



CLINICAL RESEARCH ARTICLE



Understanding how adverse childhood experiences influence the development of postpartum post-traumatic stress disorder: a qualitative study in China

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ABSTRACT

Background: Adverse childhood experiences (ACEs) disproportionately affect women and significantly increase the risk of postpartum post-traumatic stress disorder (PTSD). However, the psychological mechanisms underlying this relationship remain inadequately investigated.

Aim: To develop a constructivist grounded theory explaining how ACEs influence the development of postpartum PTSD.

Methods: Employing a constructivist grounded theory approach, this qualitative study was conducted at a tertiary hospital in South China between November 2023 and October 2024. Data were collected through in-depth interviews conducted with 10 women who experienced ACEs and subsequently developed postpartum PTSD. Early maladaptive schemas (EMS) were identified as the central construct in the resulting theory.

Results: The developed theory contains five components: (1) the origin of EMS; (2) the formation of EMS; (3) the trigger of EMS; (4) the operation of EMS; and (5) the outcome of EMS. Findings suggest that ACEs were perceived as providing the foundation for EMS, which gradually solidified during an individual's developmental trajectory to become an ingrained subconscious framework for responding to external stressors. During the stress-inducing event of childbirth, EMS appeared to be activated, influencing cognitive appraisals of the stressor, coping strategies, and perceived social support, ultimately contributing to the experience of postpartum PTSD symptoms.

Conclusion: This study advances a constructivist grounded theory that elucidates how ACEs relate to the development of postpartum PTSD within the context of the formation, activation, and operationalisation of EMS. Given the modifiable nature of EMS, these findings highlight the potential of targeted interventions like schema therapy and trauma-informed care. Effective maternal support should address both the immediate stress of childbirth and the persisting influence of ACEs.

Comprender cómo las experiencias adversas en la infancia influyen en el desarrollo del trastorno de estrés postraumático posparto: un estudio cualitativo en China

Antecedentes: Las experiencias adversas en la infancia (ACEs en sus siglas en inglés) afectan de manera desproporcionada a las mujeres y aumentan significativamente el riesgo de trastorno por estrés postraumático (TEPT) posparto. Sin embargo, los mecanismos psicológicos que subyacen a esta relación aún no se han investigado lo suficiente.

Objetivo: Desarrollar una teoría fundamentada constructivista que explique cómo las experiencias adversas en la infancia (ACEs) influyen en el desarrollo del trastorno de estrés postraumático posparto.

Métodos: Este estudio cualitativo que emplea una teoría fundamentada constructivista, se llevó a cabo en un hospital terciario del sur de China entre noviembre de 2023 y octubre de 2024. Los datos se recopilaron a través de entrevistas en profundidad realizadas a 10 mujeres que habían sufrido experiencias adversas en la infancia (ACEs) y que posteriormente desarrollaron un trastorno de estrés postraumático posparto. Los esquemas desadaptativos tempranos (EMS, en sus siglas en inglés) se identificaron como el constructo central de la teoría resultante.

Resultados: La teoría desarrollada consta de cinco componentes: (1) el origen del EMS; (2) la formación de los EMS; (3) el desencadenante de los EMS; (4) el funcionamiento de los EMS; y (5) el resultado de los EMS. Los hallazgos sugieren que las ACEs se percibían como la base de

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Experiencias adversas en la infancia; trastorno por estrés postraumático; posparto; esquemas desadaptativos tempranos; investigación cualitativa; teoría fundamentada

HIGHLIGHTS

- This inaugural qualitative study, employing a constructivist grounded theory methodology, outlines the theoretical pathway linking adverse childhood experiences to postpartum post-traumatic stress disorder.
- Early maladaptive schemas emerged as a core construct in participants' accounts of the relationship between adverse childhood experiences and postpartum post-traumatic stress disorder. These schemas appear to distort appraisals, may foster maladaptive coping, and can impair social support utilisation when activated by childbirth.
- The findings highlight the critical need for trauma-informed perinatal care and schema-focused

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los EMS, que se fue consolidando gradualmente a lo largo de la trayectoria de desarrollo del individuo hasta convertirse en un marco subconsciente arraigado para responder a los factores estresantes externos. Durante el evento estresante del parto, los EMS parecieron activarse, influyendo en las evaluaciones cognitivas del factor estresante, las estrategias de afrontamiento y el apoyo social percibido, lo que en última instancia contribuyó a la experiencia de síntomas de TEPT posparto.

Conclusión: Este estudio propone una teoría fundamentada constructivista que aclara cómo las ACEs se relacionan con el desarrollo del TEPT posparto en el contexto de la formación, la activación y la operacionalización de los EMS. Dada la naturaleza modificable de los EMS, estos hallazgos resaltan el potencial de intervenciones específicas como la terapia de esquemas y la atención informada sobre el trauma. Un apoyo materno eficaz debe abordar tanto el estrés inmediato del parto como la influencia persistente de las ACEs.

interventions to mitigate the long-term impact of adverse childhood experiences on maternal mental health.

1. Introduction

Adverse childhood experiences (ACEs) encompass a range of harmful events occurring before the age of 18 that can threaten an individual's survival, development, and physiological and psychological health (Felitti et al., 1998). The global prevalence of ACEs is alarmingly high, posing a crucial public health challenge. A large-scale study by the Centers for Disease Control and Prevention in the United States, involving approximately 140,000 individuals across 25 states, revealed that 60.9% reported experiencing at least one form of ACE, with 15.6% exposed to three or more types (Merrick et al., 2019). Similarly, a household survey in the United Kingdom involving 100,000 adults reported that 46.4% had encountered at least one ACE, and 8.3% experienced four or more (Hughes et al., 2016). In China, ACE prevalence is also notable, as evidenced by a study of 18,341 adolescents across six cities, which indicated that 71% had experienced at least one ACE, with 14% exposed to multiple ACEs (Chan, 2013; Wang et al., 2020).

Epidemiological data consistently demonstrate that women bear a disproportionately higher burden of ACEs compared to men. For example, Knipschild et al. (2024) reported a significantly higher prevalence of ACEs among female adolescents (72.7%) than males (27.0%) in a Dutch population. Similarly, Jiang et al. (2022) found a statistically significant difference ($P < .001$) in ACE prevalence between Chinese women (37.67%) and men (32.25%) in a large-scale study of 12,421 adolescents. Furthermore, a cross-sectional study undertaken in the United States demonstrated that the likelihood of females experiencing multiple ACEs was approximately double that of males, with female ACE exposure characterised by complex patterns including sexual abuse, emotional neglect, and family dysfunction (Haahr-Pedersen et al., 2020). Given this elevated incidence among women, it is imperative to focus on the impact of ACEs on female health outcomes.

Well-documented evidence supports the immediate mental health sequelae of ACEs in women. Gajos et al.

(2022) established a significant association between ACEs and psychological disorders, particularly anxiety and depression, in female adolescents. These effects frequently extend into adulthood, increasing the risk of enduring psychiatric disorders (Karatekin, 2018). Proposed mechanisms involve ACE-induced dysregulation of the hypothalamic–pituitary–adrenal (HPA) axis and increased allostatic load, which may elevate susceptibility to depression, anxiety, and postpartum PTSD (Kurbatfinski et al., 2024). Haahr-Pedersen et al. (2020) also reported a significant association between ACEs and adult mental illness in women ($P < .05$). A dose–response relationship further substantiates this link. Almuneef et al. (2017) observed that among women, greater ACE exposure correlated with a higher probability of adult mental health disorders. Collectively, these findings underscore the profound and enduring consequences of ACEs for women's mental health throughout their lives.

The postpartum period represents a critical phase in a woman's life, encompassing physiological recovery alongside psychological and social adaptation (Dessi et al., 2024). The convergence of physiological, psychological, and social pressures during this time amplifies the effects of ACEs. Research indicates that postpartum women are particularly susceptible to exacerbated psychological distress due to ACEs, thereby increasing their risk of postpartum mental health conditions (Meltzer-Brody et al., 2018). Postpartum PTSD is a severe psychiatric condition with complex consequences for maternal health, infant development, and family dynamics. It can lead to persistent negative emotional states and, in severe cases, self-harm or suicidal ideation (Hernández-Martínez et al., 2019). Furthermore, chronic stress from PTSD may impair immune function and delay physical recovery (Nicoloso-SantaBarbara et al., 2022). The disorder also disrupts mother–infant bonding, reduces breastfeeding rates, and adversely affects the infant's physiological, psychological, and socioemotional development (Cook et al., 2018; Garthus-Niegel et al., 2017). Additionally, postpartum PTSD

contributes to familial strain by increasing the risk of spousal conflict and family discord, often exacerbated by emotional challenges and traumatic birth experiences (Li et al., 2023). Given these multifaceted consequences, it is imperative to comprehensively investigate the association between ACEs and postpartum PTSD to inform prevention and intervention efforts aimed at enhancing maternal and infant health and promoting family stability.

The association between ACEs and postpartum PTSD has been robustly established in the literature. In our recent meta-analysis, we identified 1186 women with exposure to one or more ACEs, of whom 249 developed postpartum PTSD (Zou et al., 2025). The pooled incidence of postpartum PTSD among women with ACEs exposure was 22.6% (95% confidence interval [CI] 16.1%–29.8%), which was significantly higher than the reported incidence in the general postpartum population (Zou et al., 2025). Muzik et al. (2017) reported that mothers with ACEs were at significantly higher risk for PTSD at six months postpartum. Osofsky et al. (2021) further established a dose–response relationship between ACEs scores and the severity of postpartum PTSD symptoms, with higher ACE scores corresponding to more severe symptoms. However, most existing research is quantitative, establishing correlations but offering limited insight into the dynamic psychological processes by which ACEs contribute to postpartum PTSD onset.

In contrast, qualitative research captures the subjective experiences and personal narratives of mothers, allowing exploration of how ACEs influence postpartum PTSD through complex psychological and emotional mechanisms. This approach considers social, cultural, and familial contexts, providing a comprehensive framework to understand how these factors interact with ACEs and postpartum PTSD. Qualitative studies not only enrich current theories but also generate novel hypotheses and theoretical models, guiding future research and advancing the field. Accordingly, we conducted a qualitative study to generate a theory explaining how ACEs influence the development of postpartum PTSD. Given that grounded theory provides a systematic framework for identifying data categories and integrating them into emergent theoretical processes (Charmaz & Henwood, 2017), we conducted an in-depth exploration using this approach.

2. Method

2.1. Study design

Grounded theory, originally developed by Glaser and Strauss in 1967, is a qualitative research methodology designed to generate theories grounded in empirical

data derived from real-world phenomena (Strauss & Corbin, 1990). Its core principle involves the systematic collection and iterative analysis of data to develop theoretical constructs progressively. Researchers begin with an in-depth exploration of the context of interest, gathering primary data through direct engagement (Glaser et al., 2010). These data are then analysed inductively to formulate empirical generalisations, which are continuously refined into coherent theoretical frameworks (Glaser et al., 2010). Unlike hypothesis-driven methods, grounded theory adopts a bottom-up methodology, emphasising the extraction of core concepts and elucidating their interrelationships from the data, thereby constructing novel theories. The process is cyclical and iterative, involving simultaneous data collection and analysis, identification of emerging categories, and constant refinement of the evolving theoretical model until saturation is reached, that is, when no new insights emerge (Strauss & Corbin, 1990).

This study employed grounded theory as its qualitative research methodology for several reasons. First, research on the impact of ACEs on postpartum PTSD is relatively limited both domestically and internationally, with theoretical frameworks underdeveloped. To date, no comprehensive theoretical model elucidates the mechanisms through which ACEs influence postpartum PTSD. Moreover, the complex psychological responses of mothers facing childbirth under the influence of ACEs, as well as the roles of social support systems and coping strategies within diverse cultural contexts, cannot be fully captured by standardised structured questionnaires. Therefore, grounded theory was chosen to guide this inquiry. More specifically, constructivist grounded theory was employed in this study (Charmaz, 2006). While there are varying approaches to grounded theory based on differing epistemological and ontological perspectives, constructivist grounded theory emphasises the role of the researcher-participant relationship for co-constructing theory that is underpinned by the meaning of participants' experiences (Charmaz, 2006, 2016). For women with ACEs, the development of postpartum PTSD is not a fixed or objectively observable process, but rather a meaning-making process shaped by personal history, childbirth experiences, and social contexts. From a constructivist perspective, the participants were regarded not merely as sources of information, but as active contributors to the co-construction of meaning, whose narratives helped illuminate how early experiences were interpreted, reinterpreted, and activated in the perinatal period. This approach also aligned with the sensitive nature of trauma research, as it required the research team to remain reflexive about their assumptions, professional positions, and interpretive influence throughout the analytic process (Charmaz, 2006).

Through systematic coding of primary data, the study constructed a theoretical model that explains the mechanisms by which ACEs contribute to the development of postpartum PTSD.

2.2. Sample and setting

This study was nested within a prospective cohort study on postpartum PTSD conducted in Foshan, Guangdong province of China. Participants were recruited from a tertiary hospital between November 2023 and October 2024. Inclusion criteria comprised women aged ≥ 18 years who had delivered full-term, singleton live births and provided written informed consent. To minimise confounding factors, we established the following exclusion criteria: (1) birth-related traumatic events (e.g. obstetric complications such as postpartum haemorrhage, uterine rupture, or instrumental delivery; neonatal complications such as asphyxia or clavicular fracture), based on evidence that such events could independently lead to postpartum PTSD (Lai et al., 2023); (2) traumatic events during pregnancy (e.g. intimate partner violence, natural disasters, bereavement), which might represent additional recent traumas that obscure the contribution of childhood adversity (Ayers et al., 2016); and (3) a personal or family history of psychiatric disorders (e.g. schizophrenia, bipolar disorder, major depressive disorder, or PTSD), as pre-existing mental health conditions could influence both recall of ACEs and vulnerability to postpartum PTSD (Horsch et al., 2024).

ACEs were assessed using the Adverse Childhood Experiences–International Questionnaire (ACE-IQ), a World Health Organization (WHO) tool designed for global surveillance of ACEs and their health impacts (WHO, 2020). The Chinese version of the ACE-IQ, culturally adapted and validated by Ho et al. (2019), demonstrated good reliability in Chinese populations (Cronbach's $\alpha = 0.83$). In the present study, the ACE-IQ showed good internal consistency (Cronbach's $\alpha = 0.81$). An ACE-IQ score > 0 indicated a history of ACE exposure (Ho et al., 2019).

Postpartum PTSD was assessed at 42 days postpartum using the Perinatal Post-Traumatic Stress Disorder Questionnaire (PPQ) (Zhang et al., 2018). Originally developed by DeMier et al. (1996) based on DSM-IV criteria, the PPQ is a self-report instrument designed to measure PTSD symptoms specifically related to childbirth, typically assessed between 1 and 18 months postpartum. The Chinese version, validated by Zhang et al. (2018), demonstrated strong psychometric properties (Cronbach's $\alpha = 0.84$, test-retest reliability = 0.88, and content validity = 0.99). In the present study, the PPQ exhibited good internal consistency (Cronbach's $\alpha = 0.91$). A cutoff score of ≥ 19 was used to identify clinically significant postpartum PTSD (Zhang et al., 2018).

Women who reported ACE exposure (ACE-IQ score > 0) and screened positive for postpartum PTSD (PPQ score ≥ 19) were invited for qualitative interviews. Theoretical sampling guided participant selection, with subsequent recruitment decisions informed by ongoing analysis. The sampling strategy sought to achieve maximum variation in age, education level, occupation, type of ACEs experienced, and mode of delivery. The final sample size was determined by theoretical saturation, reached when additional interviews yielded no new categories or insights, and existing concepts became well-developed and consistently supported by the data.

2.3. Data collection

Data were collected through in-depth semi-structured interviews conducted in a private office within the postpartum women's health clinic, ensuring a quiet and undisturbed setting. All interviews took place between 42 and 49 days postpartum. The interview guide was developed based on a comprehensive literature review, aligned with the study objectives, and reviewed by an expert committee for content validity. To assess the validity of the guide and the clarity of the questions, a pilot test was conducted with two postpartum women, leading to further refinement of the guide. The finalised interview outline is presented in Table 1. Prior to the interviews, participants were fully informed about the study's purpose, procedures, confidentiality measures, and their rights, after which written informed consent was obtained. All interviews were conducted by the first author, a master's candidate in nursing psychology with specialised training in qualitative research methodologies and interview techniques, under the direct supervision of the corresponding author, a distinguished expert in perinatal mental health nursing holding a Doctor of Medicine degree. Both researchers are female, which may have facilitated a stronger rapport and sense of safety among participants, potentially enhancing the openness and depth of disclosure during interviews. A shared gender identity can also contribute to a more

Table 1. Qualitative interview protocol.

No.	Interview questions
1	What adverse experiences did you have during your childhood?
2	In what ways have these childhood experiences influenced various aspects of your development, such as personality, coping strategies, daily life, interpersonal relationships, education, and future prospects?
3	What experiences of discomfort or trauma did you encounter during childbirth?
4	What psychological challenges or distress did you face postpartum, and what do you think contributed to these feelings?
5	How do you believe your postpartum psychological state is related to your adverse childhood experiences? Please elaborate on your reasoning.
6	What else would you like to share with me?

nuanced understanding of childbirth-related experiences and postpartum emotional challenges, thereby supporting the trustworthiness and contextual sensitivity of the data collected.

Given the study's focus, participants were sometimes asked to recall ACEs and childbirth-related traumatic events, which could pose potential mental health risks. Evidence suggests that, when ethical principles are strictly followed and appropriate safeguards are in place, such as a safe environment, flexible interview techniques, timely emotional feedback, and prompt psychological assessment, trauma-related interviews generally present minimal risk (Goossens et al., 2016). Moreover, individuals who have experienced adverse events found the interview experience positive and conducive to psychological recovery when provided with appropriate support and guidance (Rariden et al., 2021).

After the main questions, each participant was asked about their current psychological and emotional well-being. A psychiatric attending physician was on standby to provide immediate intervention or referral if needed. In addition, all participants were given information on follow-up counselling and support resources, including 1–3 free counselling sessions to address any distress that might arise. No participants required crisis assessment, management, or referral during the study. All interviews were audio-recorded and lasted between 30 and 60 min. To ensure methodological rigour and data accuracy, two independent researchers performed verbatim transcriptions within 24 h post-interview, followed by participant verification of the transcribed content to confirm data reliability.

2.4. Data analysis

Qualitative data were analysed using NVivo 12 software, adhering to the established procedures for data management and analysis as recommended by constructivist grounded theory (Charmaz, 2006). All interviews were transcribed verbatim from digital audio recordings to ensure accuracy and completeness. Two researchers independently coded the transcripts using constructivist grounded theory methodology to enhance rigour and minimise bias. The analysis progressed through three steps: open coding, involving a line-by-line examination of the data to identify, label, and categorise meaningful units relevant to the research objectives; axial coding, in which categories from open coding were organised, compared, and linked to establish relationships and develop broader thematic categories; and selective coding, where a core category was identified and integrated with related categories to construct a cohesive theoretical framework (Charmaz, 2006, 2016).

2.5. Rigour and trustworthiness

To ensure the credibility and trustworthiness of the findings, the researchers maintained prolonged engagement and close interaction with participants throughout the study. Field notes and memos were recorded from the outset and used as supplementary materials during coding, providing contextual depth that enriched the analysis. Methodological rigour was further strengthened through independent supervision by faculty members external to the research team, whose critical review enhanced the transparency and credibility of the analytic process.

2.6. Ethical considerations

This study was approved by the Clinical Research Ethics Committee of Foshan Women and Children Hospital (FSFY-MEC-2023-103) and conducted in strict accordance with ethical principles of informed consent and privacy protection. All participants voluntarily provided written informed consent after receiving a comprehensive explanation of the study's objectives, procedures, and potential risks. Interview data were anonymised, stored securely, and used solely for research purposes to ensure strict confidentiality.

3. Results

The study included 10 postpartum women, with a mean age of 29.09 ± 3.18 years. In terms of educational background, 2 participants had completed college, 7 held undergraduate degrees, and 1 had completed postgraduate studies. Regarding mode of delivery, 6 participants had vaginal deliveries, while 4 underwent caesarean sections. Regarding the types of ACEs encountered, 9 participants reported emotional neglect, 8 reported emotional abuse, 6 reported physical neglect, 5 reported physical abuse, 2 reported sexual abuse, 7 reported domestic violence, 3 reported parental absence or separation, 2 reported domestic substance abuse, 1 reported having a family member with a mental illness, and 2 reported bullying. Participant characteristics are presented in Table 2, with participants numbered sequentially from N1 to N10.

3.1. Storyline

The storyline approach connects the core category to related categories through logical relationships, forming a coherent and interpretable narrative framework for the research phenomenon (Birks & Mills, 2022). As both an analytical tool and a means of articulating the final theory, the storyline offers an abstract interpretation that synthesises the collective experiences of all participants, rather than describing the developmental process of postpartum PTSD in each individual case.

Table 2. Characteristics of participants ($N = 10$).

Characteristic	N (%)
Age (years), Mean (SD)	29.09 ± 3.18
Education	
College	2
Undergraduate	7
Post-graduate	1
Occupation	
Professionals	5
Worker and self-employee	3
Homemaker	2
Mode of delivery	
Vaginal delivery	6
Caesarean delivery	4
ACEs type	
Emotional neglect	9
Emotional abuse	8
Physical neglect	6
Physical abuse	5
Sexual abuse	2
Domestic violence	7
Parent's absence/separation	3
Domestic substance abuse	2
Mentally ill family members	1
Bullying	2

SD = Standard deviation.

(Birks & Mills, 2022; Freshwater, 2009). This process is illustrated in Figure 1 and further elaborated in the subsequent dialogue.

The developed theory comprises five components centred on EMS as the core concept: (1) the origin of EMS; (2) the formation of EMS; (3) the trigger of EMS; (4) the operation of EMS; and (5) the outcome of EMS. According to Young's theory, EMS are pervasive, self-defeating emotional and cognitive patterns regarding oneself and relationships with others, arising from ACEs and persisting across the lifespan (Young, 1999). Located at the deepest level of cognition, they consist of beliefs, memories, and feelings about oneself, others, and the world, shaping information processing and behaviour (Young et al., 2006). EMS typically develop during childhood and adolescence, persist into adulthood, and are activated by relevant stimuli (Young et al., 2003).

When triggered, EMS influence individuals' psychological states and coping behaviours through schema perpetuation, a process in which individuals unconsciously reinforce schema-consistent information when facing stress, leading to maladaptive coping strategies (Young et al., 2003). This reinforcement often involves behaviours that maintain the schema and avoidance of opportunities for schema modification, thereby sustaining its dysfunctional impact (Zeynel & Uzer, 2020).

Findings from this qualitative analysis indicate that ACEs serve as the foundation for EMS, which gradually solidify into subconscious patterns that shape responses to external challenges. In the context of childbirth (which participants described as a significant stressor), they experienced these schemas as becoming activated. According to their accounts, this activation shaped how they appraised the event,

influenced the coping strategies they used, and altered their perceptions of available support. Participants described this process as central to their subsequent experience of postpartum PTSD symptoms.

3.2. The origin of EMS

Participants in our study consistently reported that ACEs were the primary source of EMS. Childhood is a critical stage in psychological development, during which adverse experiences can profoundly influence cognitive processes, behavioural patterns, and emotional regulation. Existing research indicates that ACEs may contribute to EMS formation by disrupting children's core emotional needs, distorting cognitive development, and shaping maladaptive behavioural tendencies (Spirou et al., 2022). In this study, the main categories of ACEs reported by participants include emotional neglect, physical neglect, emotional abuse, physical abuse, sexual abuse, domestic violence, parental absence or separation, domestic substance abuse, having a family member with mental illness, and bullying.

3.2.1. Emotional neglect

From the coding analysis of our interview data, this concept was defined as the failure of caregivers to fulfil their duties and responsibilities in providing care and affection to children, thereby not meeting the emotional needs of the child. Participant N3 exemplified this pattern, describing how her parents consistently failed to understand or attend to her feelings, offering no meaningful response to her emotional expressions.

They (my parents) never tried to understand my feelings or anything like that. They didn't care about those things. (N3)

3.2.2. Physical neglect

From the coding analysis of our interview data, this concept was defined as the actions of parents or primary caregivers that ignore the health and physical needs of the child. Participant N9 illustrated this through her experience of persistent headaches and dizziness during high school. When she informed her mother, the concerns were dismissed, with medical care withheld in favour of studying. Her account reflects a neglect of physical well-being.

Throughout high school, I constantly had headaches and always felt dizzy. I told my mom about it, but she couldn't be bothered. She never took me to see a doctor, saying things like, 'The time spent at the hospital could be used to study more books and finish more test papers.' She just didn't care about me, all she saw were those test scores. (N9)

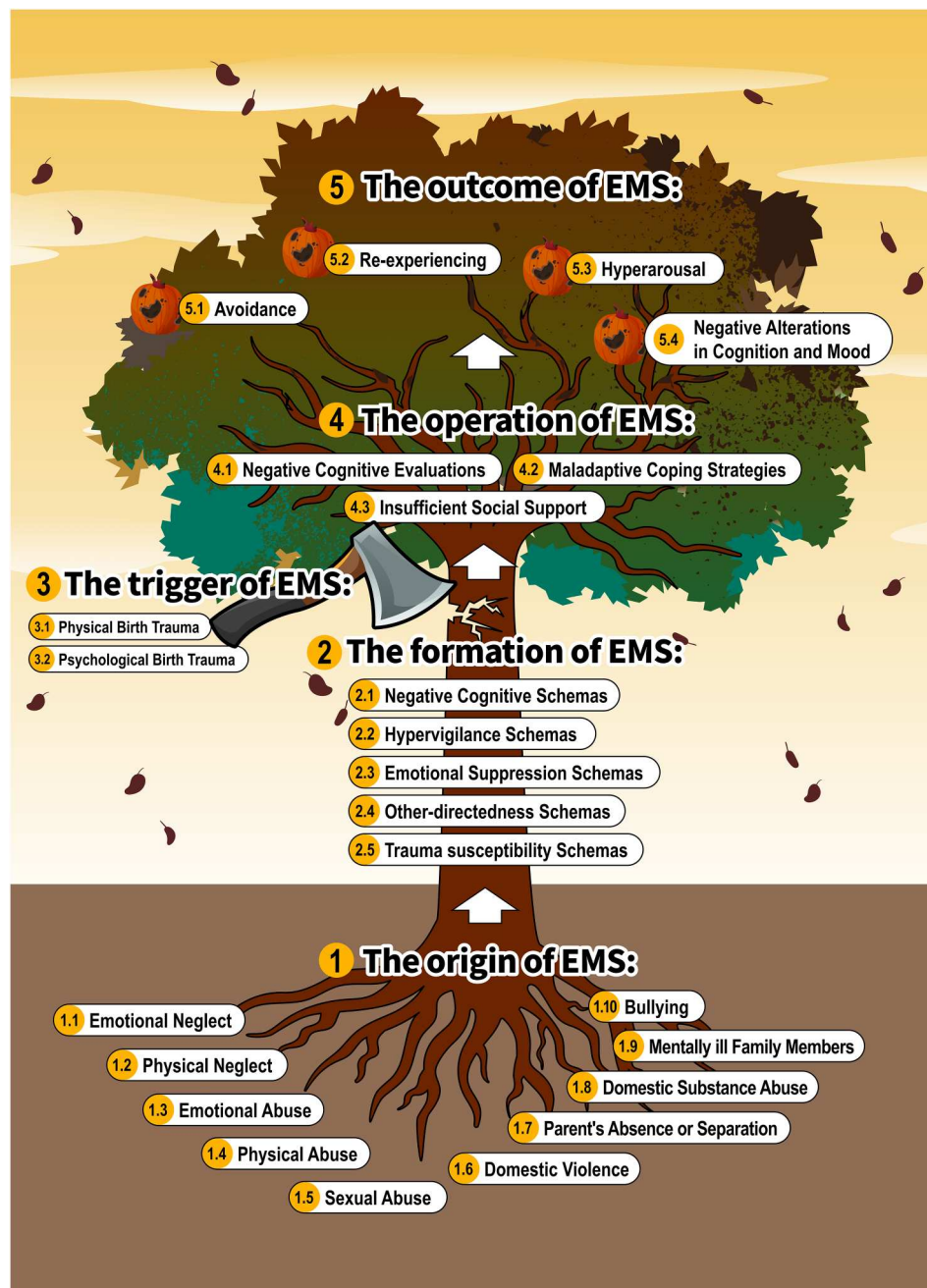


Figure 1. Model illustrating the influence of ACEs on the development of postpartum PTSD. Note. Developed via constructivist grounded theory, this five-stage tree-shaped theoretical model conceptually outlines the pathway linking ACEs, EMS, and postpartum PTSD. The directional upward arrows represent a sequential ordering within the model, indicating the theorised relationships among the stages: (1) the origin of EMS involves ten categories of ACEs that form the root system; (2) the formation of EMS comprises five categories of EMS that constitute the lower trunk; (3) the trigger of EMS includes physical and psychological birth trauma, depicted as an axe striking the trunk; (4) the operation of EMS reflects three schema maintenance mechanisms that form the upper trunk; and (5) the outcome of EMS consists of four PTSD symptom clusters that constitute the tree's bad fruit.

3.2.3. Emotional abuse

From the coding analysis of our interview data, this concept was defined as non-physical behaviours by parents or primary caregivers aimed at controlling, intimidating, subduing, belittling, punishing, or isolating the child. Participant N5 described her mother's use of weight-related verbal humiliation and emotional pressure to control her behaviour. Her narrative captures the degrading nature of such interactions.

She was always calling me fat, saying nobody would want me later because I was so fat. If I ever didn't feel like going for a walk or refused to do so, she'd make a huge fuss about it again. (N5)

3.2.4. Physical abuse

From the coding analysis of our interview data, this concept was defined as caregivers inflicting physical harm on the child through violent actions such as kicking, slapping, or corporal punishment. Participant

N4 recounted repeated physical abuse by her father, who would hit her both when he perceived wrongdoing and, at times, without any apparent reason, using her as an outlet for his frustrations.

He (my father) would hit me if he thought I'd done something wrong. Sometimes, he'd hit me even when I hadn't done anything wrong, just to take his frustrations out on me. (N4)

3.2.5. Sexual abuse

From the coding analysis of our interview data, this concept was defined as any actions by others that involve the sexual exploitation or stimulation of a child to satisfy the perpetrator's own sexual desires. Participant N1 described being sexually abused by a relative during childhood. When alone with her in a room, the relative touched her private parts under her clothes.

A relative of mine touched me ... touched me under my clothes. It happened because I was alone with him in a room at my house. (N1)

3.2.6. Domestic violence

From the coding analysis of our interview data, this concept was defined as a child witnessing or being aware of physical, emotional, or psychological abuse occurring between family members. Participant N7 described repeatedly witnessing his father physically abuse his mother. His account captures the terror of these experiences.

I remember my father constantly hitting my mother. He would come home drunk and start shouting, and then I would hear the sounds of things being knocked over and my mother crying. I was terrified and would hide under my blanket, but I could still hear everything. (N7)

3.2.7. Parent's absence or separation

From the coding analysis of our interview data, this concept was defined as a child experiencing the breakdown of their parents' relationship, including divorce or separation. Participant N3 described her mother's departure when she was very young, after which she grew up without maternal presence.

My mom left my dad when I was very young, probably divorced. I haven't lived with her since. I grew up without a mother. (N3)

3.2.8. Domestic substance abuse

From the coding analysis of our interview data, this concept was defined as living with family members who struggle with substance-related issues, such as alcoholism or gambling addiction. Participant N6 recounted that her father had a severe compulsive

mahjong addiction during her childhood, and would frequently go directly to play mahjong immediately after work, with this behaviour fully dominating his after-work time.

When I was little, my dad was really addicted to playing mahjong. He would go straight to play mahjong as soon as he got off work. (N6)

3.2.9. Mentally ill family members

From the coding analysis of our interview data, this concept was defined as a living with family members who have mental illnesses. Participant N10 described growing up with a mother whose mental state was unstable. Confined at home by the family, her mother exhibited erratic behaviour that frightened her as a child.

My mom hasn't been quite herself since I was little. The family just kept her confined at home. She often laughed for no reason and muttered things – ramblings like 'someone's coming to get me.' Although the family said she was my mom, as a kid, I didn't really understand. Honestly, I was quite afraid of her when I was young. (N10)

3.2.10. Bullying

From the coding analysis of our interview data, this concept was defined as aggressive behaviours that cause physical or psychological harm to a child outside the home environment. Participant N6 described being ostracised by her entire class during elementary school, including betrayal by a close friend.

In elementary school, I was ostracized by the whole class. Even my best friend at the time talked behind my back. Everyone was bad-mouthing me, saying things about me. (N6)

3.3. The formation of EMS

A pattern emerged from participants' accounts in our study wherein ACEs contributed to EMS development. According to their narratives, these schemas became entrenched cognitive frameworks that shaped their subconscious responses to later challenges. The main categories of EMS identified in this study included: negative cognitive schemas, hypervigilance schemas, emotional suppression schemas, other-directedness schemas, and trauma susceptibility schemas.

3.3.1. Negative cognitive schemas

From the coding analysis of our interview data, this concept was defined as persistent, distorted self-perceptions and negative views of others and the world. Across participants, these patterns were described in relation to cumulative exposure to ACEs, particularly

emotional neglect, physical neglect, emotional abuse, and physical abuse.

In N2's account, these experiences were situated within a caregiving context marked by instability and limited emotional responsiveness. Her placement in her uncle's household, although framed as facilitating school attendance, was described as deprioritising her need for consistent caregiving. Within this setting, instances of physical neglect (e.g. being provided with ill-fitting, hand-me-down clothing) were experienced as recurring indications that her basic needs were not fully attended to. These experiences co-occurred with repeated negative evaluations from family members, including unfavourable comparisons and dismissive responses.

Within this context, emotional validation from significant adults was rarely reported. In addition, her parents' long-term migration for work appeared to limit opportunities for supportive parental feedback. As a result, alternative, more positive self-appraisals were less frequently articulated in her narrative. In the absence of such counterbalancing experiences, these repeated interactions were described as gradually shaping a pattern of interpreting the self in terms of inadequacy and unworthiness.

I always feel like I can't do certain things well, probably because I'm inherently incapable. That's why I fail at these things ... Why do I think this way about myself? I think it's because of those dark, damp years of my childhood – they've soaked into me, and they keep me feeling damp, even now. (N2)

3.3.2. Hypervigilance schemas

From the coding analysis of our interview data, this concept was defined as a persistent state of heightened alertness to potential threats in both cognitive and behavioural domains. Participants associated its emergence with ACEs involving chronic stress exposure, particularly parental substance abuse and domestic violence.

In N7's account, long-term paternal alcohol misuse and recurrent domestic violence formed the central context of her childhood experience. Importantly, these experiences were described as unpredictable: periods of relative calm when her father was sober were interspersed with episodes of violence during intoxication. Because the same caregiver alternated between caregiving and threat, the boundary between safety and danger became unstable.

Within this environment, she described developing a pattern of continuous monitoring for early indicators of potential harm, such as changes in tone of voice, smell of alcohol, or shifts in behaviour. This vigilance functioned as a context-specific coping response aimed at anticipating and avoiding harm. However, when extended beyond the original family context, this pattern persisted as a generalised expectation of

threat. In adulthood, neutral or ambiguous situations were often interpreted as potentially dangerous, accompanied by sustained physiological and psychological alertness.

Back when I was a kid at home, I was exactly like this too, always on guard. I had no choice, y'know? Everyone said I was way too worried about everything, like a scared little rabbit. I always feel that something bad is going to happen. When I'm on the road and see a car coming, I get very scared, wondering if it's going to hit me. When I see people fighting, I also get scared, thinking there's a possibility I might get hurt. (N7)

3.3.3. Emotional suppression schemas

From the coding analysis of our interview data, this concept was defined as the active inhibition or avoidance of emotional expression as a coping mechanism for conflict or distress. Participant accounts most often linked the emergence of this schema to ACEs involving emotional neglect and emotional abuse.

In N3's account, her parents' divorce and her father's severe and fluctuating mental illness, together with her upbringing by a grandfather described as having limited emotional attunement, formed the broader caregiving context. Within interactions with her father, expressions of sadness or insecurity were described as being dismissed and, at times, followed by verbal aggression or physical punishment during periods of symptom exacerbation.

At the same time, her grandfather's responses were described as oriented more towards behavioural guidance than emotional engagement. Due in part to generational differences, her emotional expressions were often not taken up, and her attention was instead redirected towards academic performance and family responsibilities.

Across these relational contexts, emotional expression was infrequently associated with understanding or support, and was at times linked to negative interpersonal consequences. Within her narrative, this pattern was described as contributing to a view of emotions as ineffective or potentially problematic. Over time, she reported increasingly inhibiting emotional expression as a way of managing these interactions. This pattern was subsequently described as extending beyond the family context.

I don't really dare to truly express my emotions and feelings to anyone. Emotions feel useless; they don't solve any problems. Having these emotions makes me feel very childish, as if I'm still young and unaccepted by others. (N3)

3.3.4. Other-directedness schemas

From the coding analysis of our interview data, this concept was defined as prioritising others' needs

over one's own, often through self-sacrifice or people-pleasing behaviours to secure relational safety. Participant reports linked this schema to experiences in which personal needs were consistently deprioritised by primary caregivers.

In N8's account, this pattern was described as emerging through the cumulative influence of multiple adverse childhood experiences. She grew up in a household that favoured sons over daughters; her role included caring for a younger brother and taking on extra household work. Because resources were allocated unevenly, repeatedly meeting others' needs became associated with receiving attention. That association reinforced the behaviour until it eventually turned into a stable internal pattern.

At the same time, her mother interacted in ways described as emotionally volatile and strict. To avoid being scolded, N8 learned to remain highly compliant. This caregiver – oriented strategy for managing emotions, combined with prolonged emotional neglect and abuse, left her own needs consistently suppressed. In her account, those needs gradually weakened over time. What began as contextually adaptive behaviour, putting others first, was consolidated through repeated experiences of gaining limited approval or easing relational tension. Eventually it transformed into an automatic, schema – driven response.

Because I've been taking care of others since I was young, and my parents focused more on my brother, I subconsciously developed a habit of putting others first. This has led me to give a lot in relationships, often taking care of others while neglecting myself. (N8)

3.3.5. Trauma susceptibility schemas

From the coding analysis of our interview data, this concept was defined as psychological vulnerability to traumatic events. When participants described how this schema emerged, they most often pointed to ACEs such as chronic criticism, emotional invalidation, family instability, or repeated experiences of relational insecurity.

In N6's account, growing up in a household with ongoing domestic violence shaped how she responded to interpersonal conflicts like arguments. She reported connecting current situations back to earlier experiences, which led her to repeatedly re-experience childhood scenes. She described becoming highly sensitive to situations resembling her parents' arguments, with noticeable physiological arousal.

Her upbringing was further characterised by a combination of strict maternal control and physical punishment perpetrated by her father. On one hand, her mother's primary mode of interaction centred on rigid behavioural control, which emphasised compliance and the internalisation of rules, while lacking

the capacity to hold and respond to her emotional expressions during childhood. On the other hand, her father used corporal punishment as a primary tool for behaviour modification, establishing a conditioned association between physical discipline and perceived 'misbehavior'. While these two parenting practices differed in form, they were functionally consistent: neither provided a safe, predictable space for emotional containment, nor did they model adaptive ways to achieve self-soothing and emotional regulation during experiences of distress.

From these chronic parenting interactions, she failed to develop stable, adaptive strategies for emotion regulation. She described that when conflicts arose in later life, she was rapidly overwhelmed by physiological hyperarousal and struggled to return to a calm state. Over time, she reported that this unresolved physiological arousal reinforced the perceived significance of these traumatic events; as a result, the associated memories were not integrated into neutral past experiences, but remained emotionally active and salient in her daily life.

My father yelled at me in the kitchen, and for days afterward I couldn't stop thinking about it. His voice kept echoing in my mind, and I felt trapped in that scene, as if the pain would never end. The impact of these experiences [referring to ACEs] is that I really hate it when people argue loudly in front of me. Whenever I hear loud arguing, I feel uncomfortable and irritable. It reminds me of scenes from the past, and I can feel the sweat on my back right away. (N6)

3.4. The trigger of EMS

Analysis of our interview data indicated that childbirth, as a combined physiological and psychological stressor, may act as a trigger for the activation of EMS. Evidence from Edworthy et al., 2008 suggests that uncontrollable aspects of labour, including pain, labour progression, and medical interventions such as forceps use or episiotomy, can resemble prior ACE-related experiences, thereby contributing to schema activation. Within this analytical framework, our qualitative analysis identified two categories of childbirth-related trauma: physical trauma and psychological trauma.

3.4.1. Physical trauma

From the coding analysis of our interview data, this concept was defined as the bodily pain and physiological harm experienced during childbirth. All participants described childbirth as physically traumatic, regardless of delivery mode.

For vaginal delivery, participants reported multiple sources of pain associated with both medical procedures and physiological processes.

Frequent vaginal examinations prior to labour were described as a recurrent source of invasive and distressing pain, particularly when repeated over short intervals.

The midwife kept coming in to check me. She would put her fingers in, and it hurt so bad I was crying ... I knew it was necessary, but the examination still felt like I was being hurt. (N6)

Uterine contractions were described as progressively intensifying and increasingly frequent, producing escalating and overwhelming pain that participants perceived as approaching the limits of physical endurance.

The contractions got stronger and closer together, wave after wave. I just could not imagine the pain. People say giving birth is the most painful thing, and I really felt it. At that moment, I really thought I would die from the pain. (N1)

During fetal passage through the birth canal, participants reported intense sensations of stretching and tearing in the perineal area, often accompanied by a burning quality of pain and a perceived threat of bodily rupture.

The midwife told me to push like I was having a bowel movement. I could feel myself stretching down there. By the time the baby was about to come out, it felt like I could not stretch any further, like I was going to tear right down the middle. It was this burning, tearing pain. I felt like everything down there was destroyed. (N5)

Additional pain was attributed to episiotomy and subsequent suturing, which were experienced as sharp, penetrating, and prolonged forms of physical suffering.

The episiotomy hurt, and the stitching hurt too. I could feel every stitch, the needle going in, and the thread pulling tight. I could even feel the sharp pain of the needle going into my skin. I felt like something broken was being stitched up. It hurt so much that I cried and begged the doctor to be gentler. (N8)

For caesarean delivery, although women undergoing caesarean sections typically receive regional anaesthesia and therefore do not generally experience sharp pain during the incision or delivery, some participants still reported sensations of pulling, pressure, and discomfort during the procedure.

I was on the table and I had been numbed. I could not feel anything from the waist down. But I still felt uncomfortable. I could feel them cutting my belly open and reaching inside. At the end, I felt someone pushing on my stomach, like they were squeezing the baby out. (N9)

3.4.2. Psychological trauma

From the coding analysis of our interview data, this concept was defined as the emotional distress and

perceived loss of control during childbirth. All participants described childbirth as psychologically traumatic, reporting multiple forms of negative affect alongside a sense of diminished control.

Participants described clustered negative affective states, including fear, despair, regret, anger, resentment, helplessness, and shame. These emotional responses were linked to experiences of exposure, vulnerability, and loss of dignity during childbirth.

The repeated vaginal exams nearly shattered me. Lying there motionless while doctors touched me – down there – was excruciating, unbearable. Ever since that childhood incident, I've been intensely averse to being touched by anyone. This felt like a brutal reenactment of the past. It broke me completely. (N1)

The perceived loss of control was described as an inability to regulate bodily processes, influence the progression of labour, or participate in medical decision-making. Within this context, participants reported feeling trapped in an inescapable situation.

You know, I couldn't control anything. I wanted to give birth quickly, but I couldn't; I didn't want to give birth, but I couldn't stop it. I felt completely helpless and powerless. It was overwhelming. I felt like I had lost control over the body I had known for over 20 years, just like before, when I couldn't control anything, and I still haven't gotten over it. (N10)

3.5. The operation of EMS

Our qualitative analysis indicated that childbirth acts as a trigger that activates EMS, leading to negative cognitive appraisals, maladaptive coping strategies, and insufficient social support. Collectively, these factors contribute to the development of postpartum PTSD symptoms.

3.5.1. Negative cognitive evaluations

From the coding analysis of our interview data, this concept was defined as the individual's perception of childbirth as highly threatening, coupled with an underestimation of their personal coping resources. Analysis of our interview data revealed that activation of EMS distorts cognitive appraisal in two key stages: during the primary appraisal, women tended to overestimate the threat posed by childbirth; during the secondary appraisal, they underestimate their own ability to cope.

At that time, I even thought my child and I might not make it through, that we might die. Death seemed better; at least the pain would end. (N1)

In that situation, no one could help me. I was alone on the table, and talking to them felt pointless. They couldn't understand what I was going through, and their seemingly caring words offered no comfort.

Unless they could stop the childbirth, what else could they do? (N4)

3.5.2. *Maladaptive coping strategies*

From the coding analysis of our interview data, this concept was defined as ineffective or harmful responses that women adopted to manage the stress of childbirth. Analysis of our interview data revealed that under the influence of EMS, women predominantly employ avoidance, emotional suppression, and dissociation to escape negative emotions and traumatic memories associated with childbirth. While these maladaptive coping strategies may provide temporary relief from distress, they impede the necessary emotional processing of trauma, thereby contributing to the development of postpartum PTSD.

I felt like the doctors around me and the lights on the ceiling were far away, as if I were separated from the room by a bubble, like in those TV shows where the soul leaves the body. (N1)

It was so painful. She (the midwife) tried to teach me how to push, but in that situation, I just couldn't focus. I wanted to get off the table; I couldn't do it, and I didn't want to give birth anymore. (N4)

3.5.3. *Insufficient social support*

From the coding analysis of our interview data, this concept was defined as a deficiency in objective support, subjective support, and the utilisation of available support resources. Analysis of interview data from this study revealed that EMS leads to deficits in both the actual availability and the perceived support among postpartum women. Moreover, EMS distorts social information processing, weakening women's ability to recognise and utilise available support, thereby creating a 'support-perception' gap. As a result, even when objective support is adequate, women's subjective experience may remain lacking, leading to reduced utilisation of social resources.

It's useless. Even if I talk to someone, what's the point? In dark times, even your shadow leaves you. It's all useless. (N2)

Seeking help from others is a bother to them. Even my parents think I'm a bother. I'd rather swallow my suffering than ask for help. (N5)

3.6. *The outcome of EMS*

Our qualitative research demonstrated that postpartum PTSD is a consequence of maladaptive responses to childbirth events, triggered and maintained by EMS. The primary symptom categories of postpartum PTSD identified in this study include avoidance, re-experiencing, hyperarousal and negative alterations in cognition and mood.

3.6.1. *Avoidance*

From the coding analysis of our interview data, this concept was defined as postpartum efforts to evade childbirth-related situations, people, or medical procedures.

I refuse to remember. After finally 'delivering the package,' I'll never revisit that horror. (N3)

Don't mention this to me – any talk of having a second baby makes me walk away. (N6)

3.6.2. *Re-experiencing*

From the coding analysis of our interview data, this concept was defined as involuntary, distressing recollections of childbirth or nightmares related to delivery.

Sometimes, the scenes from childbirth play in my mind like a movie. (N4)

The worst part is dreaming about giving birth again. It hurts, there's so much blood, and in the dream, both my baby and I die because I couldn't push, and it drags me down too. (N7)

3.6.3. *Hyperarousal*

From the coding analysis of our interview data, this concept was defined as symptoms such as increased irritability, anger, reckless behaviour, difficulty concentrating, and sleep disturbances postpartum.

I feel more sensitive lately. If my husband says even one or two words, I get instantly angry and argue with him. (N10)

Recently, I haven't been feeling well; I have trouble sleeping and can't fall asleep easily. (N6)

3.6.4. *Negative alterations in cognition and mood*

From the coding analysis of our interview data, this concept was defined as postpartum negative views of oneself, others, and the world; reduced interest in activities, social withdrawal, and difficulty experiencing positive emotions.

I've felt down ever since giving birth. I can't explain it; I just feel very low and can't be happy. (N5)

My husband doesn't really want to care about me. He's just afraid that if something goes wrong with me, I won't be able to take care of the baby, so he pretends to comfort me. It's all fake. (N7)

4. *Discussion*

The present study aimed to establish a theory explaining how ACEs influence the development of postpartum PTSD. During the analytic process, EMS emerged as a core construct in participants' accounts of the relationship between ACEs and postpartum PTSD.

In constructivist grounded theory, the use of a theoretical code is not predetermined but evolves from the data and emerging theory (Charmaz, 2006, 2016). In this study, Young's EMS theory is employed as a theoretical framework to elucidate the pathways from ACEs to postpartum PTSD, thereby enhancing the explanatory power of the findings (Young, 1999). The developed theory comprises five key components: the origin, formation, trigger, operation, and outcome of EMS. These findings underscore the intricate interplay between EMS and later mental health outcomes, making a significant contribution to the understanding of the aetiology of postpartum PTSD.

4.1. The origin of EMS

At the core of this theory lies EMS, defined by Young (1999) as enduring, self-defeating cognitive and emotional patterns rooted in unmet core needs during childhood that persist into adulthood and are activated by relevant stressors. Our participants' accounts suggested that ACEs are closely related to the development of EMS, aligning with Young's assertion that ACEs such as emotional neglect, abuse, or exposure to domestic violence disrupt the development of healthy cognitive frameworks, leading to the formation of dysfunctional schemas (Young et al., 2006). For instance, participants who experienced emotional neglect during childhood described a persistent sense of being unworthy of care, consistent with Young's concept of the 'emotional deprivation' schema (Young et al., 2006). This finding echoes growing evidence that ACEs, by undermining secure attachment and core emotional needs, lay the foundation for EMS that shape individuals' perceptions of self, others, and the world (Zeynel & Uzer, 2020). Notably, the wide range of ACEs reported in this study, from emotional abuse to parental mental illness highlights that EMS were not triggered by a single type of adversity but rather emerge from cumulative or intersecting forms of early life stress, reinforcing the need for a holistic understanding of childhood adversity.

Moreover, our research added a crucial cultural dimension. Within the Chinese context, the manifestation and interpretation of these origins are often filtered through cultural norms emphasising filial piety, family harmony, and the suppression of individual needs and emotions (Ho et al., 2020). As a result, ACEs may be normalised or minimised within the family, intensifying the internalisation of negative self-perceptions such as 'I am a burden' or 'My needs are selfish'. Societal pressure to maintain family reputation can further silence expressions of distress stemming from childhood maltreatment, reinforcing schemas of defectiveness or emotional deprivation without external validation or intervention. This

cultural specificity underscores that while the universal mechanisms of schema formation proposed by Young are applicable (Uvelli et al., 2025), the content and prominence of schemas were profoundly shaped by the cultural environment in which the ACEs occur.

While this study identified multiple forms of ACEs as key origins of EMS, it is important to note that the ACEs assessed in this study were based on the ACE-IQ, which primarily captures childhood maltreatment, household dysfunction, and exposure to violence. Broader structural adversities, such as poverty, food insecurity, and experiences of discrimination or oppression, were not explicitly assessed. These factors may also shape the development of EMS by influencing early environmental stress and access to emotional and material resources.

4.2. The formation of EMS

Our qualitative analysis identified five categories of EMS among Chinese postpartum women with ACEs: negative cognitive schemas, hypervigilance schemas, emotional suppression schemas, other-directedness schemas, and trauma susceptibility schemas. Although these categories differ slightly in name from the taxonomy proposed by Young (1999), their conceptual meanings remain closely aligned with the established theory of EMS. For instance, the trauma susceptibility schema, marked by a persistent fear of impending catastrophe and helplessness in the face of potential threats, closely parallels Young's Vulnerability to Harm or Illness schema, which refers to a pervasive fear that disaster could strike at any time and that one will be unable to cope (Young, 1999). Likewise, the negative cognitive schema, defined by a stable predisposition towards interpreting experiences through a lens of hopelessness and negativity, likewise corresponds to the Negativity/Pessimism schema, which involves a pervasive focus on the negative aspects of life while minimising the positive (Young, 1999).

This alignment also extends to the developmental origins and functional operation of EMS in Young's theory (Bach et al., 2018; Young et al., 2003). Regarding origins, in Young's framework, schemas organise how individuals interpret themselves, others, and their surroundings (Young, 1999). Some of these structures become maladaptive when they consolidate rigid and dysfunctional beliefs (Young, 1999). During childhood, children depend on caregivers to make sense of their environment, and repeated interactions gradually shape these interpretive patterns (Young et al., 2006). When adverse experiences are chronic, they can distort these emerging beliefs (Young et al., 2006). Our data showed that unmet needs for safety, care, and validation, along with harmful attachment experiences, played a central role in shaping these schemas. Rather than simply co-occurring, these

conditions actively structure how EMS take form. Prior studies report similar processes, describing EMS as developing from adverse childhood environments and persisting as largely implicit frameworks that guide later interpretation and response (Vieira et al., 2023; Wesley & Manjula, 2015).

Regarding functional operation, in Young's theory, EMS are described as deep-seated cognitive structures that filter information, guide behavioural responses, and sustain maladaptive coping strategies. Once formed, they become relatively stable and trait-like, serving as enduring cognitive frameworks that organise later experiences (Young, 1999; Young et al., 2003). In childhood, they may function as adaptive responses to dysfunctional caregiving environments. In adulthood, they become maladaptive because they resist disconfirming information and distort perception to preserve cognitive self-consistency (Wright et al., 2009). This persistence is maintained through schema perpetuation across three levels (Young et al., 2003). Cognitively, it involves selective attention to schema-consistent information and filtering of disconfirming evidence (Milligan, 2013; Young et al., 2003). Emotionally, it involves suppression of schema-related painful affects, which blocks resolution of emotional distress (Bach et al., 2018; Young et al., 2003). Behaviourally, it appears in maladaptive coping strategies that reinforce the original schema and reduce corrective emotional experiences (Kaya Tezel et al., 2015; Young et al., 2003). In our participant narratives, schemas formed during childhood persist into adulthood as stable, albeit maladaptive, cognitive patterns. When activated by the physiological and psychological stress of childbirth, these schemas shape perceptual interpretations, suppressed emotional expression, and guided coping behaviours that sustained psychological distress rather than adaptive adjustment, contributing to the developmental pathway of postpartum PTSD.

Overall, the convergence between the EMS categories identified in this Chinese sample and schema theory supported the applicability of the EMS construct in explaining psychopathological pathways associated with mental health outcomes. Simultaneously, the context-specific nomenclature derived from our constructivist grounded theory analysis enriches the theoretical lexicon of schema theory and offer a more nuanced and clinically operational framework for understanding how ACEs become cognitively embedded in early development and later activated during the postpartum period to precipitate PTSD.

4.3. The trigger of EMS

Theoretical and clinical evidence widely supports that schema activation is closely linked to 'situational

similarity' (Young et al., 2003). Schema activation reaches its peak when adult life events mirror the themes, emotional tones, or interpersonal patterns of the childhood experiences that originally formed the schemas (Gay, 2025). This process can be viewed as a 're-enactment of childhood dramas', where individuals interpret and respond to current situations through the perspectives and emotions shaped in early life (Karaush & Kupriyanova, 2022).

A key insight from this study identifies childbirth as a crucial trigger for EMS. Our research shows that specific perinatal experiences strongly resonate with ACEs among participants. As a combined physical and psychological stressor, childbirth involves pain and loss of bodily autonomy, which can evoke feelings of helplessness similar to those experienced during childhood abuse or neglect, thereby readily activating EMS. Additionally, the intense shame and discomfort caused by bodily exposure during delivery parallel certain ACEs scenarios, particularly heightening schema activation for mothers with histories of sexual abuse. Moreover, inadequate support during childbirth, such as feeling unheard, neglected, or dehumanised, serves as a powerful trigger, especially for those with backgrounds of emotional detachment or abuse.

Taken together, these accounts highlight the distinctive nature of perinatal stress. Compared to other adult stressors, childbirth involves bodily vulnerability, dependence on others, and significant identity transitions, all of which may resonate with core schema-related themes such as safety, autonomy, and self-worth. From this perspective, participants' narratives suggest that the psychological experience of childbirth can be understood in relation to pre-existing cognitive-emotional patterns shaped by earlier life experiences. This interpretation extends previous research on postpartum PTSD, which has often focused primarily on obstetric factors, by incorporating women's subjective accounts of how prior experiences may be reflected in their responses to childbirth.

4.4. The operation of EMS

This study reveals that the operation of EMS involves three interrelated mechanisms: negative cognitive evaluations, maladaptive coping strategies, and insufficient social support. In our participants' accounts, several interconnected processes play a key role in the pathway they experienced from activated EMS to postpartum PTSD. These processes included how they appraised events, the coping strategies they used, and their perceptions of social support.

The activated EMS distorts maternal cognitive appraisal of childbirth events. Analysis of interview data indicates that this cognitive distortion unfolds in two stages. During the primary appraisal stage,

EMS enhances threat perception by reinforcing negative information-processing biases. Research indicates that EMS are associated with attentional bias towards negative stimuli (Ramamurthy & Chen, 2025). In the context of childbirth, these biases lead mothers to focus more on negative aspects related to childbirth, such as pain, complications, and the possibility of failure, while ignoring neutral or positive information like available medical resources and the body's natural compensatory responses. This selective attention and negative interpretive bias results in an exaggerated perception of childbirth as highly threatening. During the secondary appraisal stage, EMS impair integration of coping resources via two pathways. On one hand, EMS undermine mothers' assessment of internal resources by fostering negative beliefs about their competence and reducing self-efficacy (Güler, 2022). On the other hand, EMS distort the appraisal of external resources by fostering pervasive mistrust of others and the environment. Even when social support was objectively present, the individual's cognitive framework activates defensive mechanisms that question the sincerity and motives of supportive behaviours, further limiting effective utilisation of these resources.

Beyond cognitive distortions, EMS directly promoted maladaptive coping strategies. Our study showed that under EMS influence, mothers tend to rely on avoidance, emotional suppression, and dissociation to manage childbirth-related stress. EMS transform past painful experiences into stable but distorted cognitive templates, which continuously shape the individual's interpretation of current situations and systematically narrow the range of coping options (Babajani et al., 2014). When activated by stress, EMS engage intense emotional memory networks, prompting defense mechanisms to operate in an emotion-driven, rather than rational, manner. This leads individuals to choose negative coping strategies aimed at escaping distressing emotional responses (Spirou et al., 2022).

Insufficient social support, the third mechanism, arises not only from objective deficits but also from EMS-driven distortions in perceiving and utilising support. Participants with 'other-directedness schemas' reported prioritising others' needs over their own, leading them to avoid seeking help, meanwhile, those with 'negative cognitive schemas' expressed doubt about the sincerity of others' care. This creates a 'support-perception gap', where even adequate objective support fails to translate into a subjective experience of support, a phenomenon rarely captured in quantitative studies of social support and postpartum mental health (Panagou & MacBeth, 2022). Together, these mechanisms form a self-reinforcing cycle: negative cognitive evaluations intensify distress, maladaptive coping hinders emotional resolution, and impaired social support removes crucial

buffers, ultimately culminating in postpartum PTSD symptoms.

Existing research also suggests that the influence of EMS is not confined to adolescence, where it has been linked to maladaptive behaviours and mental disorders, but can continue to shape emotional and behavioural functioning into adulthood (Vieira et al., 2023; Wang et al., 2023). In this study, that developmental continuity is reflected in the postpartum context, where EMS appear to shape how women interpret childbirth-related stress, regulate emotions, and mobilise interpersonal resources. This highlights the role of EMS in the pathway from ACEs to postpartum PTSD and suggests that future prevention and intervention efforts should place greater emphasis on early identification of maladaptive schemas, alongside support for cognitive restructuring, coping enhancement, and the strengthening of perceived and actual social support during the perinatal period.

4.5. The outcome of EMS

Postpartum PTSD emerged as a severe outcome for women with a history of ACEs when EMS are activated and sustained during childbirth. EMS function as a central construct underlying the psychological processes, spanning from their developmental origins in ACEs, through activation by childbirth-related stressors, and finally to their operational influence on cognitive, emotional, and social processes. This study demonstrated that once triggered, EMS profoundly shaped women's appraisal of childbirth, their coping behaviours, and their perception of social support, ultimately leading to postpartum PTSD. Viewed through the lens of the stress process model, this pathway can be understood as a dynamic, staged interaction between pre existing vulnerabilities and perinatal stressors.

During primary appraisal, EMS predisposed mothers to perceive childbirth as highly threatening. Such catastrophic appraisals elicit intense fear and panic, which disrupt the normal encoding and integration of traumatic memories, resulting in memory fragmentation and persistent re experiencing symptoms. The meta-analysis by Memarzia et al. (2021) confirms a strong correlation between subjective threat perception during trauma and subsequent PTSD symptoms. Neurobiologically, heightened threat perception activates stress response systems, leading to excessive release of hormones such as cortisol. This may have long term effects on the brain and reinforce hyperarousal and avoidance behaviours (Cox et al., 2008).

During secondary appraisal, schema-driven negative self-perceptions diminish perceived self-efficacy, leading women to underestimate both internal and external resources. Low self efficacy impairs the mobilisation of coping resources, amplifies emotional

vulnerability, and hinders effective emotional regulation (Ayers et al., 2016). This heightened affective vulnerability persists postpartum, obstructing the emotional processing of traumatic memories and promoting the accumulation of negative emotions, which are core precursors of PTSD (Brenner et al., 2024). Moreover, pre-existing schemas of mistrust and alienation foster doubts about the availability or effectiveness of social support, reducing help-seeking behaviour and intensifying perceived isolation (Chen et al., 2024). A lack of support limited opportunities for emotional relief and practical assistance, thereby exacerbating negative appraisals and emotional distress (Dikmen-Yildiz et al., 2018).

Coping strategies played a significant role in the pathway to postpartum PTSD. Mothers influenced by EMS tend to adopt maladaptive coping styles such as avoidance, denial, or emotional suppression. These strategies inhibit active problem-solving and emotional processing, thereby prolonging and intensifying stress reactions. Research consistently links such avoidance-based coping with more severe and persistent PTSD symptoms (Cleveland et al., 2022). Furthermore, inadequate social support is a critical predictor of postpartum PTSD (Ahsan et al., 2023; Horstmann et al., 2024). Empirical studies, including a cohort study conducted in China, demonstrate that lower levels of subjective, objective, and utilised support are associated with greater PTSD symptom severity (Chen et al., 2024). Effective social support buffered stress and facilitates recovery, whereas its absence exacerbates feelings of anxiety and helplessness, creating conditions conducive to PTSD (Garthus-Niegel et al., 2015).

This tripartite dysfunction in cognitive appraisal, coping, and social support creates a self-reinforcing cycle in which schema-driven perceptions and behaviours perpetuate distress and impede recovery. Existing literature has indicated associations between EMS and broader psychological outcomes (Goerigk et al., 2024; Hussein Ramadan Atta et al., 2025; Lumley & Harkness, 2007; Mason et al., 2005; Wright et al., 2009), but this study advances that understanding by positioning EMS as an integrative hub during the perinatal period, directly linking childhood adversity, childbirth trauma, and postpartum psychopathology through specific, modifiable psychological and social mechanisms. The operationalisation of EMS throughout this process underscores the importance of addressing not only the immediate childbirth experience but also the underlying cognitive-affective architectures that originate in early life. These insights advocate for intervention strategies such as schema therapy, which aims to restructure EMS (Spicer et al., 2024), and trauma informed perinatal care that recognises the profound impact of early adversity on maternal mental health outcomes (Masten, 2019).

4.6. Recommendations for clinical practice

The practical implications of this theory are substantial. In clinical settings, early identification of EMS in women with a history of ACEs during prenatal care could allow for targeted interventions aimed at preventing or mitigating EMS activation during childbirth. For example, cognitive schema therapy (Young et al., 2006), which seeks to modify EMS through cognitive restructuring and experiential techniques, could be adapted for the perinatal period to specifically address schemas such as hypervigilance or emotional suppression. Additionally, training healthcare providers to recognise signs of activated EMS, such as excessive avoidance, emotional withdrawal, or distrust of care, can facilitate more empathetic, trauma-informed care during labour, potentially reducing the risk of postpartum PTSD by addressing distress more effectively in the moment. Furthermore, enhancing healthcare providers' understanding of the potential mechanisms through which EMS contribute to postpartum PTSD, including negative cognitive appraisal, maladaptive coping strategies, and insufficient social support, may support the implementation of more targeted, mechanism-based interventions. Interventions that aim to enhance self-efficacy, strengthen emotional regulation capacities, and promote the effective utilisation of support resources may be particularly important in fostering psychological resilience and mitigating trauma-related responses.

From a public health perspective, this theory highlights the importance of early screening for ACEs and EMS not only during pregnancy but across the lifespan. Identifying women at risk prior to childbirth enables the implementation of preventive interventions that strengthen coping resources and challenge maladaptive schemas. This is particularly pertinent in contexts like China, where awareness of ACEs and their long-term psychological consequences remains limited (Ho et al., 2020). Community-based programmes focused on family support and mental health education could help reduce the prevalence of EMS, thereby decreasing the incidence of postpartum PTSD in future generations.

5. Strengths and limitations

To our knowledge, this is the first qualitative study to explore how ACEs influence the development of postpartum PTSD. Utilising constructivist grounded theory methodology, we constructed a theoretical model that delineates the pathways through which ACEs contribute to postpartum PTSD. This study advances current understanding by highlighting how ACEs shape individual cognitive-behavioural frameworks, ultimately influencing the manifestation of postpartum PTSD in response to childbirth stress, with

particular emphasis on the dynamic role of EMS as a core mechanism.

However, several limitations should be noted. First, the sample was small and drawn from a well-educated, urban tertiary hospital population, which may limit generalisability to other cultural or rural groups. Second, ACEs data were collected retrospectively via self-report, introducing potential recall bias influenced by current mental states. Third, confounding factors such as socio-economic status, education, and health-care access were not controlled for, which could affect both ACE exposure and postpartum PTSD risk. Fourth, although the WHO ACE-IQ captures multiple forms of childhood adversities, it does not include broader structural stressors (e.g. poverty, food insecurity, discrimination), which may also be relevant to EMS and postpartum mental health. Fifth, this study focused on ACEs-related pathways and did not examine other biopsychosocial contributors, such as biological vulnerabilities or perinatal experiences of disrespect or abuse, which are linked to postpartum PTSD. Lastly, while the qualitative design provided deep insights into the mechanisms linking ACEs and postpartum PTSD, it cannot establish causality; quantitative studies are needed to test and confirm these pathways.

6. Conclusion

This study establishes a constructivist grounded theory elucidating the theoretical processes through which ACEs contribute to the development of postpartum PTSD via the formation, activation, and operationalisation of EMS, providing novel insights into the potential mechanisms through which ACEs influence the development of postpartum PTSD. The findings underscore the clinical significance of implementing EMS-targeted therapeutic interventions, such as schema-focused therapy and trauma-informed maternity care, which are critical for addressing the enduring influence of early-life adversity and perinatal psychological distress.

Author contributions

CRedit: **Linli Zou:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Writing-Original Draft, Writing-Review & Editing; **Shu Wang:** Data curation, Formal analysis, Investigation; **Yan Liao:** Visualization, Writing-Review & Editing; **Smita Pakhale:** Methodology, Writing-Review & Editing; **Daniel Krewski:** Writing-Review & Editing; **Shi Wu Wen:** Formal analysis, Supervision, Visualization, Writing-Review & Editing; **Ri-Hua Xie:** Conceptualization, Methodology, Supervision, Writing-Review & Editing.

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Data availability statement

The data underlying this article will be shared on reasonable request to the corresponding author.

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