

# Non-pharmacological coping skills for Labor: A comparative study

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**Abstract**— Rhythmic breathing is one non-pharmacological method women are using to cope with labor pains. A quasi-experimental trial was utilized to compare the effect of cleansing vs. light breathing on labor pains. The study was conducted on a labor ward of a private hospital with a uniform active labor management. Fifty participants enrolled in this study according to certain inclusion criteria. Labor pains are assessed by visual analogue scale. There was a significant difference between both the cleansing breathing group and the light breathing group in relation to mean VAS after using the rhythmic breathing were  $P = .013$  to the favor of the cleansing breathing. From the study results it can be concluded that labor pains can be greatly minimized with any of the rhythmic breathing management techniques with much reference to the cleansing breathing as being more effective than light breathing in reducing labor pains among primiparous women.

**Keywords**— Rhythmic breathing, cleansing breathing, light breathing, labor pains.

## 1. Introduction

Labor also called, Childbirth birth, partus or parturition is the end of a gestational period with birth of one or more newborn babies. Although it is a joyful event; labor is usually painful. Pain can be described as a multifarious, subjective and complex phenomenon, predisposed by numerous factors, such as emotional, physical, and socio-economic as well as culture. In another word, pain characterized by that it can be shared only from the elaborations by those who suffer it, such as labor pain [1].

For many women, labor pain is considered the worst experience of their lives. The pain of uterine contractions is a complex one concerning relations and interactions between peripheral and central systems, as well as the incessant transaction of numerous stimulus by ascending and descending receptors channels. In this perspective, labor pains involve affective, sensory, environmental and surrounding features [2].

When the process of labor launched, the muscular layer of the uterine wall begins to contract causing the cervix to relax and expand, ultimately imposing the cervix to open. Throughout a contraction, the fetus undergoes forceful stress that causes it to descend. Labor has four stages namely; dilatation which is the first stage, delivery that is the second stage, third or placental stage and fourth stage of labor. The dilatation or the first stage of labor involves cervical dilatation from zero to ten centimeters. This stage is further subdivided into latent, active and transitional phases. Cervical dilatation up to three cm. occurs during the latent phase. As labor evolves; uterine contractions rise in intensity and occur more frequently and remain longer. By other

words the active stage of labor emerges; in which cervical dilatation increases from four up to seven centimeters. These forceful contractions are also increased in pain. As the cervix dilates to eight to ten cm, the phase called the transition. This refers to approaching the second phase where delivery of the fetus actually occurs. Volunteer pushing by the laboring woman should be delayed to the second stage of labor, since bearing down during the first stage causes cervical edema, tear, and bleeding. The present healthcare giver should advice the woman on when to start to push [3].

During the 1st stage of labor Pain throughout this stage is not the same through labor, varying in accordance with its evolution. During the first stage, i.e. dilation, pain is visceral, arising due to uterine contractions and dilation of the cervix, transmitted by the sympathetic efferent fibers. In this stage, pain is conveyed to the spinal cord at the level of T10-L1 by Delta A fibers and C efferent visceral fibers originating in the lateral wall and uterine bottom. The transmission that follows efferent from the uterus and cervix toward the spinal cord is conveyed by means of the hypogastric and aortic plexus. So, the nociceptive efferent impulses cross the lumbar sympathetic chain and pass to the thoracic sympathetic chain by means of branches that communicate with the T10-L1 nerves. Therefore, the fibers that lead the painful impulse perform synapses with the interneuron of the dorsal spine returning after modulation [4].

Pain is an important factor of many, influencing women's experience with the process of childbirth. As pain and discomfort increase, women may request pain medication. In some countries, doctors commonly prescribe inhaled nitrous oxide gas for pain control, especially as 50% nitrous oxide, 50% oxygen, and known as Entonox. In the UK, midwives may use this gas without a doctor's prescription. Pethidine (with or without promethazine) may be used early in labor, as well as other opioids such as fentanyl I, but if given too close to birth there is a risk of respiratory depression in the infant [5].

Popular medical pain control in hospitals includes the regional anesthetics epidural blocks, and spinal anesthetics have numerous side effects and complications on mother and/or fetus. Epidural analgesia is a generally safe and effective method of relieving pain in labor, but is associated with longer labor, more operative intervention (particularly instrument delivery), and increases in cost [6]. A study resulted that the mothers who administrated epidural anesthesia complained of more fright before the epidural than those who did not been given it, but pain not necessarily increased. Medicine administered via epidural can cross the placenta and enter the blood stream to the fetus [7]. Breathing techniques is one of the non-pharmacological methods of pain relieve during the 1st stage of labor. The theory behind rhythmic breathing currently is viewed as a relaxation and attention focusing strategy that reduces pain via several mechanisms. Researches show pain impulses are perceived more quickly when anxiety is present. Women who believe breathing techniques reduce labor pain are less anxious and therefore perceive less pain. Its messages are transmitted to the brain where they are interpreted as ouch. Fewer pain messages are noted when brain cells responsible for interpreting impulses are preoccupied with the breathing techniques. Pain presence was ignored because the brain was otherwise engaged. Tension is known to increase the body's production of adrenaline which adversely affects laboring women. Large amounts of adrenaline cause blood vessels to constrict; this reduces oxygen to the muscles, causing pain. Adrenaline also decreases the body's production of oxytocin which slows labor. Longer labors result in fatigue which lowers the pain threshold. Rhythmic breathing promotes reduction in muscle tension, thereby directly and indirectly decreasing labor pain. The last but not the least advantage of these breathing techniques, it delays bearing down to the appropriate time during the 2nd stage of labor [8].

In this context, the researcher was motivated by the need to select breathing technique from two breathing approaches (cleansing breathing and light breathing) for parturient pain relief, with the general aim of evaluating the effectiveness of rhythmic breathing to reduce the pain intensity level during their active stage of labor.

## 2. Subjects & Methods

### 2.1 Aim of the study

The study aimed to examine the effect of two rhythmic breathing (cleansing vs. light breathing) on labor pains among primiparous women.

### 2.2 Research design

A quasi-experimental approach was utilized for this study.

### 2.3 Setting

The study was carried out at a private hospital with a uniform active labor management.

### 2.4 Subjects

The study subjects consisted of a convenient sample of 50 women. To obtain the requisite number of participants, the researcher went to the maternity hospital twice a week during the day shift and approached all women who met the inclusion criteria during the three months of data collection period.

### 2.5 Inclusion Criteria

The study sample consisted of low-risk (without chronic disease, their age is 20 to 35 years old). Premature rupture of membranes or other pregnancy complications were excluded. Full term laboring women and had no antenatal Lamaze preparations who volunteered to participate were recruited to this study. They were expected to have a normal spontaneous birth with a healthy single vertex fetus weighing between 2,500 and 3,999 g. Women in this research do not receive analgesics during the first stage of *labor*. **The aims of these inclusion criteria were to** avoid high-risk group, who need special medical and nursing interventions, which may affect the results of the study, and multiparous women, who had previous experience that can interfere with the current study results.

### 2.6 The sample was further subdivided randomly into two groups

#### Group I:

It comprised 25 women who were admitted to the previously mentioned setting and who met the above-mentioned inclusive criteria. This group **cleansing breathing** was demonstrated for them.

#### Group II:

It consisted of the other 25 women who were admitted to the same setting with the same selection criteria. The **light breathing** was implemented for them.

#### Tools for data collection:

**Tool 1: interview schedule used for the research groups** developed and utilized by the researcher

**Part 1:****1- Demographic and obstetric characteristics:**

Demographic and obstetric characteristics were obtained to elicit data such as (age, socio-economic status (SES), last menstrual period, expected date of delivery and gestational age). Based on the two-factor index of “social status”, “education and occupation”, the socioeconomic status of participants included the lower middle class, middle class, and upper middle class [9].

**Part 2:**

Examination of women during labor, such as vital signs and blood pressure, were evaluated to indicate normal maternal status during labor. Cervical dilatation was measured in centimeters.

**Tool 2:**

**The visual analog scale (VAS)** adopted from Katz and Melzack (1999) [10]. It is a self-report scale used for subjective assessment of pain. It encompassed 10 numerical points; equivalent to the degree of pain with zero means no pain and 10 stands for worst agonizing pain. Along this continuum, expressions such as annoying, uncomfortable, dreadful and horrible pain are allocated to each 2 cm expanse, correspondingly.

**2.7 Operational design****2.7.1 Operational design**

A pilot study was carried out on 10% of the study sample. It served to ensure clarity, readability, time of administration for the tools of data collection. Also, it helped in determining the obstacles and problems that may be arising during the actual collection of data. Based on the pilot results; there was no need for amendment in the tools. The subjects of the pilot were excluded from the main study sample.

**2.7.2 Field work**

Before the conduction of the research, written ethical approval for the study was obtained from the ethical review board of the hospital.

Consequently, once permission was granted to proceed in this study, the researcher also approached the director of the selected setting to explain the purpose and methods of the study & to obtain their cooperation. Also, a simple explanation for the purpose of the study was done by the researcher for the study subjects to obtain their cooperation & participation and to clarify the items of the different tools used in data collection. The participated women were assured anonymity that the information will be used for scientific research only and will be strictly confidential. To obtain the requisite number of participants, the researcher went to the maternity hospital twice a week during the day shift and approached all women who met the inclusion criteria during the research period. The fieldwork spanned relatively within three months whereas the data of this study were collected throughout the period from October to December 2018. Data collection has been accomplished by means of interviews and participant observation. Fifty women during their active phase of the 1<sup>st</sup> stage of labor when cervical dilatation ranging from 3 to 7 centimeter and under the orientation and close observation of the researchers were randomly assigned to two groups. The first group included twenty-five women *cleansing breathing* is used by them and the second twenty-five women assigned for light breathing. Cervical dilatation was measured in centimeters by the researcher. VAS was used to measure the sensory components of *labor pains for all women in the study sample* at the beginning of the trial before

using any breathing techniques and at the end of one hour after using the rhythmic breathing assigned for each. **Cleansing breathing** is done as at the beginning of each contraction; the woman takes a deep breath in through nose, then exhale through mouth, loud enough that others can hear the exhale. When a contraction ends, the parturient takes another deep cleansing breath, perhaps also yawning or stretching to release tension. Welcoming breath gives both mother and fetus an extra boost of oxygen, serves as a signal to relax and focus, and informs the researcher that a contraction has begun. Closing breath serves as a release, informs the researcher that contraction has passed, and serves as a reminder to relax between contractions. **Light breathing** is done through inhaling and exhaling through the mouth. Lips are relaxed, with a slight smile. On exhale, the woman makes a soft “hee” sound. To avoid hyperventilation, the woman focuses most attention on this exhale – let the inhale happen easily. Breathing is shallower than in slow breathing, approximately one breath per second. It is used with contraction. This way of breathing helps with relaxation, distracts attention from contraction. The participant's labor pains are indicated through rating the VAS. The intensity of pain woman is feeling is tracked on a highlighted slope and marked off line.

### 3. Statistical Design

Statistical analyses were done by an expert statistician. All information was entered into a recorded form. SPSS software was used to analyze the data. X<sup>2</sup>, t test, and p values were calculated to show the significance differences between the two breathing techniques used to the study sample. P<0.05 was considered to be statistically significant.

### 4. Results

A total of fifty women (cleansing breathing group = 25, light breathing group = 25) completed VAS pain measurement for the active phase of the 1st stage of labor. Several demographic characteristics were present in approximately equal ratios in each group. As table (1) illustrated that no significant difference between the two groups in relation to age and socioeconomic status. X<sup>2</sup>=0.56 (P=.907) and X<sup>2</sup>=1.44 (P=.487) for both groups respectively. P < .05

**Table (1) Distribution of the study sample according to their demographic characteristics: -**

Demographic and obstetric	control group (cleansing breathing) (n=25)		study group (light breathing) (n=25)		Test of significance
	No.	%	No.	%	
<b>Age in years:</b>					
25 or less	8	32.0	10	40.0	X <sup>2</sup> =0.56 (P=.907)
26 to 30	14	56.0	14	56.0	
30 to 35	3	12.0	1	4.0	
<b>Socioeconomic Status (SES)</b>					
Lower middle	5	20.0	11	44.0	X <sup>2</sup> =1.44 (P=.487)
Middle	16	64.0	12	48.0	
Upper middle	4	16.0	2	8.0	

According to table (2) and before the use of any rhythmic breathing, no statistically significant difference was observed among the cleansing and light breathing groups which grantee homogeneity of the two study samples.

**Table (2) Distribution of women according to their (VAS) before and after using rhythmic breathing**

VAS	Type of rhythmic breathing											
	Cleansing breath (n=25)					Light breath (n=25)					Test of significance	
	before		after			before		after			Before rhythmic breathing	After rhythmic breathing
	No.	%	No.	%	No.	%	No.	%				
Annoying	6	24.0	13	52.0	5	20.0	5	20.0	t = 0.0919 (p = 0.463)	t = 2.2785 (P = .013)*		
Uncomfortable	10	40.0	10	40.0	9	36.0	10	40.0				
Dreadful	6	24.0	2	8.0	6	24.0	6	24.0				
Horrible	1	4.0	0	0.0	2	8.0	1	4.0				
Agonizing	2	8.0	0	0.0	3	12.0	3	12.0				
The mean intensity of pain	4.46±2.00		2.20±1.53			4.40±2.58		3.28±1.81				
<b>Test of significance</b>	t = 4.4877 (p < .00001) **					t = 1.7769 (p = 0.0413) *						

NB. \* Significant P < .05

\*\* Highly significant < .00001

There is a highly significant relation between mean pain levels before and after the cleansing breathing were ( $p < .00001$ ). Among women used light breathing significant relation was found between the levels of pain before and after demonstrating that breathing  $p = 0.0413$ . In addition, the mean score of pain intensity among women after cleansing breathing was  $2.20 \pm 1.53$  which is less than the one after light breathing =  $3.28 \pm 1.81$ . There was a significant difference between both the cleansing breathing group and the light breathing group in relation to mean VAS after using the rhythmic breathing were  $P = .013$  to the favor of the cleansing breathing.

### 5. Discussion

Previous meta-analysis of randomized clinical trials have found that there is a reduction in the number of cesarean deliveries, length of labor, and use of analgesia along with increased infant Apgar scores in women who receive continuous support during labor [11]. One form of support can be provided by the maternity nurse.

In this context, for many women, labor involves a change in environment; thus maternity nurse should pay special attention to support women’s use of coping strategies at such times. Procedures such as electronic fetal monitoring or intravenous infusions were also cited as reasons for increasing women’s agitation and pain perception. Rhythmic breathing can stabilize the mood of parturient, reduce labor pain effectively, prevent laceration of birth canal, shorten the birth process, increase oxygen supply of fetus, and reduce the incidence of either fetal distress in uterus or neonatal asphyxia [12].

The findings of the current study suggest using rhythmic breathing in managing the first stage of labor. As the effectiveness of the breathing strategies the parturients demonstrated for pain relief during the active stage of labor where approved by current study results. Research noticed that the pain scores, when compared “before and after” the application of the cleansing breathing was obviously decreased. There was significant difference between the scores of pain before and after demonstrating cleansing breathing among women in the control group ( $P < 0.05$ ). The effect of light breathing was obvious for reducing labor pain. This result is congruent with Lil et al, 2004 [13] in studying the effect of various respiratory modes used in different birth processes on childbirth. It was concluded that to take various respiratory modes in different birth processes can lessen labor pain efficiently. In several studies, women who used rhythmic breathing found them helpful in achieving

relaxation, offering a distraction, and associated with lower levels of pain in labor. Women who expected breathing exercises to be useful were more likely to experience them as such and to be more satisfied than women without these expectations [13, 14, and 15].

Which suggest that light breathing is more helpful with increased cervical dilatation and more painful uterine contractions where cleansing breathing can not be adequate any more. The pain scores before and after using the light breathing can be interpreted as the women experiencing agonizing pain before shifted to less intensity pain scores after the intervention. There was a significant relation between pain scores before and after light breathing among women in the study group ( $P < 0.05$ ). Most women feel the need to switch to light breathing at some time during the active phase of labor [16].

There is some controversy surrounding the specifics of how breathing should be taught. The general trend is to move away from rigidly prescribed breathing toward individualization and flexibility. The sensory (pain intensity) and affective (negative or positive experience) dimensions of pain, the complexity of labor pain as well as need for pain relief during labor were explored and the results indicated that mothers stated that being dominant over the choices concerning dealing with labor pains turning the process into positive experience. Among those mothers some of them specified that caregiver should be knowledgeable enough about the non-pharmacological method of pain relieve they. Pain is not a completely undesirable experience, more than one quarter of laboring women describing it as more positive; suggesting that coping with pain is a gratifying experience for some women [17].

In this regard although pain and suffering go hand in hand, labor pains do not have to cause suffering. The two main medical approaches to labor pains are intravenous narcotic-like drugs and regional block (for example the epidural). Both have serious side effects on mother and fetus witch make the move toward the non pharmacological of pain relieve methods-one of them is rhythmic breathing-. Ensue maternity nurse has to work within the context to make the woman have the best birth possible as she defined it.

## **6. Conclusion**

The researcher concluded that labor pains can be greatly minimized with any of the rhythmic breathing management techniques with much reference to the cleansing breathing as being more effective in reducing labor pains among primiparous women.

## **7. Recommendations**

In the light of the current study conclusions, it was recommended that, further researches are necessary to identify the effect of various non-pharmacological pain relieve methods on labor pains and its relation to maternal perception about these methods.

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