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SCIENTIFIC ARTICLE

# Association of Pain Catastrophizing with the Incidence and Severity of Acute and Persistent Perineal Pain after Natural Childbirth: Longitudinal Cohort Study

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**Abstract**

Background and objectives: Vaginal birth delivery may result in acute and persistent perineal pain postpartum. This study evaluated the association between catastrophizing, a phenomenon of poor psychological adjustment to pain leading the individual to magnify the painful experience making it more intense, and the incidence and severity of perineal pain and its relationship to perineal trauma.

Method: Cohort study conducted with pregnant women in labor. We used the pain catastrophizing scale during hospitalization and assessed the degree of perineal lesion and pain severity in the first 24 hours and after 8 weeks of delivery using a numerical pain scale.

Results: We evaluated 55 women, with acute pain reported by 69.1%, moderate/severe pain by 36.3%, and persistent pain by 14.5%. Catastrophizing mean score was 2.15 ± 1.24. Catastrophizing patients showed a 2.90 relative risk (RR) for perineal pain (95% CI: 1.08-7.75) and RR: 1.31 for developing persistent perineal pain (95% CI: 1.05-1.64). They also showed a RR: 2.2 for developing acute and severe perineal pain (95% CI: 1.11-4.33).

Conclusions: The incidence of acute and persistent perineal pain after vaginal delivery is high. Catastrophizing pregnant women are at increased risk for developing acute and persistent perineal pain, as well as severe pain. Perineal trauma increased the risk of persistent perineal pain.

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## Introduction

Childbirth is a natural process that may result in maternal morbidity for a long period of time [1]. According to the literature, 87-94% of women report some health problems in the first three months after delivery [2]. Acute perineal pain is a major problem affecting 57-92% of postpartum women [3-6]. Its incidence is related to several factors, including parity, duration of active expulsion period, degree of perineal trauma, type of suture used, and episiotomy [6,7,8]. The severity of acute pain is related to a relative risk (RR) 2.5 higher for developing chronic pain and RR: 3.0 for postpartum depression, regardless of the type of delivery (vaginal or cesarean section) [1,9]. Recent studies have evaluated the relationship between catastrophizing pain during labor and severity of acute perineal pain, incidence of postpartum depression, and ability to recover after childbirth [4,10]. Originally, researchers studied catastrophizing in patients with chronic pain, but its influence on labor remains open to further research[4]. In this study, we evaluated the association of catastrophizing pain during labor and perineal trauma with the incidence and severity of acute and persistent perineal pain.

## Method

After approval by the Ethics and Research Committee and obtaining written informed consent from all participants or guardians, we conducted a longitudinal cohort study at the Obstetric Center of the Instituto de Medicina Integral Professor Fernando Figueira (IMIP), Recife (PE), between June 2010 and October 2011. We collected at two times: during hospitalization for childbirth and 8 weeks after delivery, by telephone. Participants were low-risk women, age over 16 years, admitted in labor, whose fetuses were born via spontaneous vaginal delivery. Exclusion criteria were women with previous perineal disease and those who, after inclusion, did not understand the explanation of the scales used or did not respond to telephone calls for persistent pain evaluation. In total, 127 women agreed to participate in the study. Of these, 97 met the inclusion criteria and participated in the first phase of data collection. However, only 55 responded to the second contact via phone.

We chose to apply the Pain-Related Self-Statements Scale – Catastrophizing Subscale (PRSS-Catastrophizing) [11] to measure catastrophizing pain due to its simplicity as it is composed of only nine items listed on a Likert scale with a score ranging from zero (almost never) to 5 (almost always) points (Box 1). The total score is the sum of the items divided by the number of items answered, in which the higher scores indicate greater catastrophic thinking in a self-administered questionnaire. We applied this scale, which was validated in Portuguese [12], to the study participants during hospitalization. We considered labor pain as the painful experience (Table 1).

Pain severity was evaluated at two-time periods using the Numerical Pain Scale. Participants were asked to quantify a value for their pain (0 = no pain, 10 = worst pain imaginable) [15,16]. The first evaluation occurred within 24 hours after delivery and pain was classified as acute. The second evaluation was conducted by phone 8 weeks after delivery, and pain was classified as persistent, if present. For statistical analysis, pain was categorized as mild (≤ 3), moderate (4-7), and severe (> 7). The service protocol for postpartum analgesia (natural childbirth) was maintained for

**Box 1** – Pain-Related Self-Statements Scale – Catastrophizing Subscale.

| | Almost never | | | | | Almost always |
|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 |
| 1. I can't bear it any longer | | | | | | |
| 2. No matter what I do, my pain will not change | | | | | | |
| 3. I need to take pain medicine | | | | | | |
| 4. It will never end | | | | | | |
| 5. I am a hopeless case | | | | | | |
| 6. When will I be worse again? | | | | | | |
| 7. This pain is killing me | | | | | | |
| 8. I can't continue any longer | | | | | | |
| 9. This pain is driving me crazy | | | | | | |

**Table 1** - Incidence and Severity of Acute and Persistent Perineal Pain.

| **Incidence** | **Acute Perineal Pain (%)** | **Persistent Perineal Pain (%)** |
|---|---|---|
| Absent | 17 (31%) | 47 (85.5%) |
| Present | 38 (69%) | 8 (14.5%) |
| Total | 55 (100%) | 55 (100%) |
| **Severity** | **Acute Perineal Pain (%)** | **Persistent Perineal Pain (%)** |
| Mild | 18 (47.3%) | 6 (75%) |
| Moderate | 19 (50%) | 2 (25%) |
| Severe | 1 (2.6%) | - |
| Total | 38 (100%) | 8 (100%) |

the participants, and consisted of oral analgesics (dipyrone or paracetamol) or anti-inflammatory non-steroidal drugs (NSAIDs), if necessary.

The obstetrician or obstetric nurse who conducted the delivery assessed the degree of perineal trauma, based on a specific annex previously presented to the laboring women. The classification used considered the following degrees of trauma: intact perineum, which corresponds to the absence of injury; first degree injury, which involves the skin around the vaginal opening; second degree injury, which involves the vaginal mucosa and perineal muscles; third degree injury, which involves the anal sphincter, in addition to vaginal mucosa and perineal muscles; fourth degree injury, which involves the third degree injury affected tissues and the rectum wall.

For data analysis, we used Epi Info software, version 3.5.3. The outcomes were considered statistically significant when $p < 0.05$.

## Results

The sample consisted of 55 women, mean age 25 ± 5.6 years, with an average education of 10 ± 2 years. Patients with more than 11 years schooling were attending college and constituted 18% of the sample. The mean number of pregnancies was equal to two per participant.

Regarding the occurrence of pain, 69.1% of participants reported pain in the first 24 hours after delivery and 14.5% reported persistent pain after 8 weeks of delivery. Among the patients who reported pain, 52.6% rated it as moderate to severe in the first 24 hours (Table 1).

Regarding the occurrence of perineal injury, 80% of patients had some degree of injury. Only two patients underwent episiotomy (Table 2).

The mean score on the scale of catastrophic thinking about pain was 2.15 ± 1.24, and a median of 2.11 was used as the cut-off point for inclusion (or not) of patients in the catastrophizing group. We observed that catastrophizing patients have a relative risk (RR) equal to 2.90 (95% CI: 1.08-7.75) to present with acute perineal pain and a RR of 1.31 (95% CI: 1.05-1.64) to develop persistent pain. We also observed among catastrophizing patients a risk 2.2 higher to develop more severe pain in the first 24 hours (95% CI: 1.11-4.33) (Table 3).

As for perineal trauma, we found that the presence of trauma was not significantly related to increased risk of acute perineal pain. However, in patients with perineal trauma, the risk of persistent pain is 1.15 higher. The relationship between perineal trauma and severity of pain was not statistically significant (Table 4).

**Table 2** - Incidence and Degree of Perineal Injury.

| **Perineal Injury** | **Incidence** |
|---|---|
| Absent | (16.4%) |
| Present | 44 (80%) |
| Episiotomy | 2 (3.6%) |
| Total | 55 (100%) |
| **Degree of injury** | **Incidence** |
| 1st degree | 31 (10.3%) |
| 2nd degree | 13 (29.7%) |
| 3rd degree | 44 (100%) |

**Table 3** – Association between Pain Catastrophizing, Incidence, and Severity of Acute and Persistent Perineal Pain.

| **Acute Perineal** | | | | | | |
|---|---|---|---|---|---|---|
| **Pain** | **Incidence** | | | **Severity** | | **P value** |
| | Without pain (%) | With pain (%) | | Mild (%) | Moderate/severe (%) | |
| Non-catastrophizing | 13 (76.5%) | 15 (41.7%) | **RR = 2.90** | 11 (61.1%) | 4 (22.2%) | |
| Catastrophizing | 4 (23.5%) | 21 (58.3%) | (95%CI: 1.8-7.75) | 7 (38.9%) | 14 (77.8%) | **0,01** |
| **Persistent Perineal** | | | | | | |
| **Pain** | **Incidence** | | | **Severity** | | |
| | Without pain (%) | With pain (%) | | Mild (%) | Moderate/severe (%) | |
| Non-catastrophizing | 28 (59.6%) | 0 | **RR = 1.31** | 0 | 0 | |
| Catastrophizing | 19 (40.4%) | 6 (100%) | (95%CI: 1.05-1.64) | 5 (100%) | 1 (100%) | **0,022** |

Values expressed as number (percent); RR: relative risk; CI: confidence interval.

**Table 4** – Association between Perineal Trauma and Acute and Persistent Perineal Pain.

| Acute Perineal Pain | | | |
|---|---|---|---|
| **Trauma** | **Without pain (%)** | **With pain (%)** | |
| Absent | 3 (17.6%) | 6 (16.7%) | |
| Present | 14 (82.4%) | 30 (83.3%) | RR = 1.04 (95% CI: 0.37-2.9) |
| **Persistent Perineal Pain** | | | |
| **Trauma** | **Without pain (%)** | **With pain (%)** | |
| Absent | 9 (19.1%) | - | |
| Present | 38 (80.9%) | 6 (100%) | RR = 1.15 (95% CI: 1.02-1.3) |

Values expressed as number (percent); RR: relative risk; CI: confidence interval.

## Discussion

In our sample, 69% of patients presented acute pain after childbirth, an incidence similar to that described in the literature (57-92%) [1,6,9]. The incidence of persistent perineal pain was 14.5%, which is higher than that reported in the literature (9.7-10%) [6,9,15]. However, when we exclude the patients who underwent episiotomy, the incidence is similar to those already published (10.8%). Patients undergoing episiotomy were excluded from the analysis assessing the relationship between catastrophizing and perineal pain, as there is strong evidence that episiotomy is a risk factor for perineal pain [6,7], which could act as a confounding variable in this study.

We found that about 70% of patients had acute pain and, of these, 52.6% reported moderate to severe pain. This indicates that postpartum pain is not being managed properly, which is due to the fact that the institutional protocol only contemplates treatment for mild pain. This finding indicates the need for reevaluation of this protocol.

Our study found no significant relationship between perineal trauma and acute pain. The severity of pain differed from a previous study that reported positive association between the degree of trauma and severity of perineal pain after vaginal delivery [7]. This can be explained by the following reason: although we found a high incidence of perineal trauma (80%), the degree of injury was low (1st and 2nd), which probably contributed to the lack of relationship between the degree of trauma and severity of perineal pain in the outcomes. The prevalence of low-grade lesions may simply reflect the reality of the data collection place: a center offering humanized and spontaneous birth services, with low incidence of episiotomy, provided by obstetric nurses for low-risk women, so that the patients who progressed to assisted vaginal delivery (with the use of forceps) or showed some distorted progression were taken to the high risk unit and excluded from data analysis.

As for catastrophic thoughts, considering its importance as a disability and stress arising from the painful stimulus, several measures have been developed to assess this construct. The most frequently used tools are the Catastrophizing Scale of the Coping Strategies Questionnaire (CSQ) [16], Pain Catastrophizing Scale (PCS) [17], and Pain-Related Self-Statements Scale – Catastrophizing Subscale (PRSS-Catastrophizing) [11], which have no cut-off points [12,18]. The latter was the scale used in this study. In an initial validity study [19], the mean score was 2.03 ± 1.22. The mean score of our sample was 2.15 ± 1.24, and a median of 2.11 was used as cut-off point for inclusion (or not) of patients in the catastrophizing group. Although there are no cut-off points for this scale, we chose to use the median score to classify catastrophizing and non-catastrophizing patients in an attempt to improve and facilitate the understanding during data analysis. This strategy was adopted in previous studies using the PCS [4], which also has no cut-off points, although in the original validation study, the author has used the scores that limited the upper and lower third distribution of the PCS scores of his sample [17]. In our study, we found that catastrophizing patients have a 2.9 higher risk for acute perineal pain and 1.31 risk for developing persistent perineal pain. Although catastrophizing was not originally described as a predictor of pain, it seems to be particularly important to predict the occurrence of acute pain. In line with the findings of Flink who, comparing catastrophizing with non-catastrophizing patients, found that the catastrophizing patients experienced more severe pain up to one month after childbirth ($p < 0.0125$) [4], in our study, we found that these patients have a 2.2 higher risk of presenting more severe pain in the first 24 hours. We also found a statistically significant relationship between catastrophizing and persistent pain severity ($p < 0.023$), which corroborates the findings of previous studies assessing chronic pain and reporting that catastrophizing patients are more likely to experience more severe pain [17,18,19]. Given these findings, we suggest the identification of catastrophizing pregnant women during prenatal and the development of interventions to improve these patients' adaptation to postpartum pain. One option that has been successfully used in other populations is cognitive behavioral therapy. However, further studies are needed to evaluate the effectiveness of this therapy to prevent pain in women [4,18].

This study has limitations that should be discussed. First, some factors that could influence the incidence of perineal pain after childbirth, such as fetal weight at birth

and delivery duration, were not evaluated. However, these factors are indirectly related to perineal trauma, which we analyzed. Second, the catastrophic thoughts scale used in this study is self-administered, which could hinder understanding and cooperation by the participants. To minimize this fact, the investigator administered and later verbally confirmed the scale.

With this study, we conclude that there is a high incidence of acute and persistent perineal pain after spontaneous vaginal delivery. Catastrophizing pregnant women seem to have a higher risk of developing acute, persistent, and severe perineal pain. First-degree perineal trauma discreetly increased the risk of persistent perineal pain. Further studies are needed to identify the best strategy to support catastrophizing patients postpartum and for better understanding the role of catastrophizing in the incidence and severity of acute pain.

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