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Pain and emotions reported after childbirth and recalled six months later: The role of controllability

Carla Tinti^a

Susanna Schmidt^a

Nicoletta Businaro^b

^aDepartment of Psychology, University of Turin, Turin, Italy

^bDepartment of Human Science, University of Milan Bicocca, Milan, Italy

Corresponding author: Carla Tinti, University of Turin, Via Verdi 10, 10124 Turin, Italy, Tel.:

+390116702896, Fax: +390116702795; e-mail: carla.tinti@unito.it

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Abstract

The aim of this longitudinal study was twofold: to investigate the relationship between subjectively evaluated control, positive and negative emotional feelings, and pain intensity during childbirth; to assess the recall of these aspects of childbirth experience six months after delivery. Participants were 123 women who delivered naturally and spoke fluent Italian. Results showed that both immediately after delivery and six months later, higher subjective controllability was related to less severe reported pain, more intense positive emotions and less intense negative emotions. Furthermore, although there was no significant bias in the vividness of the recall, six months after delivery women reported higher subjective controllability, more intense positive emotions, less intense negative emotions, and less intense pain. It is concluded that in preparing women for childbirth, two aspects deserve particular attention: the enhancement of subjectively perceived controllability and the possibility to work on both negative and positive emotions.

Introduction

Labor pain, differently from illness- or trauma-related pain, is not an indicator that something is going wrong; it signals that labor is proceeding and its expected outcome is generally considered as positive [1]. Nonetheless, labor pain requires the woman to deploy considerable physical and mental efforts and there are individual differences in the ability to face it, which can positively or negatively influence childbirth experience as well as postpartum recovery [2]. Thus it seems important to investigate how this event is experienced and remembered. Several studies suggest that the emotional aspects have a central role during the moment of delivery as well as during the postpartum. For instance, the relationship between fear and pain is already well documented in the pain literature [3 for a review]. Specifically, as regards labor, anxiety and fear of pain, are related to slow labor progress [4], more frequent requests for caesarean section [5,6], and prolonged intervals between first and second pregnancies [4]. Indeed, expecting very severe pain can provoke catastrophizing, one of the most important predictors of pain-related fear, which, in turn, may increase pain intensity [2].

One mediating factor which seems to be fundamental in this relation between emotion and pain is the subjective perception of having control over what is happening during delivery [7,8]. In this respect, appraisal theories [e.g. 9,10] suggest that emotions are the result of cognitive evaluations, and subjectively perceived controllability constitutes a core appraisal dimension in the process of emotion formation. It can be assumed that also in the labor experience, subjective controllability and felt emotions are strictly related, i.e. the evaluation of low control will provoke negative feelings such as fear, anxiety and despair, whereas the evaluation of high control will enhance positive emotions. This assumption is supported by Sjögren [11], who observed that besides labor pain, women are frightened of “the development of total chaos during the delivery, either on their own part or by the attending hospital” (p. 268).

If subjective controllability and the related positive and negative feelings are likely to influence labor pain, the recall of this experience and the associated emotional feelings are prone to

influence the post-partum. Negative memories can increase the incidence of different symptoms such as post-traumatic stress disorder [12], post-partum depression [13], prenatal depression in future pregnancy [14], the loss of the desire to have another child [15]. On the other hand, also positive emotions could have long-term effects, since they enhance the building of important and enduring personal resources [16,17], such as sense of self-efficacy, which could favor the adaptation to motherhood. Therefore it seems important to investigate both, how delivery is experienced, and how it is recalled.

While the popular myth claims that labor pain is quickly forgotten [18], several studies show that it is often recalled as the most intense pain experienced in a woman's life [19]. However, studies on autobiographical memory [e.g. 20,21], show that what is recalled after a certain length of time is not always congruent with what was reported just after the event happened. Actually, autobiographical memory is often reported to be extremely vivid, but not always very accurate [20]. In particular, reports of pain experienced during delivery and pain recalled later, are not consistent in most cases [19,22,23].

Based on these premises, the current study aimed at investigating the relationship between subjectively evaluated control, felt emotions and pain intensity. We hypothesized that the evaluation of low control will be related to anxiety/fear and more intense pain, while subjectively evaluated high control will be associated to positive feelings such as happiness and pride, and less intense pain. Furthermore, we assessed the memories of childbirth experience several months later. In particular, we concentrated on autobiographical memory which includes recalls that are specific, personal, long-lasting, and of significance to the self [24], by considering felt emotions, subjective control, intensity of pain, and the vividness of these recalls.

Methods

Design

In this longitudinal study, data were collected by questionnaire on two occasions: within three days after delivery and six months later.

Participants

To be included in the study, women had to give birth naturally and speak fluent Italian. A total of 306 women who met these inclusion criteria completed the first questionnaire, and 123 of them also returned the second one (40.2% of the initial sample). The women who participated on the two occasions were aged from 19 to 43 years ($M = 32$, $SD = 4.5$) and were mostly married or cohabiting (91.9%). About half of them were primiparas (49.6%), almost all delivered at term (95.1%), and 24.4% complained more or less severe obstetric complications (e.g haemorrhage, episiotomy, cephalopelvic disproportion, transverse lie, insufficient contractions). The sample which only completed the first questionnaire and the one which participated on the two occasions did not differ with respect to the following variables: mean age, $F(1, 304) = 3.12$, $p = .078$, proportion of single mothers, $X^2(1, N=306) = 0.26$, $p = 0.612$, of primiparas and multiparas, $X^2(1, N=306) = 0.58$, $p = 0.439$, of mothers giving birth at term, $X^2(1, N=306) = 0.50$, $p = 0.480$, and of mothers who complained obstetric complications, $X^2(1, N=306) = 0.06$, $p = 0.811$. Informed consent was obtained from all participants and the study was carried out in accordance with the ethical standards of the World Medical Association Declaration of Helsinki [25].

Measures

The questionnaire used to collect data on the two occasions included the following items:

Pain: Women indicated pain intensity on an 11 - point scale (0 = no pain at all, 10 = worst pain imaginable).

Subjective controllability: Women evaluated to what extent they felt able to control the situation during the moment of most intense pain (0 = not at all, 10 = completely).

Vividness: Women indicated how vividly they recalled the moment of most intense pain (0 = not at all, 10 = extremely).

Emotions: Women rated the intensity with which they felt each of 10 emotions using 11-point scales that ranged from 0 (not at all) to 10 (extremely). The emotions assessed are listed in Table I.

The measures of subjective controllability and emotion intensity were selected on the basis of literature regarding appraisal theories of emotion [9,10], whereas vividness of recall was measured by adopting the scale generally used in studies on flashbulb memory [20,21].

Procedure

The questionnaire was completed by the women the first time within three days after delivery, the second time six months later. On the first occasion, trained doctoral students visited the gynecological and obstetric sections of different hospitals of three cities of Northern Italy (Biella, Turin, Milan), having obtained prior consent from the hospital directors. They provided women who had just delivered with information about the study, the first questionnaire and a consent form on which also the respondent's home address had to be supplied. Some hours later, they collected the completed questionnaires (response rate 90.5%). Six months later, the second questionnaire was mailed to the women's home with a pre-paid envelope to return the completed questionnaire. The two questionnaires of the same woman were matched on the basis of a 6-bit personal code which each respondent had to provide on the first page of both questionnaires.

Data analyses

Data were analyzed with SPSS (PASW Statistics version 18.0). In order to determine whether the recall of the moment of most intense pain changed over time, a MANOVA (GLM procedure) was calculated by considering time (just after delivery and six months later) as the within subject factor and the following dependent variables: pain intensity, subjective controllability, vividness of recall, intensity of emotions. To assess whether positive and negative emotional feelings and pain intensity are related to subjective controllability just after delivery and

six months later, two multiple regression analyses (GLM procedure) were computed with subjective controllability as predictor variable (covariate) and pain intensity and the intensity of the felt emotions, as dependent variables.

Results

Descriptive statistics

Pain intensity: Just after delivery, women generally reported they felt very intense pain (Table I). Six months later, intensity of recalled pain was still very high, but lower than just after delivery.

Subjective controllability: Just after delivery, women reported that they had rather low control over the situation during the moment of most intense pain, whereas they recalled a higher level of subjective controllability six months later.

Vividness: The recall of the moment of the most intense pain was very vivid immediately after delivery and remained so six months later.

Emotions: Just after delivery, the emotions women reported they felt most intensely were hope, fear, anxiety and happiness. At medium intensity they also reported that they felt interest, despair and pride, and at a rather low level of intensity serenity, anger and sadness. Six months later, women recalled that they felt most intensely hope, happiness, interest and anxiety. At medium intensity level they recalled they felt fear, pride and serenity, and at a rather low level despair, anger and sadness.

--- Table I ---

Differences between pain intensity, subjective controllability and intensity of felt emotions reported after delivery and six months later

A repeated measures MANOVA computed to test eventual biases in the recall of the moment of most intense pain showed a main effect of time, $F(13, 108) = 7.37, p < .001$. In particular, although there was no significant bias in the vividness of the recall, six months after delivery, women recalled they felt less intense pain, and less intense fear, despair, and sadness; whereas they recalled higher subjective controllability, and more intense pride and serenity (Table I).

Relationship between subjective controllability, pain intensity, and emotions just after delivery and six months later

Two multiple regression analyses were computed to assess whether the women's evaluation of subjective controllability was related to their emotions and the intensity of pain reported just after delivery and six months later. The first analysis showed that just after delivery subjective controllability was a significant predictor of reported pain intensity and felt emotions, $F(11, 111) = 4.75, p < .001$. In particular, as shown in Table II, the lower the self-evaluated controllability, the more intense the emotions of fear, anxiety, and despair; the higher the evaluated subjective controllability, the more intense the emotions of hope, serenity, and pride, and, importantly, the lower the intensity of pain.

Also the second multiple regression analysis computed to assess whether the women's recalled evaluation of subjective controllability was related to their recalled emotions and pain intensity six months after delivery, showed that subjective controllability was a significant predictor, $F(11, 111) = 4.42, p < .001$. The lower the recalled subjective controllability, the more intense the recalled negative feelings of fear, despair, and anger; the higher the recalled subjective controllability, the more intense the recalled emotions of hope, happiness, interest, pride, and serenity, and the lower the intensity of recalled pain.

--- Table II ---

Discussion

The experience of delivery displays a bidimensional nature: on the one hand, there are subjective feelings related to physical states of intense pain; on the other, there is an emotional and existential dimension which is characterized by happiness about the birth of one's child [23]. Delivery is thus a very significant, unique and emotionally involving personal event, whose recalls are e stored in autobiographical memory [24,26].

The present study focused on two aspects of labor and delivery: the subjective experience related to pain and the characteristics of recall of the moment of most intense pain. The aim was to determine which psychological factors could influence perceived pain, and how vividly and accurately the event is recalled several months later.

Regarding the factors which could influence pain, we hypothesized that the subjective controllability of the moment of most intense pain would be related to its reported intensity and to the quality and intensity of the experienced emotions. The results seem to confirm this relationship. Considering the women's report just after delivery, lower subjective controllability was related to more intense pain and more intense negative emotions.

This finding replicates and expands findings from previous studies, which mostly focused on the relation between subjective controllability and anxiety and fear [e.g. 3], but did not consider positive emotions. Starting from appraisal theories, in which the degree of evaluated subjective controllability is fundamental for the elicitation of both negative and positive emotions [9,10], we considered also the latter and found that higher subjective controllability is related to more intense positive emotions and less intense pain.

An interesting theory which can help to explain this result, is the broaden-and-build theory of positive emotions, proposed by Fredrickson [16,17]. According to this theory, positive emotions enhance creative, flexible and efficient problem-solving [27,28], and are useful in building important and enduring personal resources [17]. In this sense, positive emotions can have a short-term and a long-term effect. In particular, a positive childbirth experience could enhance fulfillment

and favor the adaptation to the role of becoming mother. Fortunately, in most women, delivery is related to feelings of pride for having been able to cope with very intense pain and this feeling enhances their sense of self-esteem and self-efficacy [19]. On the other side, when there are problems during delivery, these can negatively influence the women's emotional feelings, and provoke the recall of more intense pain after delivery and a delay in adaptation to the parental role [29].

Considering these long-term effects, in the present study women's experience was assessed not only immediately after delivery, but also after a certain lapse of time. In accordance with previous studies [29], our results confirm that although delivery and the related pain remains a very vividly recalled experience, there is a discrepancy between the experience reported immediately after delivery and the one recalled six months later. In particular, women recalled they had higher control during the moment of most intense pain, and less intense pain. Moreover, negative emotional feelings such as fear, sadness and despair were recalled as less intense, whereas positive feelings of pride and serenity were recalled as more intense. Interestingly, despite these biases, even six months after childbirth, the relationship between subjective controllability, quality and intensity of felt emotions and pain intensity persists: the higher the recalled subjective controllability, the more intense the recalled positive emotions; the lower the recalled subjective controllability, the higher the recalled negative, and, importantly, the higher the intensity of recalled pain.

Conclusions

The present research highlights the strong relationship between emotions and pain. This relationship is already documented in the literature through studies which showed that anxiety and fear have a strong impact in intensifying pain [3]. In addition, the results of this study suggest that positive emotions may be very important in reducing pain intensity during delivery. Unfortunately, very few prenatal interventions focus on emotions, and, if so, they only concentrate on anxiety and fear [6].

The results reported here suggest that in projecting prenatal interventions, one aim should certainly be to reduce negative emotions, but also to enhance positive emotions. Furthermore, considering the significant impact of subjective controllability on emotional feelings, this important cognitive aspect also deserves great attention.

Even though these conclusions can not be considered as definitive, also given the rather low response rate at the retest, the reported findings provide some interesting suggestions for practical application. In particular, in preparing women for childbirth, on the one hand it seems very important to provide them with all necessary information in order to favor their sense of control and capacity to cope with events which could occur during labor; on the other hand, it seems very important to give them the possibility to work on their emotions by considering both negative and positive emotions.

Declaration of interest

The authors report no conflicts of interest.

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Table I

Differences of pain intensity, subjective controllability, vividness and felt emotions reported just after delivery and six months later

	Test		Retest		<i>F</i> (1,122)	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Pain intensity	8.76	1.57	8.11	1.72	21.94	.000
Subjective controllability	4.06	3.10	4.83	2.89	8.48	.004
Vividness	7.92	2.57	7.63	2.43	0.95	.331
Emotions						
Hope	7.59	2.79	7.39	2.90	0.43	.512
Fear	6.73	3.47	5.76	3.24	9.40	.003
Anxiety	6.48	3.76	6.15	3.34	1.47	.227
Happiness	6.22	4.04	6.48	3.84	0.55	.461
Interest	5.86	3.78	6.17	3.82	0.92	.339
Despair	5.65	4.00	3.26	3.74	52.53	.000
Pride	4.49	3.84	5.57	3.99	7.63	.007
Serenity	2.92	3.13	4.54	3.57	30.42	.000
Anger	2.84	3.61	2.24	3.28	3.78	.054
Sadness	2.07	3.02	1.39	2.15	7.27	.008

Table II

Results of the two regression analyses: Subjective controllability predicting pain intensity, and intensity of felt emotions at the test and at the retest

	Test			Retest		
	β	$t(122)$	p	β	$t(122)$	p
Pain intensity	-.183	-4.26	<.001	-.188	-3.67	<.001
Emotions						
Hope	.207	2.60	<.05	.185	2.06	<.05
Fear	-.240	-2.41	<.05	-.247	-2.48	<.05
Anxiety	-.316	-2.97	<.01	-.195	-1.88	.062
Happiness	.231	1.98	.050	.351	3.02	<.01
Interest	.189	1.73	.086	.430	3.79	<.001
Despair	-.520	-4.84	<.001	-.375	-3.34	<.01
Pride	.367	3.42	<.01	.450	3.80	<.001
Serenity	.333	3.84	<.001	.441	4.21	<.001
Anger	.008	0.074	.941	-.341	-3.47	<.01
Sadness	-.058	-0.650	.517	-.087	-1.30	.197

Current knowledge on this subject

- Low subjectively perceived controllability during delivery is related to more intense feelings of anxiety and fear, and more intense pain.
- Reports of pain experienced during delivery and pain recalled later, are not consistent in most cases.
- Very few prenatal interventions focus on emotions, and they mainly concentrate on anxiety and fear.

What this study adds

- Higher control is related to more intense positive emotions and less intense pain.
- Memory biases concern not only recalled pain, but also subjective controllability and emotional feelings: six months after delivery women reported less intense pain and less intense negative emotions; whereas they recalled higher subjective controllability and more intense positive emotions.
- In preparing women for childbirth, two aspects deserve particular attention: the enhancement of subjectively perceived controllability and the possibility to work on both negative and positive emotions.