



THE EFFECT OF THE INFLATABLE METHOD ON THE PAIN SCALE OF LABOR AT STAGE I

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Abstract

Labor pain is a problem that mothers complain about in normal labor. Some of these pains often make mothers frustrated and desperate so some of them have alternative actions such as Sectio Caesarea surgery to avoid suffering from pain in labor. The purpose of this study was to determine the effect of the Inflatable Method on the Pain Scale of Stage I Labor. Methodology: This study used a quantitative approach with the *Quasi-Experimental* method using the Pre-Post Test with Control Group design. The population of this study consisted of first-time laboring mothers who fit the sampling criteria using the accidental sampling technique, with a sample size of 54 respondents. The analysis used the *Wilcoxon Signed Ranks Test* and *Mann-Whitney Test*. The data collection instrument is observation through the *Numeric Rating Scale* format. Results: it was found that the average pain scale of laboring mothers before the intervention of the Blow-Off Method was 6.89 and after the intervention of the Blow-Off Method was 4.89. The results of the statistical tests showed that the blow-off method affected the Pain Scale of Labor Period I ($p = 0.000$). This research is expected to be used by respondents in the process of childbirth with minimal trauma. Conclusion: There is a decrease in pain levels in the intervention group and control group after treatment with a value of $p < 0.05$.

Keywords: Blow-Off Method, First Period Labor Pain.

INTRODUCTION

Childbirth is the final stage of pregnancy, and it involves the opening and thinning of the cervix and the movement of the fetus towards the birth canal. In general, labor occurs at 37-42 weeks of gestation, which is considered full-term with the baby's head facing down (hind-head presentation) and has no complications for the mother and baby (Irawati et al., 2019). One important aspect of labor is "power," which in this context is uterine muscle contractions or His. These contractions cause the fetus to push out, resulting in stretching of the cervix, ischemia of the corpus uteri, and stretching of the lower uterine segments. All of these factors contribute to the onset of pain during labor. (Sari and Handayani, 2023). Based on data from the Rejang Lebong District Health Office (2022), the number of maternity cases reported during the year was 4,784, with Puskesmas Curup Timur being a consistent delivery facility with the best capacity for maternity coverage. Based on an initial survey of the East Curup

Puskesmas Working Area in April-May 2024, a total of 354 deliveries were obtained and all mothers complained of moderate to severe pain.

Based on previous studies, the peak pain due to labor is generally on a scale of 7-10, already included in the category of severe to very severe pain. Some of these pains often make mothers frustrated and desperate so some of them have alternative actions such as Sectio Caesarea surgery to avoid suffering from pain in labor (Suarmini and Tangkas, 2020). Labor pain can be reduced by non-pharmacological techniques, namely the *Lamaze* method or breathing exercises. The results of Gayatri and Patil's research (2023) show that the *Lamaze* method as a tactic to avoid pain and anxiety during labor involves distracting women from concentrating on labor pain (Gayatri and Patil, 2023). The findings of Hamidah et al (2019), state that pain scores in the first phase of active labor decreased from an average of 4.93 to 3.00 after the application of *Lamaze Exercise*, with the minimum pain intensity score decreasing from 4 to 2, and the maximum score from 6 to 4 ($p < 0.05$). It can be concluded that the *Lamaze* breathing technique is proven to have a significant impact in reducing the pain scale in laboring women in the first phase of the active phase. (Hamidah et al, 2019).

The *Lamaze* method has now been modified into the Blow-Breath Method which is carried out with breathing exercise procedures as a distraction for the mother's focus on labor pain which is used to reduce anxiety. Thus, reduced anxiety can reduce the pain scale in laboring mothers. The results of research by Isaac Alwin et al, breathing exercises can stimulate the parasympathetic nervous system to increase blood oxygenation and release endorphins which will reduce heart rate and provide a feeling of calm. As a result of this endorphin release, the sympathetic nervous system will also be suppressed and release the low-stress hormone cortisol. (Ishak et al, 2023). This technique is done by inhaling through the nose for a count of four, then exhaling through the mouth for a count of four, and repeating during the contraction until the contraction ends (Devi Kavita, 2020).

METHOD

This research was conducted on May 15-June 15, 2024. This study used a quantitative approach with the *Quasi-Experimental* method using the *Pre-Post* Test with Control Group design. The population of this study was all mothers in labor at the time in the East Curup Health Center Working Area who fit the sampling criteria using the *Accidental Sampling* technique. The sample calculation in this study using the Unpaired Categorical Analytical formula is 22 people. To anticipate the occurrence of Dropouts or disobedient subjects, an additional sample of 20% was made. Then, the sample size needed was 27 people in each group.

This study involved two groups. A total of 27 respondents in the intervention group were given treatment in the form of the Inflatable Method, which is a breathing technique with the 4 3 4 technique,

where inhaling counts 1-4 seconds, holding the breath counts 1-3 seconds, and exhaling counts 1-4 seconds, which is done when the mother experiences contractions. Meanwhile, 27 respondents in the control group only performed simple mobilization, such as sitting or tilting to the right/left. Both groups began with the measurement of pain scale values before intervention (pre-test) using the NRS (*Numeric Rating Scale*) sheet, followed by treatment, and ended with measurement (post-test) using the same instrument to assess pain during contractions.

The variables in this study include the Blow-Off Method as the independent variable and changes in labor pain intensity as the dependent variable. The instruments used included a questionnaire to collect data on respondents' characteristics as well as an NRS (*Numeric Rating Scale*) to measure pain levels. Data collection was done through primary and secondary data. The data obtained will be processed through data processing stages. Furthermore, data analysis was conducted using univariate and bivariate approaches.

Inclusion Criteria In This Study :

- 1) Willing to be a respondent
- 2) Active phase of labor (opening 4-7 cm)
- 3) Willing to be given the intervention of Lamaze breathing technique (inflatable method)
- 4) Normal labor with head presentation
- 5) Single fetus
- 6) At term or full term pregnancy of 37-42 weeks
- 7) Interpreted fetal weight 2,500 grams - 4,000 grams
- 8) No labor complications
- 9) No excessive anxiety
- 10) No respiratory problems (asthma)
- 11) Do not have heart problems

The Exclusion Criteria :

- 1) Mothers who were not cooperative at the time of the study
- 2) The laboring mother was referred
- 3) Mothers with labor complications
- 4) Mothers with oxytocin induction.

RESULTS AND DISCUSSION

Table 1. Frequency Distribution of Respondent Characteristics

Variable	Categories	Intervention Group		Control Group	
		n	%	n	%
Parity	Primigravida	13	48.1	13	48.1
	Multigravida	14	51.8	14	51.8
	Grandemultigravida	0	0	0	0
Education	Elementary School	0	0	0	0
	Junior High School	2	7.4	4	14.8
	Senior High School	13	48.1	11	40.7
	Higher Education	12	44.4	12	44.4
Occupation	Working	21	77.8	20	74.0
	Not Working	6	22.2	7	25.9

Results Table 1, Characteristics of respondents are mostly multiparous, namely 14 people (51.8%). In the intervention group, almost half of the respondents with high school education, namely 13 people (48.1%), in the control group, almost half of the respondents had a college education, namely 12 people (44.4%) and in the intervention group almost all respondents worked, namely 21 people (77.8%), in the control group most of the respondents were already working, namely 20 people (74.0%).

Table 2. Average Frequency of Respondent Characteristics

Characteristic	Intervention Group			Control Group		
	Mean	Min	Max	Mean	Min	Max
Age	28	23	33	29	20	34
Pregnancy Age	39	38	40	39	37	41
Vaginal Touch	6	5	7	6	5	7
Fetal Weight	2996	2800	3300	3040	2700	3400

Based on Table 2, the characteristics of respondents at the age of the intervention group obtained a mean value of 28 with a minimum of 23 and a maximum of 33, the control group a mean value of 29 with a minimum of 20 and a maximum of 34. At the gestational age, the intervention group obtained a mean value of 39 with a minimum of 38 and a maximum of 40, and the control group had a mean value of 39 with a minimum of 37 and 41. At the opening, the intervention group obtained a mean value of 6 with a minimum of 5 and a maximum of 7, and the control group had a mean value of 6 with a minimum of 5 and a maximum of 7. In Estimated Fetal Weight, the intervention group obtained a mean value of 2996

with a minimum of 2800 and a maximum of 3300, in the control group the mean value was 3040 with a minimum of 2700 and a maximum of 3400.

Table 3. Average Pain Scale Before and After Intervention

		Pain Scale			
Group		Mean $\pm$ SD	Min-Max	Median	CI 95%
Intervention (Blow-Off Method)	Pre test	6.89 $\pm$ 0.80	6-8	7	6.57-7.21
	Post test	4.89 $\pm$ 0.69	4-6	5	4.61-5.17
Control (Mobilization)	Pre test	6.44 $\pm$ 0.97	5-8	5	6.06-6.83
	Post test	6.22 $\pm$ 0.97	5-8	6	5.84-6.61

Based on Table 3, the pain scale of laboring mothers in the intervention group before the intervention was carried out obtained a Mean value of 6.89 with a minimum of 6 and a maximum of 8. After the intervention, the Mean value is 4.89 with a minimum of 4 and a maximum of 6. While in the control group before the intervention, the Mean value is 6.44 with a minimum of 5 and a maximum of 8. After the intervention, Mean 6.22 was obtained with a minimum of 5 and a maximum of 8.

Bivariate Analysis Result

Test the normality of the data using the *Kolmogorov-Smirnov Test*.

Table 4. Normality Test Results

Group		<i>p value</i> ^a	Description
Intervention (Blow-Off Method)	Pre test	0.000*	Abnormal
	Post test	0.000*	Abnormal
Control (Mobilization)	Pre test	0.000*	Abnormal
	Post test	0.000*	Abnormal

Ket: ^aKolmogorov-Smirnov test

* Level of sign $p > 0,05$

Based on Table 4, the results of the normality test show a *p-value* < 0.05 , which means that the data is not normally distributed (*p-value* < 0.05), so the appropriate statistical test is to use non-parametric statistics, namely the *Wilcoxon Signed Ranks Test* and the *Mann Whitney Test*.

Table 5. Difference in Pain Scale Before and After Intervention

Group	Variable	Mean ±S D	Difference of Mean	<i>p value</i> ^a
Intervention (Blow-Off Method)	Pre test	6.89 ± 0.801	2.0	0,000*
	Post test	4.89 ± 0.698		
Control (Mobilization)	Pre test	6.44 ± 0.974	0.22	0,175*
	Post test	6.22 ± 0.974		

Ket: ^a*wilcoxon signed ranks test*

* Level of sign $p < 0,05$

Based on Table 5, the results showed a significant difference in the pain scale before and after the intervention in the treatment group, with a $p\text{-value} = 0.000$ (<0.05). In contrast, in the control group, there was no significant difference in the pain scale before and after treatment, with a $p\text{-value} = 0.175$ (>0.05).

Table 6. Effect of the Blow-Off Method on the Pain Scale of First-Period Pregnancy

Group	Intervention (Blow-Off Method)	Control (Mobilization)	Difference of Mean	<i>p value</i> ^a
	Mean±SD	Mean±SD		
Pre test	6.89±0.801	6.44±0.974	2.0	0.076*
Post test	4.89±0.698	6.22±0.974	0.22	0,000*

^a*Mann Whitney Test*

* Level of sign $p < 0,05$

In Table 6, Mann-Whitney analysis shows that in the pre-test results the $p\text{-value} = 0.076$, while in the post-test results, it drops to 0.000. The results show that there is an effect of the Inflatable Method on the scale of labor pain during the first stage in the East Curup Health Center Working Area in 2024.

Frequency Distribution of Respondent Characteristics

In this study, of the intervention and control groups, most of them were multiparous, namely 14 people (51.9%). Widiawati and Legiati (2019) reinforced this by stating that pain during labor in primigravida and multigravida is caused by oxytocin release and contractions, muscle spasms, and myometrial ischemia. It is the decrease in blood flow that causes pain. However, in this study, there were differences in the level of pain perception between primiparous and multiparous. So it can be concluded that primiparous and multiparous experience the same pain but different levels of pain perception (Widiawati and Legiati, 2019).

From the results of the study, almost half of the respondents with the latest high school education, namely 13 people (48.1%). In the mobilization control group, almost half of the respondents had a college education, namely 12 people (44.4%). Educational factors can also affect labor pain where education affects a person's level of knowledge.

From the results of the study, the inflatable method intervention group almost all respondents worked, namely 21 people (77.8%). In the mobilization control group, most respondents worked, namely 20 people (74.0%). Employment status has a close relationship with the economic situation which is often a source of anxiety during childbirth (Purnama and kurnia, 2019).

Average Frequency of Respondent Characteristics

The results showed that in the intervention group, the average age of respondents was 28 years, while in the control group, it was older with an average of about 29 years. Young age has been associated with unstable psychology and can lead to increased levels of anxiety, increased sensitivity to pain, and higher levels of depression. From the results of the study, the Inflatable Method intervention group had an average gestational age of 39 weeks with a range of gestational ages of 38 weeks to 40 weeks. In the mobilization control group, the average gestational age was 39 weeks with a range of gestational ages of 37 weeks to 41 weeks. Anxiety experienced just before labor seems to increase with the woman's gestational age, which in turn will affect the level and duration of pain experienced when labor begins (Sunarsih and Tuti, 2019).

From the results of the study, the inflatable method intervention group had an average opening of 6 cm with the smallest opening of 5 cm and the largest opening of 7 cm. In the mobilization control group, the average opening was 6 cm with the smallest opening of 5 cm and the largest opening of 7 cm. With further opening of the cervix, the level of pain during labor also increases, this is explained by the fetal head pressing on the pelvic bones and strong contractions of the uterus caused by myometrial anoxia (Nurachmania and Jayatmi, 2019).

From the results of the study, the inflatable method intervention group had an average estimated fetal weight of 2996 grams with the lowest weight of 2800 grams and the highest of 3300 grams. In the mobilization control group, the average estimated fetal weight was 3040 grams with the lowest weight of 2700 grams and the highest of 3400 grams. Babies with larger sizes are likely to cause more pain than normal-weight babies (Kissler and Hurt, 2022).

Average Pain Scale Before and After Intervention

The average scale of labor pain before the Blow-Off Method intervention obtained from this study was 6.89 (severe pain) with a minimum of 6 maximum pain 8 and after the Blow-Off Method intervention was 4.89 (moderate pain) with a minimum of 4 maximum pain 6. The results of this study also show the average pain in the mobilization control group, the average pain scale before is 6.44 (severe pain) with a minimum of 5 and maximum pain 8, and after mobilization is 6.22 (severe pain) with a minimum of 5 pain and a maximum of 8 pain.

Labor pain or pain felt during the birthing process can be defined biologically as a combination of objective components, namely the sensory aspects of pain, and subjective components related to emotional and psychological aspects. This pain occurs due to the stimulation of various ages substances consisting of prostaglandins, serotonin, bradykinin, and so on which stimulate pain receptors in the superficial layer of the skin and other body tissues such as the periosteum of surface joints and skeletal muscles (Hekmawati et al., 2018). Pain during childbirth can be classified into two major components, namely physiological components in the form of stimulus felt on sensory nerves and nerve centers and psychological ones in the form of recognition of sensations, meaning of pain and reactions caused. The physiological process of labor pain begins when the cervix begins to open. Pain impulses are closely concentrated in the cervical organs and corpus uteri, then these impulses will flow through afferent nerve fibers to the spinal cord through sympathetic autonomic nerves in the T10 T11 T12, and L1 segments. The uterine nerve supplies to the two thoracic nerves namely T11 and T12 vertebrae through the paraservical plexus, which disperses pain in cervical dilatation. In the late phase of stage I, nerves from T10 and T11 are also involved. This is because the location is close to the pelvis (Pratiwi et al., 2021).

The Effect Of The Inflatable Method On The Pain Scale Of Labor At Stage I

The results of the normality test show a *p-value* <0.05, which means that the data is not normally distributed (*p-value* <0.05), so the appropriate statistical test is to use non-parametric statistics, namely the *Wilcoxon Signed Ranks Test* and the *Mann Whitney Test*. The results showed a significant difference in the pain scale before and after the intervention in the treatment group, with a *p-value* = 0.000 (<0.05). In contrast, in the control group, there was no significant difference in the pain scale before and after treatment, with a *p-value* = 0.175 (>0.05). *Mann-Whitney* analysis shows that in the pre-test results the *p-value* = 0.076, while in the post-test results, it drops to 0.000. The results show that there is an effect of the Inflatable Method on the scale of labor pain during the first stage in the East Curup Health Center Working Area in 2024.

The Blow-Off Method is a breathing exercise method performed with certain techniques. Based on the observations of researchers in the field, this method is effective because, during contractions by doing the inflatable method, the mother is more focused on breathing techniques which can distract the mother's attention from pain. In addition, this technique also provides a feeling of relaxation so that the mother is more cooperative and the anxiety that the mother feels is also reduced. In addition, breathing exercises can stimulate endorphins which can reduce pain naturally. Pain during childbirth can be classified into two major components, namely physiological components in the form of stimulus felt on sensory nerves and nerve centers and psychological ones in the form of recognition of sensations, meaning of pain and reactions caused. In line with research from Manurung et al (2021), the Respiratory technique is one method to reduce pain in laboring mothers. This technique is performed by taking deep breaths during

contractions using chest breathing through the nose, which helps deliver oxygen throughout the body. This process is also associated with the release of endorphins, which naturally contribute to reducing pain (Manurung et al., 2021).

The advantages of this breathing technique are very beneficial because it is one of the safer techniques for mothers and babies, economical, easy to do, and does not require medical intervention. Breathing techniques help reduce pain by increasing endorphin levels, which act as pain relievers and are also an easy way to help mothers cope with anxiety and pain intensity and reduce the duration of the first stage of labor breathing is an effective way to manage stress (Devi Kavita, 2020).

CONCLUSION

Based on the results of research that has been conducted in the working area of the East Curup Health Center, it can be concluded that :

1. The characteristics of respondents in the intervention group were mostly multiparous, almost most of the respondents had a high school education, almost all respondents worked, the average age was 28 years, the average gestational age was 39 weeks, the average opening was 6 cm and the average estimated fetal weight was 2996 grams. In the control group, most multiparous, almost half of the respondents had a college education, most of the respondents were working, the average age was 29 years, the average gestational age was 39 weeks, the average opening was 6 cm and the average estimated fetal weight was 3040 grams
2. The average scale of labor pain before and after the Inflatable Method is 6.89 and 4.89
3. There is a difference in the pain scale before and after the intervention in the intervention group and the control group
4. There is an effect of the inflatable method on the first stage of the labor pain scale.

REFERENCES

- Devi Kavita. 2020. Effectiveness Of Lamaze Technique On The Level Of Anxiety, Intensity Of Labour Pain And Duration Of First Stage Of Labour In The Primigravida Mothers. *International Education And Research Journal*. 4(7).
- Gayatri and Patil, 2023. Effectiveness of Jacobson Relaxation and Lamaze Breathing Techniques in the Management of Pain and Stress During Labor: An Experimental Study. *National Library Of Medicine*. 15(1).
- Hamidah dkk. 2019. Pengaruh Lamaze Exercise Terhadap Intensitas Nyeri Pada Persalinan Kala I Fase Aktif Di Klinik Utama Bersalin Taman Sari I Pekanbaru. *Jurnal Ibu Dan Anak*. 7(2). Hal : 78
- Hekmawati dkk. 2018. Mengurangi Rasa Sakit Persalinan Dengan Shiatsu. Tasikmalaya : LPPM Universitas Muhammadiyah Tasikmalaya.

- Irawati A, S. S. H. I. (2019). Mengurangi Nyeri Persalinan. *Jurnal Bidan Cerdas*.
- Ishak dkk. 2023. Effectiveness of breathing exercise on the duration of labour: A systematic review and meta-analysis. *National Library Of Medicine*. 5(3).
- Kissler and Hurt. 2022. The pathphysiology of labor dystocia : Theme With Variations. *National Library Of Medicine*.
- Manurung dkk. 2021. *Solusi Pendekatan Sebagai Upaya Tindakan Keperawatan dalam Menurunkan Kecemasan, Stress dan Depresi*. Jakarta: CV. Trans Info Media Purnama dan Kurnia. 2019. Pengaruh Posisi Tegak Terhadap Intensitas Nyeri Persalinan Pada Primipara Di Bidan Praktik Mandiri (BPM) Kota Bengkulu. *Journal Of Midwifery*. 7(1). Hal 56.
- Nurachmania dkk. 2019. Effleurage Massage, Kompres Dingin, Pengaturan Posisi Terhadap Penurunan Intensitas Nyeri Kala I Fase Aktif. *Jurnal Ilmiah Kebidanan Indonesia*. 9(03). Hal :128– 37.
- Pratiwi dkk. 2021. *Asuhan Kebidanan Komplementer Dalam Mengatasi Nyeri Persalinan*. Surabaya : Pustaka Aksara.
- Sari dan Handayani. 2023. Pengaruh Induksi Oksitosin Terhadap Intensitas Nyeri Persalinan Di Rumah Sakit Umum Arifin Achmad Pekanbaru. *Jurnal Kesehatan Tambusai*. 4(1). Hal : 45-46.
- Suarmini dan Tangkas. 2020. Pengaruh Kompetensi Asuhan Kebidanan Komplementer Massage Punggung Terhadap Intensitas Nyeri Ibu Bersalin. *Jurnal Kesehatan MIDWINERSLION*. 5(2). Hal : 236- 237.
- Sunarsih dan Tuti. 2019. Nyeri Persalinan Dan Tingkat Kecemasan Pada Ibu Inpartu Kala I Fase Aktif. *Jurnal Malahayati*. 13(4). Hal : 328-331.
- Widiawati dan Legiati. 2019. Mengenal Nyeri Persalinan Pada Primipara Dan Multipara. *Jurnal BIMTAS*. 2(1). Hal : 42–48.