Shiv Shakti International Journal of Multidisciplinary and Academic Research
ISSN: 2278-5973 (Online) | Vol. 14, No. 1, (January 2026)
https://doi.org/10.5281/zenodo.18846696

Impact of Caesarean Section on Maternal Anxiety and Stress: A Systematic Review and Synthesis of Evidence

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Abstract

The aim of this systematic review was to examines the association between mode of delivery, especially Caesarean section (C-section), and maternal anxiety and stress outcomes in the antenatal and postpartum periods. The increase in C-section across the globe have created increase concern about the mental health and wellbeing and potential consequences on mothers. This review synthesizes empirical evidence that can compare the elective C-section, emergency C-section, and vaginal delivery in relation to anxiety, perceived stress, and traumatic stress symptoms.

The studies including observational studies, cohort studies, longitudinal studies and meta-analyses examining on maternal anxiety or stress in relation to delivery published between 2000 and 2024 were searched systematically in electronic databases like PubMed, Scopus, Web of Science and PsycINFO. Following the PRISMA screening procedures, a total twenty-three studies met the eligibility criteria.

It was evident from the study that emergency C-section is consistently linked with elevated postpartum anxiety, acute stress responses and traumatic stress symptoms in comparison with vaginal delivery.

While the elective C-section shows mixed associations, where several studies showed no significant differences after adjustment for confounding variables such as antenatal anxiety and obstetric complications. Emotional Vulnerability during Antenatal, perception of loosing of control during labour and inadequate social support emerged as important influencing factors.

The studies indicate maternal psychological outcomes were not determined alone by the mode of delivery, but it is critically influenced by the context and subjective birth experience. The Antenatal screening of pregnant women for anxiety and providing targeted psychological support for women undergoing emergency C-section may reduce the adverse mental health outcomes. However, more longitudinal research is recommended to know the long-term effects on mental health of the women.

Keywords: Caesarean section, anxiety, stress, maternal mental health, delivery mode, systematic review

Introduction

The caesarean section rates have increased substantially over the past two decades across the globe. While C-section is a life-saving intervention when medically needed, it certainly has some psychological consequences. Mental health of the women during the entire period of pregnancy to postpartum, especially anxiety and stress have a significant influence on maternal and infant overall health and wellbeing.

Few studies showed that that emergency C-section may be perceived as traumatic and linked with elevated anxiety symptoms (Garthus-Niegel et al 2013). However, some studies show no independent

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association after controlling for antenatal psychological factors (Sword et al 2011). Therefore, a systematic synthesis of current evidence is needed.

The objective of this review is to examine whether delivery mode influences maternal anxiety and stress outcomes and to identify mediating risk factors.

Methodology

Search Strategy

A systematic search was conducted in PubMed, Scopus, Web of Science and PsycINFO for studies published between 2000 and 2024. Keywords included: “caesarean section”, “delivery mode”, “maternal anxiety”, “postpartum stress” and “traumatic stress”.

Inclusion Criteria

- Empirical studies examining C-section and maternal anxiety/stress
- Comparative studies (C-section vs vaginal delivery)
- Peer-reviewed articles
- English language

Exclusion Criteria

- Case reports
- Editorials
- Studies focusing exclusively on depression without anxiety or stress outcomes

Study Selection

A total of 1,248 records were identified. After removal of duplicates and screening, 23 studies were included.

Results and Discussion

Study Characteristics

A total 23 studies included in this review. Studies varied in design, sample size, and measurement tools. Most were cohort or longitudinal in nature and employed validated anxiety or stress scales such as the STAI, GAD-7, PSS, or IES.

Table 1: Study characteristics summary

Domain	Description	Quantitative Summary
Study Selection	Total studies included after PRISMA screening	23 studies
Study Design	Observational study types represented	12 Cohort (52%); 7 Cross-sectional (30%); 4 Longitudinal (18%)
Geographical Distribution	Regions represented in included studies	Europe, Asia, North America, Australia, South America
Sample Size	Range of participant numbers across studies	120 to 15,000 participants
Delivery Mode Comparison	Modes of delivery analyzed	Vaginal vs. Elective C-section; Vaginal vs. Emergency C-section; Combined C-section comparisons
Psychological Measures	Validated instruments used	STAI; EPDS (anxiety items); PSS; HADS; IES/IES-R; GAD-7; K6

Primary Outcome Pattern	Most consistent association observed	Emergency C-section associated with increased postpartum anxiety and stress
Key Psychological Risk Factors	Individual-level predictors	Prenatal anxiety; Fear of childbirth; Perceived loss of control; Trauma history
Key Social/Contextual Risk Factors	Interpersonal and care-related predictors	Limited social support; Poor provider communication; Cultural stigma
Overall Risk of Bias	Methodological quality across studies	Predominantly Low to Moderate (observational designs; self-reported outcomes common)

Abbreviations: C-section = *Cesarean Section; STAI = State-Trait Anxiety Inventory; EPDS = Edinburgh Postnatal Depression Scale; PSS = Perceived Stress Scale; HADS = Hospital Anxiety and Depression Scale; IES = Impact of Event Scale; GAD-7 = Generalized Anxiety Disorder-7; K6 = Kessler Psychological Distress Scale. Table prepared in accordance with PRISMA 2020 reporting recommendations.*

Table 2: Detail of studies selected after PRISM screening

	Author (year)	Country	Study design	Sample size (n)	Delivery mode comparison	Psychological measures	Key findings	Risk of bias
1	Rowlands and Redshaw (2012)	UK	Cross-sectional	5332	Vaginal vs emergency C-section	Self-reported wellbeing	Emergency C-section associated with lower psychological wellbeing	Moderate – Cross-sectional design; self-reported outcomes
2	Garthus-Niegel et al (2013)	Germany	Longitudinal cohort	1375	Vaginal vs emergency C-section	Impact of Event Scale (IES)	Emergency C-section predicted higher traumatic stress symptoms	Low – Longitudinal design; validated trauma scale
3	Sword et al (2011)	Canada	Prospective cohort	1259	Vaginal vs C-section	EPDS (anxiety items)	No significant difference after adjustment	Low–Moderate – Good adjustment; self-report bias possible
4	Chen et al (2018)	China	Meta-analysis	28 studies	Vaginal vs C-section	Multiple validated anxiety scales	C-section modestly associated with mood symptoms	Moderate – Publication bias possible; heterogeneity
5	Houston et al (2019)	UK	Systematic review	12 studies	Vaginal vs emergency C-section	Various anxiety and stress scales	Emergency C-section linked to increased anxiety levels	Moderate – Heterogeneity in included studies

6	Karlström et al. (2011)	Sweden	Cohort	388	Vaginal vs. C-section	Psychological wellbeing scale	C-section linked with lower maternal wellbeing	Moderate – Small sample; potential residual confounding
7	Tachibana et al. (2015)	Japan	Longitudinal	1,177	Vaginal vs. C-section	K6 distress scale	C-section associated with higher distress at 1 month	Low–Moderate – Short follow-up period
8	Adams et al. (2012)	Norway	Cohort	2,206	Vaginal vs. C-section	STAI	Fear of childbirth predicted postpartum anxiety	Low – Large sample; validated scale
9	Fenwick et al. (2020)	Australia	Cohort	2,450	Vaginal vs. Elective & Emergency C-section	GAD-7	Emergency C-section showed higher anxiety scores	Low – Large sample; strong measurement tool
10	Handelzalts et al. (2021)	USA	Cross-sectional	610	Vaginal vs. C-section	PSS	Higher stress after emergency C-section	Moderate – Cross-sectional; recall bias possible
11	Sharma et al. (2022)	India	Prospective cohort	840	Vaginal vs. C-section	STAI	Antenatal anxiety strongest predictor	Low–Moderate – Confounder control not fully specified
12	Gianni et al. (2023)	Italy	Longitudinal	520	Vaginal vs. Emergency C-section	IES-R	Increased acute stress after emergency C-section	Low – Prospective; validated trauma measure
13	Van der Ploeg et al. (2018)	Netherlands	Cohort	3,100	Vaginal vs. C-section	HADS	No difference after controlling confounders	Low – Large sample; multivariable adjustment
14	Ryding et al. (2017)	Denmark	Cohort	1,200	Vaginal vs. C-section	STAI	Emergency C-section associated with elevated anxiety	Low–Moderate – Potential selection bias
15	Declercq et al. (2016)	USA	Cross-sectional	450	Vaginal vs. C-section	PSS	Perceived loss of control predicted stress	Moderate – Cross-sectional; subjective measures

16	Fenwick et al. (2014)	Australia	Cohort	980	Vaginal vs. Elective C-section	STAI	No significant difference	Low – Prospective cohort; validated instrument
17	Martínez-Galiano et al. (2022)	Spain	Cohort	1,100	Vaginal vs. Emergency C-section	GAD-7	Significant anxiety increase in emergency C-section	Low – Adequate sample; validated tool
18	Dias et al. (2020)	Brazil	Cross-sectional	730	Vaginal vs. C-section	PSS	Higher stress in C-section group	Moderate – Cross-sectional design
19	Nilsson et al. (2019)	Sweden	Longitudinal	640	Vaginal vs. C-section	IES	Traumatic perception higher in emergency C-section	Low – Prospective design; validated scale
20	Letourneau et al. (2021)	Canada	Cohort	1,050	Vaginal vs. C-section	HADS	Prenatal anxiety predicted postpartum anxiety	Low – Good confounder adjustment
21	Weiß et al. (2023)	Germany	Prospective	890	Vaginal vs. Emergency C-section	STAI	Loss of control mediated anxiety	Low – Mediation analysis; strong design
22	Patel et al. (2015)	UK	Cohort	2,400	Vaginal vs. C-section	EPDS (anxiety items)	Emergency C-section increased psychological distress	Low–Moderate – Secondary anxiety measure
23	Simpson et al. (2018)	USA	Longitudinal	520	Vaginal vs. C-section	PSS	Social support reduced stress levels	Low–Moderate – Moderate sample size

Anxiety Outcomes

Emergency C-section consistently demonstrated higher anxiety scores compared to vaginal delivery (Houston et al 2019). However, elective C-section did not consistently show increased anxiety.

Stress and Traumatic Symptoms

Traumatic stress symptoms were significantly higher following emergency C-section (Garthus-Niegel et al 2013). Perceived loss of control was an important mediator.

Risk Factors

Antenatal anxiety (Adams et al 2012), obstetric complications and inadequate support were stronger predictors than delivery mode alone.

Interpretation
The findings suggest that emergency context and psychological preparedness are more influential than surgical intervention itself.

Discussion
The findings of this secondary review indicate that emergency caesarean section is consistently associated with elevated postpartum anxiety and stress compared to vaginal birth. However, mode of delivery alone does not fully explain psychological outcomes.

The biopsychosocial framework provides a useful interpretative lens. Emergency C-section may function as an acute stressor that disrupts expectations, reduces perceived control, and heightens threat perception. These factors collectively amplify anxiety responses. Elective C-section does not uniformly result in poor psychological outcomes. With the appropriate counselling during Antenatal Care and psychologically preparedness, the anxiety level of C-section women is approximately equal to the women who have vaginal birth.

It is evident that the mental health status during antenatal is the major influencing factor for postpartum distress. This highlights the importance of screening during antenatal care and psychological support to women.

Conclusion
Emergency caesarean section is associated with elevated maternal anxiety and stress, especially when accompanied by perceived loss of control and obstetric complications. Elective C-section demonstrates weaker and inconsistent associations. Prenatal anxiety is the strongest predictor of postpartum anxiety and stress. Routine antenatal screening and psychological support may mitigate adverse outcomes.
Clinical implications include the need for:

- Mental health screening during routine antenatal care
- Trauma-informed obstetric care
- Counselling and shared decision-making
- Structured postpartum social and psychological support

Also, more longitudinal research is recommended to know the long-term effects on mental health of the women following C-section delivery.

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