal affectivity during the perinatal period. PAMA scores showed adequate internal consistency reliability ($\alpha=0.76$).

Descriptive statistics for all the variables of interest are shown in Table 2

Statistical analysis

To evaluate childhood experiences of emotional abuse and neglect, we assessed 61 (48%) pregnant women with the CECA.Q, and the remaining 67 (52%) with the CTQ.

To integrate the scores of both questionnaires, the overall emotional abuse score (EAS) was calculated by considering, for participants who had completed the CECA.Q, a Z-score-standardized sum of the maternal and paternal antipathy scores, whereas for participants who had completed the CTQ, the emotional abuse subscale scores, standardized in Z points. Similarly, to obtain the overall neglect score (NS), we used the scores of maternal and paternal neglect for the CECA.Q and the physical and emotional neglect subscales of the CTQ and transformed all scores into Z scores.

To facilitate comparison among all the variables included in the study, we standardized each variable into

Table 2 Descriptive statistics of the variables of interest

	Mean	SD	Range
PAMA-TOT	6.98	4.24	0–22
MAAS-QA	46.56	2.75	38–50
MAAS-IC	29.92	3.84	18–38
MAAS-TOT	81.11	5.75	64–92
CTQ Emotional Abuse	6.3	3.28	5–21
CTQ Emotional Neglect	10.48	4.1	5–25
CTQ Physical Neglect	6.64	2.33	5–16
CECA-Q Antipathy Mother	8.48	3.9	4–22
CECA-Q Antipathy Father	3.74	4.27	0–16
CECA-Q Neglect Mother	3.59	4.51	0–24
CECA-Q Neglect Father	5.75	6.42	0–25

Z-scores, subsequently transforming them into T-scores. All variables were tested for the possible presence of outliers using Grubb's test ($p < 0.05$). We identified one outlier for the variable NS and one outlier for the variable PAMA-TOT. Both values were removed from the dataset and were not used in subsequent analyses. Skewness and kurtosis were used to assess the normality of the variables. We adopted the conservative criterion of skewness and kurtosis < 2 [36] to identify deviations from normality. All variables showed acceptable normality except NS, which showed marked kurtosis (NS: skewness = 1.8; kurtosis = 3.8). Given the effectiveness of the Log10 transformation for variables with marked kurtosis [41], we computed the Log10 transformations of the NS obtaining acceptable distribution parameters (skewness = 1.1; kurtosis = 1.3).

To assess the potential impact of confounding factors, we tested the association between the variables of interest and age using Pearson correlation ($p < 0.05$), as well as the association between the variables of interest and the trimester of pregnancy at the time of the survey using ANOVA statistics ($p < 0.05$).

Using Pearson correlation ($p < 0.05$), we investigated the possible association between childhood experiences of neglect and EA, as measured by the NS and EAS scores, and the dimensions of perinatal affectivity and prenatal maternal attachment as measured by the PAMA and MAAS scales. In addition, also using Pearson's correlation ($p < 0.05$), we explored the possible association between the PAMA and MAAS scales. All correlations were corrected for multiple comparisons using the False Discovery Rate procedure (Benjamini–Hochberg method) [7].

The possible relationships between childhood experiences of neglect and EA, and the dimensions of perinatal affectivity and prenatal maternal attachment were further analyzed with mediation analysis to explore the potential mediating role of prenatal maternal attachment [6]. For this purpose, separate models were created using the measure of exposure to childhood experiences of neglect and EA (NS and EAS) as the predictor, the total score on the Perinatal Affectivity Scale (PAMA) as the outcome, and the measures of perinatal affectivity (MAAS-TOT,

MAAS-QA, MAAS-IC) as the mediator. All models were bootstrapped for 1000 repetitions. The statistical significance of the mediation models was set at $p < 0.05$.

Results

Correlation analyses between exposure to childhood of neglect and EA and the dimensions of perinatal affectivity and prenatal maternal attachment showed a positive correlation between NS and PAMA-TOT ($r = 0.22$, $FDRp = 0.02$), as well as a negative correlation between NS and the measures of MAAS-TOT ($r = -0.28$, $FDRp = 0.004$), MAAS-QA ($r = -0.31$, $FDRp = 0.004$) and MAAS-IC ($r = -0.19$, $FDRp = 0.03$). There was no significant correlation for the EAS ($p > 0.05$). The PAMA-TOT was also negatively associated with the dimensions of MAAS-TOT ($r = -0.27$, $FDRp = 0.002$) and MAAS-QA ($r = -0.43$, $FDRp = 0.002$). Analyses of the potential effect of age and trimester of pregnancy on the variables of interest indicated no effect of these variables (Table 3).

Mediation analyses performed on the variables showed significant associations between childhood exposure to neglect and abuse and the dimensions of perinatal affectivity and prenatal maternal attachment, which is in line with the Baron e Kenny (1986) assumptions.

Specifically, we found a total mediation of the MAAS-TOT on the relationship between NS and PAMA-TOT (direct effect Z: 1.8, $p = 0.7$; indirect effect Z: 2, $p = 0.04$; total effect Z: 2.6, $p = 0.01$, Fig. 1a). Similarly, the MAAS-QA scale was also found to fully mediate the relationship between NS and PAMA-TOT (direct effect Z: 1.3, $p = 0.2$; indirect effect Z: 2.9, $p = 0.004$; total effect Z: 2.6, 0.008, Fig. 1b). In contrast, no mediation was detected for the MAAS-IC scale.

Discussion

This study aimed to investigate the association between experiences of childhood EA and neglect, prenatal maternal attachment, and psychological distress in a non-clinical sample of pregnant women, also testing the mediating effect of prenatal attachment in the link between childhood EA and neglect and psychological distress.

Table 3 Results of correlation analyses

	PAMA-TOT		MAAS-TOT		MAAS-QA		MAAS-IC	
	<i>r</i>	<i>p</i> -value	<i>r</i>	<i>p</i> -value	<i>r</i>	<i>p</i> -value	<i>r</i>	<i>p</i> -value
NS	0.22	0.02*	-0.28	0.004*	-0.31	0.004*	-0.19	0.03*
EAS	0.11	0.2	-0.17	0.054	-0.1	0.27	-0.15	0.09
			MAAS-TOT		MAAS-QA		MAAS-IC	
			<i>r</i>	<i>p</i> -value	<i>r</i>	<i>p</i> -value	<i>r</i>	<i>p</i> -value
PAMA-TOT	-	-	-0.27	0.002*	-0.43	0.002*	-0.08	0.36

* FDR *p*-value

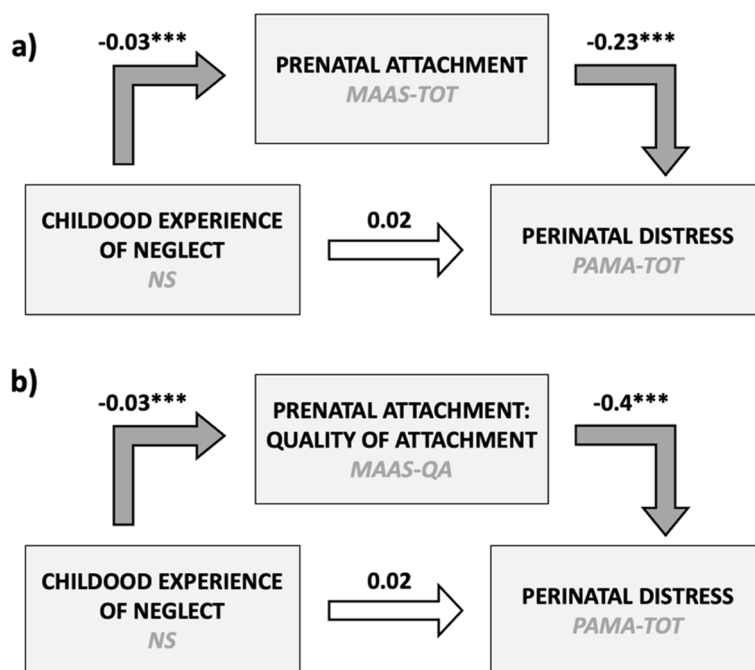


Fig. 1 Mediating role of prenatal attachment (**a**: total score; **b**: quality of attachment) on the relationship between maternal exposure to neglect in childhood and perinatal maternal distress. Note. The solid arrows between the blocks indicate the statistical significance of the path coefficient, while the values above each arrow indicate the standardized path coefficient estimates

Results first showed that participants who experienced childhood maltreatment were more likely to report psychological distress during pregnancy than non-exposed participants. Regarding the association between experiences of childhood EA and neglect, and psychological distress (hypothesis 1), we found that childhood neglect, but not EA, was positively associated with increased levels of perinatal psychological distress. This finding corroborates results from previous research which observed that experiences of physical or psychological neglect during childhood represented a significant risk factor for psychological distress during the perinatal period, particularly for depressive symptoms [14, 46]. The transition to motherhood involves a process in which women tend to recall memories of care that they experienced with their own parents during childhood. When these early experiences are marked by interpersonal adversities, such as neglect by a caregiver, traumatic memories may be reactivated and prompt the onset of negative affective responses, along with the intensification of underlying feelings of vulnerability [19]. Pregnancy is a particularly sensitive period characterized by an increase of a woman’s physiological and emotional needs, such as those of care, support, and attention [44]. Pregnant women with histories of childhood neglect may expect that significant others will be unable to respond to these demands, as previous negative caregiving experiences may have

conveyed a representation of others as being inherently unavailable, unreliable, and detached [70]. In turn, this belief may promote feelings of loneliness, favoring the appearance of perinatal signals of psychological distress.

Results from our study highlight that childhood neglect is negatively associated with all the prenatal attachment scores (MAAS-QA, MAAS-IC, MAAS-TOT) (hypothesis 2), suggesting that having experienced this kind of childhood adversity may have deleterious effects on a woman’s disposition to emotionally and behaviorally invest in the creation of a bond with her unborn baby. This result aligns with previous studies that found that childhood neglect [23, 66], as well as childhood maltreatment and early interpersonal trauma globally [19, 60, 62], were associated with lower maternal–fetal attachment. One possible explanation is that previous life events, particularly those occurring during childhood with one’s own caregivers, shape the acceptance of and the adaptation to the experience of motherhood. Indeed, women start to forge their novel identities as mothers during gestation, developing specific expectations regarding their ability to effectively assume and adjust to this new role [48, 65]. Women who have grown up in warm, nurturing, and supportive family environments have more opportunities to develop a positive perception of self and an adequate sense of maternal efficacy, which in turn may positively affect their emotional investment towards their

babies [68]. These feelings may favor protective, sensitive, and caring mother–fetus interactions, with documented benefits for mothers’ and children’s physical and psychological well-being both during pregnancy and the postnatal period [19, 59]. Conversely, women who have lived in negligent families, in which their material and emotional needs as children were not recognized, may acquire a defective sense of self and thus perceive themselves as scarcely effective in responding to the demands of their new role, which can potentially have negative effects on their relationships with the fetus [68]. These women may also feel that they lack the emotional resources to fulfill their children’s needs, and that may cause them to experience feelings of frustration and resentment towards the baby [16].

Our results show a negative association between prenatal attachment and psychological distress, specifically that lower levels of prenatal attachment are associated with higher levels of psychological distress in mothers. This finding is consistent with previous studies showing that distress experienced by mothers can negatively affect the establishment of adequate prenatal attachment bonding and the development of appropriate parenting attitudes [5, 11], although the literature is not fully consistent [37, 51]. Indeed, some studies report increased perinatal distress in mothers with greater sensitivity to the child’s needs and richer bonding experiences [22, 43], while others point out that perceived good prenatal attachment bonding positively affects the dimensions associated with psychological well-being, such as self-care [34, 45], body self-perception [20], or self-efficacy [29]. The complexity of the scenario therefore justifies the adoption of specific, hypothesis-based statistical models, like mediation analyses. Through this analysis, we showed that prenatal attachment acts as a full mediator within the relationship between exposure to adverse events in childhood—particularly neglect—and perinatal distress. Given that prenatal attachment is negatively associated with both exposure to neglect in infancy and perinatal distress, it is conceivable that this mediation describes a potential protective role of prenatal attachment on prenatal distress from the harmful effects of exposure to childhood neglect.

Interestingly, this mediation emerged selectively with both general and quality of attachment MAAS dimensions rather than with the intensity of concerned MAAS dimension. This finding reflects the absence of an association between neglect dimensions and measures of perinatal distress in our dataset. Moreover, this finding is in line with previous work showing a stronger relationship with psychological distress dimensions for the attachment quality scale than for the worry intensity scale [42, 61, 69].

We believe that our mediation findings might have important clinical implications, especially when considered in the context of existing findings. Indeed, it should be noted that the relationship between prenatal distress and attachment has been more frequently investigated in terms of the influence of distress on attachment during pregnancy, although a full mediation of distress between childhood trauma and prenatal distress has not been found (see Berthelot et al., [11]). On the one hand, this existing literature has pointed out that prenatal distress might be a relevant proximal factor buffering the potential negative effects of childhood trauma on the parent–child relationship. On the other hand, we demonstrated that if the terms are reversed, prenatal attachment might also buffer the maladaptive effects of childhood trauma on prenatal distress, therefore potentially acting as a distal factor on the parent–child relationship. In this framework, our findings complement extant literature and point out the urgency of considering not only prenatal distress, but also prenatal attachment as relevant correlated protecting factors for postnatal psychological well-being of mothers and, in turn, of a secure mother–child relationship.

However, the lack of association with emotional abuse, which was consequently not investigated further in the mediation analysis, is surprising. Previous work suggested an effect of emotional abuse on prenatal attachment, albeit to a lesser degree than neglect [66], but the literature on this issue remains substantially sparse. Within this framework, our findings differentiating the effects of neglect and emotional abuse on prenatal attachment represent a point of novelty that deserves further study. Many works investigating parental adversity in childhood do not differentiate the dimensions of neglect and emotional abuse (e.g., Berthelot [11]), possibly underestimating the specific contribution of each dimension.

Limitations

Several limitations should be considered when interpreting the results of this study. First, the data were cross-sectional, so it was not possible to examine causal inferences between EA and neglect and psychological distress. Indeed, the experiences of EA and neglect and prenatal emotional distress were measured concurrently, precluding temporal conclusions. Thus, our cross-sectional mediation findings should not be interpreted in absolute causal terms, and are therefore intrinsically limited in their impact by the nature of our data and by our research design. Future research should employ a longitudinal design to elucidate how experienced EA and neglect during childhood may impact women emotional distress during pregnancy and whether our findings can

be generalized to a different temporal design. Furthermore, data about women's experiences of emotional abuse and neglect were collected retrospectively. Participants were required to recall experiences from their childhood, but the literature has demonstrated a good agreement between adverse childhood experiences and recall in adulthood [33]. Furthermore, the measures used in the present study were self-reported, which could be influenced by social desirability bias. Future research should adopt a multi-method approach, including qualitative interviews. It should be also noted that childhood trauma was assessed with two different instruments (namely, CECA Q and CTQ) across all the enrolled women. To maximize the sample size, neglect and abuse composite scores were derived based on Z-scores from both questionnaires obtained from subscales measuring overlapping constructs. These findings should therefore be replicated in larger and more consistent samples in which childhood trauma is univocally assessed with a single instrument.

Another important limitation of this study is the fact that the literature has reported several other variables and circumstances which characterize the pregnancy period and may affect perinatal distress, psychological and physical health of future parents (e.g., social support, personal attributes, pregnancy complications, stressful life events during pregnancy, marital satisfaction, psychiatric history (for a full review, see Alipour et al., [3])). Although our study specifically focused on childhood trauma, it cannot be ruled out that these factors might intervene in the relationship between childhood trauma, prenatal attachment, and prenatal distress, for example, as potential mediators. Future studies are warranted to test this hypothesis.

As a last relevant limitation issue, it must be pointed that our sample was mainly composed of women with a low-risk status. The participants were characterized by their higher education, higher economic status, stable marital situation, and lack of any pregnancy complications. In more heterogeneous samples, variability in such socio-demographic conditions might have affected the results. Thus, on the one hand, our findings should be considered as being related mainly to low-risk samples. On the other hand, future studies could be conducted in higher vs. lower socio-demographic risk status women employing a statistical design allowing control for such heterogeneity to fully understand the generalizability of our findings.

Strengths and clinical implications

The major strength of this study is that it addresses a gap in the current literature concerning the knowledge of the clinical consequences of EA and neglect. Previous studies

largely concentrated on the outcomes of sexual and physical abuse and have thus not paid attention to the specific effects of these types of maltreatment. Additionally, our study focused on a specific sample, namely, pregnant women. To our knowledge, only a few studies have specifically explored a variety of traumatic childhood experiences in pregnant women and how these experiences influence a woman's emotional distress during pregnancy.

Our findings show that neglect represents a significant risk factor for psychological symptoms during pregnancy. For this reason, clinicians working with pregnant women should consider that routinely asking about childhood family environment could provide crucial prognostic understanding for their assessment. It is relevant to implement prevention strategies to reduce the risk of depression and other emotional symptoms in pregnant women.

Another strength of the study is the comprehensive evaluation of women's emotional distress. In contrast to other studies that focused only on the risk of depression during pregnancy, our study examined the risk of psychological distress in pregnant women using PAMA, an instrument that is capable of assessing perinatal maternal affective disorders [4] through numerous psychological dimensions (e.g., anxiety, depressive symptoms, stress, anger, somatization). This may allow for a more extensive understanding of the general psychological distress experienced by women during pregnancy that could result in more severe psychopathological outcomes in the post-partum period. The assessment of psychological distress during pregnancy, in particular, may be crucial to preventing depression and psychopathology in the post-partum period. Indeed, several studies have found that among women with high depression scores in late pregnancy, almost half carried the symptoms with them into the postpartum period [39]. Moreover, a recent umbrella review revealed that antenatal depression is widespread, with a prevalence ranging from 15 to 65% [28].

Research has highlighted the need for more accurate information regarding specific risk factors for antenatal depression and psychological distress. With this information, we could target and prioritize healthcare expenditures more efficiently and thereby optimize preventive interventions [8, 35].

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Authors' contributions

MR: conception and design of the work, interpretation of data, manuscript drafting; LF and LAA: analysis and interpretation of data, critical revision of the manuscript; EB and GC: data acquisition, manuscript drafting; AM: support for data acquisition, critical revision of the manuscript; GF and FG: supervision,

critical revision of the manuscript. All authors have approved the submitted version of the manuscript.

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Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

All procedures performed in this study were in accordance with the ethical standards of the institutional and national research committee and with the 2021 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all participants included in the study. The study protocol has been approved by the Bioethics Committee at the University of Palermo (167/2023). Written informed consent has been obtained by each individual who took part in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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