Effect of Non-Pharmacological Pain Relief Measures on Progress of Labor during First Stage of Labor

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Abstract: **A variety of non-pharmaceutical pain managements have been used to control pain. Massage includes manipulation of the body's parts and soft tissues. It is usually used to help relax strained muscles and to soothe and calm the persons. The effects of heat and packs on relieving labor pain and increase progress of labor by enhance uterine contraction; dilatation and effacement of the cervix by Stimulate heat receptors in derma and deeper tissues, and improving blood flow and oxygenation of tissues.** *The Aim of the Study* **is evaluate the effect of non-pharmacological pain relief measures on progress of labor during first stage of labor.** *Subjects and Methods***, a quasi-experimental design was conducted in labor room of Al-Ahrar teaching Hospital. A Purposive sample was consisted of one hundred and twenty laboring women divided into two groups; study group 80 parturient women (40 parturient women used massage method and 40 parturient women used warm compresses method) and control group 40women admitted to labor rooms without obstetrical or medical complications. Data collected by using interview questionnaire, Partograph. Results highly significant differences between three groups in relation to progress of labor after first 30 minute during intervention, after second 30 minute during intervention, after third 30 minute during intervention, and after fourth 30 minute during intervention In addition, the progress of labor is increased in first group who used Lumbosacral Massage than second group who used worm compress. Meanwhile, the progress of labor is lower in third group who didn't use any methods. Conclusion lumbosacral massage and warm compress is a safe and effective intervention to increase progress of labor during first stage labor. Recommendation Providing laboring women with simple instructions pamphlet or brochure about non pharmacological pain relief method dissemination among laboring women for assurance and enhancement their knowledge, Emphasize on the importance of using lumbosacral massage and warm compress as anon pharmacological method for enhancing labor progress, Studying the effectiveness of lumbosacral massage and warm compress on labor progresses in the first stage of labor for high risk women.**

Keywords: **Labour progress, non-pharmacological measures, partograph.**

1. INTRODUCTION

Non-pharmacological procedures of labor analgesia include lumbosacral massage, Doula support during labor and delivery, music therapy, postural changes, warm water compresses, and acupuncture. Non-pharmacological methods are simple to administer and have no side effects or adverse effects on the mother and fetuses. They have gradually become popular; however, their efficacy still requires more comprehensive and in-depth research (*Royal College of Obstetrics and Gynecology, 2017*).

Some non-pharmacological interventions have been shown to assist with the relief of labor pain and/or the progression of labor. Several studies indicate that exercises with a Swiss ball aid in the efficient evolution of dilation, pain relief and facilitating fetal descent. The effectiveness of massage in reducing pain intensity has been demonstrated in several individual randomized trials. A Cochrane systematic review with six studies contributing data on 326 women confirmed that massage significantly reduces labour pain and also showed that it improves the emotional experience of labor. Another systematic review with data on 3243 women showed that showering reduces pain severity in women with 8 to 9 cm of cervical dilation, reduces the need for pharmacological analgesia, and shortens the duration of the first phase of labor *(Oyetunde., 2018).*

The Aim of the Study is evaluate the effect of non-pharmacological pain relief measures on progress of labor during first stage of labor

Study hypothecs:

Women who received non-pharmacological pain relief measures will be increase progress of labor during first stage of labor.

Study design:

Quasi experimental intervention study.

Study Setting:

This study was conducted in the obstetric labor unit at Al Ahrar hospital in Zagazig city, Sharkia governorate, Egypt.

Sample type and Criteria: Purposive sample with the following criteria:

1- Age 18-35 years old

2- Different parity at first stage of labor.

3- Full term gestation (38-40 wks.) without complication

4- Doesn't use any method to relief pain except study method.

Sample Size:

Selection of total number of parturient women (120women) according to the previous mentioned criteria the first group (40 women) is used as control group, while the second group as study group (40 women) used lumbosacral massage, and third group (40 women) used warm compresses.

Sampling technique:

The intervention group1 warm compresses(40 women) the researcher started intervention in the first stage of active phase with cervix dilatation between 4 and 8 cm, the investigator applied warm packs to the participants' sacral area at a temperature of roughly 45 C was used as a warm pack *(Simin et al, 2016).* uterin contraction and cervical dilatation were recorded by the investigator every 30 min till the dilation has reached 8 cm.

The interventional group2 lumbosacral massage (40 women) the researcher started intervention at the beginning of the active phase of labor, during the period of 4–5 cm of cervical dilation and during uterine contractions for 30 minutes. The intensity of the massage was determined by the participant. The technique was applied between T10 and S4 (*Rubneide, 2013*).

The control group (40 women) was not receiving any pain relief measures and complete pretest data collection form at enrollment in the study as (baseline data). They asked to complete posttest data after the intervention.

Tools of Data Collection include: two tools was used in this study it was in an Arabic language designed by the researchers after reviewing of the related literature, to find out the Effect of Pain Relief Measures on Women's Pain Perception during First Stage of Labor it consists of the following:

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I- Structured interviewing   questionnaire:

The questionnaire was written in simple Arabic language in the form of close questions. It consisted of three parts:

 A- Socio-demographic data such as: age,   occupation,   education   level, residence....ect.

B- Present pregnancy history as: it included data about history of receiving antenatal care, LMP.

II- Partograph (adopted from WHO, 2015) :

Partograph acts as a simple and accurate tool for early detection of abnormalities during labor, it contain the following point:

1- General examination such as; vital signs, weight, height, BMI, and any signs mark as complications.

2- Local abdominal examination to determine the fetal position, level of the funds, and presentation as well as the fetal heart rate.

3- The characteristics of uterine contractions; frequency, intensity and duration were also recorded.

4- Vaginal examination to determine the onset of labor and exclude any abnormality. It gave description about the condition of vulva and vagina, cervical effacement and dilatation.

5- The condition of the membranes intact or ruptured was also recorded.

6-   Diagnosis of labor was determined and adequacy of the pelvis was assessed.

7- Bishop Score that estimated which include; cervical dilatation, effacement, station of the fetal head, cervical consistency, and position.

In addition to illustrated booklet: - (Appendix IIII)

Booklet was given to each parturient women .The booklet used simple Arabic language and different illustrated pictures in order to facilitate the parturient women understanding: which included explanation of how and when to use the non-pharmacological measures (warm compresses and back massage). Parturient women instruct about the 30 minute duration that used for every methods.

Tools validity and reliability:

Content validity was done by panel expertise .The developed tool was reviewed for appropriateness of items and measuring the concepts through 3 expert jury panels in the same specialty to assure content validity.

$$r = \frac{N\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{[N\Sigma x^2 - (\Sigma x)^2][N\Sigma y^2 - (\Sigma y)^2]}}$$

Where:

N	=	number of pairs of scores
Σxy	=	sum of the products of paired scores
Σx	=	sum of x scores
Σy	=	sum of y scores
Σx^2	=	sum of squared x scores
Σy^2	=	sum of squared y scores

Ethical considerations:

- The aim of the study was explained to parturient women before applying the tools to gain their confidence and trust.

- An oral consent was obtained from parturient women to participate in the study; withdrawn is permissible at any time.

- The researcher informs the parturient that the study tools neither embarrass their modesty not to cause any harm for them.

- The data are collected and treated confidentially.

Pilot study:

The pilot study was carried on 10% (20 parturient women) of sample size before starting the data collection. These parturient women were excluded from the study sample.

Field work:

The actual field work is carried out from the beginning of October 2016 to the end of January 2017 covering 4 months. The study setting was visited three times/week, and throughout the visits:- At the beginning of interview the researcher greeted the parturient women, introduced herself to parturient women participating in the study, explained the purpose of the study, and filled a structured interviewing schedule, the researcher interviewing each women and teach how do Lumbosacral massage technique on the back takes about 30 minutes.

Instructions for each group of lumbosacral massage and warm compresses technique:-

- The time needed for apply each procedure is 30 minutes.

-During lumbosacral massage procedures instruct the parturient about lumbosacral area on back as a site for procedure.

Assessment phase of labor progress by using partograph by:

- reviewing the uterine contraction and cervical dilatation assessment

Intervention phase by applied lumbosacral massage for 30 minute (in the group of lumbosacral massage) and applied warm compress (on the group of warm compress) on the back of laboring women every 30 minute for 2 hours (during first stage of labor) and reviewing the level of labor progress by using partograph every 30 minute for 2hours.

Evaluation phase by using partograph every 30 minute for 2 hours throughout intervention the researcher can evaluate the uterine contraction and cervical dilatation for study groups and control group.

2. STATISTICAL ANALYSIS

Upon completion of data collection, variables included in each data collection sheet were organized and tabulated then coded prior to computer data entry, by using a program of statistical analysis the statistical package for social science (SPSS) version (17). The following tests for significance were used: Mean and standard deviation as well as percentage, frequency, F test, paired t test and Probability level of 0.05 was adopted as the level of significance for testing hypothesis.

3. RESULTS OF TH STUDY

Table (1): Distribution of the studded sample according to Socio demographic data of laboring women:

		Method			Total	Test	P
		Warm Compresses (40)	Lumbosacral Massage (40)	No method (40)			
Age	Mean±SD. Deviation	28.08 ± 2.920	28.70±2.990	28.10 ±2.94	120	F 5.675	0.004*
	Range (year)	22-34	22-35	20-35			
Occupation	House wife	26 (65%)	28 (70%)	25 (62.5%)	74 (61.7%)	X^2 0.52	0.077
	Worker	14	12	15	46		

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		(35%)	(20.0%)	(60.0%)	(38.3%)		
Education	illiterate	10 (25.0%)	11 (40.0%)	9 (10.0%)	30 (25.0%)	X^2 1.81	0.077
	Secondary	20 (55.0%)	18 (40.0%)	16 (40.0%)	54 (45.0%)		
	University	10 (20.0%)	11 (20.0%)	15 (50.0%)	36 (30.0%)		
Monthly income	Insufficient	13 (32.5%)	14 (35%)	15 (37.5%)	42 (35.0%)	X^2 0.22	0.896
	Sufficient	27 (67.5)	26 (65%)	25 (62.5%)	78 (65.0%)		
Residence	Urban	22 (55%)	24 (60%)	23 (57.5)	69 (59.5%)	X^2 0.21	0.903
	Rural	18 (45%)	16 (40%)	17 (42.5%)	51 (40.5%)		

Table (1): This table illustrate there are in significant differences between three groups in relation to Age (P=0.004), and the table represent age of studded sample ranged 22-34 years in warm group, with Mean±SD 28.08 ± 2.920 with method used .

Table (2): Distribution of the studded sample according to History of present pregnancy (N=120):

		Method			Test	P	
		Warm Compresses 40	Lumbosacral Massage 40	No method 40			
Wight	Mean±Std. Deviation	68.78±3.724	69.60±3.954	70.80±3.443	F 3.008	0.053	
	Range (Kg)	62-75	65-74	65-75			
Height	Mean±SD. Deviation	168.15±3.302	168.60±3.078	168.40±3.241	F 0.198	0.821	
	Range (Cm)	160-172	165-162	162-170			
Gestational Age	Mean±SD. Deviation	37.70±1.856	38.30±1.436	38.70±1.203	F 4.372	0.015*	
Number Of Antenatal Visit	<6Vist	3 (7.5%)	2 (5%)	9 (22.5%)	Total 14 (11.7%)	X^2 6.95	P 0.031*
	>6Vist	37 (92.5%)	38 (95%)	31 (77.5%)	106 (88.3%)		
Initiation of Antenatal Care	First Trimester	25 (62.5%)	16 (40.0%)	0 (0.0%)	41 (34.2%)	75.2	0.001**
	Second trimester	12 (30.0%)	24 (60.0%)	12 (30.0%)	48 (40.0%)		
	Third trimester	3 (7.5%)	0 (0.0%)	28 (70.0%)	31 (25.8%)		

Table (2): This table represent that highly significant difference between three groups in Gestational Age, number of antenatal visit and initiation of antenatal care respectively (P=0.015, P=0.031, P=0.001) with method used.

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Table (3): Distribution of the studied sample according to Uterine Contraction and Method of the Studied Groups:

Uterine Contraction		Method			Total 120	X^2	P
		Warm Compresses (40)	Lumbosacral Massage (40)	No method (40)			
Uterine Contraction Regularity And Duration	Normal3-5minute for40-60second	40 (100.0%)	40 (100.0%)	0 (0.0%)	80 (66.7%)	120.0	0.001**
	Abnormal Irregular >10minute for40second	0 (0.0%)	0 (0.0%)	40 (100.0%)	40 (33.3%)		
Uterine Contraction Frequency 10 minute	Regular3contraction/10minute	37 (92.5%)	40 (100.0%)	0 (0.0%)	77 (64.2%)	108.67	0.001**
	<3contraction/10minute	3 (7.5%)	0 (0.0%)	24 (60.0%)	27 (22.5%)		
	>3contraction /10minute	0 (0.0%)	0 (0.0%)	16 (40.0%)	16 (13.3%)		
Uterine Contraction Interval	=1min	32 80.0%	32 80.0%	12 30.0%	76 63.3%	63.8	0.001**
	<1min	5 12.5%	8 20.0%	0 0.0%	13 10.8%		
	>1min	3 7.5%	0 0.0%	28 70.0%	31 25.8%		
Uterine Contraction intensity	Mild	3 7.5%	0 0.0%	20 50.0%	23 19.2%	43.17	0.001**
	Moderate	28 70.0%	28 70.0%	20 50.0%	76 63.3%		
	Sever	9 22.5%	12 30.0%	0 0.0%	21 17.5%		

Table (3): This table represents that highly significant differences between three groups in relation to uterine contraction regularity, duration, frequency10minute, interval, and intensity respectively (P= 0.001, P= 0.001, P= 0.001, P= 0.001) with method used.

Table (4): Distribution of the studded sample according to Cervix Dilatation and Method of the Studied Groups:

		Method			Total 120	X^2	P
		Warm Compresses (40)	Lumbosacral Massage (40)	No method (40)			
Cervix Dilatation	Normal 3 - 4 hours (Latent phase 0-3cm)	40 (100.0%)	40 (100.0%)	12 (30.0%)	92 (76.7%)	73.04	0.00**
	Abnormal >4h (Active phase 4-10cm)	0 (0.0%)	0 (0.0%)	28 (70.0%)	28 (23.3%)		
Descend Presenting Part	Normal 2-+3 (> 0 station)	37 (92.5%)	40 (100.0%)	8 (20.0%)	85 (70.8%)	75.59	0.00**
	Abnormal (≤ 0 station)	3 (7.5%)	0 (0.0%)	32 (80.0%)	35 (29.2%)		
Progress Of Labor	Normal Progress	37 92.5%	40 100.0%	8 20.0%	85 70.8%	75.59	0.00**
	Abnormal Progress	3 7.5%	0 0.0%	32 80.0%	35 29.2%		

Table (4): This table show highly significant differences between three groups regarding to Cervix dilatation, Descent presenting part normal 2+ - +3 (> 0 station)**,** and Normal progress of labor respectively (P=0.00, P=0.00, P=0.00) with method used .
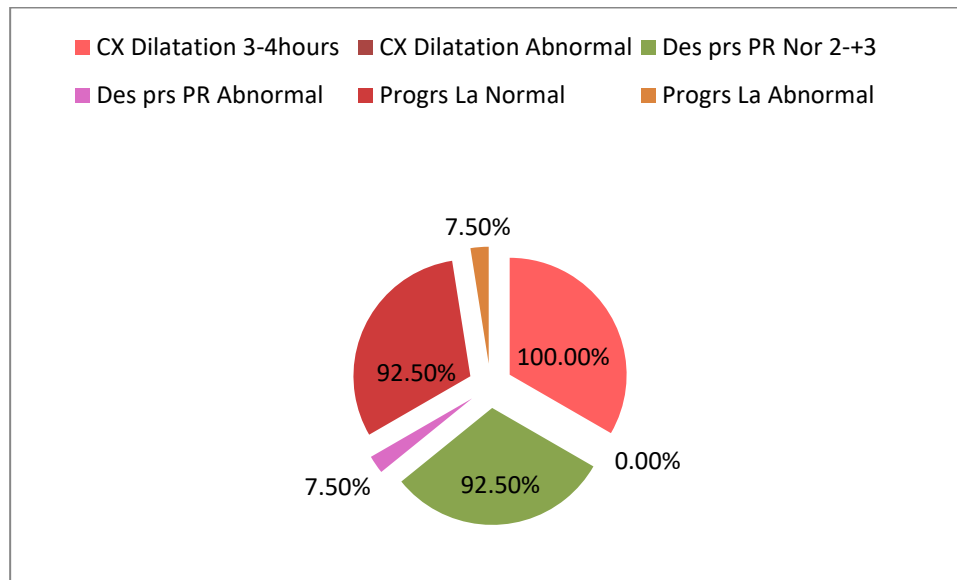
Figure (1): Presentation labor progress during intervention:

4. DISCUSSION

Childbirth is associated with strong pain caused by uterine contractions which dilate the cervix and the lower uterine segment. When the labor process starts, the contractions are irregular and the pain experienced is mild to moderate. The contractions gradually occur more frequently, and the pain becomes severe or intolerable *(McDonald, 2017).*

As labor progression is dependent on distension of vagina and perineum, uterus contractions, and cervical dilatation, it is not possible to remove the pain source and methods should be applied for decreasing the pain *(Woolf., 2016).* Pain originates from different sites during labor and birth. In the first stage of labor (defined as the period from the onset of labor to the complete dilatation of the cervix) *(Wildman et al., 2016).*

The present result showed that there was a statistically significant association between three groups in relation to women age. Thus women with young age group were significantly to use non pharmacological intervention as lumbosacral massage and warm compress. This finding is in accordance with **Faezah et al., 2016** study on effects of massage therapy on anxiety and satisfaction of pregnant women during labor in Iran, who reported that younger maternal age and one para was considered as more response to use lumbosacral massage and warm compress to relieve pain during first stage of labor and therefore deserve special attention.

Meanwhile the present study which examine the non pharmacology procedures relief labor pain, found that educational level and occupation play a role in increase use lumbosacral massage and warm compresses, and that use non pharmacological procedures common in working mothers might be due to vitality life and increase of activity of working mothers, high educational women were significantly more likely to use non pharmacological procedure to relieve pain during first stage of labor (p=0.077). In the same respect with **(McCrea., 2016)**.

The present result revealed that women with short birth interval with active first stage of labor and those who had no previous complication were significantly more likely to use non pharmacological procedure (lumbosacral massage and warm compress) to relief pain in the first stage of labor. This finding is supported by **Scott et al., 2016** who found that the shorter the previous birth interval the more uses non pharmacology procedures in previous delivery that more response to massage and warm compress to relief first stage labor pain.

In the current study represent that highly significant differences between three groups in gestational age, number of antenatal visit and initiation of antenatal care respectively., a study done by **Simikin.,(2016)** found that normal gestational age that helping factor for response to use lumbosacral massage and warm compress as non-pharmacological methods to relief labor pain, this results by **Davim(2016)**, whom considered that increase counseling of antenatal visits, dependent factors for using non pharmacologic procedures through awareness and counseling that giving to mothers during visits.

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Also **Nilsson, (2016)** reported that women who early initiation of antenatal care its more liable to procedures that enhance the laboring women to use non pharmacology procedures to relief labor pain during first stage of labor.

The current study showed that there was highly significant differences between three groups in the same line **Chang., (2017),** and **Behmanesh., (2016)** whom found that, the normal progress of cervical dilatation at the first delivery increases by used non pharmacological procedures as lumbosacral massage and warm compress that used to relief labor pain, Concerning descend of presenting part, the present result showed that, high significant relation of women that used lumbosacral massage and warm compresses to relief labor pain in first stage. This finding is agreement with **Allaire., 2017** who reported that births assisted by lumbosacral massage and warm compresses with high chance with normal descend presenting part and have lower rates of most interventions, including episiotomies and perineal tear.

The present finding confirmed highly significant differences between three groups in relation to uterine contraction regularity, duration, frequency, interval, and intensity. Similar findings were also reported by **Smith., 2016** in their studies comparing method used with uterine contraction regularity, frequency, intensity, interval, and duration for first stage of laboring women being normal rate in experimental group that used lumbosacral massage and warm compresses within normal rang progress. These result was on the same line with **Hodnett, 2017** who reported that using back massage and local heat compress it enhance uterine contraction during labor.

5. CONCLUSION

Non pharmacological pain relief measures (Lumbosacral massage and warm compress) have positive effect on progress of labor during first stage of labor.

6. RECOMMENDATION

- Providing laboring women with simple instructions pamphlet or brochure   about non-pharmacological method dissemination among laboring women for assurance and enhancement their knowledge.

- Emphasize on the importance of using lumbosacral massage and warm compress as a non-pharmacological method for enhancing labor progress.

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