

## ORIGINAL RESEARCH ARTICLE

# Association between postpartum post-traumatic stress disorder, maternal functioning, and self-efficacy in women after cesarean section

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## Abstract

Childbirth, particularly cesarean delivery, can trigger postpartum post-traumatic stress disorder (PTSD), impairing maternal functioning and self-efficacy. Although self-efficacy is crucial for patient outcomes, its mediating role between postpartum PTSD and maternal functioning remains unclear. This study addressed these gaps by investigating the association between postpartum PTSD and maternal functioning, with a specific focus on exploring the mediating role of self-efficacy. Data were collected during a 42-day postpartum follow-up of 307 women post-cesarean section using the Barkin Index of Maternal Functioning, General Self-Efficacy Scale, and Post-Traumatic Stress Disorder Checklist-Civilian version. Non-parametric tests and Spearman rank correlation were analyzed using SPSS 26.0 and the mediating effect using SmartPLS 4. Median scores for maternal functioning, self-efficacy, and postpartum PTSD were 70.00 (60.00, 77.00), 24.00 (22.00, 26.00), and 26.00 (23.00, 32.00), respectively. Spearman's correlation analysis revealed a significant positive correlation between maternal functioning and self-efficacy ( $r = 0.532$ ,  $p < 0.01$ ), and a negative correlation between maternal functioning and postpartum PTSD ( $r = -0.301$ ,  $p < 0.01$ ). We conclude that self-efficacy fully mediated the association between postpartum PTSD and maternal functioning. Therefore, enhancing self-efficacy and addressing postpartum PTSD are crucial for improving maternal functioning in post-cesarean women. (*Afr J Reprod Health 2025; 29 [10]: 62-74*).

**Keywords:** maternal functioning; self-efficacy; mediating role; postpartum post-traumatic stress disorder, cesarean section

## Résumé

L'accouchement, en particulier par césarienne, peut déclencher un trouble de stress post-traumatique postpartum (TSPT), altérant le fonctionnement maternel et l'auto-efficacité. Bien que l'auto-efficacité soit essentielle pour les résultats cliniques, son rôle médiateur entre le TSPT postpartum et le fonctionnement maternel demeure incertain. Cette étude a exploré cette question en examinant l'association entre le TSPT postpartum et le fonctionnement maternel, en mettant particulièrement l'accent sur le rôle médiateur de l'auto-efficacité. Les données ont été recueillies lors du suivi à 42 jours postpartum chez 307 femmes ayant subi une césarienne, à l'aide de l'Indice de Fonctionnement Maternel de Barkin, de l'Échelle Générale d'Auto-efficacité et de la Checklist du Trouble de Stress Post-traumatique – version civile. Les tests non paramétriques et la corrélation de Spearman ont été réalisés avec SPSS 26.0, et l'effet médiateur a été analysé avec SmartPLS 4. Les scores médians de fonctionnement maternel, d'auto-efficacité et de TSPT postpartum étaient respectivement de 70,00 (60,00–77,00), 24,00 (22,00–26,00) et 26,00 (23,00–32,00). L'analyse de corrélation de Spearman a montré une corrélation positive significative entre le fonctionnement maternel et l'auto-efficacité ( $r = 0,532$ ,  $p < 0,01$ ), ainsi qu'une corrélation négative entre le fonctionnement maternel et le TSPT postpartum ( $r = -0,301$ ,  $p < 0,01$ ). Nous concluons que l'auto-efficacité médie entièrement l'association entre le TSPT postpartum et le fonctionnement maternel. Ainsi, le renforcement de l'auto-efficacité et la prise en charge du TSPT postpartum sont essentiels pour améliorer le fonctionnement maternel chez les femmes ayant accouché par césarienne. (*Afr J Reprod Health 2025; 29 [10]:62-74*).

**Mots-clés:** fonctionnement maternel; auto-efficacité, rôle médiateur; trouble de stress post-traumatique postpartum; césarienne

## Introduction

As societal perspectives on childbirth methods shift in China, approximately 46% of expectant mothers now opt for cesarean sections (C-sections)<sup>1</sup>. Alarming, the rate of elective C-sections without

medical indications has been steadily increasing<sup>2</sup>. Unlike vaginal delivery, C-sections are major surgical procedures that carry significant risks, including severe postoperative pain, life-threatening infections, prolonged immobilization, and potentially permanent gastrointestinal

dysfunction<sup>3</sup>. While sometimes necessary for managing complicated deliveries<sup>4</sup>, C-sections often lead to extended recovery periods and a myriad of serious postoperative complications. These include not only physical trauma but also profound psychological consequences such as post-traumatic stress disorder (PTSD), clinical depression, and anxiety disorders<sup>5</sup>. Furthermore, the invasive nature of C-sections can severely impact maternal-infant bonding, breastfeeding success, and the mother's ability to adapt to her new parenting role, potentially leading to long-term family dysfunction<sup>5</sup>. The gravity of these outcomes underscores the critical need for careful consideration and medical justification when opting for this surgical intervention.

Maternal functioning refers to the comprehensive ability of postpartum women to adapt to their new roles and effectively cope with the multifaceted demands of motherhood during the first year after childbirth<sup>6</sup>. This encompasses not only the physical recovery from delivery but also the psychological, emotional, and social adjustments required to care for a newborn while managing personal responsibilities. Optimal maternal functioning is typically achieved within the first 1–6 weeks postpartum<sup>7</sup>, a critical period during which mothers must balance infant care, household duties, and their own physical and emotional recovery. However, this process is often complicated by external challenges, such as insufficient family or social support, societal expectations, and the pressure to resume professional responsibilities. Internally, a lack of self-regulation, diminished psychological well-being, or inadequate access to positive coping resources can significantly impair a mother's ability to fulfill her maternal role<sup>8</sup>. When maternal functioning is compromised, it can lead to cascading effects, including strained mother-infant bonding, reduced parenting efficacy, and negative long-term impacts on both maternal and child well-being. Thus, understanding and supporting maternal functioning is crucial for promoting healthy postpartum adaptation and family dynamics. Maintaining positive postpartum maternal functioning benefits the growth and development of the newborn and the mother–infant bond. It also reduces postpartum fatigue,

depression, and other adverse emotions, contributing to better physical and mental health<sup>9</sup>. Assessing postpartum maternal functioning is crucial in clinical practice and serves as a key tool for evaluating perinatal emotional well-being<sup>10</sup>.

Childbirth is often perceived as a positive and natural event, yet for many women, it can become a traumatic experience due to intense pain, physical discomfort, inadequate communication with healthcare providers, and negative psychological emotions such as fear, anxiety, and frustration during the delivery process<sup>11</sup>. Research indicates that approximately 50% of women report childbirth as traumatic, with about 12% developing postpartum post-traumatic stress disorder (PTSD)<sup>12–15</sup>. Postpartum PTSD is a delayed-onset stress disorder that manifests in mothers after childbirth, characterized by symptoms such as re-experiencing negative emotions related to delivery, avoiding childbirth-related triggers, and persistent hyperarousal<sup>16,17</sup>. This condition can severely impair a mother's social and psychological functioning, disrupt family and couple relationships, hinder the establishment of mother-infant bonding, and negatively impact the infant's cognitive, emotional, and developmental growth. These adverse effects often persist for 6–12 months or longer, drawing significant attention from researchers globally<sup>18</sup>. Notably, Chen<sup>19</sup> found that 17.55% of women who underwent C-sections experienced postpartum PTSD, underscoring the heightened risk associated with this delivery method. Despite the growing recognition of postpartum PTSD, research on its relationship with maternal functioning remains limited. A recent cross-sectional study focusing on adolescent mothers revealed that those without postpartum PTSD scored significantly higher in maternal functioning compared to those with the condition, suggesting a clear correlation between PTSD symptoms and impaired maternal functioning. This highlights the critical need to further explore how postpartum PTSD impacts a mother's ability to adapt to her new role and care for her infant, as well as the potential mechanisms, such as self-efficacy that may mediate this relationship<sup>20</sup>.

Self-efficacy, a central concept in cognitive-behavioral theory, serves as a significant psychological resource that influences individuals'

ability to manage challenges and achieve goals<sup>21</sup>. In healthcare contexts, research has demonstrated that self-efficacy plays a vital role in enhancing patients' confidence in managing their health conditions, promoting early engagement in rehabilitation activities, and improving overall physical recovery outcomes<sup>22,23</sup>. Within the maternal health domain, self-efficacy has been identified as a critical factor influencing mothers' confidence in breastfeeding and the development of positive mother-infant relationships<sup>24</sup>. Specifically, maternal self-efficacy significantly impacts a mother's ability to navigate the challenges associated with transitioning to her new role. Mothers with higher levels of self-efficacy tend to exhibit greater persistence and resourcefulness in utilizing available support systems, actively engaging in nurturing interactions with their infants, and effectively adapting to their maternal responsibilities, thereby optimizing their maternal capabilities and outcomes<sup>1,25,26</sup>.

A study of primiparas revealed a correlation between self-efficacy and maternal functioning, indicating that self-efficacy is an independent factor influencing maternal functioning<sup>25</sup>. Another study of women after C-sections found a positive correlation between self-efficacy and maternal role adaptation<sup>1</sup>. Palanci<sup>26</sup> revealed a positive link between self-efficacy and maternal functioning. Additionally, some studies have shown a negative correlation between self-efficacy and PTSD<sup>27,28</sup>, suggesting that women who experience traumatic childbirth or postpartum PTSD might have lower self-efficacy during the postpartum period. Women were unsure of themselves when coping with challenging events, caring for their newborn, and breastfeeding, thus amplifying the stress from traumatic events and negatively impacting their maternal functioning.

Notably, research directly examining the mediating effect of self-efficacy on the relationship between PTSD and maternal functioning after C-sections is sparse. This study addresses this gap by hypothesizing positive correlations between self-efficacy and maternal functioning, negative correlations between PTSD and both maternal functioning and self-efficacy. We also believe that self-efficacy mediates the relationship between postpartum PTSD and maternal functioning.

Using a cross-sectional design, this study explored the mediating role of self-efficacy in the relationship between postpartum PTSD and maternal functioning among women who underwent C-sections.

## Methods

### Participants

An online calculator was used to calculate the sample size for the structural equation model (SEM) comprising three latent variables and eight observed variables. Based on an alpha of 0.05, a power of 80%, and a moderate effect size of 0.3, a minimum sample size of 256 was required. After factoring in a 20% dropout rate, the estimated required sample size increased to at least 307. A total of 337 participants completed the questionnaire, with 307 valid responses, resulting in an effective response rate of 91.10%.

This cross-sectional study employed convenience sampling, focusing on three tertiary hospitals in Central China. The sample included women who were 18 years or older, had undergone a C-section, did not have substance abuse issues, and were alert, rational, and able to communicate effectively. Additionally, the participants were required to have a singleton pregnancy. The exclusion criteria were gestational age < 37 weeks, and severe personal or newborn illnesses requiring special care.

### Instruments

#### Demographic data questionnaire

Following a comprehensive literature review, we designed a demographic and general information section for a questionnaire. This section comprised 16 items: age (in years), education level, occupation, average income, method of delivery, pregnancy complications, number of children, pregnancy planning status, levels of pregnancy-related anxiety, frustration, fear of childbirth, quality of the couple's relationship, methods of feeding the baby, postpartum living arrangements, and participants' perceptions of childbirth trauma.

### ***Barkin Index of Maternal Functioning (BIMF)***

The 16-item BIMF measures mothers' adaptability and functioning in new roles<sup>29</sup>, as well as physical and psychological well-being<sup>30,31</sup>. It comprises five dimensions: self-care of the mother (three items), care for the baby (four items), psychological state (two items), maternal role adaptation (four items), and family or social support (three items). Each item is assessed using a 7-point Likert-like scale, with responses ranging from 0 ("not at all") to 6 ("completely agree"). The overall score ranges from 0 to 96, with higher scores indicating higher levels of maternal functioning in women during the postpartum period. Cronbach's alpha coefficient for the BIMF was 0.833.

### ***General self-efficacy scale (GSES)***

The 10-item GSES is a self-report measure of an individual's confidence in their ability to successfully complete a task or cope with challenges in a specific situation<sup>32</sup>. Each item is rated on a 4-point Likert-type scale, with responses ranging from 1 ("not confident at all") to 4 ("extremely confident"). The total score ranges from 10 to 40, with higher scores indicating stronger self-efficacy<sup>33</sup>. The Cronbach's alpha of the GSES was 0.870.

### ***Post-traumatic Stress Disorder Checklist-Civilian version (PCL-C)***

The 17-item PCL-C questionnaire quantifies the degree of postpartum PTSD<sup>34</sup>. It comprises three dimensions: re-experiencing (five items), avoidance (seven items), and hyperarousal (five items). Each item is rated on a 5-point Likert-like scale ranging from 1 ("not at all") to 5 ("extremely"). The total score ranges from 17 to 85, with higher scores indicating more severe PTSD symptoms<sup>35</sup>. Cronbach's alpha coefficient for the PCL-C was 0.830.

### ***Survey method***

Data were collected face-to-face using a self-administered paper questionnaire, distributed to

participants by trained research assistants at the obstetrics outpatient clinic of the hospital during the 42-day postpartum follow-up. The assistants provided standardized instructions and remained available to clarify questions without influencing responses. Participants completed the questionnaire in a quiet room within the hospital, and the completed forms were collected immediately in sealed envelopes to ensure confidentiality.

### ***Statistical analysis***

The SPSS 26.0 software was used in all analyses except the SEM, which was constructed using SmartPLS4<sup>TM</sup>. Categorical data were presented as frequencies and composition ratios. As continuous data followed a non-normal distribution, the median and interquartile range were used for description. The rank-sum test was used for univariate analysis, and Spearman's correlation was used to examine the relationships among the variables. Partial least squares SEM (PLS-SEM) was used for further analyses. The mediating effect between variables was assessed using the beta ( $\beta$ ) value,  $R^2$  value, and the corresponding  $t$  value derived from a bootstrapping procedure with 5,000 resamples. A significance threshold of  $\alpha = 0.05$  was established. There were no missing data in this study.

### ***Ethical considerations***

Approval was obtained from the hospital before the questionnaires were distributed. During the 42-day postpartum follow-up period, mothers were invited to complete the questionnaires. This study adhered to the ethical guidelines of the Declaration of Helsinki and was approved by the Ethics Committee of the First Affiliated Hospital of Henan University of Science and Technology (No.2023-0068). The study was conducted anonymously. All participants provided informed and voluntary consent, with the assurance that their data would remain confidential and would be used solely for research purposes. This study complied with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for cross-sectional studies, and data were collected between May and October 2024.

**Results**

**Basic characteristics**

In the cohort of 307 respondents, over one-third were aged 31–35 years (47.88%), and more than half held a bachelor’s degree or higher (51.14%). Housewives comprised the largest occupational group (54.07%). Univariate analysis of the BIMF total scores across diverse participant characteristics revealed significant differences. These variations were noted in the number of children, whether the pregnancy was planned, levels of pregnancy anxiety, frustration, and fear of childbirth, quality of couple relationships, postpartum living arrangements, and whether women perceived childbirth trauma (Table 1).

**BIMF, GSES, and PCL-C Scores**

The median scores for maternal functioning, self-efficacy, and postpartum PTSD were 70, 24, and 26, respectively. All the scores were based on 307 participants. These scores indicate moderate levels for each of these aspects. The detailed scores for each dimension are presented in Table 2.

**Correlation between BIMF, GSES and PCL-C**

Spearman’s correlation analysis revealed a significant correlation between maternal functioning and self-efficacy ( $r = 0.532, p < 0.05$ ) and postpartum PTSD ( $r = -0.301, p < 0.05$ ), as well as between the dimensions of these scales (Table 3).

**Table 1:** Women’s BIMF total scores with different demographic characteristics (N = 307)

Variables	n (%)	BIMF total scores	Z	p-value
<b>Age(years)</b>			6.591	0.159
≤25	18(5.86)	77.00(64.00,78.50)		
26-30	102(33.22)	66.00(58.00,77.00)		
31-35	147(47.88)	71.00(60.00,77.00)		
36-40	36(11.73)	70.00(57.00,74.75)		
≥41	4(1.30)	75.50(64.25,80.00)		
<b>Educational levels</b>			3.684	0.158
Junior high school	98(31.92)	69.50(60.00,77.00)		
Senior high school	52(16.94)	74.00(65.00,78.00)		
Undergraduate or above	157(51.14)	70.00(58.50,77.00)		
<b>Job Occupation</b>			3.565	0.468
Worker	57(18.57)	67.00(61.00,75.50)		
Civil servant	23(7.49)	76.00(70.75,78.00)		
Professional personnel	49(15.96)	70.00(59.00,75.00)		
Freelancer	12(3.91)	74.00(58.50,75.00)		
Housewife	166(54.07)	69.00(58.00,78.00)		
<b>Average income level</b>			2.700	0.259
≤3000	40(13.03)	75.70(61.00,78.00)		
3001-6000	163(53.09)	69.00(58.00,77.00)		
≥6001	104(33.88)	71.00(61.00,77.00)		
<b>Delivery way</b>			-1.462	0.144
Elective C-section	201(65.47)	70.00(60.00,77.00)		
Emergency C-section	106(34.53)	62.00(60.00,75.00)		
<b>Pregnancy complications</b>			-0.489	0.625
Yes	185(60.26)	70.00(59.50,77.50)		
No	122(39.74)	71.00(61.00,77.00)		
<b>Number of children</b>			11.722	0.008*
1	76(24.76)	61.00(55.00,74.25)		
2	153(49.84)	72.00(61.50,78.00)		
3	74(24.10)	71.50(61.00,76.00)		
4	4(1.30)	67.00(66.00,67.50)		
<b>Planned pregnancy</b>				

Yes	211(68.73)	72.00(61.00,78.00)	-2.170	0.030*
No	96(31.27)	66.00(57.00,77.00)		
<b>Pregnancy anxiety</b>			-4.842	0.000*
Yes	120(39.09)	64.00(55.00,74.00)		
No	187(60.91)	73.00(62.00,78.00)		
<b>Pregnancy Frustration</b>			-4.385	0.000*
Yes	70(22.80)	61.00(53.00,74.00)		
No	237(77.20)	72.00(61.00,78.00)		
<b>Fear of childbirth</b>			-4.714	0.000*
Yes	169(55.05)	65.00(57.00,75.00)		
No	138(44.95)	74.00(63.75,78.00)		
<b>Marital Relationship</b>			9.557	0.002*
Good	285(92.83)	70.50(60.00,77.00)		
General	17(5.54)	56.00(50.75,66.50)		
Bad	5(1.63)	50.50(45.25,57.50)		
<b>Ways of feeding the baby</b>			-1.295	0.195
Exclusive breastfeeding	147(47.88)	71.00(60.00,78.00)		
Bottle-feeding	40(13.03%)	69(58.00,76.00)		
Mixed feeding	120(39.09)	70.00(59.00,77.00)		
<b>Living situations after childbirth</b>			13.879	0.003*
Couple without other relatives	102(33.22)	66.00(55.00,74.00)		
Living with wife's parents	43(14.01)	71.50(58.50,77.25)		
Living with husband's parents	143(46.58)	74.50(63.00,78.25)		
Maternity centre	19(6.19)	70.00(57.00,75.00)		
<b>Perceived childbirth trauma</b>			-4.937	0.000*
Yes	107(34.85)	62.00(55.00,74.00)		
No	200(65.15)	73.00(62.00,78.00)		

Note: \* $p < 0.05$ ; Z indicates the test statistic of the rank-sum test; BIMF indicates the maternal functioning score.

### Mediating effects of GSES between PCL-C and BIMF

Using SmartPLS4 for the PLS-SEM analysis, a SEM was constructed with self-efficacy as the mediator (Figure 1). The analysis revealed that, when self-efficacy was included as a mediator, the direct effect of postpartum PTSD on maternal functioning was statistically insignificant (Standardized estimates, STD = -0.056,  $p > 0.05$ ). However, postpartum PTSD negatively influenced self-efficacy (STD = -0.338,  $p < 0.001$ ), and self-efficacy positively affected maternal functioning (STD = 0.506,  $p < 0.001$ ). The complete path parameters of the model are listed in Table 4. Employing the bootstrap method with 5000 resamples to assess the mediating effects' significance, the findings revealed that postpartum PTSD's direct impact on self-efficacy was not

statistically significant ( $\beta = -0.056$ ,  $p > 0.05$ ). Nonetheless, the indirect influence of postpartum PTSD on maternal functioning via self-efficacy was significant ( $\beta = 0.171$ ,  $p < 0.05$ ), with a 95% confidence interval not encompassing 0. This finding indicated that self-efficacy completely mediated the relationship between postpartum PTSD and maternal function. As shown in Table 5, the mediating effect size for self-efficacy was 0.171, contributing 75.3% of the total effect size of 0.227. tab5

A single-factor analysis using unrotated principal component factor analysis was performed on all items of the scales used in this study. The analysis revealed that the first principal component's explained variance was 27.12%, which fell below the 50% threshold for the total variance explanation recommended by Chen<sup>36</sup>. This indicates that the data did not exhibit common method bias.

**Table 2:** Participants' Scores on BIMF, GSES, and PCL-C

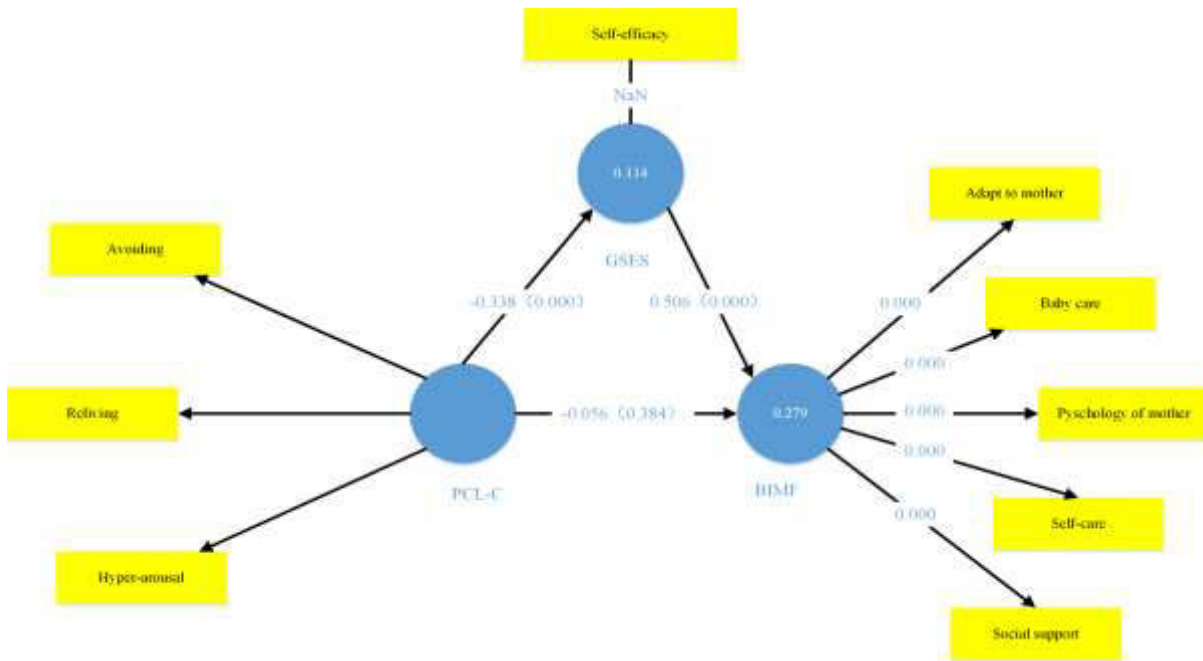
Items	M	P25	P75	Minimum	Maximum	N
<b>BIMF total score</b>	70	60	77	30	82	307
<b>Self-care</b>	11	9	14	1	16	307
<b>Baby-care</b>	18	15	20	1	21	307
<b>Psychology of mother</b>	9	8	10	2	11	307
<b>Adapt to mother</b>	19	17	20	2	21	307
<b>Social support</b>	14	12	15	1	16	307
<b>PCL-C total score</b>	26	23	32	19	72	307
<b>Reliving</b>	8	7	10	5	25	307
<b>Avoidance</b>	10	9	13	7	31	307
<b>Hyper-arousal</b>	8	7	10	5	20	307
<b>GSES total score</b>	24	22	26	13	36	307

Note: BIMF = Maternal Functioning score; PCL-C = PTSD score; GSES = General Self-Efficacy score. Self-care, Baby-care, Psychology of mother, Adapt to mother, and Social support are subscales of Maternal Functioning; Reliving, Avoidance, and Hyper-arousal are subscales of PTSD.

**Table 3:** Correlation analysis of BIMF, GSES, and PCL-C

Items	1	2	3	4	5	6	7	8	9	10	11
<b>1. Self-care</b>	1										
<b>2. Baby-care</b>	0.524*	1									
<b>3. Psychology of mother</b>	0.488*	0.627*	1								
<b>4. Adapt to mother</b>	0.424*	0.733*	0.729*	1							
<b>5. Social support</b>	0.511*	0.553*	0.524*	0.585*	1						
<b>6. BIMF</b>	0.790*	0.833*	0.770*	0.815*	0.754*	1					
<b>7. Reliving</b>	-0.245*	-0.200*	-0.144*	-0.196*	-0.213*	-0.264*	1				
<b>8. Avoidance</b>	-0.137*	-0.073	-0.091	-0.067	-0.129*	-0.145*	0.433*	1			
<b>9. Hyper-arousal</b>	-0.295*	-0.206*	-0.164*	-0.172*	-0.185*	-0.298*	0.427*	0.422*	1		
<b>10. PCL-C</b>	-0.302*	-0.200*	-0.173*	-0.185*	-0.223*	-0.301*	0.743*	0.761*	0.786*	1	
<b>11. GSES</b>	0.359*	0.513*	0.431*	0.502*	0.366*	0.532*	-0.258*	-0.214*	-0.328*	-0.354*	1

Note: \* $p < 0.05$ ; BIMF = Maternal Functioning score; PCL-C = PTSD score; GSES = General Self-Efficacy score. Self-care, Baby-care, Psychology of mother, Adapt to mother, and Social support are subscales of Maternal Functioning; Reliving, Avoidance, and Hyper-arousal are subscales of PTSD



**Figure1:** Mediating effects of GSES between PCL-C and BIMF

**Table 4:** Model parameters of the structural equation

Path relationships	STD	SE	T values	p-values	CR	AVE
Adapt to mother ←BIMF	0.876	0.016	55.197	0.000*	0.882	0.603
Baby-care ←BIMF	0.821	0.019	43.963	0.000*		
Psychology of mother ←BIMF	0.835	0.02	41.556	0.000*		
Self-care ←BIMF	0.651	0.043	15.284	0.000*		
Social support ←BIMF	0.673	0.047	14.34	0.000*		
Hyper-arousal ←PCL-C	0.875	0.025	34.824	0.000*	0.896	0.742
Reliving ←PCL-C	0.852	0.031	27.472	0.000*		
Avoiding ←PCL-C	0.857	0.034	25.452	0.000*		
GSES ←BIMF	0.506	0.05	10.156	0.000*		
PCL-C ←GSES	-0.338	0.042	7.967	0.000*		
PCL-C ←BIMF	-0.056	0.065	0.871	0.384		

Note: \* $p < 0.05$ ; BIMF = Maternal Functioning score; PCL-C = PTSD score; GSES = General Self-Efficacy score. Self-care, Baby-care, Psychology of mother, Adapt to mother, and Social support are subscales of Maternal Functioning; Reliving, Avoidance, and Hyper-arousal are subscales of PTSD. SE = standard error; CR = composite reliability; AVE = average variance extracted.

**Table 5:** Effects estimate of mediation model

Effect	Model path	Estimate	Boot S.E.	p-values	95% CI
Direct effect	PCL-C →BIMF	-0.056	0.065	0.384	-0.193 ~ 0.065
Indirect effect	PCL-C →GSES →BIMF	-0.171	0.029	0.000*	-0.234 ~ -0.119
Total effect	PCL-C →BIMF	-0.227	0.058	0.000*	-0.351 ~ -0.122

Note: \* $p < 0.05$ .

## Discussion

A high level of maternal functioning is pivotal for the growth and development of newborns, aiding in the prevention of postpartum fatigue and depression, and maintaining a high quality of life<sup>37</sup>. In this study, the maternal functioning score among women after C-section was moderate, yet higher than that reported by Jia<sup>25</sup>. This difference may be attributed to the demographic composition of the study participants: Jia's study primarily included primiparous women, whereas this study had only 24.76% primiparous women and a larger proportion of multiparous women who had more experience in motherhood. In specific dimensions, scores for the adapted mother and family or social support dimensions in this study were significantly higher than those in Jia's study<sup>25</sup>. This discrepancy could be due to the majority of participants in the current study having previous children, thereby possessing more parenting experience and adapting more effectively to the maternal role.

Furthermore, a substantial number of families in this study were second or third-time parents, potentially organizing family resources more efficiently and offering stronger family support for childcare.

In this study, mothers with multiple children had higher maternal functioning scores than first-time mothers, likely due to their accumulated parenting experience and improved adaptation to their maternal roles. Mothers in stronger marital relationships also scored higher, possibly due to enhanced spousal support and effective emotional communication with their partners, which subsequently improved their psychological well-being<sup>38</sup>. Regarding postpartum living conditions, mothers residing with their parents displayed higher levels of maternal functioning than those living solely with their spouses. This can be attributed to the greater availability of family support resources<sup>37</sup>. Planned pregnancies correlated with higher maternal functioning scores than unplanned pregnancies, suggesting that these mothers were better psychologically prepared, had more accumulated knowledge, and were more ready for role adjustment. Conversely, mothers who experienced anxiety, frustration, fear of childbirth, and

perceived childbirth trauma exhibited lower levels of maternal functioning. This highlights the influence of perinatal psychological and emotional states on adaptation to maternal roles and functional performance<sup>39</sup>.

Postpartum PTSD significantly impairs mothers' social and psychological functioning, disrupts the establishment of a parent-child bond, affects partner and family harmony, and influences the cognitive, emotional, and developmental aspects of babies<sup>18</sup>. In this study, the median postpartum PTSD score was higher than that reported by Chen<sup>35</sup> and another study<sup>40</sup>. This heightened level may be due to all participants having undergone C-sections, which often involve intense pain, fear, frustration, and various negative emotions during childbirth. Furthermore, as a traumatic surgical procedure, C-sections can adversely affect mothers' physiological mechanisms, triggering heightened stress and consequent physiological and psychological trauma<sup>41</sup>. Research has also indicated that women undergoing C-sections face a higher risk of developing PTSD than those with natural deliveries<sup>42</sup>. In our study, the prevalence of PTSD was higher than that reported by Chen<sup>35</sup> and Yildiz<sup>43</sup>, likely due to the exclusive focus on mothers who underwent C-sections.

In this study, self-efficacy scores were lower than those reported by Jia<sup>25</sup>. This discrepancy may be due to all participants having undergone C-sections. Such surgical procedures often lead to challenges, including physical discomfort, pain, and the need for wound healing, all of which can negatively affect a mother's belief in her ability to face postpartum challenges. These factors may contribute to a more pessimistic outlook and diminished confidence in their capabilities<sup>44</sup>.

We found a significant positive correlation between self-efficacy and maternal functioning, consistent with the findings of Palanci and Aktas<sup>26</sup>. Mothers with high self-efficacy typically display confidence in their ability to adapt to maternal roles, along with resilience, determination, and positive emotional states. They exhibit strong role adaptation and well-being, even in challenging situations, through self-encouragement and proactive coping. Additionally, this study found a negative correlation between postpartum PTSD and

maternal functioning. This finding is consistent with Vahidi<sup>20</sup>, indicating that mothers with higher levels of postpartum PTSD tend to have lower maternal functioning scores. This suggests that PTSD can lead to adverse cognitive and emotional states, impair social functioning, and affect physiological and psychological health<sup>17</sup>. These challenges can hinder the development and maintenance of a mother–infant bond, impacting the mother’s ability to effectively fulfill her roles and responsibilities.

Furthermore, this study found a negative correlation between PTSD and self-efficacy, consistent with Lu<sup>33</sup>. Self-efficacy plays a crucial role in shaping an individual's perception of potential threats. Those with high self-efficacy are more confident in their ability to manage threats, reducing their likelihood of experiencing distress. Conversely, individuals with low self-efficacy tend to overestimate the severity of threats and focus on potential negative outcomes<sup>45</sup>. Research has demonstrated that self-efficacy serves as a protective factor against PTSD symptoms for different traumatic experiences<sup>46</sup>.

This study’s findings also revealed that self-efficacy in women after a C-section fully mediates the relationship between postpartum PTSD and maternal functioning, thus confirming our hypothesis. Our study demonstrated, for the first time, that lower postpartum PTSD levels can enhance maternal functioning by improving self-efficacy. Women with lower PTSD scores experienced less psychological burden from their C-section experience, thereby maintaining stronger social and psychological functioning<sup>17</sup>. This bolstered their confidence in managing postpartum challenges and caring for their newborns, resulting in higher maternal functioning scores. Conversely, women with higher postpartum PTSD scores experienced elevated traumatic stress and negative emotions, undermining their ability to fulfill social responsibilities and leading to psychological avoidance and self-doubt. This negative attitude adversely affected maternal functioning.

Healthcare providers should implement strategies to mitigate postpartum post-traumatic stress symptoms, particularly in women after C-sections. A nurse-led brief counseling intervention, delivered through face-to-face and telephone

sessions, has proven effective. This approach emphasizes empathizing with the emotions of women experiencing the postpartum period by providing comfort and encouragement to foster social support and positive coping mechanisms. Asadzadeh<sup>17</sup> highlighted its success in reducing PTSD symptoms.

Enhancing self-efficacy in women after a C-section is crucial. High-quality postpartum guidance can help achieve this by providing direct and indirect experiences related to maternal role adaptation, correcting misconceptions, and equipping women with comprehensive knowledge about newborn care, parenting, feeding, and self-care. This guidance boosts postpartum confidence, enabling women to effectively manage the challenges of nurturing their babies. Moreover, psychological counseling and family support are vital for addressing negative emotions in women during the postpartum period. This support can lead to improvements in self-efficacy and maternal functioning, as indicated by Jia<sup>25</sup>. By integrating psychological support with practical guidance, healthcare providers can facilitate a smooth transition into maternal roles, promoting the well-being of both mothers and their newborns.

## Study strengths and limitations

This study has several notable strengths. First, it focused on a specific and clinically relevant population — women at 42 days postpartum after C-sections — providing targeted evidence for early postpartum interventions. Second, it adopted a novel perspective by not only examining the association between postpartum PTSD and maternal functioning but also exploring the mediating role of self-efficacy, thereby filling an important gap in the literature. Third, the study collected data from a relatively large sample of 307 participants using well-validated and reliable Chinese versions of instruments, ensuring measurement accuracy. Furthermore, the statistical approach was rigorous, employing non-parametric tests and Spearman rank correlations appropriate for skewed distributions, and utilizing structural equation modeling to test mediation effects, which allowed for a more comprehensive understanding of the pathways among variables.

Although this study provides valuable insights, several limitations should be acknowledged. First, the cross-sectional survey design limits the findings to a specific point in time, potentially overlooking the deeper mechanisms underlying the relationships between variables. Second, the dependence on self-reported data introduces potential biases, such as self-enhancement and inaccuracies in the information provided. Third, the sample was limited to three tertiary hospitals in Luoyang City, which may restrict the generalizability of the findings to other populations. Fourth, the study focused solely on self-efficacy as the mediating variable, excluding other factors that might influence maternal functioning. This narrow scope may have missed significant variables affecting this relationship.

Future studies should address these limitations by developing more comprehensive approaches. Longitudinal designs are recommended to capture a dynamic understanding of the relationships among variables over time. Large-scale, multicenter studies employing stratified sampling methods could enhance the scientific robustness and generalizability of findings. Additionally, exploring other potential mediating pathways may offer deeper insights into factors affecting maternal functioning, thereby contributing to the development of more effective interventions and support mechanisms for women experiencing postpartum.

## Implications

The findings of this study have important implications for both policy and practice. The identification of factors influencing maternal functioning and postpartum mental health highlights the need for routine screening of self-efficacy and PTSD symptoms during postpartum follow-up visits. Integrating mental health assessment into maternal care policies could help detect women at risk earlier and provide timely interventions. For clinical practice, health professionals should consider tailored interventions that strengthen maternal self-efficacy and address postpartum PTSD symptoms, thereby improving maternal functioning and overall well-being. At the policy level, these results support the development

of guidelines that promote multidisciplinary postpartum care, combining medical, psychological, and social support services.

## Conclusion

This study found that mothers who underwent C-sections typically exhibited moderate levels of self-efficacy, maternal functioning, and postpartum PTSD. A key finding was that self-efficacy fully mediated the relationship between postpartum PTSD and maternal functioning. Self-efficacy was negatively associated with postpartum PTSD and positively influenced maternal functioning, whereas postpartum PTSD negatively affected maternal functioning. To enhance maternal functioning, clinical nurses should create a supportive environment, provide psychological counseling, and address postpartum PTSD symptoms. Comprehensive postpartum education and support are essential for improving self-efficacy. Collectively, these interventions enable healthcare providers to play a pivotal role in promoting maternal functioning in women after C-sections.

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## Conflict of interests

The authors declare no competing interests.

## Data availability statement

The datasets generated and analyzed in the current study are available from the corresponding author upon reasonable request.

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