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ABSTRACT

Objective: To examine the influence of attachment dimensions and sociodemographic and physical predictors in the experience of labour pain. **Methods**: Eighty-one pregnant women were assessed during their third trimester of pregnancy and during labour. The perceived intensity of pain in the early stages of labour (3 cm of cervical dilatation) and before the administration of patient-controlled epidural analgesia (PCEA) was measured using a visual analogue scale (VAS). Pain was also assessed based on the consumption of anaesthetics. Attachment was assessed using the Adult Attachment Scale – Revised (AAS-R). **Results**: Attachment anxiety and avoidance were positively and significantly correlated with labour pain and anaesthetic consumption. In the multivariate models, attachment anxiety was a significant predictor of higher pain at 3 cm of cervical dilatation (β = 0.36, p = .042) and before the administration of PCEA (β = 0.51, p = .002). Older age (β = 0.31, p = .005), a shorter duration of labour (β = -0.41, p = .001) and attachment avoidance (β = 0.41, p = .004) were significant predictors of higher anaesthetic consumption. **Conclusions**: The study findings suggest that perceived labour pain and anaesthetic consumption are strongly associated with attachment, rather than demographic and physical factors. These data support the importance of understanding the experience of labour pain within an attachment theoretical framework.

Key words: Adult attachment; Analgesia; Labour; Pain

INTRODUCTION

Labour pain is a systemic and multifactorial process that consists of perceptual, affective, cognitive and emotional dimensions that influence pain expression through cortical and limbic inputs for supraspinal modulation (1). Due to its intensity and impact on women's health and life (2), multiple therapeutic approaches have been developed to address labour pain, and neuro-axial blocks are frequently used (3). Patient-controlled epidural analgesia (PCEA) is an important therapeutic development and is increasingly used worldwide (4). The PCEA allows patients to be active agents in managing their pain, by self-administering doses of analgesics according to their individual needs, and within safe limits that are programmed into an infusion pump (4).

Recent advances in PCEA involve the administration of lower anesthetic concentrations and produce excellence clinical results (5), even when initiated in the early stages of labour (6). The technical characteristics of PCEA promote respect for non-intrusion and the expression of the individuality of the woman, who has control over the process, and enable objective pain data to be recorded. In this context, maternal satisfaction with childbirth may be increased by allowing the woman greater control over her analgesia (4).

The experience of labour pain is a result of the complex processing of multiple physical and psychosocial factors. These factors, which are often interconnected, do not have an independent influence on pain perception during labour (7). Instead, each factor occurs within the context of the total functioning of the woman and helps to create a unique labour experience. As a result, psychological factors are of considerable importance. Psychological research in the context of labour pain has primarily focused on factors such as fear and anxiety, which have been correlated with increased pain and reduced tolerance to pain (8-11). Recently, theoretical (12-14) and empirical evidence (15-23) has highlighted the potential of attachment theory in providing valuable insights regarding individual differences in pain response and adaptation. Thus, incorporating attachment into psychosomatic research can provide a unique perspective on the contribution of interpersonal constructs to health behaviours (24). Because attachment constructs are theoretically and empirically distinct from other psychological constructs, such as emotional states (25), this assessment may help

identify women who are at a higher risk for reporting more pain or more problematic adaptation to pain during childbirth.

Pregnancy and childbirth constitute a significant life transition that, according to attachment theory, should activate the attachment system and elicit a complex interplay of cognitions, emotions, and attachment behaviours, in order to increase proximity to attachment figures (26). The attachment patterns are formed during infancy and early childhood and are based upon the interactions with primary caregivers, particularly those surrounding affect regulation and the management of stress-inducing events (27). Attachment can be seen as the stable propensity of an individual to establish an emotional bond to others (attachment figures) for safety and security. Accordingly, interpretation and meaning given to the world, including symptoms such as pain, range from positive to negative personal representations of the self (conceptually similar to attachment anxiety) and from positive to negative personal representations of others (conceptually similar to attachment avoidance) (28).

Although the role of attachment patterns during the transition to parenthood has been supported empirically (26,29,30), studies examining how attachment relates to labour pain are still lacking. Childbirth is considered to be one of the most intense and painful experiences of a women's life. As pain is often described as an unpleasant feeling or emotional experience and is appraised as a form of physical and emotional threat to one's well-being, women may use attachment behaviours to regulate negative emotions and to manage threatening or stress-inducing situations, in order to increase their sense of security (25). These behaviours may have important implications for understanding individual differences in pain and are crucial for prevention and the initiation of early intervention and pain management (31).

As mentioned, various studies have examined how attachment patterns relate to pain. Research has produced mixed findings, and while some studies have found significant associations between attachment patterns and pain disability (15,16) and intensity (16,17), others have reported no association between attachment and pain intensity (15,18,19). There is evidence to suggest that attachment anxiety has a more consistent effect on pain than attachment avoidance (14). Specifically, attachment anxiety has been associated with higher levels of pain (16,17), less perceived control over pain (20), more pain-related suffering (17), and higher levels of pain-related fear and pain-related

catastrophising (20-22). In contrast, attachment avoidance has been associated with lower pain self-efficacy (19).

Other variables are also important in understanding labour pain. There is evidence to suggest an inverse association of labour pain intensity with maternal age (8,32). Furthermore, while some findings have shown that, on average, nulliparous women report greater pain than parous women during labour (32, 33), others have not found such an association (34). Other obstetric factors that have been shown to be associated with pain include foetal presentation (35), dystocia (36), higher foetal weight (32), and the artificial induction of labour (37). A history of dysmenorrhoea and menstrual back pain has also been documented as a gynaecological predictor for obstetric pain (8,32). Although some data have suggested a positive association between labour pain and the pre-pregnancy body mass index (BMI) (32), this relationship has not been confirmed in other studies (38,39). Finally, some studies have also stressed the importance of childbirth training in decreasing labour pain (32,40). This training can increase the levels of endogenous opioids (41), help to set more accurate expectations about uterine contractions and teach women how to use active coping methods, such as controlled breathing during labour (40).

The purpose of this study was to examine the influence of maternal attachment, sociodemographic and physical predictors in the experience of labour pain. Based on the literature review, it was expected that attachment dimensions, particularly attachment anxiety, would be significantly associated with higher pain intensity (assessed directly and indirectly by the consumption of anaesthetics), as would younger age, nulliparity, higher pre-pregnancy BMI, dysmenorrhoea, a history of low back pain, higher foetal weight, and non-participation in childbearing preparation classes.

METHODS

Participants and Procedures

Ethical approval to conduct this prospective and observational study was obtained from the Ethics Committee of the Maternity Alfredo da Costa (Lisbon, Portugal) as well as from the National Commission of Data Protection. All participants were informed of the purpose of the study, and those

who agreed to participate provided written informed consent. Participants received no compensation for their participation.

General inclusion criteria were as follows: age ≥ 18 years; normal and singleton pregnancy; nulliparous or parous (≤ three pregnancies); absence of obstetric indices for foetal-pelvic incompatibility; absence of a history of caesarean section for dystocia; absence of psychopathological disorders and substance abuse; absence of contraindications to epidural techniques and prior analgesia with opioids; and ASA Physical Status I and II (according to the American Society of Anesthesiologists (ASA)'s Physical Status Classification System).

The sample collection took place between April 2010 and November 2011. Participants were assessed at the following three time points: within their third trimester of pregnancy (26 weeks or more), before the PCEA protocol was administered, and after the PCEA protocol was administered. In the first assessment, sociodemographic and obstetric-gynaecological data were collected. In addition, participants completed the Adult Attachment Scale – Revised. The second and third assessments included the collection of data regarding labour, delivery, the newborn, the analgesic technique, and pain assessment. A total of 132 pregnant women who were consecutively recruited by convenience sampling accepted the invitation to participate in the study. Of those, 51 participants were excluded because they did not complete all phases of the study (completion rate = 61.4%), out of which 47 women were excluded because of an incomplete antenatal assessment (e.g., incomplete sociodemographic, psychometric and biological data), and four because of an interruption in the analgesic protocol during labour. Therefore, the final sample consisted of 81 pregnant women. Women who were excluded from the analyses were more likely to be nulliparous ($\chi^2(1) = 4.31$; $p = .038$; Cramer's $V = .18$ (69.6% vs. 50.6%)) and to report lower attachment anxiety scores ($t(125) = -3.06$, $p = .003$, Cohen's $d = .57$ ($M \pm SD = 2.21 \pm 0.72$ vs. $M \pm SD = 2.66 \pm 0.84$)). Based on Cohen's (42) recommendations, this sample size provides adequate statistical power for detecting medium to large effect sizes using correlational and multiple regression analyses.

All participants received the standard PCEA protocol adopted at the institution. The protocol consisted of ropivacaine 0.6 $mg.ml^{-1}$ plus sufentanil 0.5 $\mu g.ml^{-1}$. After an initial dose (10-12 ml), the epidural catheter was connected to an infusion pump (Smart Pump CADD® - SOLIS, Smiths Medical

MD, Inc., St. Paul, USA), programmed with a background infusion of 3 ml. h^{-1}, a 5-ml patient-controlled bolus, a lockout of 15 minutes, and an hourly limit of 20 ml.h^{-1}. This regimen was maintained both in the early and late stages of labour. However, women who experienced inadequate analgesia received supplemental doses of a solution of ropivacaine 0.06% (without sufentanil). The participants were instructed on the use of the PCEA pump before the epidural catheter was inserted. The instructions included specific directions to each woman to press the button whenever she began to feel discomfort. According to the same institutional protocol, after epidural analgesia was established, all women received an oxytocin infusion.

Measures

Sociodemographic and clinical information

Sociodemographic, obstetric-gynaecological history, physical variables and data about childbirth preparation classes were gathered during the interview. Additional data were collected during the second and third assessments, including cervical dilatation at the beginning of analgesia, oxytocin use before analgesia, and the duration of labour. After birth, the newborn's weight and Apgar scores at 1 and 5 minutes were also collected.

Pain

The perceived intensity of labour pain was measured using the visual analogue scale (VAS), with one anchor at 0, which represented "no pain at all", and a second anchor at 100, which represented "the worst pain imaginable." The first measurement was obtained before the administration of the PCEA when the patient was at 3 cm of cervical dilatation (VAS initial), and the second measurement was taken at the beginning of analgesia (VAS analgesia) at two consecutive uterine contractions (mean of the two scores). After the PCEA was initiated, pain was also indirectly assessed by analysing the anaesthetic consumption, which was defined in terms of the average dose per hour. This indicator indirectly reflects labour pain because it is determined by the needs of the patient, who is free to administer the required additional analgesia. Local anaesthetic requirements were obtained from the PCEA recordings, and all records were transcribed as individual reports using the CADD® software (Solis Medication Safety software).

Adult attachment

Adult attachment was assessed with the Portuguese version of the Adult Attachment Scale – Revised (AAS-R) (43). The AAS-R consists of 18 items that are scored on a 5-point scale (1 = *Not at all characteristic of me* and 5 = *Extremely characteristic of me*) and organised into two dimensions (*Anxiety* and *Avoidance*) (44). Individuals with high scores on the *Anxiety* dimension tend to display an excessive concern with their own distress and negative emotions and tend to overreact to their negative feelings to elicit support from others. Individuals with high scores on the *Avoidance* dimension seek distance (at the cognitive and behavioural levels) from the stressful event, appearing less sensitive; avoid closeness and interdependence in relationships; and avoid seeking emotional or instrumental support from others (45). Examples of items in each scale include the following: "I want to get close to people, but I worry about being hurt" (anxiety) and "I find it difficult to allow myself to depend on others" (avoidance). A recent literature review (46) reported that AAS-R had a good reliability and validity, is widely used and has potential utility for psychosomatic research. In this sample, Cronbach's alpha values were .87 (*Avoidance*) and .89 (*Anxiety*).

Covariates

Potential confounders, identified as those theoretically linked or significantly correlated with the dependent variables at $p < .05$ in a univariate analysis, were entered as covariates. Thus, all models controlled for age, parity, pre-pregnancy BMI, dysmenorrhoea, low back pain, newborn birth weight, and participation in childbearing preparation classes. For analyses concerning analgesic consumption, the mode of delivery and the duration of labour were also added to the model. Categorical variables were dummy-coded before inclusion in the models.

Statistical Analyses

Data analyses were conducted with IBM SPSS, version 20.0. Descriptive statistics with means and standard deviations (*SD*) are reported for continuous variables, and frequencies are reported for categorical variables. A paired-samples t-test was used to assess changes in the pain score over time. Associations between study variables were examined using Pearson's correlation. In order to assess the association between attachment dimensions and the increase in pain intensity over time, a change score was calculated by subtracting the VAS initial score from the VAS analgesia score. This association was then analysed using Pearson's correlation. Predictors of labour pain were examined in

a hierarchical multiple regression (HMR) analysis. The dependent variables were the measures of pain (VAS scores and anaesthetic consumption), and the predictor variables were the sociodemographic and physical variables and the attachment dimensions. In the first step, sociodemographic and physical variables were included in the regression analysis. In the second step, the attachment dimensions were included to explore the additional effect of these dimensions on the pain scores. Based on established procedures (47), attachment dimensions were centred (i.e., re-scaled so that the mean of each scale was 0) to reduce multicollinearity. The multicollinearity was assessed using tolerances and variance inflation factors (VIF). As suggested by Cohen et al. (48), the effect size that was attributable to the increment in R^2 was also calculated. The effect sizes were calculated with Cohen's *d* for Student's *t* test and Cohen's f^2 for the multiple regression analysis. The effect sizes are presented for all analyses (small: Cohen's $d \geq 0.20$, Cohen's $f^2 \geq 0.02$; medium: Cohen's $d \geq 0.50$, Cohen's $f^2 \geq 0.15$; large: Cohen's $d \geq 0.80$, Cohen's $f^2 \geq 0.35$) (42).

RESULTS

Participant Characteristics

The study sample consisted of 81 pregnant women in the third trimester of pregnancy (median = 33 weeks) with a mean age of 32.07 years. All women were married or cohabitating, and the majority had secondary (n = 30; 37%) or higher education (n = 37; 45.7%). Additional clinical, obstetric and newborn characteristics are shown in Tables 1 and 2.

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Labour Pain

The report of pain intensity prior to analgesia administration was significantly higher than the pain at 3 cm of cervical dilatation ($t(80) = -10.53$; $p < .001$; Cohen's $d = 0.11$). Neither attachment anxiety ($r = -0.15$; $p = .19$) nor avoidance ($r = -0.15$; $p = .17$) were significantly associated with this increase in pain intensity.

Although the VAS initial scores ranged from 21.0 to 100, 28.4% (n = 23) of scores were at or above 80, and five participants (6.2%) rated their pain peak at 100. The VAS analgesia score ranged from 55 to 100. Fifty ratings (61.7%) were at 80 or above, and 19.8% (n = 16) rated their pain peak at 100. Women who rated their peak at 100 reported significantly higher attachment anxiety (M ± SD =

3.39 ± 0.53) than those who did not (M ± SD = 2.48 ± 0.48) ($t(79) = -4.25$; $p < .001$; Cohen's d = 1.78). Similar results were found for avoidance (M ± SD = 3.34 ± 0.49 vs. M ± SD = 2.77 ± 0.59) ($t(79) = -3.55$; $p = .002$; Cohen's $d = 1.04$).

Correlation between Labour Pain and Anaesthetic Consumption

A range of analyses was conducted to explore the associations between the pain scores, anaesthetic consumption, attachment dimensions, and any of the sociodemographic and physical variables (Table 3). The VAS pain scores were significantly positively correlated with anaesthetic consumption. Of note, older age was positively associated with anaesthetic consumption. The duration of labour was negatively correlated with anaesthetic consumption. All pain scores and anaesthetic consumption were significantly correlated with both attachment anxiety and avoidance.

The attachment dimensions were not significantly correlated with most sociodemographic and clinical variables. However, a significant association was found between attachment anxiety and age ($r = 0.33$; $p = .002$). Additionally, both attachment anxiety and avoidance were significantly correlated with the number of boluses ($r = 0.60$, $p < .001$, and $r = 0.69$, $p < .001$, respectively) and the ratio of PCEA demands/PCEA delivered ($r = 0.60$, $p < .001$, and $r = 0.55$, $p < .001$, respectively). Attachment avoidance and anxiety dimensions were also significantly correlated ($r = 0.77$, $p < .001$).

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Predictors of Labour Pain and Anaesthetic Consumption

To assess the combined contribution of sociodemographic, physical, and attachment dimensions on the pain scores, separate HMR analyses were conducted. The final models are summarised in Table 4. The preliminary analyses of the collinearity statistics in the regression models (tolerance values > 0.31 and VIF < 3.20) suggested that multicollinearity did not compromise the interpretability of these results (49).

Regarding the initial VAS, the results indicated that none of the variables included in the first step were significant. In the second step, attachment anxiety was statistically significant and was responsible for 23% of the additional variance (the effect size attributable to the addition of attachment dimensions [Cohen's f^2] was 0.33). For the VAS analgesia scores, the results demonstrated significant coefficients for age. Older age was associated with higher pain intensity. In the second step,

attachment anxiety was statistically significant and accounted for 33% of the additional variance (Cohen's $f^2 = 0.61$).

A similar analysis was conducted for anaesthetic consumption. In the first step, older age and a shorter duration of labour were associated with a higher hourly dose of ropivacaine and accounted for 33% of the variance. After including attachment dimensions, the duration of labour remained significant, and age was marginally significant ($p = .064$). Attachment avoidance was also a significant contributor (Cohen's $f^2 = 0.57$) and accounted for 25% of the additional variance. Together, the duration of labour and attachment avoidance accounted for 57% of the total variance.

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DISCUSSION

Because it is an intense stress-inducing event, labour pain may activate a woman's internal resources, particularly attachment system, as a means of adaptation (25). To assess this hypothesis, the current study examined the associations between attachment dimensions and labour pain, in addition to sociodemographic and physical predictors, based on the premise that insecure dimensions (that is, higher attachment anxiety and avoidance) may represent significant predictors of labour pain. To date, this is the first study that has confirmed a significant association between attachment and labour pain and substantiated the relationship between the two attachment dimensions and pain (either directly assessed by VAS or indirectly through the analgesic consumption). As this association has not been considered in other studies that addressed the implications of psychological factors for labour pain, this study makes a contribution to the growing body of literature examining adult attachment in the context of pain.

The most significant results of this study show that attachment dimensions are positively associated with both direct and indirect indicators of pain, above and beyond demographic and physical factors. This association supports the study's initial predictions, expands the understanding of labour pain beyond the already known variables, and emphasises the role of psychological factors and of attachment theory as a valuable conceptual framework for understanding labour pain.

In the multivariate models for the VAS initial and VAS analgesia, only attachment anxiety accounted for significant variances in labour pain. These findings are consistent with the study

hypothesis and with prior studies suggesting an association with perceptions of higher pain intensity (16,17). These findings are also consistent with other studies that have found that individuals who are anxious about the availability of support perceive their pain more negatively (18) and cope poorly with pain (20). Although the evidence suggests that individuals with higher attachment anxiety and avoidance scores are more likely to experience higher levels of pain, these effects appear to be more consistent for attachment anxiety than for attachment avoidance (14). This finding may occur because women who perceive others as unwilling to provide support (and perceive themselves as unworthy of support) tend to appraise pain as more threatening, to amplify their pain and its implications to receive more care and support from others, and to rely on less effective coping strategies (14,22). Together, these results support the conclusions of earlier studies that portray attachment security as a more adaptive trait and attachment insecurity as a vulnerability to more negative experiences of pain (19).

Based on the results of this study, attachment avoidance has a smaller association with pain scores than attachment anxiety, since the former was only significantly associated with anaesthetic consumption. Although to the author's knowledge no studies have examined this association, these findings are partially consistent with the evidence that has linked attachment avoidance to lower pain self-efficacy (19). These results are reflective of the negative view of others held by individuals with attachment avoidance and also reflect their views on self-reliance; these individuals have a tendency to doubt the capacity of others to provide support, to minimise threats and to view themselves as more capable of coping on their own (45). As adult attachment has been developmentally linked to self-efficacy (50), it is possible that insecure dimensions may be associated with diminished control over pain, and greater anaesthetic consumption may thus reflect a means to manage pain. An alternate explanation may be related to prior evidence from studies in other samples that have identified a link between attachment avoidance and substance use (51). Consistent with the evidence relating attachment avoidance to greater use of external regulators of affect (24), the higher analgesic consumption among women with avoidant attachment can be understood as an attempt to minimise dependence on others and to suppress negative affects through "self-medication".

As mentioned, multiple sociodemographic and physical factors can influence the intensity of labour pain (7,8,10,32), and research focusing on the psychological component should also take these

factors into consideration. Along with attachment dimensions, older age was significantly associated with greater labour pain; however, this result was not consistent with prior literature (32). As age is frequently assumed to be a minor predictor, an alternate hypothesis is that the interaction of age with other variables may help to explain this inconsistency. Particularly, in this study, older age was significantly associated to higher scores in attachment anxiety. Future studies should therefore examine this association more comprehensively. Additionally, these characteristics may have also influenced our results regarding parity, which did not indicate any significant association between nulliparity and pain, as was reported in prior studies (10,32,33). However, this finding is consistent with another study that also failed to identify an association between nulliparity and labour pain (34). It was also expected that a history of dysmenorrhoea would be a significant predictor of higher labour pain; however, no significant associations were observed. The low percentage of women with dysmenorrhoea (12.3%) may explain the absence of a significant effect on pain scores and pharmacological consumption. It is possible that the association between the length of labour and lower hourly consumption of anaesthetics may be an indication of the efficiency of the PCEA ultra-light dose (4-6). In this study protocol, low anaesthetic volumes in the continuous background infusion and in the self-administered bolus were used for labour analgesia. Analgesia was administered early in the active phase of labour (pre-analgesia cervical dilatation: 3.46 cm ± 0.50) using an initial dose of significant volume (10-12 ml). As the initial dose is reflected in the computation of the hourly consumption, that may have influenced the volumes in short-term deliveries.

This study had several methodological strengths. First, the respect for the ethical limits of a naturalistic investigation was reflected in the method and had operational implications. Specifically, because pain is multi-dimensional, it can be difficult to assess; therefore, measures were selected to allow a valid communication (direct or indirect) of painful symptoms and their variations through an approximately standardised description. When using a PCEA, the use of unidimensional scales to record pain intensity is a common procedure, especially at pre-determined intervals or in defined moments of cervical dilation (4). The PCEA allows for some degree of autonomy and provides a space of intimacy, allowing the woman to control the therapy to establish a sense of comfort during labour. In this study, it was chosen not to interfere in this environment because regular assessments cannot

reveal the dynamics of individual oscillations, and the intrusion of the researcher could have interfered with the painful experience. Thus, the VAS was used in designated time points (before analgesia, at 3 cm of cervical dilatation, and at the time of analgesia administration (VAS analgesia)). In the PCEA, self-administrations are triggered early once the woman experiences the beginning of a nociceptive increase in pain; at these times, the pain scores are usually very low (4). Therefore, the rhythm of boluses and the consumption of analgesics represent rigorous indicators of individual differences. Second, the assessment of attachment during pregnancy and the underlying longitudinal design of this study allowed to more clearly demonstrate the directionality of the association between attachment and the study main outcomes. Third, the inclusion of multiple determinants into one model was useful in explaining labour pain and analgesic consumption.

Despite these strengths, there are also some limitations that should be considered when interpreting these findings. First, a convenience sampling method was used, and the available participants may not be representative of the pregnant population. Second, the modest sample size limits the strength of the conclusions and limits its power to detect small but potentially important differences. According to Cohen (42), post-hoc power calculations demonstrated that the achieved sample size allowed for the detection of moderate to large effects. Additionally, the reasonably high and biased dropout rate (e.g., the participants that were excluded were more likely to be nulliparous and to report lower scores on attachment anxiety) must be considered as it may have compromised the validity of these findings. Accordingly, the current study should be replicated with larger samples to confirm and further clarify the findings reported herein. Third, attachment was assessed using a self-report measure. Because attachment reflects an individual's subjective perceptions of their close relationships, it is possible that participants may be vulnerable to reporting bias. Therefore, it may be useful to replicate these findings with alternative methods of data collection, such as the Adult Attachment Interview (52). The assessment of attachment patterns using this interview may strengthen the validity of these findings. Finally, other psychological constructs that were not assessed may have a significant impact on the relationships examined. Because of the evidence indicating associations between attachment and other psychological constructs, such as anxiety and fear, it may have been valuable to include these variables in the current study. It is worth noting, however, that although an

association between these constructs exists, the associations are modest (22,23), which suggests that these constructs are not redundant. Further research should incorporate these variables along with others, such as individual characteristics (e.g., personality traits such as neuroticism) and social support. In the absence of these measures, caution should be exercised when interpreting the observed effects as a reflection of attachment.

The findings of this study may also translate into relevant clinical implications. First, these findings support the attachment model as a reliable framework to elucidate the interplay between psychological models of self and others, pain, and intrapartum anaesthetic consumption. The assessment of attachment has the potential to early identify women who are at a high risk of suffering from more pain during childbirth and of coping with pain in a less effective manner. As secure attachment representations are an important inner resource in the face of stress-inducing events, an understanding of attachment patterns and a better knowledge of psychosocial factors will allow for more effective interventions and better pain management. The efficient management of pain requires not only the use of pharmacological agents but also careful attention to individual and relational factors that may account for variabilities in the pain experience. The use of non-pharmacological methods of labour pain management, such as emotional preparation/support and training interventions to teach coping skills, may be helpful for women. This focus may create an opportunity for obstetric care health professionals to educate patients about pain management, provide coping strategies for increasing perceived personal control and self-efficacy, and individualise care, which will avoid a "one size fits all" approach (13). For example, women with higher attachment anxiety, who are more likely to catastrophise about pain, may benefit from interventions that focus on reducing excessive support-seeking, modifying the appraisal of pain (to see it as less threatening) and developing more adaptive pain-coping skills. In contrast, women with higher attachment avoidance may benefit from interventions that are adjusted to their discomfort with intimacy as well as from interventions that encourage them to communicate their emotions; these interventions may decrease the need to regulate their emotions by using more analgesics. Thus, these results can promote a major shift in institutional practices and therapeutic procedures to recognise pregnancy as a complex process of biological changes and psychological reorganisation.

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Table 1. Descriptive Statistics for Categorical Variables (n = 81)

	N	%
Nulliparous	41	50.6
Childbirth preparation training	67	82.7
Back pain	22	27.2
Dysmenorrhoea	10	12.3
Oxytocin use before analgesia	56	69.1
Mode of delivery		
Vaginal	57	70.4
Instrumental	13	16.0
Caesarean	11	13.6
Apgar score < 7		
At 1 min	8	9.9
At 5 min	2	2.5

Table 2. Descriptive Statistics for Continuous Variables (n = 81)

	Mean	SD	Range
Age (years)	32.07	5.09	19-45
BMI (pre-pregnancy) ($kg.m^{-2}$)	24.47	3.77	16.30-18.21
Cervical dilatation prior to analgesia (cm)	3.48	0.50	3-4
Duration of labour (min)	409.88	182.81	90-876
Newborn birth weight (gr)	3190.89	343.14	2465-3860
Attachment – Anxiety	2.66	0.84	1.00-4.17
Attachment – Avoidance	2.88	0.61	1.58-3.92

Table 3. Descriptive Statistics and Pearson Correlation Coefficients for the Study Variables

Variables	VAS initial	VAS analgesia	Analgesic consumption
	r (*p*)	*r* (*p*)	*r* (*p*)
VAS initial	-		
VAS analgesia	0.65 (< .001)	-	
Analgesic consumption	0.19 (.095)	0.35 (.001)	-
Age	0.17 (.13)	0.25 (.022)	0.31 (.004)
Parity	-0.09 (.41)	-0.11 (.35)	-0.02 (.84)
Low back pain	-0.16 (.17)	-0.14 (.20)	-0.01 (.90)
Dysmenorrhoea	-0.02 (.86)	0.02 (.84)	0.04 (.72)
Pre-pregnancy BMI	-0.03 (.81)	-0.05 (.67)	0.12 (.29)
Childbirth preparation	-0.01 (.92)	-0.02 (.85)	0.04 (.71)
Oxytocin use before analgesia	-	-	0.01 (.95)
Mode of delivery	-	-	0.19 (.093)
Duration of labour	-	-	-0.46 (< .001)
Newborn birth weight	0.02 (.87)	0.00 (.99)	0.11 (.34)
Attachment – Anxiety	0.53 (< .001)	0.65 (< .001)	0.49 (< .001)
Attachment – Avoidance	0.46 (< .001)	0.53 (< .001)	0.46 (< .001)
M	66.25	84.11	12.02
SD	20.08	12.85	3.70
Range	21.00-100.00	55.00-100.0	5.66-21.45

Note: Parity (0 = Nulliparous, 1 = Parous); Low back pain (0 = No, 1 = Yes); Dysmenorrhoea (0 = No, 1 = Yes); Childbirth preparation (0 = No, 1 = Yes); Oxytocin use before analgesia (0 = No, 1 = Yes); Mode of delivery (0 = Vaginal, 1 = Instrumental/Caesarean).

Table 4. Hierarchical Multiple Regression Analyses for Variables Associated with Pain Scores and Anaesthetic Consumption

	β	p	F	p	ΔR^2
VAS initial					
Step 1			0.91	.51	.08
Age	0.23	.057			
Parity	-0.15	.23			
Pre-pregnancy BMI	-0.05	.66			
Dysmenorrhoea	-0.04	.77			
Low back pain	-0.15	.21			
Childbirth preparation	-0.01	.91			
Newborn birth weight	0.06	.64			
Step 2			3.57	.001	.23
Anxiety	0.36	.042			
Avoidance	0.18	.30			
VAS induction					
Step 1			1.51	.18	.13
Age	0.32	.008			
Parity	-0.18	.15			
Pre-pregnancy BMI	-0.08	.50			
Dysmenorrhoea	-0.00	.99			
Low back pain	-0.16	.17			
Childbirth preparation	-0.04	.74			
Newborn birth weight	0.05	.71			
Step 2			6.70	< .001	.33
Anxiety	0.51	.002			
Avoidance	0.13	.38			
Analgesic consumption					
Step 1			3.83	.001	.33
Age	0.31	.005			
Parity	-0.01	.96			
Pre-pregnancy BMI	0.02	.87			
Dysmenorrhoea	-0.02	.83			
Low back pain	-0.04	.71			
Childbirth preparation	0.08	.48			
Mode of delivery	0.13	.24			
Duration of labour	-0.41	< .001			
Newborn birth weight	0.13	.24			
Step 2			8.39	< .001	.25
Anxiety	0.14	.34			
Avoidance	0.41	.004			

Note: Parity (0 = Nulliparous, 1 = Parous); Low back pain (0 = No, 1 = Yes); Dysmenorrhoea (0 = No, 1 = Yes); Childbirth preparation (0 = No, 1 = Yes); Mode of delivery (0 = Vaginal, 1 = Instrumental/Caesarean).