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Effects Of Lavandula Angustifolia During And After Childbirth On Women Assisted At The Maternity Ward Of The Regional Hospital Of São José – SC, Brazil.

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Abstract
The physiology of childbirth can be a moment marked by intense pain, despite being a desired and special moment for women. Thus, implementing non-pharmacological, low-cost and easy-to-apply measures is vital during this process. This study investigated the effect of inhaling Lavandula angustifolia essential oil in active labour and in the immediate postpartum period. This randomized and placebo-controlled clinical trial was conducted at a public maternity hospital from southern Brazil in 2021. The women were allocated to a control group with inhalation of grape seed oil and to an intervention group with the Lavandula angustifolia essential oil. The women were evaluated with the pain score and subjected to inhalation until their infants were born. Other variables related to the perinatal outcome were collected from the medical record, and a delivery and postpartum satisfaction questionnaire was applied. Lavender oil showed an analgesic effect from the 4^{th} hour since the beginning of labour, associated with the lower need for analgesics requested by the parturients. Both groups showed no changes concerning the Apgar score at the 1^{st} and 5^{th} minutes, showing no toxicity due to lavender. The advancement in knowledge about the effect of Lavandula angustifolia essential oil on pain control during childbirth is highlighted. Future studies are suggested to confirm the possible benefit of the protocol employed in reducing the need to use analgesics during labour.

Keywords: *Labour pain, Aromatherapy, Lavandula angustifolia, Postpartum period.*

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I. Introduction

Despite being special and desired, childbirth is a time when symptoms such as pain, anxiety and fatigue may occur.[1] Pain during labour is mainly caused by uterine contractions, cervical and vaginal floor dilatation and pelvic stretching, being described as one of the most intense forms of pain experienced by human beings.[2,3]

In addition to pain, at the time of labour, many emotions are present and in conflict. The anxiety experienced by parturient women can enhance the perception of pain, prolong the delivery period, or interfere with their experience of satisfaction with labour and birth.[4] These emotions (such as fear, for example) are among the main reasons why women decide on caesarean sections, associated with more significant risks for the mothers and newborns.[5]

In this way, pain management during labour becomes critical and can be carried out through pharmacological or non-pharmacological measures. Thus, although non-opioid and non-steroidal anti-inflammatory drugs are effective and relatively safe, epidural analgesia is associated with more prolonged labour and may interfere with release of the endogenous hormone (oxytocin) responsible for stimulating breast milk production.[6] On the other hand, it has been argued that pharmacological interventions for pain management are not always directly related to women's satisfaction with childbirth. At the same time, factors such as support from caregivers, respect for the parturients' expectations and the possibility of being involved in decision-making during this process are crucial.[7]

Many women have been looking for non-pharmacological, easy-to-apply and low-cost methods to relieve pain during labour,[8,10] which have even influenced the emergence of service providers such as doulas, who work in hospital services for the care to be provided to parturients. These caregivers employ different therapeutic modalities, including water immersion techniques, massage, ambulation, acupuncture, transcutaneous electrical nerve stimulation and prenatal education.[9, 34]

In this context, aromatherapy is another modality used during labour, aiming to reduce pain and anxiety, as well as duration of delivery.[11,12] Essential oils from different plants have been used, with lavender offering promising applicability, both due to the number of scientific studies that investigated its action and to the positive results it has presented.

However, it is noted that the current literature on aromatherapy has limitations, such as the small number of patients evaluated in each study, the difficulty implementing the blinding technique due to the odour of essential oils, and the lack of studies conducted with populations from different continents. Thus, some crucial aspects for the safe implementation of aromatherapy remain to be elucidated, such as: which would be the best intervention technique (inhalational or topical, for example); which is the best protocol/technique for the application of essential oils; which oil is best for each woman depending on clinical conditions; the best dose; the best time interval between administrations; and the maximum administration period, among others that need to be defined.[13]

In this sense, we investigated the effects of inhalation with Lavandula angustifolia essential oil on active and postpartum labor of women assisted at the Maternity Ward of the Regional Hospital of São José, Santa Catarina.

II. Subjects, Ethics And Methods

Study design

This study was conducted as a randomized and placebo-controlled clinical trial. Data collection was only initiated after approval of the project by the Research Ethics Committee of UNISUL (registration number: 42172720.4.0000.5369). The study was also registered on the Brazilian Registry of Clinical Trials platform (REBEC, registry no. RBR-5hrnpd5).

Population and sample

The population chosen for the study consisted of women who arrived for delivery at the maternity care service of the Regional Hospital of São José - SC from November to December 2021. In this service, approximately 300 pregnant women are assisted per month, coming from the municipalities of Florianópolis - SC metropolitan region. Pregnant women admitted to the maternity ward of this hospital were included, primiparous, aged between 18 and 40 years old, at the beginning of active labor, who accepted the Lavandula angustifolia aromatherapy, had not used glucocorticoids in the last 30 days, and who accepted not to make use of other analgesic practices that were not routine at the service and that could be offered in other studies conducted at the hospital. In addition, the patients had to express their agreement to participate in the research by signing the Free and Informed Consent Form. The participants who expressed the desire to no longer participate in the research after being included in the study, or even those who required caesarean sections, were admitted as exclusion criteria. The reason why this procedure was performed was recorded.

The sample was calculated using the OpenEpi software, version 3.01, for a hypothesis test with a comparison of means to detect a possible 30% difference in the meantime (in hours) of the evolution of the active

labor phase; this difference is assumed to be clinically relevant by the research team. Thus, taking as parameters for a two-tailed test a 5% significance level, 80% test power, and a mean evolution time of 7.6 hours with a standard deviation of 2.41, we obtained a sample number of 18 pregnant women per group. The sample was for convenience, in order of entry into the study until the minimum number of participants per group was reached.[14]

Groups

The participants were divided into two groups: a Control Group, consisting of women subjected to the inhalation protocol with a pharmacologically inert oil (grape seed); and an Intervention Group, comprised by women subjected to the inhalation protocol with Lavandula angustifolia essential oil. Allocation of the participants in the groups was made by means of randomization, using a list of figures containing the total number of participants calculated for the study. To guarantee quality of the product used in the consultations, the researchers provided both the grape seed oil used in the Control Group and the Lavandula angustifolia essential oil, which were always of the same brand and with a confirmed expiration date.

Procedures

The maternity service at the Regional Hospital of São José – SC, in the Greater Florianópolis region, assists women in labour at usual risk that arrive on demand, making it impossible to predict who will come for care and at what labour stage. When women were hospitalized and after verifying that they were in active labour, those who met the other inclusion criteria of the study were invited to participate in the research. They were sent to a reserved environment individually so that the research objectives were explained to them and doubts were cleared. For those who accepted, the consent and agreement documents were delivered for them to sign them. The researcher handed in the invitations when the women were in the interval between contractions (without pain). In the same way, an approach was carried out for the other procedures related to the research carried out during labour, always at the moments corresponding to the interval between contractions. Furthermore, the necessary time was given for the participants to read the Free and Informed Consent Form and to clarify their doubts with the researcher.

Subsequently, according to the previous randomization process, the participants were allocated to one of the study groups and taken to the environment intended for their care. Periodic assessment and interventions were initiated at the moment when labour became active, characterized from the moment when the women had regular painful contractions every 3 to 5 minutes, leading to cervix dilation.

In the first evaluation, information on the time (hours and minutes) when labour started (recorded in the partograph), as well as the pain score reported by the participant, was collected using a Visual Analog Scale (VAS) and then referred to the procedure related to the study group to which they belonged (Control or Intervention). Recording of the pain score and the intervention procedure were repeated at 120-minute intervals, considering the time necessary for onset of the evaluated intervention's analgesic effect until delivery (birth).[12,15] This time interval was also selected considering the hospital's maternity service routine because the hospital's obstetrics team performed foetal heartbeat assessments every 30 minutes. Thus, it would be possible for the team members to choose a time interval that coincided with one of these moments to perform the intervention (every 2 hours) and record pain intensity (every 60 minutes).

The use of analgesic drugs was also recorded, as this is a procedure routinely recorded in the parturient's medical chart (if yes, time and number of times), as well as the time (hours and minutes) at which delivery took place and whether an urgent caesarean section or foetal distress was indicated. After birth, and from the data on the partograph, Apgar scores were recorded at the 1st and 5th minute since birth of the infant.

Intervention protocol

The inhalation procedure was performed by a single member of the research group, duly trained in its execution. Each inhalation treatment with *Lavandula angustifolia* essential oil was performed for 5 minutes every 2 hours of the interval during the active labor phase. The protocol consisted in applying 3 drops of the plant's essential oil diluted in grape seed oil (10% concentration) on clean gauze that was attached to the parturient's nightgown.[16-19]

To avoid problems with randomization of the study participants, a single aware participant per day was included. Thus, it was possible to perform inhalation in the control and experimental groups, in the order determined by the randomization numbers, without the intervention odour exerting any influence on the Control Group participants. In this last group, inhalation with grape seed oil (placebo) was performed, following the same protocols as in the Intervention Group.

Study outcomes

The labor evolution time was recorded in minutes, from the beginning of active labor to birth of the infant, according to the partograph. The cases in which delivery progressed to caesarean section and the reason for performing this procedure were also recorded.

Pain intensity during labor was assessed using VAS at 60-minute intervals after the onset of active labor was recorded. This type of scale uses a graphic representation on a line containing a score of zero at the beginning, meaning absence of pain. On the other end, a score of ten means unbearable pain or the most significant imaginary pain. It is measured when the patients indicate the intensity of the pain, they are feeling by placing a pointer or finger on the number that most represents their sensation. In a group of individuals, the arithmetic mean of the values attributed by the patients generates a score. This scale is widely used today because it is simple to apply and interpret by the patients.[14] Another reason is linearity with pain grade, showing linearity when applied to medium- and low-intensity pain. Thus, when patients state a high value and then a lower one on this scale, pain can be faithfully inferred in the proportion indicated by them.[16]

The need to prescribe analgesics during labor was recorded in the form of which drugs (dose and number of times) were administered to each participant, as well as the latency (in minutes) for using the first dose from the beginning of active labor, and this information was collected from the participants' physical records.

The "Experience and Satisfaction with Childbirth Questionnaire (ESCQ)" was used to assess the degree of satisfaction with childbirth. This instrument was selected for its application ease, considering the participants' vulnerability in the period indicated for their evaluation. However, once it was validated and adapted to Portuguese from Portugal, at the time of applying the questionnaire, the participants were asked to read all the questions and clear any doubts with the researcher before answering.[20] This instrument comprises a self-report questionnaire comprising 104 questions regarding expectations, experience, satisfaction and pain related to labor, delivery and immediate postpartum. The questions have Likert-type scales with different scores according to the domain investigated, and the sum of the domain scores (subscales) and the total score can be obtained. The higher the score, the more positive the woman's perception in the dimension assessed or in the total scale.[17] Considering the study's main objectives, we chose to use subscales 2, 3, 4 and 8 of the questionnaire, totaling 65 questions that evaluate positive experience, negative experience, relaxation and postpartum.[20] The instrument was applied in the postpartum period, between 12 and 30 hours after birth of the infant, before hospital discharge.

The Apgar score attributed to the newborn at the 1st and 5th minutes after birth, obtained from the partograph, was also evaluated to indirectly assess any possible toxicity of the intervention tested on the newborn. This score has been used for decades worldwide as a form of clinical evaluation of newborns, mainly because it is the only evaluation in developing countries where laboratory tests may not be available. The low Apgar score applied at 1 and 5 minutes of life helps identify children who need additional care. Overall, the consensus is that an Apgar scores between 7 and 10 represent a healthy child unlikely to have future problems, while children with scores < 7 deserve special attention.

As a final step for the study participants, a question was included at the end of the data collection instrument to verify if they could identify the treatment group to which they were linked. This question aimed at confirming that the participants were blinded.

Procedures

When the patients were hospitalized, and after verifying that they were in active labour, those who met the study inclusion criteria were invited to participate in the research. They were sent to a reserved environment individually to explain the research objectives and solve doubts. Those who accepted were given two copies of the Free and Informed Consent Form, one signed by the participants and returned to the researchers.

In this document, the pregnant women were informed that, due to their participation in the research, the protocol adopted during their care would be different from those who were not taking part in the study only because they would receive inhalation of *Lavandula angustifolia* essential oil as an intervention (if they were in the Treatment Group) or grape seed oil (if they were in the Control Group).

Blinding of the participants regarding the Intervention Group to which they belonged was verified the other assessment instruments were answered in the postpartum period, adding the following question to the interview: "What type of treatment do you believe was used on you? Lavender oil or grapeseed oil?".

Statistical analysis

The data obtained were submitted to the Shapiro-Wilk normality test. One-way ANOVA followed by Bonferroni was used to compare the parametric data. The Kruskal-Wallis test was employed to treat the non-parametric data. For the bivariate analyses, the chi-square test was used. In all analyses, p-values < 0.05 were considered statistically significant. For statistical calculation, the GraphPad Prism 6 and Open Epi software programs were used.

III. Results

During the study, 41 women admitted to the hospital's obstetric centre met the inclusion criteria and were invited to participate in the research. Of these, the first 36 who accepted the invitation were included in the study. In addition, another three were excluded because they had cephalopelvic disproportion (n=1) or because the fetus was in acute fetal distress (n=2). For convenience, all 36 participants were randomized into two groups with n=18, and each one was evaluated on a different day.

Both groups did not statistically differ in terms of mean maternal age at the time of inclusion in the study. Table 1 presents the mean values obtained for the main variables related to the effects of inhalation with *Lavandula angustifolia* essential oil in both treatment groups (n=36).

Table 1

Variables related to the effect of inhalation with Lavandula angustifolia essential oil in both treatment groups (n=36).

Variables	Groups		*P* value
	Control	Lavanda	
Age (years, mean ± SD)	25.9 ± 5.6 (n=18)	23.9 ± 5.1 (n=18)	0.2743[a]
Labour evolution time (min, mean ± SD)	363.3 ± 130.7 (n=18)	330.0 ± 180.2 (n=18)	0.3508[b]
Latency to 1st analgesic use (min, mean ± SD)	181.9 ± 91.2 (n=10)	236.0 ± 100.9 (n=5)	0.3710[b]
Pain intensity, 1st hour (score, mean ± SD)	7.8 ± 1.7 (n=18)	7.8 ± 1.5 (n=18)	0.8930[b]
Pain intensity, 2nd hour (score, mean ± SD)	8.5 ± 1.5 (n=18)	8.8 ± 1.0 (n=18)	0.6204[b]
Pain intensity, 3rd hour (score, mean ± SD)	9.1 ± 1.3 (n=17)	9.2 ± 0.9 (n=16)	0.8211[b]
Pain intensity, 4st hour (score, mean ± SD)	9.5± 0.8 (n=16)	8.9 ± 1.0 (n=13)	0.0442[b]
Pain intensity, 5st hour (score, mean ± SD)	10.0 ± 0.0 (n=8)	9.0 ± 0.3 (n=11)	0.0111[b]
Caesarean section	01	01	-
Satisfaction with childbirth (score, mean ± SD)	144.7 ± 15.0 (n=18)	148.6 ± 16.4 (n=18)	0.2413[b]
Apgar, 1st minute	8.6 ± 0.5 (n=18)	8.9 ± 0.9 (n=18)	0.1120[a]
Apgar, 5th minute	9.2 ± 0.5 (n=18)	9.5 ± 0.8 (n=18)	0.1414[a]

[a] Student´s t test (unpaired); b Mann Whitney test (unpaired).

It is noted that the intervention tested showed a statistically significant analgesic effect from the 4th hour since the beginning of labor. No statistically significant differences were observed for the other parameters investigated. The analgesics used were dipyrone (1 g) and meperidine (50 mg). Regarding the need for caesarean section, the reason for performing the procedure (n=1 in each group) was failure to respond to the induction procedure in parturients who, although in labor, did not progress to full dilation and fetal expulsion.

Figure 1 shows how the number of participants belonging to both treatment groups evaluated in the study declined as a function of duration of labor, from the beginning of active labor to birth of the infant (n=36). It is noted that, at the 4th hour, there was a significant reduction in the number of patients who remained in labor in the group treated with the intervention when compared to the placebo group.

Figure 1

Analysis of the decline in the number of participants belonging to both treatment groups as a function of the labor evolution time from the beginning of active labor to birth of the infant (n=36).

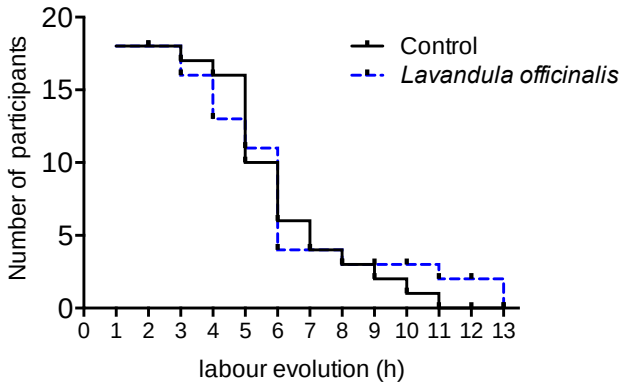

Table 2 shows the bivariate analysis results regarding use of analgesics throughout labor and the participants' knowledge about the treatment group to which they were allocated. It is noted that the proportion of women who did not use analgesics during the labor period in the group treated with inhalation of Lavandula

angustifolia in relation to the Control Group was quite substantial, although there was no statistically significant difference.

Table 2

Bivariate analysis regarding use of analgesics during labor and the participants' knowledge about the treatment group to which they were allocated (n=36).

Outcomes	Groups				*P* value[a]
	Control		Lavanda		
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	
Analgesics used	10 (55.5)	8 (44.4)	5 (27.8)	13 (72.2)	0.0909
The woman was able to inform the group	6 (33.3)	12 (66.7)	7 (38.9)	11 (61.1)	0.7286

[a] Chi-square test.

IV. Discussion

As its main findings, the study showed that inhalation with 10% Lavandula angustifolia essential oil for 5 minutes every 2 hours until delivery promoted a reduction in pain intensity from the 4th hour of labor, as well as that it did not cause changes in the Apgar scores, both in the 1st and 5th minute after birth of the infant. These effects suggest a potential benefit of this procedure in parturients on relieving labour pain, low cost and easy application of the procedure, although without presenting toxicity to the newborns.

The mean age of the women who participated in the study as primiparous who are starting their experience in motherhood corroborates the international results.[21] Similarly, in Brazil, in a descriptive cross-sectional study carried out at four public maternity hospitals in Salvador (BA) from 2007 to 2009, Novaes et al., described the sociodemographic profile of postpartum women assisted by the Unified Health System. A total of 449 puerperal women were evaluated, predominantly of favourable reproductive age (72.5%) and relatively young, with a mean age of 25 years old.[22]

The labour evolution time in the women treated with Lavandula angustifolia was not altered in relation to the Control Group. Similar results were obtained by other authors who investigated different procedures and oils as aromatherapy interventions. Yazdkhasti and Pirak evaluated the mean duration of the active phase among primiparous women in Iran, defined by them as 3-4 cm of cervical dilation, and the second labour phase, which they defined as between 5-10 cm.[15] On the other hand, Burns et al, evaluated 251 women in the intervention groups with different essential oils and 262 in control groups in a district maternity hospital from Milan (Italy), showing that, in the aromatherapy group with Roman chamomile (Chamaemelum nobile), sage (Salvia sclarea), incense (Boswellia carteri), lavender (Lavandula augustifolium) and tangerine (Citrus reticulata), there was an increase in the time of the first and second labour phases.[23] It should be noted that the labour period mentioned in these articles is similar to the one defined in the current study.

Regarding the benefit of the inhalation protocol with Lavandula angustifolia in reducing pain intensity from the 4th hour of labour (4th hour of inhalation), our findings reinforce the data obtained with the essential oil of this plant in other populations, expanding the discussion to some differences in the protocols used. Mohamadkhani-Shahri et al. compared the effect of massage with aromatherapy with lavender oil when compared to women who received massage alone on term pregnant women referred for vaginal delivery who were admitted to a hospital in Tehran (Iran) between 2007 and 2008. In this clinical trial, the Lavender massage procedure significantly decreased pain intensity in the second labour phase when compared to the massage-only group.[24] In the clinical trial by Yazdkhasti and Pirak conducted with 120 pregnant women from Iranshahr (Iran), inhalation of Lavandula angustifolia reduced pain intensity. In this study, the participants received the intervention in the form of two drops of 10% diluted lavender oil inhaled three times at the stages of 4-5 cm, 6-7 cm or 8-9 cm of cervical dilatation. At the same time, Labour pain intensity, assessed with the VAS scale, was measured at two moments before and 30 minutes after the three-phase intervention. In addition, the Control Group was treated with distilled water as a placebo.[15]

In addition, Tanvisut et al. conducted a clinical trial with women in Thailand, primigravidae, in labour of single pregnancies, at low risk and undergoing vaginal deliveries, who received aromatherapy with lavender only during the first labour phase, defined by the authors as with cervical dilatation of 3-10 cm. The women were evaluated for pain intensity using a numerical scale from 0 (no pain) to 10 (worst possible pain) at different labour phases, with a reduction in pain in the latent phases (cervical dilation from 3 to 4 cm), initial pain score in the active phase (cervical dilatation from 5 to 7 cm). In contrast, there was no difference between the groups in the late active phase (from 8 to 10 cm).[25] Vakilian et al. recorded the analgesic effect in the late active phase of inhaling Stoechas lavender when compared to inhaling distilled water, associated with a respiratory technique in 120 postpartum women from Iran, using the same pain scale employed in the current study.[26]

These findings are very promising to publicize/expand use of the aromatherapy intervention, which has been allowed since 2016 in the hospital where the research was carried out, in line with the guidelines for delivery

care and the National Policy on Integrative Practices and Complements of the Unified Health System in Brazil.[27,28] Currently, both the Nursing staff and doulas are allowed to use Lavandula angustifolia essential oil in postpartum women. This was one of the reasons that motivated the current study, as well as the fact that it is believed that the women who were the study subjects or their newborns would be subjected to minimal risk because follow-up of these women by obstetricians and paediatricians throughout this time did not identify any signs or symptoms that would justify contraindication of this type of on-site service. In addition, the maximum concentration indicated for using Lavandula angustifolia in pregnant women via the olfactory route is 20%. Its lethal dose (LD50) is determined to be 5.00 g/kg via the oral and dermal routes[29] (above the dose used in this study). At the same time, another clinical trial also did not record contraindications for the practice of inhaling this oil with the same dosage.[13]

Another exciting finding of the current study was the significant reduction (p=0.0909), although not statistically significant, in the proportion of women who requested analgesics in the Intervention Group when compared to the Control Group, prompting a new investigation in a more substantial number of participants. This data is consistent with what was recorded by Dhany et al. in a retrospective study of obstetric records of 601 nulliparous women and 478 multiparous women who used aromatherapy with Lavender and massage in a general maternity hospital from southwestern England (UK).[30] The authors observed that the intervention reduced the need for analgesia during labour when compared to other groups that received transcutaneous electrical stimulation and nitrous oxide and, although they did not differ for the group that used pethidine, the use rates corresponding to epidural anaesthesia, spinal and general anaesthesia were also lower in the aromatherapy-treated group.[30]

Another intriguing fact is related to the decline in the number of participants in the lavender group, which was higher (although not statistically significant) when compared to the Control Group in the 4th hour period, the time in which onset of the analgesic effect for the intervention tested was observed. These findings suggest an expanded future investigation, as the literature mentions the relationship between pain/anxiety reduction and labour time reduction. The aforementioned paper by Tanvisut et al. evaluated, in addition to the primary outcome of pain intensity, the need for analgesic use and labour time in women treated with Lavender, which reduced the use of analgesics and labour time in women with lower pain intensity.[25] Furthermore, in primiparous women treated at a university hospital from Alexandria (Egypt), Mansour et al. also observed that the group treated with massage and aromatherapy with lavender oil showed reductions both in pain and in anxiety at different labour phases, in addition to reducing labour time in women with less pain and anxiety.[31]

It is possible that one of the actions of inhaling the Lavandula angustifolia essential oil to generate the analgesic effect observed is related to stress reduction and to improvements in the immune function, as observed by Chen et al. in pregnant women in China. The authors recorded a reduction in salivary cortisol levels and an increase in IgA in the women who received the lavender oil massage intervention when compared to the Control Group immediately after the procedure.[32] On the other hand, effects on the central nervous system should not be ruled out, especially considering that reductions in the pain/anxiety levels can improve satisfaction with childbirth.[24]

Given the above, it is also interesting to assess a possible association between the reduction in pain/anxiety levels and the potential increase in satisfaction with childbirth modulated by different interventions. In the current study, the investigated protocol of inhalation of Lavandula angustifolia essential oil did not change, concerning the Control Group, the scores in the instrument adopted to evaluate this outcome. Although this result seems contradictory, Costa et al. discussed in an article that, in general, although women do not see many of their previous expectations regarding childbirth confirmed and have experienced a high number of negative emotions and pain, this does not seem to interfere with their ability to care for their newborns or relate to their partners, feeling satisfied with the quality of care provided by health professionals.[20] These findings are reinforced by Riegert et al., who, in a cross-sectional and descriptive study, reported that the puerperal women described their experience and satisfaction with normal birth assisted by nurses as satisfactory, both with the quality of care received and in terms of the labour and delivery time, in addition to the time it took to hold the newborn for the first time.[33]

Regarding the caesarean section data and Apgar scores observed for both groups, other authors also reported similar results, without the aromatherapy interventions with Lavandula angustifolia having produced changes in the effects of the respective control groups.[15,23,25] As a study limitation, it is believed that evaluating a larger number of participants might show a statistically significant effect on the proportion of women who did not need to use analgesics when compared to the controls. In addition, use of the ESCQ instrument was validated for the Portuguese language from Portugal and, despite having been selected by convenience for the current study, its adaptation and validation for Brazilian Portuguese is suggested. As strengths, it should be noted that, to ensure good quality of the product used during the interventions of both groups, the researchers provided both grape seed oil (control) and Lavandula angustifolia essential oil to all participants. In addition, the procedure was always performed by the same researcher.

V. Conclusion

In conclusion, it was possible to advance knowledge about using *Lavandula angustifolia* essential oil on pain and satisfaction with childbirth as a complementary and integrative practice in the care provided to parturient women. These results will contribute to the maternity service of the Regional Hospital of São José – SC, reinforcing the benefit of allowing/offering the use of aromatherapy with this oil by the assisted parturients. Knowing the benefit of inhaling it with the protocol investigated in this study on pain from the 4th hour of labor, as well as absence of its toxicity, it can be offered with a greater degree of confidence in its analgesic action, being able to relieve pain and anxiety in the labor experience and reduce complications and unnecessary procedures, often applied to this population. As perspectives, it is suggested that future studies expand research with a more significant number of participants to confirm the possible benefit of this inhalation protocol with *Lavandula angustifolia* essential oil on the need for analgesics and those parturients who continue in labor after the 4th hour of its use.