Original Research Article

Effect of Breathing Exercise in Reduction of Pain during First Stage of Labour among Primigravidas

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ABSTRACT

The pain that women experience during labour is affected by multiple physiological and psychosocial factors and its intensity can vary greatly. Complementary and alternative medicines have been used to decrease labour pain for many years. Despite reports that some of these methods reduce pain, increase maternal satisfaction and improve other obstetrical outcome, they have received limited attention in medical literature. Breathing exercise is one of the most effective complimentary therapies which are proven to be beneficial for labour management.

Materials and methods: The study was done by using experimental approach on 48 subjects (24 in experimental group and 24 in control group) randomly allotted. The experimental group received breathing exercise during contraction at a rate of 45 mins interval 3 times during the active phase of labour whereas routine care was provided to the subjects in the control group. Pain level was assessed after each contraction with wong weber's facial pain scale and behavioural checklist. The result showed that there was a significant difference between the mean pain score of the experimental and control group (p<0.001 as per t-test). Hence the null hypothesis is rejected at 0.05 level of significance. So breathing exercise is effective in decreasing the intensity of labour pain during the first stage of labour.

Conclusion: Hence breathing exercise could be used in clinical practice in order to improve the quality of care in labour and delivery.

Keywords: Breathing exercise; labour pain; primigravida mothers

INTRODUCTION

Pregnancy and childbirth is a very special time in every women's life which bring physical and emotional changes in the body. Women experience a wide range of pain in labour and exhibit an equally wide range of responses to it. An individual's reaction to labour pain may be influenced by the circumstances of her labour, as well as the environment and support provided to her during this period. psychological factors, such as stress, anxiety, fear, sense of loss of control and sense of abandonment also contribute to it. [1] First-time mothers are more likely to give their pain a higher rating than woman who've had babies before. The childbearing women experiences pain and discomforts during labour. Alternative and

complimentary therapy like breathing exercises is proven to be effective in providing natural pain relief. [2] Labour pain is a complex, personal, subjective, multi-factorial phenomenon which is influenced by psychological, biological, socio-cultural and economic factors. Although labour is often thought of as one of the most painful events in human experience, it ranges widely from woman to woman and even from pregnancy to pregnancy. [2,3]

In 2011 a study was conducted to assess the effectiveness of Patterned Breathing Technique in reduction of Pain during first stage of labour among primi-gravidas admitted in labour units of selected hospitals of Pune city. A Non Equivalent Pre-test Post-test control group design was adopted for the study. Non-Probability purposive sampling technique was followed to select 60 primi-gravida women. Then the subjects were assigned to the experimental group (30) and control group (30).The mean pre test score (on admission) and for overall mean post test scores (at 1st, 2nd, 3rd, 4th and 5th hour) of pain level before and after practicing Patterned breathing technique during first stage of labour, among primigravida women in experimental group, has p-value 0.00, which is less than 0.05 level of significance. Therefore, it was concluded that on admission the pain level during the active phase of first stage of labour, the pain level was less after that as the labour progressed there was a significant increase in the level of pain every hourly .And the level of pain on admission was mild then increased severely at the end of 5th hour Findings regarding comparison of primigravida women's pain level in experimental and control group. The mean pre-test score of pain level in primigravida women before practicing Patterned breathing technique in experimental was (2.6) which is less than control group which

is (2.8) with a mean difference of (0.2),which is not significant as evident from 'z' value of(1.68) which is less than 0.05 level of significance. Therefore, it was concluded that on admission before practicing Patterned breathing technique the level of pain experienced by the primigravida women in experimental and control group was almost same with no significant difference. The overall mean post test scores of pain level at 1st,2nd, 3rd, 4th and 5thhour after practicing Patterned breathing technique among primigravida women during first stage of labour, in experimental and control group has p-value of 0.000,which is less than 0.05 level of significance. Therefore it was conclude that there was significant reduction in pain level among primigravida women in experimental group after practicing selected Patterned breathing technique during first stage of labour as compared to the pain level among women in control group without practicing Patterned breathing technique. [4]

Therefore, since the humanized approach is considered as fundamental to help parturient women experience a less painful labor process, the effectiveness breathing exercises the object of this study to provide pain intensity relief for women in the active phase of labor. Although initial studies have found breathing exercise to be effective treatment for many ailments yet more researches is needed to provide the evidences and safe therapy for labour management. [5]

MATERIALS AND METHODS

This study was based on experimental approach. True experimental research design was selected as the research design for the present study. Simple random sampling technique lottery method was followed to select 48 primigravida women in the first stage of labour in Krishna Hospital

of Karad city. Then the subjects were assigned to the experimental group (24) and control groupn (24). Inclusion criteria were primigravida women who were in active phase of labour (with cervical dilatation of 4 cm), undergoing normal vaginal birth, were ready to participate in the study. After obtaining permission from the authority, Interview Schedule was used for collecting Demographic and base line data. Standardized, Wong Weber's Facial Pain Scale and Structured Observational checklists for assessment of pain. Content validity of the tool was ensured by fifteen experts from the field of Obstetrics & Gynaecology and biostatistics. Suggestions proposed were incorporated in tool and appropriate changes were made. After explaining the objectives and purpose of the study to the primigravida women written consent was obtained from each one of them for participation in the study. Pre-test score of the pain level was assessed and recorded in both the experimental and control group. Then, in the experimental group, slow paced breathing Technique was demonstrated and instructed by the investigator to the primigravida women in the labour room. After that the women were instructed to practice slow paced breathing technique during each contraction. The women practiced breathing technique during each contraction from the beginning of contraction and continued till the contraction ceased, in front of the investigator. As, the variations in the pain level could not be completely assessed by a single pre test and post test observation because as the time passes then intensity of uterine contractions also increases; hence the pain level would also increase. Therefore, 3 observations at the interval of 45 mins were recorded. 3 pre test and 3 post tests scores were recorded using facial pain scale and observational checklists for assessment of pain level after each pre test during the contraction. Similarly, in the control group, 3 pre and post tests scores were recorded using the same facial pain scale and structured observational checklist for assessment of pain level at the interval of every 45mins without practicing slow paced breathing technique.

RESULTS

The 't' test was used to find out the effectiveness of breathing exercise on perception of labour pain and chi square was used for finding the association. The data was analyzed using Instat software.

I. Findings related to sample characteristics:

Majority of the women in Experimental group(45.83%) and in Control group(37.5%) belonged to the age group of 18-21years. The education status showed Majority of women have secondary education in both Experimental Group (37.5%) and Control Group (33.34%). All the samples in both groups belong to Hindu Religion. Data shows all the women are housewives. All the women belong to joint family. Majority of the women in both Experimental group(62.5%) and Control group(66.6%) have 8-10 hours duration and Experimental Group (37.5%) and Control Group (33.3%) have 4-8hours duration. Data shows all women lives in urban area. In Experimental group (45.84%) and Control Group (33.34%) majority of the women belongs to the income group of Rs. 4810-8009None of the women had receive information regarding breathing exercise

II. Comparison of pretest and post test level of pain perception score between experimental and control group

Table 1.Behavioural checklists

Grp	Test	Mean	Median	Sd	T	Df	P Value	Inference
Experimental	pre-1	17.584	19	1.248	8.377	46	<0.0001	Significant
	post-1	21.7	21	2.036				
	pre-2	18.042	18	1.681	5.927	46	<0.0001	Significant
	post-2	21.375	20	2.183				
	pre-3	16.73	16	1.032	8.847	46	<0.0001	Significant
	post-3	20	20	1.474				
Control	pre-1	17.167	17	1.341	0.4512	46	0.6540	Not significant
	post-1	17	17	1.216				
	pre-2	17.84	17	1.308	1.438	46	0.1571	Not significant
	post-2	17.292	17	1.301				
	pre-3	16.042	16	1.429	1.306	46	0.1981	Not significant
	post-3	15.542	15	1.215				

Table 2.Facial pain scale

Group	Test	Mean	Sd	T	Mean Difference	P value	Significance
Experimental	Pre-1	3	0.525	3.948	-0.7500	0.0003	significant
	Post-1	2.541	0.509				
	Pre-2	3.542	0.5090	6.806	-1.000	<0.0001	significant
	Post-2	2.542	0.55				
	Pre-3	4.0416	0.550	4.281	-0.8335	<0.0001	Significant
	Post-3	3.208	0.779				
Control	Pre-1	3.125	0.536	1.062	0.1667	0.2936	NS
	Post-1	3.542	0.509				
	Pre-2	3.292	0.55	1.151	0.1667	0.2559	NS
	Post-2	4.2916	0.4643				
	Pre-3	3.375	0.4945	0.3052	0.04167	0.7616	NS
	Post-3	4.33	0.4815				

The behavioural checklists shows that the pain perception of the patient is decreased after the breathing exercise whereas in control group the pain was increasing with increase in contraction

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III. EFFECTIVENESS OF BREATHING EXERCISE ON REDUCTION OF LABOUR PAIN AMONG PRIMIGRAVIDA WOMEN

Table 3: Mean Post Test Pain Score of Pain Scale of Score of Experimental Group and Control Group.   n=24+24

Group	E	C	E	C	E	C
Test	post-1	post-1	post-2	post-2	post-3	post-3
Mean	2.292	3.292	2.542	3.542	3.208	4.34
SD	0.7509	0.55	0.509	0.509	0.779	0.4815
Mean Difference	1.000		1.000		1.125	
T	5.265		6.806		6.018	
P-Value	<0.0001		<0.0001		<0.0001	

Table 4: Mean Post-Test Pain Score of Behavioural Checklists of Experimental and Control Group.   n=24+24

Sample	24	24	24	24	24	24
Group	E	C	E	C	E	C
Test	post-1	post-1	post-2	post-2	post-3	post-3
Mean	21	17	21.375	17.29	20	15.542
SD	2.036	1.216	2.183	1.301	1.474	1.215
Mean Difference	-4.667		-4.083		-4.458	
T	9.461		7.87		11.432	
Df	46		46		46	
P-Value	<0.0001		<0.0001		<0.0001	

Since the p value is less than 0.0001 , it shows that breathing exercise was effective in reducing the perception of labour pain

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IV. ASSOCIATION OF PERCEPTION OF LABOUR PAIN WITH SELECTED SOCIO DEMOGRAPHIC VARIABLES

Table 5: Association of the pre-test facial pain scale with selected socio-demographic variables like age and duration of labour in experimental and control group

Sr No	Socio Demographic Variable	1	2	3	4	5	Chi Square	P Value	Df	Significance
1	Age - Pre Test 1(Experimental Group)									
	18 -21	0	1	8	2		2.914	0.5723	4	NS
	22 – 25	0	2	5	2					
	26 – 29	0	0	4	0					
	Age - Pre Test 2(Experimental Group)									
	18 -21			3	8		3.24	0.1979	2	NS
	22 – 25			5	4					
	26 – 29			3	1					
	Age - Pre Test 3(Experimental Group)									
	18 -21			1	8	2	3.898	0.5723	4	NS
	22 – 25			2	5	2				
	26 – 29			0	4	0				
	Age - Pre Test 1(Control Group)									
	18 -21		2	6	3		4.378	0.3573	4	NS
	22 – 25		0	7	2					
	26 – 29		0	4	0					
	Age - Pre Test 2(Control Group)									
	18 -21			8	3		0.9428	0.6241 **	2	NS
	22 – 25			5	4					
	26 – 29			2	2					
	Age - Pre Test 3(Control Group)									
	18 -21				8	3	0.1283	0.9378	2	NS
	22 – 25				6	3				
	26 – 29				3	1				
2	Duration Of 1st Stage Of Labour-Pre Test-1(Experimental)									
	> 12						7.435	0.0243	2	NS
	8-10Hour		0	11	4					
	4-8hr		3	6	0					
	< 4									
	Duration Of 1st Stage Of Labour-Pre Test-2(Experimental)									
	> 12						0.01119	0.9158 **	1	NS
	8-10Hour			7	8					
	4-8hr			4	5					
	< 4									
	Duration Of 1st Stage Of Labour-Pre Test-3(Experimental)									
	> 12						1.83	0.4005 **	2	NS
	8-10Hour			1	12	2				
	4-8hr			2	5	2				
	< 4									
	Duration Of 1st Stage Of Labour-Pre Test-1(Control)									
	> 12						0.8847	0.6425	2	NS
	8-10Hour		1	10	4					
	4-8hr		1	7	1					
	< 4									
	Duration Of 1st Stage Of Labour-Pre Test-2(Control)									
	> 12						1.434	0.2311 **	1	NS
	8-10Hour			8	7					
	4-8hr			7	2					
	< 4									
	Duration Of 1st Stage Of Labour-Pre Test-3(Control)									
	> 12						2.272	0.1317 **	1	NS
	8-10Hour				9	6				
	4-8hr				8	1				
	< 4									

There was no association found between age and duration of labour since the p value is > 0.05

Table 6: Association of the pre-test behavioural checklists with selected socio-demographic variables like age and duration of labour in experimental and control group

Sr No	Socio Demographic Variable	Positive	Negative	Chi Square	p Value	Df	Significance
1	Age - Pre Test 1(Experimental Group)						
	18 -21	8	3	0.1283	0.9374 **	2	NS
	22 – 25	6	3				
	26 – 29	3	1				
	Age - Pre Test 2(Experimental Group)						
	18 -21	10	1	1.4666	0.4804 **	2	NS
	22 – 25	7	2				
	26 – 29	4	0				
	Age - Pre Test 3(Experimental Group)						
	18 -21	7	5	2.791	0.2477 **	2	NS
	22 – 25	2	7				
	26 – 29	2	2				
1	Age - Pre Test 1(Control Group)						
	18 -21	8	3	0.1283	0.9378 **	2	NS
	22 – 25	6	3				
	26 – 29	3	1				
	Age - Pre Test 2(Control Group)						
	18 -21	11	0	2.921	0.2322 **	2	NS
	22 – 25	7	2				
	26 – 29	3	1				
	Age - Pre Test 3(Control Group)						
	18 -21	4	8	0.1702	0.9478 **	2	NS
	22 – 25	3	6				
	26 – 29	1	3				

There was no association found between age and duration of labour since the p value is > 0.05

DISCUSSION

Breathing exercise is a natural way to relieve labour pain.. Mothers who have used breathing exercise during child birth have been incredibly satisfied with this natural method. [6] So it is valuable to offer complementary pain relief methods to women in childbirth. Most childbirth education classes and most books on childbirth present relaxation techniques, along with a variety of rhythmic breathing patterns intended to complement and promote relaxation or to provide distraction from labor pain. They are also used to enhance a woman's sense of control. [7,8] Various studies were conducted to determine the effect of breathing exercise in reduction of labour pains and duration of the first stage of labour. On the same lines the present study was undertaken with an objective to assess the effect of breathing exercise on the perception of labour pain.

The present study showed that chi-square value of selected demographic variables like age in pre test 3 (χ^2=2.914,3.24 and 3.898) in experimental group and control group(χ^2=4.378, 0.9428 and 0.128) and duration of 1st stage of labour in all the 3 pre test in experimental group(χ^2=7.435,0.01119 and 1.83) and control group(χ^2=0.8847,1.434 and 2.272) are not found significant at 0.05 level of significance. Therefore there is no association between the pre-test pain scores in experimental and and control group with the selected demographic variable. A similar findings were noted by Sruthi in Mangalore showed there is no association between the pre test pain score of women in experimental and control group age (χ^2=0.010) is not found significant at 0.05

level of significance but this finding was congruent with the findings of Melzack et al [9] who also found a trend towards less labor pain experienced by older women compared to younger. A multicentre study in six hospitals in five European countries 7 and a study by Sheiner et al [10] in 447 women have also confirmed that pain perception decreased with advancing age. This may be due to a higher pain threshold with increased age which was confirmed by some studies. [11,12] but other studies could not find such an association. Age as a predictor of higher pain scores was not shown in the study done by Klostergaard et al [13] in 139 primipara or by Ohel et al in 40 parturients which may be because of small sample size.

In the present study subjects were selected by random sampling technique. Study consist of 48 subjects in two groups i.e.; experimental and control group. Data was collected in the month of September and October 2013. After selecting subjects, Pain was assessed during contraction Breathing exercise was taught to experimental group and post test pain was assessed after administration of breathing exercise during contraction at an interval of 45 mins during the active phase of labour. The present study is supported by the following-

A similar study was conducted by Jayabharathi.B to assess the effectiveness of relative nursing interventions (such as breathing exercise, massage and positions) on pain during labour among primigravida mothers. In this study the post-assessment level of labour pain perception of primi mothers showed a mean value of 3.33 with SD of 1.86 in experimental group and mean value of 5.69 with SD of 2.59 in control group. The mean value (3.33) of experimental group was comparatively lower than the mean value (5.69) of control group. Therefore the study concluded that selected nursing interventions (such as breathing exercise, massage and positions) to the primi mothers were effective in reducing their labour pain perception in experimental group. [14]

This study was similar to another findings conducted in Coimbatore indicating there was a significance difference between the mean pain scores of experimental group (4.28) was lower than the mean pain scores of control group (6.22) which shows that that the slow paced breathing initiated by the investigator was effective in reduction of pain during the first stage of labour. [15]

Another study similar to this study is a study conducted in the city of Goiânia, in the state of Goiás (GO), Brazil, using individualized assistance with guidance and encouragement of breathing exercises and muscle relaxation techniques during labor, it was found that in the active phase of labor there was a predominance of pain; with the increase in pain tolerance during labor, encouragement, force, and physical and psycho-emotional well-being occurred in that period. [18] Another study using methods of progressive muscle relaxation showed significant reduction in the level of pain in parturient women subjected to this technique. [16]

A survey of women in the United States who gave birth in 2005 found that 49 percent of the respondents used breathing techniques, and of those, 77 percent rated them as "very" or "somewhat" helpful, while 22 percent rated them as "not very helpful" or "not helpful at all" [17] This finding may reflect differences in the quality of the teaching received by the women, or indicate that breathing techniques are not helpful for everyone. A survey of British women found that 88 percent of women who reported using relaxation techniques found them to be "good" or "very good" [18]

Findings of the study clearly indicate that breathing exercise is an effective complementary means for inducing a relief from labour pain(p<0.01 as per t-test). Hence the null hypothesis is rejected at 0.05 level of significance. So t is concluded breathing exercise is effective in decreasing intensity of labour pain. So it can be effective nursing management for women in labour.

The findings of the present study can be implicated in nursing practice for labouring mothers to promote comfort by reducing the labour pain intensity. Breathing exercise has shown to be an effective measure and could be used in clinical practice in order to improve the quality of care in labour and delivery. In contexts where more effective methods of pain relief are available, such as epidural analgesia, breathing exercise can be used as an alternative predominantly in early labour. In context where resources are limited breathing exercise could be important option for women to reduce the labour pain.

However, further studies of efficacy as well as effectiveness are needed to determine the clinical applicability of breathing exercise in labour pain. Further investigations are necessary to replicate the beneficial findings of breathing exercise in a larger population and to better elucidate physiologic mechanisms underlying pain relief during 1st stage of labour.

CONCLUSION

The results show that breathing exercise is proven to be an effective nonpharmacological method of treatment to reduce labour pain among primigravida women. It was concluded from the statistical tests that practicing breathing exercise was effective in reduction of labour pain among primigravida women. Analysis of data showed that there was a significant difference between the intervention and non intervention group. Breathing exercise is the effective, simple & non-invasive methods having no side effects on labour.

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