# Impact of Labor Epidural Analgesia on Maternal Satisfaction and Childbirth Expectations in a Tertiary Care Center in Portugal: A Prospective Study

# Impacto da Analgesia do Trabalho de Parto na Satisfação Materna e Expectativas Relativamente ao Parto num Hospital Terciário em Portugal: Estudo Prospetivo

Sofia FERNANDES✉[1], João GALACHO[1], Andreia BORREGO[1], Daniela PEREIRA[1], Filipa LANÇA[1], Lucindo ORMONDE[1]

## ABSTRACT

**Introduction:** In the current century, increasing importance has been given to the opinions, expectations and experiences of women using healthcare services. The fulfillment of expectations is determined by satisfaction. This study aims to analyze both expectations and satisfaction during childbirth regarding labor epidural analgesia among parturients, with a focus on myths.
**Material and Methods:** A prospective observational study was conducted in parturients at the Centro Hospitalar Universitário Lisboa Norte - Santa Maria Hospital in Lisbon, Portugal, applying a questionnaire to 317 random women. SPSS v22.0 was used for data analysis.
**Results:** Three hundred questionnaires were returned, from women with a mean age of 31. Among the respondents, 46.3% had a college degree and 64% were employed, 46% were primiparas and only 14% had a previous anesthesiology appointment for childbirth purposes. The overall degree of satisfaction surrounding the birth experience was good/excellent for 87% of women. Labor epidural analgesia was performed on 96% of all patients, with an excellent/good outcome for 82.1% and a higher than expected results for 40.7% of them. Regarding the myths, 52.5% believed that epidural analgesia imposes a dose limit and 58.9% that it often causes permanent back pain. The level of education was significantly associated with some myths (*p* < 0.05), since women with a higher level of education do not believe most of them.
**Discussion:** This study supports the need for an evaluation of the current information that women have about labor epidural analgesia/childbirth. Women's individual needs can be met by multidisciplinary teams including Anesthesiology specialists.
**Conclusion:** Maternal satisfaction with childbirth and analgesia is a complex and dynamic process that includes and is not limited to the relief of pain.
**Keywords:** Analgesia, Epidural; Labor, Obstetric; Labor Pain/psychology; Parturition/psychology; Patient Satisfaction

## RESUMO

**Introdução:** As opiniões, expectativas e experiências das mulheres que utilizam os serviços de saúde têm vindo a alcançar crescente importância. O cumprimento das expectativas é determinado pela satisfação. Este estudo tem como objetivo analisar as expectativas e satisfação das mulheres durante o trabalho de parto em relação à analgesia epidural, com foco principal nos mitos.
**Material e Métodos:** Foi realizado um estudo observacional e prospetivo em grávidas do Centro Hospitalar Universitário Lisboa Norte - Santa Maria Hospital, em Lisboa, Portugal, através da aplicação aleatória de um questionário a 317 mulheres. Foi utilizado o programa SPSS v.22 para análise estatística.
**Resultados:** Foram obtidos 300 questionários, provenientes de mulheres com idade média de 31 anos. Entre as grávidas que responderam ao questionário, 46,3% possuíam diploma universitário e 64% estavam empregadas. Apenas 14% tiveram consulta prévia de Anestesiologia. O grau de satisfação em torno da experiência do parto foi bom/excelente para 87% das mulheres. A analgesia epidural foi realizada em 96% das grávidas, tendo 82,1% considerado a analgesia excelente e 40,7% avaliado como superior ao esperado. Em relação aos mitos, 52,5% acreditam que a técnica epidural apresenta uma dose limite e 58,9% consideram que a técnica acarreta dor permanente nas costas. O nível de escolaridade mostrou-se significativamente associado a alguns mitos (*p* < 0,05), uma vez que as mulheres com maior grau de escolaridade não acreditam na maioria destes.
**Discussão:** Este estudo demonstra a necessidade da avaliação da informação que as mulheres possuem sobre a analgesia do trabalho de parto. As necessidades individuais devem ser geridas por equipas multidisciplinares que incluamanestesiologistas.
**Conclusão:** A satisfação materna com o parto e respetiva analgesia é um processo complexo e dinâmico, que inclui e não se limita ao alívio da dor.
**Palavras-chave:** Analgesia Epidural; Dor do Parto/psicologia; Parto/psicologia; Satisfação do Paciente; Trabalho de Parto

## INTRODUCTION

Patient satisfaction is a concept that is highly important in medical care. Patient satisfaction is the degree to which the individual regards the healthcare service, product or the way it is delivered by the provider as useful, effective or beneficial.[1] Maternal satisfaction is multifactorial and evaluating it is difficult.[2] According to Cheung *et al*, patient satisfaction is an interplay of expectations and experience.[3] Factors affecting expectations include reliability, responsiveness, empathy and the ability to make things right if mistakes are made.[4-7] Women's involvement in decisions,

support provided by caregivers, and the quality of the established relationship, seem to be key factors.[8-11]

The experience of a sensory perception event, such as labor pain, is subjective and can vary substantially from one woman to another. It is influenced by several factors such as psychological, obstetric, and social factors.[12] Porro *et al* consider that both the subjective experience of pain and pain-related brain activation decrease significantly through the expectations of decreased pain.[13]

Neuraxial techniques are the gold standard in labor analgesia.[14] These techniques are well established and increasingly requested by women, even though some still fear and refuse the procedure. The choice of undergoing a neuraxial technique should be a conscious one, so pregnant women should be informed correctly.

Up until now, there have been limited studies regarding parental childbirth expectations in Portugal. Therefore, the aims of this study were to understand the expectations of mothers during childbirth and to evaluate the amount of information that parturients have regarding epidural analgesia and their level of satisfaction, in order to improve the anesthesiological approach in our institution.

## MATERIAL AND METHODS
### Ethical considerations
The study was approved by the Ethics Committee of the Academic Medical Center of Santa Maria Hospital (106/19) and all participants completed and signed an informed consent form. All information was treated in confidence.

### Setting
A cross-sectional survey design was carried out in the Obstetrics Department of Santa Maria Hospital in Lisbon. It is a teaching hospital and one of the biggest referral tertiary care providers in Portugal with around 2500 births each year, offering care for both low and high-risk pregnancies. A non-probability convenience sampling technique was used. Parturients were randomly recruited over a 12-month period during the postpartum period depending on researcher availability.

### Recruitment
The inclusion criteria were women that presented with active labor undergoing neuraxial analgesia with vaginal deliveries or emergent cesarean sections. The exclusion criteria were elective caesareans.

We introduced the study as a survey on satisfaction with perinatal care and briefly explained the procedure. Consenting women were handed an informed consent form, a participant information sheet and a questionnaire which was completed afterwards.

In order to ensure that women with less developed literacy skills could also participate, the researcher was always present to clarify items or to answer questions, although keeping an appropriate distance. Only a small proportion of women (eight women) needed assistance. Completing the questionnaire took an average of ten minutes. The questionnaire was anonymous and was handed to administrative staff before discharge.

### Questionnaire
We developed a well-structured questionnaire containing 39 closed questions. The questionnaire was pretested. It covered information on the sociodemographic characteristics of parturients, pregnancy and delivery process, satisfaction and expectations with labor and anesthesiology care and the myths regarding the epidural analgesia. Satisfaction was assessed with a 5-point Likert scale (very poor to excellent).

### Statistical analysis
Statistical analyses were performed using the Statistical Package for the Social Sciences version 22.0 (SPSS Inc., Chicago, IL, USA). A $p$ value below 0.05 was considered as statistically significant. Missing values comprise characteristics without applying for specific data or data unavailable for consultation. Descriptive analysis was performed for all the variables with frequency and percentages for qualitative variables, mean and standard deviation for continuous variables. We analyzed nominal and categorical variables using Pearson's chi-squared and Fisher's exact test for differences between two groups. The comparisons between continuous quantitative variables were made through parametric tests, using the Student $t$ test.

The central aim of the analysis was to examine the extent to which sociodemographic characteristics, pregnancy and childbirth characteristics, and parturients' experiences with the care process can explain differences in satisfaction and myths. In order to explain such differences, these variables should show variation regarding being transferred. Subsequently, multivariate analyses using logistic regression were conducted.

## RESULTS
### Socio-demographic characteristics
Three hundred women who gave birth completed the questionnaire, giving a response rate of 94.5%. The mean age was 31.39 ± 6.42 (range 15 - 50). Portuguese nationals accounted for 80.3% of the surveyed patients. From the total population of this study, 46.3% had a college degree, while 27% had reached 9th grade or below. About 64% were employed. Baseline demographic characteristics are presented in Table 1.

### Pregnancy and delivery characteristics
In this study, 46.0% of women were primiparas and 54.0% were multiparas. The mean gestational age was 38 weeks and 4 days ± 2.2. The mean newborn weight was 3128.11 g ± 593.93. Of all patients, only 13.7% had a previous anesthesiology appointment for childbirth purposes. However, all of them felt clear about labor analgesia and the role of the anesthesiologist during childbirth. Eutocic delivery was the most frequent mode of delivery (47.7%). The time frame between labor epidural analgesia and delivery

Table 1 – Sociodemographic, pregnancy and delivery characteristics (n = 300)*

| Variables | Mean (SD) |
|---|---|
| Age (years) | 31.39 (6.42) |
| Gestational age (weeks) | 38.65 (2.2) |
| Newborn weight (g) | 3128.11 (593.93) |
| | n (%) |
| Nationality | |
| Portuguese | 241 (80.3) |
| Other | 59 (19.7) |
| Marital status | |
| Married/ co-habiting | 228 (76) |
| Single/ divorced/ widow | 72 (24) |
| Education level | |
| No education or primary | 14 (4.7) |
| 9th grade | 67 (22.3) |
| High school | 80 (26.7) |
| College | 139 (46.3) |
| Employment status | |
| Employed | 191 (63.7) |
| Non employed | 109 (6.3) |
| Anesthesiology appointment | |
| Yes | 41 (13.7) |
| No | 259 (86.3) |
| Planned pregnancy | |
| Yes | 214 (71.3) |
| No | 86 (28.7) |
| Parity | |
| Primiparous | 138 (46.0) |
| Multiparous | 162 (54.0) |
| Mode of delivery | |
| Eutocic | 143 (47.7) |
| Dystocic | 57 (19.0) |
| Cesarean section | 100 (13.3) |
| Duration of labor analgesia | |
| < 12 hours | 187 (62.3) |
| > 12 hours | 113 (37.7) |

* Continuous variables have been summarized as mean (SD: standard deviation). Categorical variables are summarized as n (%)

lasted less than 12 hours in 187 patients (62.3%). Pregnancy and delivery characteristics are demonstrated in Table 1.

### Satisfaction

The main reason for giving birth at our institution was high-risk pregnancy (27.2%). The overall satisfaction related to the birth experience was good or excellent for 86.9% of women. Labor epidural analgesia (LEA) was performed on 96.0% of all patients, and of these, 10.6% had doubts about LEA, which were felt to have been reasonably or completely clarified by the anesthesiologists. Amongst the women on whom LEA was not performed, it was the choice of the pregnant woman in 55.6% of, and among these, all considered they had no doubts about the technique.

As for satisfaction with LEA, 37.5% of women regarded it as excellent and 44.6% as good. Regarding pregnant women's LEA satisfaction *versus* expectations, 40.7% considered it higher than expected, 45.0% considered it the same as expected and only 14.3% considered it lower than expected. A total of 92.2% of women felt accompanied by their anesthesiologist during labor, 98.2% found this monitoring to be important, while 96.1% of women would recommend LEA to family members or friends (Table 2).

### Information

Most pregnant women obtained knowledge about LEA

Table 2 – Satisfaction characteristics*

| Variables | n (%) |
|---|---|
| Labor epidural analgesia | |
| Yes | 282 (96) |
| No | 18 (4) |
| Pregnant woman's choice | 10 (55.6) |
| Medical contraindication | 1 (5.6) |
| No timing | 7 (38.9) |
| Reason to give birth at our institution | |
| Area of residence | 68 (23.1) |
| Family doctor referral | 32 (10.9) |
| Obstetrician referral | 52 (17.7) |
| High risk pregnancy | 80 (27.2) |
| Previous experience | 33 (11.2) |
| Other | 29 (9.9) |
| Overall satisfaction | |
| Excellent | 118 (39.3) |
| Good | 142 (47.3) |
| Acceptable | 33 (11.0) |
| Poor | 6 (2.0) |
| Very poor | 1 (0.3) |
| LEA satisfaction | |
| Excellent | 105 (37.5) |
| Good | 125 (44.6) |
| Acceptable | 35 (12.5) |
| Poor | 7 (2.5) |
| Very poor | 8 (2.9) |
| Expectations | |
| Higher than expected | 114 (40.7) |
| Same as expected | 126 (45.0) |
| Lower than expected | 40 (14.3) |
| LEA recommended to family members/ friends | |
| Yes | 271 (96.1) |
| No | 11 (3.9) |

* Categorical variables are summarized as n (%). LEA: labor epidural analgesia

from physicians (Table 3). Regarding the myths associated with epidural analgesia, more than half of patients believe that epidurals impose a dose limit (52.5%) and that epidurals often cause permanent back pain (58.9%). Educational level (Table 4) was observed to be significantly associated with some myths ($p < 0.05$), since women with higher education do not believe most of them.

A logistic regression was performed to ascertain the effects of age, educational level, employment status and parity on the likelihood that women believe 'epidurals make pushing difficult' (Table 5) and 'epidurals often cause permanent back pain' (Table 6). We used the Wald chi-square test to assess the unique contribution of each predictor.

The first model explained 21.3% of the variance in this myth and correctly classified 81.7% of cases [$\chi^2(8) = 11.126$, $p < 0.05$]. Women with a higher educational level were 3.06 times less likely to believe that an epidural makes pushing difficult compared to women with no education or with primary school education.

The second model explained 13.7% of the variance in this myth and correctly classified 66.3% of cases [$\chi^2(8) = 10.381$, $p < 0.05$]. Increasing age was associated with an increased likelihood of women believing that epidurals often cause permanent back pain.

Table 3 – Pregnant women information sources and myths*

| Variables | n (%) |
|---|---|
| Information source | |
| Family or friends | 49 (27.5) |
| Physician | 103 (57.9) |
| Internet | 12 (6.7) |
| Books | 7 (3.9) |
| Other | 7 (3.9) |
| Epidural myths | |
| Epidurals can harm the baby | 3 (1.7) |
| I can get an epidural just after 3 - 4 cm cervix dilatation | 65 (39.2) |
| If I have an epidural, I'm more likely to end up needing a C-section | 7 (4.1) |
| An epidural makes pushing difficult | 35 (20.7) |
| Epidural poses a dose limit | 83 (52.5) |
| An epidural can leave a woman paralyzed | 63 (37.1) |
| Epidurals often cause permanent back pain | 103 (58.9) |
| An epidural is not always performed by an anesthesiologist | 8 (4.7) |

* Categorical variables are summarized as n (%)

Table 4 – Education level and myths

| Variables | $\chi^2$ (df) | p |
|---|---|---|
| An epidural makes pushing difficult | 21.816[a] | < 0.001 |
| If I have an epidural, I'm more likely to end up needing a C-section | 7.332[a] | 0.047 |
| I can get an epidural just after 3 - 4 cm cervix dilatation | 8.089[a] | 0.039 |
| Epidurals often cause permanent back pain | 7.959[a] | 0.042 |

[a] Fisher exact test; $p < 0.05$

Table 5 – Binomial logistic regression model 'epidural makes pushing difficult'

| Variables | B | SE | p | Exp(B) | CI 95% |
|---|---|---|---|---|---|
| Constant | -2.026 | 1.267 | 0.110 | 0.132 | |
| Age | -0.010 | 0.037 | 0.787 | 0.990 | [0.921;1.064] |
| Educational level | | | 0.009* | | |
| No education or primary | | | | | |
| 9th grade | 3.765 | 1.236 | 0.002* | 43.179 | [3.826; 487.247] |
| High school | 1.477 | 0.613 | 0.016* | 4.379 | [1.318; 14.550] |
| College | 1.123 | 0.549 | 0.041* | 3.075 | [1.049; 9.017] |
| Employment status | 0.503 | 0.443 | 0.256 | 1.654 | [0.694; 3.943] |
| Parity | -0.393 | 0.445 | 0.378 | 0.675 | [0.282; 1615] |

Nagelkerke $R$ 0.213; overall percentage 81.7; * $p < 0.05$

Table 6 – Binomial logistic regression model for the myth 'back pain with epidural'

| Variables | B | SE | p | Exp(B) | CI 95% |
|---|---|---|---|---|---|
| Constant | 2.535 | 1.032 | 0.014 | 12.618 | |
| Age | -0.091 | 0.031 | **0.004*** | 0.913 | [0.859; 0.971] |
| Educational level | | | 0.189 | | |
| No education or primary | | | | | |
| 9th grade | 0.075 | 0.982 | 0.939 | 1.078 | [0.157; 7.390] |
| High school | 0.530 | 0.453 | 0.243 | 1.698 | [0.698; 4.130] |
| College | 0.839 | 0.399 | 0.036 | 2.314 | [1.058; 5.063] |
| Employment status | -0.074 | 0.367 | 0.841 | 0.929 | [0.453; 1.907] |
| Parity | 0.695 | 0.351 | **0.048*** | 2.004 | [1.007; 3.989] |

Nagelkerke $R$ 0.137; overall percentage 66.3; * $p < 0.05$

## DISCUSSION

To the best of our knowledge, this is the first study in Portugal to assess the perinatal experience from the perspective of pregnant women and considering the satisfaction and expectations of pregnant women pertaining to childbirth and the influence of LEA. There is an increasing need to improve the quality of care in healthcare: patients' satisfaction is the desired outcome of every healthcare unit. The overall satisfaction level with birth experience (86.9%) and LEA (82.1%) is very high in our center. Most women chose to accept LEA. Sociodemographic factors do not seem to affect these observations.

Fenwick *et al* pointed out that the use of different sources to obtain information and knowledge about childbirth helped women to cope with the actual childbirth experience and influenced their childbirth expectations as well.[15] Our findings showed that the primary sources of information about childbirth and LEA were their physicians (57.9%) and family members or friends (27.5%). Unexpectedly, the internet accounted for only 6.7%. Other studies indicated that family, friends and the internet were women's primary sources of information about childbirth.[16,17]

The potential role of women's individual beliefs, perceptions, attitudes, and thoughts should not be ignored in relation to how they feel and behave in labor.[3] Regarding LEA satisfaction versus expectations, 40.7% considered it higher than expected, 45.0% considered it same as expected and only 14.3% considered it lower than expected. In our center, a very small percentage of women (13.7%) are referred to an anesthesiology appointment before labor. Our data highlighted the importance of the organizational aspects of care and the need for more information during consultations in order to achieve greater maternal satisfaction with anesthesiology healthcare. There is a significant association between the level of education and misconceptions about LEA. This means that most women did not have enough information, which in turn affected their expectations about behavior during labor. It is important to point out that some women have unrealistic expectations about their ability to cope during labor. Therefore, inconsistencies between women's expectations and coping during labor may be improved so that women can clarify their doubts and clear up any myths surrounding LEA.

The implications from this study support the need for an evaluation of the current information of women about LEA and childbirth. Women's individual needs can be significantly covered by multidisciplinary teams including anesthesiology appointments. Educational programs are a contributory factor in increasing realistic knowledge to expectant mothers about what happens during labor.

Certain limitations of this study should be noted. The sampling was a convenience sample using face-to-face recruitment which may be a source of selection bias and the data collected were restricted to a single-center. The study is strengthened by its prospective nature and being a study that looked at the relationship between sociodemographic and obstetric components with misconceptions. Further research with a larger sample size and comparing postnatal care with antenatal care with anesthesiology appointments would be of great interest.

## CONCLUSION

Maternal satisfaction with childbirth is a complex dynamic that includes, but is not limited to pain relief. The overall experience of childbirth for each woman depends on meeting the pre-delivery or antenatal expectations of childbirth. Even with the provision of significant pain relief through LEA, the obstetric and anesthetic teams and pregnant woman will have to work together to understand and address the expectations and misconceptions of childbirth for each pregnant woman in a pragmatic manner. A systematic assessment of maternal satisfaction may help obstetric units to identify potential trouble spots.

## PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association updated in 2013.

## DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

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