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RESEARCH ARTICLE

# Posttraumatic Growth and Depreciation After Childbirth: The Role of Mode of Delivery and Psychological Resilience in a Turkish Postpartum Sample

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## ABSTRACT

**Objective:** This study aimed to examine the effects of mode of delivery on posttraumatic growth (PTG), posttraumatic depreciation (PTD), and psychological resilience in postpartum women and to explore their associations with postpartum depression (PPD) and each other.

**Materials and Methods:** This cross-sectional study included 174 postpartum women attending a tertiary training and research hospital in Istanbul, Türkiye, divided into three groups: vaginal delivery (n=61), elective cesarean section (CS; n=58), and emergency CS (n=55). PPD was assessed using the Edinburgh Postnatal Depression Scale (EPDS), resilience with the Brief Resilience Scale (BRS), and posttraumatic changes with the Posttraumatic Growth and Depreciation Inventory – Expanded Version (PTGDI-X). Data were analyzed using one-way ANOVA with Tukey post-hoc tests, ANCOVA, Pearson correlation, and multiple linear regression.

**Results:** No significant difference was found in PPD risk across delivery groups. Psychological resilience was significantly lower in the emergency CS group compared with the vaginal and elective CS groups ($p<0.001$). PTG was significantly higher in the emergency CS group than in the elective CS group ($p=0.006$), while PTD was significantly higher in the emergency CS group than in both other groups ($p<0.05$). Emergency CS and BRS independently predicted PTG ($\beta=0.279$ and $\beta=0.295$, respectively), while EPDS, emergency CS, and BRS predicted PTD ($\beta=0.476$, $\beta=0.177$, and $\beta=-0.198$, respectively).

**Conclusion:** Mode of delivery, particularly emergency CS, is associated with distinct posttraumatic psychological profiles in postpartum women. Routine screening beyond PPD—including PTG, PTD, and resilience—is warranted following operative delivery.

**Keywords:** Cesarean section, mode of delivery, postpartum depression, posttraumatic depreciation, posttraumatic growth, psychological resilience

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## INTRODUCTION

PPD is a widely recognized psychiatric condition emerging in the postpartum period, reported to affect around 17% of women globally.[1] PPD is related to serious adverse outcomes for moms and babies, including impaired mother-infant bonding, reduced breastfeeding rates, and long-term neurodevelopmental delays in the child.[1] In Türkiye, a recent meta-analysis of 34 studies involving 10,236 women reported a pooled PPD prevalence of 17.8%, with rates rising to 20.2% during the COVID-19 pandemic.[2] Beyond individual psychosocial risk factors, the mode of delivery has increasingly been recognized as a significant determinant of postpartum psychological outcomes. Türkiye has an extremely high C-section rate, with 60.5% of all deliveries performed by CS in 2022, far exceeding the WHO's suggested threshold of 10–15%.[3–5] Meta-analytic evidence indicates that women who deliver by CS, particularly by emergency CS, are at significantly higher risk for PPD compared with those with

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vaginal delivery, with odds ratios ranging from 1.12 to 1.53.[6–8] Importantly, emergency and elective CS may carry distinct psychological implications, as the unplanned and often urgent nature of emergency CS may heighten perceptions of threat and loss of control during childbirth.[9]

Childbirth is a profound life event that, when experienced as traumatic, may initiate significant psychological change. Research suggests that between 20% and 45% of women describe their childbirth experience as traumatic, and posttraumatic stress disorder (PTSD) affects approximately 4% of postpartum women in community samples, rising substantially among those who undergo emergency operative delivery.[10–13] However, the psychological sequelae of traumatic childbirth are not exclusively negative. According to the theoretical model proposed by Tedeschi and Calhoun, individuals who struggle with highly challenging life events may undergo posttraumatic growth (PTG), defined as positive psychological transformation across five domains: personal strength, new possibilities, relating to others, appreciation of life, and spiritual change. Importantly, trauma may simultaneously give rise to posttraumatic depreciation (PTD), reflecting negative changes across these same domains.[14,15] Unlike PTG alone, the concurrent assessment of both PTG and PTD provides a more complete and balanced picture of post-trauma psychological change. The Posttraumatic Growth and Depreciation Inventory – Expanded Version (PTGDI-X), validated across ten countries, including Türkiye, by Senol-Durak and colleagues, is currently the only instrument capable of measuring both constructs simultaneously.[14] In the perinatal context, studies have demonstrated that women who experience traumatic childbirth, particularly those delivered by emergency CS, may report substantial PTG alongside posttraumatic stress symptoms.[16–20]

Psychological resilience, which is generally characterized as the ability to adapt and persist in the face of challenges, has become an important part of postpartum mental health.[21] In the postpartum context, resilience has been shown to buffer against the development of PPD and to facilitate positive psychological adaptation following challenging birth experiences.[22] Evidence from meta-analytic studies indicates a significant positive association between resilience and PTG, suggesting that women with greater psychological resources are better equipped to derive growth from difficult experiences.[22] Conversely, lower resilience has been consistently linked to higher levels of posttraumatic stress and depressive symptoms in the postpartum period.[21] The mode of delivery may further modulate resilience, as the unpredictable and often distressing nature of emergency CS may place greater demands on a woman's adaptive capacities compared with planned vaginal or elective CS delivery. Despite this, the role of psychological resilience as a mediating or moderating variable between mode of delivery and posttraumatic outcomes remains insufficiently explored in the postpartum literature.

To date, no research has examined the simultaneous relationship between postpartum depression (PPD), posttraumatic growth (PTG), posttraumatic depreciation (PTD), and psychological resilience in relation to mode of delivery in a postpartum population. Furthermore, the PTGDI-X, which is the only instrument that can assess posttraumatic growth and depreciation at the same time, has not been used with a Turkish postpartum sample before. Given Türkiye's exceptionally high CS rate and the distinct psychological profiles potentially associated with vaginal, elective CS, and emergency CS deliveries, investigating these outcomes within this context is both timely and clinically relevant. The present study, therefore, aimed to compare PPD, PTG, PTD, and psychological resilience across three delivery groups—vaginal delivery, elective CS, and emergency CS—and to examine the associations and predictors of these outcomes in postpartum women attending a tertiary training and research hospital in Istanbul.

## MATERIALS and METHODS

A cross-sectional analytical design was adopted for this study, which was conducted at a tertiary care training and research hospital in Türkiye. Ethical approval was granted by the University of Health Sciences Hamidiye Scientific Research Ethics Committee (Meeting No: 2023/15, Decision No: 15/26, Registration No: 23/425, Date: 11.08.2023), and the study was carried out in accordance with the Declaration of Helsinki. All participants were asked to sign a document confirming their consent before they could join the study.

Postpartum women attending the obstetrics outpatient clinic of a tertiary care hospital in Türkiye were recruited between July 2024 and December 2025. Eligible participants were informed about the study by the research team in the clinic setting. Those who agreed to participate provided written informed consent and were directed to complete an online questionnaire via a QR code linked to a Google Forms platform. All data were collected anonymously without any personal identifying information.

Participants were eligible for inclusion if they (1) were within the first postpartum year and (2) were aged 18 years or

older. Women were excluded if they had (1) a mental or physical disability, (2) an active psychiatric diagnosis or current psychiatric treatment prior to delivery, (3) a clinically significant physical health condition, (4) incomplete questionnaire responses, (5) an inability to read or write in Turkish, (6) perinatal loss (stillbirth or neonatal death), or (7) multiple gestation.

The minimum sample size was calculated using the Raosoft sample size calculator (http://www.raosoft.com/samplesize.html) with a 5% margin of error, a 95% confidence interval, and a 50% response distribution, yielding a minimum of 132 participants. Accounting for a 10% potential dropout rate, a minimum of 145 participants was planned.

Postpartum depression was assessed using the Edinburgh Postnatal Depression Scale.[23,24] A cut-off score of ≥13 indicated depression risk. Psychological resilience was measured with the Brief Resilience Scale.[21,25] Posttraumatic growth and depreciation were evaluated using the Posttraumatic Growth and Depreciation Inventory – Expanded Version, which yields separate PTG and PTD subscale scores ranging from 0 to 125.[14,26] Additional variables, including partner/family support, fear of childbirth, obstetric complications, neonatal intensive care unit (NICU) admission, income level, birth satisfaction, and postpartum duration (days since delivery), were also collected via the questionnaire and hospital records.

Statistical analyses were performed using IBM SPSS Statistics version 31 (IBM Corp., Armonk, NY, USA). Normality of continuous variables was assessed using the Shapiro-Wilk test, and homogeneity of variances was evaluated using Levene's test. Since all scale scores demonstrated a normal distribution and homogeneous variances, one-way analysis of variance (ANOVA) with a Tukey post hoc test was used for group comparisons. Categorical variables were compared using the chi-square ($\chi^2$) test. Pearson correlation analysis was performed to examine associations among scale scores. Multiple linear regression analyses were conducted to identify independent predictors of PTG and PTD. Effect sizes for pairwise group comparisons were calculated using Cohen's d. Analysis of covariance (ANCOVA) was performed to compare scale scores across delivery groups while controlling for age, parity, and BMI. For the regression models, multicollinearity was assessed using the variance inflation factor (VIF), and regression assumptions were examined, including normality of residuals (Shapiro-Wilk test), homoscedasticity (Breusch-Pagan test), and independence of residuals (Durbin-Watson statistic). Statistical significance was set at $p<0.05$.

## RESULTS

A total of 174 postpartum women were enrolled in this study within the first postpartum year. The group was organized into three subgroups based on the type of delivery: vaginal delivery (n=61, 35.1%), elective cesarean section (n=58, 33.3%), and emergency cesarean section (n=55, 31.6%). The mean age of all participants was 27.5±4.8 years (range, 18–42). Mean gravidity was 2.2, and mean parity was 1.8. Regarding educational level, 29.3% had primary school education, 27.6% had middle school education, 32.2% had high school education, and 10.9% had university education. The majority of participants were unemployed (61.5%). Most pregnancies were spontaneous (89.1%), and 11.5% of deliveries were preterm. Regarding the additional variables, fear of childbirth and NICU admission differed significantly across delivery groups, both being highest in the emergency CS group ($p=0.029$ and $p=0.002$, respectively). Partner/family support, obstetric complications, income level, birth satisfaction, and postpartum duration did not differ significantly between groups. Detailed sociodemographic and obstetric characteristics stratified by mode of delivery are presented in Table 1.

Cronbach's alpha coefficients were as follows: EPDS $\alpha=0.81$, BRS $\alpha=0.89$, PTG subscale of the PTGDI-X $\alpha=0.89$, and PTD subscale of the PTGDI-X $\alpha=0.89$. All coefficients exceeded the recommended threshold of 0.70.

Mean scale scores stratified by mode of delivery are presented in Table 2. No statistically significant difference was found in EPDS scores across the three groups ($F=0.225$, $P=0.799$). The proportion of women at risk for postpartum depression (EPDS ≥13) was 21.3% in the vaginal delivery group, 29.3% in the elective CS group, and 30.9% in the emergency CS group.

Statistically significant group differences were observed for BRS ($F=14.835$, $p<0.001$), PTG ($F=4.895$, $p=0.009$), and PTD ($F=7.033$, $p=0.001$). Post hoc Tukey comparisons revealed that BRS scores differed significantly between all three groups (vaginal > elective > emergency; all $p<0.05$), with the largest effect observed between vaginal delivery and emergency CS (Cohen's $d=1.04$). For PTG, the emergency CS group scored significantly higher than the elective CS group ($p=0.006$, Cohen's $d=0.62$), while vaginal delivery did not differ significantly from either CS group. For PTD, the emergency CS group scored significantly higher than both the vaginal delivery ($p=0.001$, Cohen's $d=0.63$) and elective CS groups ($p=0.013$, Cohen's $d=0.54$), with no significant difference between the vaginal and elective CS groups.

**Table 1. Sociodemographic and obstetric characteristics by mode of delivery**

| Variable | Vaginal (n=61) | Elective CS (n=58) | Emergency CS (n=55) | p |
|---|---|---|---|---|
| Continuous variables, mean±SD | | | | |
| Age (years) | 25.7±4.3 | 29.1±4.8 | 27.9±4.8 | **<0.001** |
| Gravidity | 2.0±0.8 | 2.6±0.9 | 2.1±0.8 | **<0.001** |
| Parity | 1.6±0.6 | 2.0±0.9 | 1.9±0.7 | **0.013** |
| Postpartum duration (days) | 110.0±99.2 | 79.7±85.9 | 92.9±89.0 | 0.198 |
| Categorical variables, n (%) | | | | |
| Educational level | | | | 0.183 |
| Primary school | 23 (37.7) | 14 (24.1) | 14 (25.5) | |
| Middle school | 16 (26.2) | 16 (27.6) | 16 (29.1) | |
| High school | 14 (23.0) | 25 (43.1) | 17 (30.9) | |
| University | 8 (13.1) | 3 (5.2) | 8 (14.5) | |
| Employment status | | | | 0.638 |
| Employed | 23 (37.7) | 25 (43.1) | 19 (34.5) | |
| Unemployed | 38 (62.3) | 33 (56.9) | 36 (65.5) | |
| Income level | | | | 0.126 |
| Low | 35 (57.4) | 27 (46.6) | 33 (60.0) | |
| Middle | 26 (42.6) | 26 (44.8) | 18 (32.7) | |
| High | 0 (0.0) | 5 (8.6) | 4 (7.3) | |
| BMI group | | | | **<0.001** |
| Normal (<25) | 34 (55.7) | 19 (32.8) | 19 (34.5) | |
| Overweight (25–29.9) | 11 (18.0) | 18 (31.0) | 31 (56.4) | |
| Obese (≥30) | 16 (26.2) | 21 (36.2) | 5 (9.1) | |
| Conception type | | | | 0.541 |
| Spontaneous | 56 (91.8) | 52 (89.7) | 47 (85.5) | |
| Assisted | 5 (8.2) | 6 (10.3) | 8 (14.5) | |
| Gestational age | | | | **0.037** |
| Term (≥37 weeks) | 58 (95.1) | 52 (89.7) | 44 (80.0) | |
| Preterm (<37 weeks) | 3 (4.9) | 6 (10.3) | 11 (20.0) | |
| Gestational weight gain | | | | **0.022** |
| <8 kg | 3 (4.9) | 8 (13.8) | 5 (9.1) | |
| 8–12 kg | 17 (27.9) | 15 (25.9) | 29 (52.7) | |
| 13–18 kg | 26 (42.6) | 23 (39.7) | 15 (27.3) | |
| >18 kg | 15 (24.6) | 12 (20.7) | 6 (10.9) | |
| Partner/family support | | | | 0.323 |
| Insufficient | 10 (16.4) | 18 (31.0) | 13 (23.6) | |
| Moderate | 22 (36.1) | 21 (36.2) | 22 (40.0) | |
| Sufficient | 29 (47.5) | 19 (32.8) | 20 (36.4) | |
| Fear of childbirth | | | | **0.029** |
| Low | 18 (29.5) | 16 (27.6) | 12 (21.8) | |
| Moderate | 31 (50.8) | 20 (34.5) | 17 (30.9) | |
| High | 12 (19.7) | 22 (37.9) | 26 (47.3) | |

**Table 1. Cont.**

| Variable | Vaginal (n=61) | Elective CS (n=58) | Emergency CS (n=55) | p |
|---|---|---|---|---|
| Obstetric complication | | | | 0.063 |
| No | 50 (82.0) | 45 (77.6) | 35 (63.6) | |
| Yes | 11 (18.0) | 13 (22.4) | 20 (36.4) | |
| NICU admission | | | | **0.002** |
| No | 57 (93.4) | 51 (87.9) | 39 (70.9) | |
| Yes | 4 (6.6) | 7 (12.1) | 16 (29.1) | |
| Birth satisfaction | | | | 0.353 |
| Low | 20 (32.8) | 12 (20.7) | 20 (36.4) | |
| Moderate | 25 (41.0) | 24 (41.4) | 20 (36.4) | |
| High | 16 (26.2) | 22 (37.9) | 15 (27.3) | |

One-Way ANOVA was used for continuous variables and Chi-square ($\chi^2$) test for categorical variables. Bold P values indicate statistical significance (p<0.05). CS: Cesarean section; SD: Standard deviation; BMI: Body mass index; NICU: Neonatal intensive care unit

**Table 2. Scale scores by mode of delivery (mean±SD)**

| Scale | Total (n=174) | Vaginal (n=61) | Elective CS (n=58) | Emergency CS (n=55) | F | p |
|---|---|---|---|---|---|---|
| EPDS (0–30) | 9.68±4.05 | 9.41±3.92 | 9.78±4.20 | 9.89±4.07 | 0.225 | 0.799 |
| ≥13, n (%) | 47 (27.0) | 13 (21.3) | 17 (29.3) | 17 (30.9) | – | – |
| BRS (6–30) | 19.64±4.98 | 21.90±4.21[a] | 19.57±4.85[b] | 17.22±4.82[c] | 14.835 | **<0.001** |
| PTG (0–125) | 64.31±21.54 | 65.03±23.20[ab] | 57.91±19.03[a] | 70.25±20.65[b] | 4.895 | **0.009** |
| PTD (0–125) | 38.10±20.35 | 33.18±19.44[a] | 35.60±17.28[a] | 46.20±22.15[b] | 7.033 | **0.001** |

One-Way ANOVA with Tukey post-hoc comparisons. Different superscript letters (a, b, c) indicate statistically significant pairwise differences (p<0.05). Bold p values indicate statistical significance. EPDS: Edinburgh postnatal depression scale; BRS: Brief resilience scale; PTG: Posttraumatic growth; PTD: Posttraumatic depreciation; CS: Cesarean section; SD: Standard deviation

Group differences in BRS, PTG, and PTD scores are illustrated in Figure 1.

Pearson correlation analysis revealed a strong negative correlation between EPDS and BRS (r=−0.600, p<0.001) and a strong positive correlation between EPDS and PTD (r=0.593, p<0.001). BRS was negatively correlated with PTD (r=-0.541, p<0.001) and weakly positively correlated with PTG (r=0.152, p=0.045). No statistically significant correlation was found between EPDS and PTG (r=-0.100, p=0.190) or between PTG and PTD (r=-0.065, p=0.392). The full correlation matrix is presented in Table 3.

The identification of independent predictors of PTG and PTD was the objective of the multiple linear regression models. Results are presented in Table 4. In the PTG model ($R^2$=0.136, adjusted $R^2$=0.083, F=2.562, p=0.007), emergency CS (β=0.279, p=0.005) and BRS (β=0.295, p=0.006) were significant positive predictors of PTG. In the PTD model ($R^2$=0.444, adjusted $R^2$=0.409, F=12.996, p<0.001), EPDS was the strongest predictor of PTD (β=0.476, p<0.001), followed by emergency CS (β=0.177, p=0.025) as a positive predictor and BRS (β=-0.198, p=0.021) as a negative predictor. Elective CS, parity, educational level, and conception type did not significantly predict either PTG or PTD. Postpartum duration was included as a covariate in both regression models but did not significantly predict either PTG (β=0.031, p=0.696) or PTD (β=0.045, p=0.479). Multicollinearity was not a concern, as all VIF values were below 2.2. All regression assumptions were satisfied for both models (Shapiro-Wilk p>0.05; Breusch-Pagan

**Table 3. Pearson correlation matrix of scale scores**

| Scale | 1. EPDS | 2. BRS | 3. PTG | 4. PTD |
|---|---|---|---|---|
| 1. EPDS | 1 | | | |
| 2. BRS | **-0.600**** | 1 | | |
| 3. PTG | -0.100 | 0.152* | 1 | |
| 4. PTD | **0.593**** | **-0.541**** | -0.065 | 1 |

*: p<0.05; **: p<0.01. EPDS: Edinburgh postnatal depression scale; BRS: Brief resilience scale; PTG: Posttraumatic growth; PTD: Posttraumatic depreciation

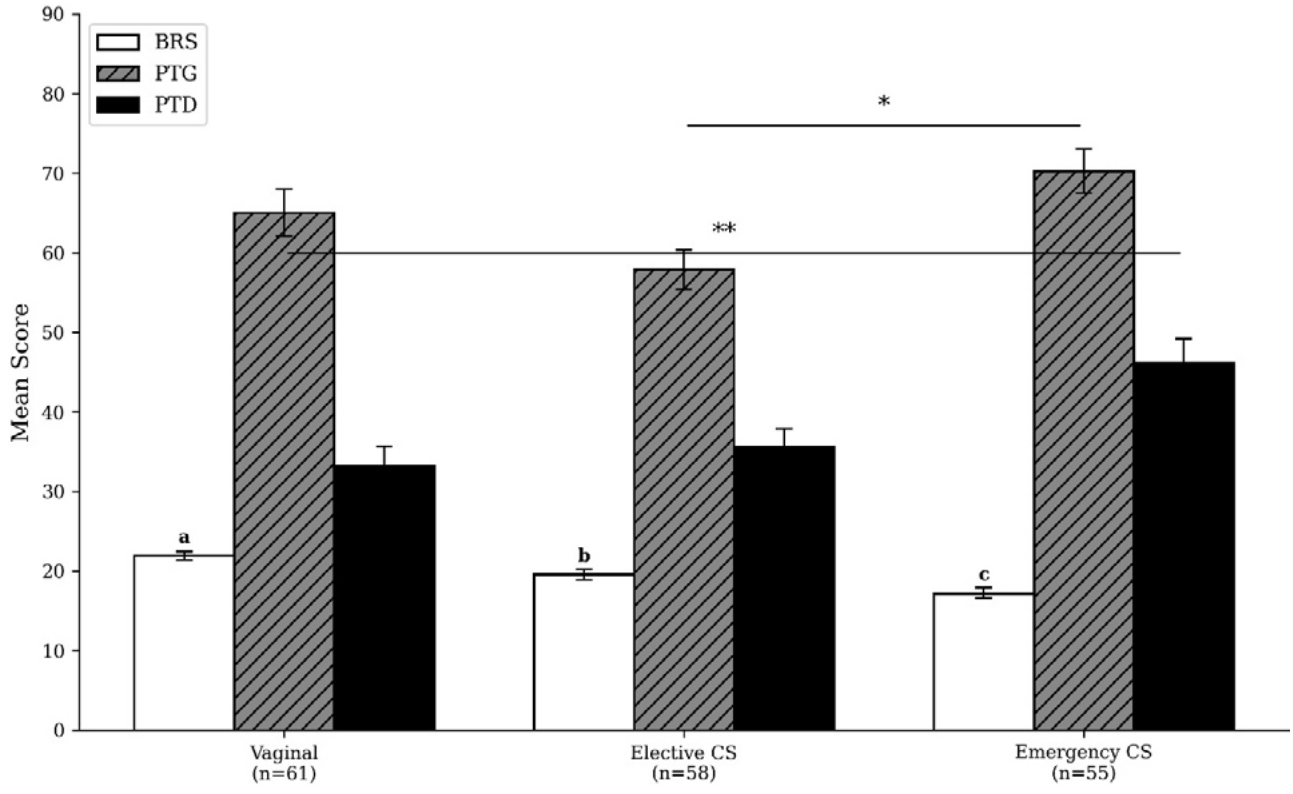


**Figure 1.** Scale scores by mode of delivery

*Error bars represent SEM. Tukey post-hoc comparisons: *: p<0.05; **: p<0.01. BRS: Brief resilience scale; PTG: Posttraumatic growth; PTD: Posttraumatic depreciation*

p>0.05; Durbin-Watson, 1.83–1.93). In ANCOVA adjusting for age, parity, and BMI, group differences remained significant for BRS (p<0.001), PTG (p=0.011), and PTD (p=0.001), whereas EPDS remained non-significant (p=0.502).

## DISCUSSION

In the present study, PPD risk scores, as measured by the EPDS, did not differ significantly across the three delivery groups. This finding is consistent with several previous studies reporting no significant association between mode of delivery and PPD severity when assessed by the EPDS at a cut-off of ≥13.[7,8] Although meta-analytic evidence suggests that CS, particularly emergency CS, is associated with a modestly elevated risk of mild PPD, the association with clinically significant PPD defined by a threshold score is less consistent.[6,7] One plausible explanation is that PPD is a multifactorial condition influenced by a broad range of psychosocial, hormonal, and relational factors and that the mode of delivery may represent only one contributing variable among many.[1] Notably, the proportion of women at risk for PPD (EPDS ≥13) was numerically higher in the emergency CS group (30.9%) compared with the vaginal delivery group (21.3%), a pattern that, while not reaching statistical significance, may carry clinical relevance. Indeed, a difference of approximately 10 percentage points in PPD risk between the vaginal delivery and emergency CS groups (21.3% vs. 30.9%) could potentially reach statistical significance in a larger, adequately powered sample. Future studies with prospective designs and sufficient statistical power to detect group differences in PPD risk are therefore warranted.

Psychological resilience scores differed significantly across delivery groups, with vaginal delivery associated with the highest resilience and emergency CS with the lowest.[22] This finding suggests that the mode of delivery may have a meaningful impact on women's capacity to recover from the challenges of childbirth. The unplanned and often distressing nature of emergency CS, characterized by time pressure, loss of control, and heightened fear for maternal and fetal well-being, may deplete psychological resources and undermine resilience in the postpartum period.[9,12] Interestingly, elective CS was also associated with lower resilience com-

**Table 4. Multiple linear regression models for PTG and PTD**

| Variable | PTG model | | | | | PTD model | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | B | SE | β | t | p | B | SE | β | t | p |
| Mode of delivery (ref: Vaginal) | | | | | | | | | | |
| Elective CS | -2.036 | 4.276 | -0.045 | -0.476 | 0.635 | -0.708 | 3.241 | -0.016 | -0.218 | 0.827 |
| Emergency CS | **12.903** | 4.516 | **0.279** | 2.857 | **0.005*** | **7.727** | 3.423 | **0.177** | 2.257 | **0.025*** |
| Scale Scores | | | | | | | | | | |
| EPDS | 0.226 | 0.510 | 0.042 | 0.443 | 0.658 | **2.394** | 0.386 | **0.476** | 6.196 | **<0.001**** |
| BRS | **1.275** | 0.457 | **0.295** | 2.794 | **0.006**** | **-0.808** | 0.346 | **-0.198** | -2.336 | **0.021*** |
| Obstetric characteristics | | | | | | | | | | |
| Parity | -0.407 | 2.292 | -0.014 | -0.178 | 0.859 | 0.323 | 1.737 | 0.012 | 0.186 | 0.853 |
| Education level | -1.484 | 1.723 | -0.069 | -0.861 | 0.390 | -0.167 | 1.306 | -0.008 | -0.128 | 0.899 |
| Conception type | 2.807 | 5.436 | 0.041 | 0.516 | 0.606 | 5.017 | 4.120 | 0.077 | 1.218 | 0.225 |
| Age | -0.675 | 0.358 | -0.151 | -1.886 | 0.061 | 0.058 | 0.271 | 0.014 | 0.214 | 0.830 |
| BMI | 2.145 | 2.039 | 0.079 | 1.052 | 0.294 | 0.799 | 1.546 | 0.031 | 0.517 | 0.606 |
| Postpartum duration | 0.007 | 0.018 | 0.031 | 0.392 | 0.696 | 0.010 | 0.014 | 0.045 | 0.709 | 0.479 |
| $R^2$ | | | **0.136** | | | | | **0.444** | | |
| Adjusted $R^2$ | | | **0.083** | | | | | **0.409** | | |
| F (df) | | 2.562 (10,163) | | | **0.007** | | 12.996 (10,163) | | | **<0.001** |

Vaginal delivery was used as the reference category. *: p<0.05; **: p<0.01. B: Unstandardized coefficient; SE: Standard error; β: Standardized coefficient; CS: Cesarean Section; EPDS: Edinburgh postnatal depression scale; BRS: Brief resilience scale; PTG: Posttraumatic growth; PTD: Posttraumatic depreciation; BMI: Body mass index

pared with vaginal delivery, which may reflect the psychological burden of surgical recovery and altered birth expectations even in planned operative deliveries. These results are consistent with emerging evidence suggesting that the subjective experience of childbirth, rather than the objective clinical outcome alone, plays a central role in shaping postpartum psychological resilience.[11] To our knowledge, this is the first study to directly compare psychological resilience across vaginal, elective CS, and emergency CS groups using the BRS in a Turkish postpartum sample, and these findings highlight the need for targeted resilience-building interventions for women undergoing operative delivery.

Posttraumatic growth scores differed significantly across delivery groups, with the emergency CS group reporting the highest PTG and the elective CS group reporting the lowest. Post hoc analysis revealed that the difference was statistically significant only between the elective CS and emergency CS groups (p=0.006), while the vaginal delivery group did not differ significantly from either CS group. These findings are partially consistent with previous research demonstrating that more challenging and unexpected birth experiences may paradoxically serve as a catalyst for psychological growth.[16,19,20] The higher PTG observed in the emergency CS group may reflect the greater degree of cognitive disruption and core belief challenge inherent to unplanned operative delivery, which, according to the theoretical model of Tedeschi and Calhoun, is a prerequisite for the growth process. Notably, women who deliver by CS have been reported to experience higher PTG compared with those with vaginal delivery in other cultural contexts, lending cross-cultural support to the present findings.[15,27] The comparatively lower PTG in the elective CS group may be explained by the planned and anticipated nature of this delivery mode, which may afford less opportunity for the kind of profound psychological struggle that drives posttraumatic growth.[17] Notably, the absence of a significant difference between vaginal delivery and emergency CS groups suggests that growth may occur across a range of birth experiences and that the planned versus unplanned distinction may be more determinative than the route of delivery per se.[18]

Posttraumatic depreciation scores were significantly higher in the emergency CS group compared with both the vaginal delivery and elective CS groups, indicating that unplanned operative delivery is associated not only with greater growth potential but also with more pronounced negative psychological change. This finding underscores the dual nature of post-trauma psychological responses, whereby PTG and

PTD may coexist and operate as independent constructs rather than opposing ends of a single continuum.[14] The elevated PTD in the emergency CS group is consistent with evidence that unplanned CS is associated with heightened posttraumatic stress symptoms, loss of sense of control, and negative appraisal of the birth experience.[9,10,12,28] Importantly, the absence of a significant PTD difference between the vaginal delivery and elective CS groups suggests that it is specifically the unplanned and potentially traumatic nature of emergency CS, rather than the surgical route itself, that drives posttraumatic depreciation. However, it should be acknowledged that emergency CS is frequently performed in the context of acute obstetric complications such as fetal distress, labor arrest, or placental abruption, which may themselves independently contribute to adverse psychological outcomes. Future studies should systematically record emergency CS indications to disentangle the psychological impact of the procedure itself from that of the underlying obstetric emergency. These results highlight the clinical importance of distinguishing between elective and emergency CS when assessing postpartum psychological outcomes and support the utility of the PTGDI-X as a sensitive instrument for capturing the full spectrum of post-trauma change in postpartum women.[14] Consistent with this interpretation, both fear of childbirth and NICU admission were also significantly more frequent in the emergency CS group, suggesting that women undergoing emergency CS experienced a more distressing perinatal course. This accumulation of stressors may partly explain the elevated posttraumatic depreciation observed in this group.

Pearson correlation analysis revealed several significant associations among the study variables. The strong negative correlation between EPDS and BRS scores (r=-0.600) indicates that women with higher levels of depressive symptoms tend to report lower psychological resilience, a finding consistent with the broader literature linking resilience as a protective factor against depression and adverse psychological outcomes in clinical populations.[22] The strong positive correlation between EPDS and PTD scores (r=0.593) suggests that postpartum depressive symptoms and posttraumatic depreciation share considerable common variance, potentially reflecting overlapping cognitive and emotional processes such as negative self-appraisal, hopelessness, and perceived loss of personal competence following childbirth. Similarly, the significant negative correlation between BRS and PTD (r=-0.541) indicates that women with lower resilience are more vulnerable to posttraumatic depreciation, reinforcing the role of psychological resources in buffering against negative post-trauma change.[22] In contrast, PTG and PTD were not significantly correlated (r=-0.065), supporting the theoretical position that these two constructs are independent dimensions of post-trauma change rather than opposite poles of a single continuum.[14,29] This finding has important methodological implications, as it validates the decision to assess PTG and PTD simultaneously using the PTGDI-X rather than relying on PTG measures alone. Additionally, BRS was weakly but significantly positively correlated with PTG (r=0.152, p=0.045), suggesting that higher resilience is modestly associated with greater posttraumatic growth.

Multiple linear regression analyses identified emergency CS and psychological resilience as significant independent predictors of PTG, together explaining 13.5% of its variance. Although age approached but did not reach statistical significance (β=-0.156, p=0.051), the negative trend suggests that younger women may be more prone to posttraumatic growth following childbirth, consistent with previous literature. Women who delivered by emergency CS reported higher PTG (β=0.279, p=0.005), while higher resilience was also associated with greater PTG (β=0.295, p=0.006). These findings suggest that both the nature of the birth experience and individual psychological resources independently contribute to posttraumatic growth in the postpartum period, consistent with theoretical models emphasizing the interplay between event-related challenge and personal strengths in driving PTG.[15,17] For PTD, the regression model explained a substantially larger proportion of variance ($R^2$=0.444), with three significant predictors identified: EPDS scores (β=0.476, p<0.001), emergency CS (β=0.177, p=0.025), and BRS scores (β=-0.198, p=0.021). The dominant role of depressive symptoms in predicting PTD suggests that posttraumatic depreciation and postpartum depression may share common psychological pathways, including negative cognitive appraisal and emotional dysregulation. The independent contribution of emergency CS to both PTG and PTD underscores the psychological complexity of unplanned operative delivery, simultaneously increasing the risk of negative change while also creating conditions conducive to growth. The protective role of resilience against PTD, alongside its facilitative role for PTG, further highlights psychological resilience as a key intervention target in postpartum care following operative delivery. Importantly, these group differences remained significant after adjusting for age, parity, and BMI in ANCOVA, indicating that the observed effects were not attributable to demographic differences between delivery groups. Moreover, the effect sizes for the observed group differences ranged from moderate to large, supporting their clinical relevance.

Several limitations of the present study should be acknowledged. First, the cross-sectional design precludes any causal inference regarding the relationship between mode of delivery and the psychological outcomes assessed. Longitudinal studies are needed to elucidate the temporal trajectory of PPD, PTG, PTD, and resilience following different delivery modes. Second, data were collected via self-report questionnaires, which are subject to recall bias and social desirability effects, particularly in the context of sensitive postpartum experiences. Third, the study was conducted at a single tertiary training and research hospital in Istanbul, which may limit the generalizability of findings to other geographic regions and healthcare settings in Türkiye. Fourth, although women with active psychiatric diagnoses prior to delivery were excluded, other potential confounders—including posttraumatic stress symptoms and pregnancy intention—were not assessed and therefore could not be controlled for in the regression analyses. This may partly explain the relatively modest variance explained by the PTG model ($R^2$=0.136), as posttraumatic growth is known to be influenced by a broad range of cognitive, social, and event-specific factors that extend beyond mode of delivery and resilience alone. Fifth, although the time elapsed since delivery varied across participants within the first postpartum year, postpartum duration was included as a covariate in the regression models and did not significantly predict PTG or PTD, suggesting that this heterogeneity did not substantially confound the main findings. Nonetheless, the cross-sectional assessment at varying postpartum time points precludes conclusions about the temporal evolution of these constructs. Finally, emergency CS indications were not systematically recorded in a standardized format; as operative notes were documented by different surgeons, varied considerably across cases, and frequently included multiple concurrent indications, retrospective categorization was not feasible. Future studies should prospectively record emergency CS indications using a standardized classification system to disentangle the psychological effects of the procedure itself from those of the underlying obstetric emergency.

## CONCLUSION

In conclusion, the present study demonstrates that mode of delivery is differentially associated with psychological resilience, posttraumatic growth, and posttraumatic depreciation in the postpartum period, with emergency CS emerging as the delivery mode most strongly linked to both negative and positive post-trauma psychological change. Although PPD risk did not differ significantly across delivery groups, emergency CS was independently associated with higher PTD and higher PTG, while lower psychological resilience predicted both greater PTD and lesser PTG. These findings underscore the psychological complexity of operative delivery and highlight the importance of routine postpartum psychological screening that extends beyond depression to include assessment of posttraumatic growth, depreciation, and resilience. Clinically, women who undergo emergency CS may benefit from targeted psychological support interventions in the early postpartum period aimed at strengthening resilience and facilitating adaptive post-trauma processing.[30] Future studies with longitudinal designs, larger and more diverse samples, and objective measures of birth experience are warranted to further elucidate the pathways linking mode of delivery to postpartum psychological outcomes.

### Disclosures

**Ethics Committee Approval:** The study was approved by the University of Health Sciences Hamidiye Scientific Research Ethics Committee (No: 15/26, Date: 11/08/2023).

**Informed Consent:** Written informed consent was obtained from all participants prior to enrollment.

**Conflict of Interest Statement:** The authors declare that there is no conflict of interest.

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