



## Effect of Birthing Ball on Level of Discomfort and Cervical Dilatation in First Stage of Labour among Primigravida Expectant Mothers

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### ABSTRACT:

**Background:** Pregnancy and normal delivery are areas that midwives serve. birthing ball are a multifunctional delivery item that are readily available to women. The device is helpful to speed up childbirth, increase its effectiveness, increase mother's comfort and aid in the foetal head. **Objectives:** 1. To determine the pre-intervention and post-intervention level of discomfort among women. 2. To measure the pre-intervention and post-intervention dilatation of cervix among women. 3. To compare the pre-intervention and post-intervention discomfort score and cervical dilation in experimental and control group. **Methods:** Quantitative research approach and a quasi-experimental control group pre and post-test research design were adopted for this study. The conceptual framework used in the study was - Modified theory by Ernestine Wiedenbach's. The study was conducted in selected maternity hospitals of Sangli- Miraj- Kupwad Corporation area. The sample size for the study was 40 primigravida mothers (20 in experimental group and 20 in control group). The sample size was obtained by G. Power software. Samples were selected using non-probability purposive sampling technique. Data collection was done by using demographic variables, observational table for level of discomfort and assessment of cervical dilatation. The data was analysed using descriptive and inferential statistics. **Results:** In the present study it was found that after intervention of birthing ball technique there was significant difference in experimental group i.e., p value was 0.001. The result shows that there was significant difference between pre-test and post test scores of discomfort levels and facilitation of cervical dilatation in experimental group. The obtained t value of discomfort score was -15.06, -27.09 and -34.33 and in cervical dilatation -5.87, -4.53 and -2.69 respectively with 48 degrees of freedom which was greater than the table value and It is evident that the birthing ball is significantly effective in reducing the discomfort and facilitate cervical dilatation among women in first stage of labour. **Conclusion:** The study findings revealed that using a birthing ball technique effectively decreased discomfort levels and facilitate cervical dilatation. The experimental group of women who received birthing ball experienced less discomfort and expressed a high level of satisfaction with the intervention of birthing ball technique.

**Keywords:** Birthing ball, level of discomfort, cervical dilatation  
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## 1. Introduction

The birth of a child is a joyous and significant event in a woman's life. From the dawn of humanity, women have been forced to experience labour pain, one of the most excruciating conditions. Crossing a small bridge when pregnant and giving delivery is certainly difficult. You can have company getting to the bridge and being greeted by others when you cross it, but the journey doesn't end there. Children are both the world's distinctive gifts and the future of a civilization. We must pay attention to and cherish them and their health as our culture and the wider globe change.<sup>1</sup>

The birth ball is an affordable, reusable, non-pharmacological, and non-invasive resource that is frequently used during labour in hospitals that value humanised birth and women's empowerment. Since the 1980s, birth balls have been a common sight in delivery rooms, and more and more studies are being done to demonstrate their effectiveness.<sup>2</sup>

A woman's pregnancy is a special, exciting, and frequently joyful period because it shows cases her incredible creative and nurturing abilities while building a connection to the future. The stages of growth that bring a woman into motherhood, a couple into family and a lovely kid into the world are pregnancy and birth. The labour process can be seen as a test of womanhood a measure of individual competence, a pinnacle of experience, and the first act of motherhood. The beginning of regular uterine activity which is accompanied by the cervix's effacement and dilation as well as the fall of the putting a component through the cervix.<sup>5</sup>

A woman's perception of pain during labour is thought to be influenced by a variety of variables. To do various movements during labour such as pelvic rotation and back-and-forth rocking. Birthing balls are a tool that midwives and nurses use to help women who are giving birth naturally without the use of an epidural, feel more comfortable, widen the pelvic outlet, and go through labour more quickly.<sup>6</sup>

It has been reported that using a birth ball during labour can reduce discomfort, lower anxiety, minimise the need for analgesics, facilitate easier foetal head descent and rotation, shorten the time needed for the initial stage of labour, and improve maternal happiness and wellbeing. Because of the dynamic nature of the ball, exercising with it has a positive psychological impact on posture, balance, coordination, and body awareness. As a result, the mother is better able to manage her body and develop self-confidence.<sup>7</sup>

During the latter trimester of pregnancy. Additionally, sitting on a birth ball may reduce spinal pressure, improve blood flow to the uterus, placenta, and baby, as well as increase pressure on the perineum and thighs.<sup>7</sup>

There are four stages to the entire labour process. The first stage of labour, also referred to as the cervical stage of labour, begins with the onset of real labour pains. In first-time mothers, this stage of labour can last up to 12 hours. As labour progresses, labour pains become more frequent and intense, sometimes to the point where they are intolerable for the woman. The birthing ball makes it easier to maintain an upright position throughout labour, which encourages the foetus to descend with the help of gravity and increases pelvic size. Birthing ball exercises give women a psychological boost of empowerment because they actively participate in their own care during labour, which enhances their body posture control and helps them deal with labour discomfort.<sup>8</sup> Consequently, the purpose of this study is to determine whether birthing ball exercises are effective in reducing labour pain and improving labour outcomes for primigravidae mothers.

The uterine muscles involuntary contractions during the first few hours of regular labour are what cause the pain. The mother typically has lower back pain during the first few stages of labour. The mother experiences increased discomfort in her back and abdomen as the labour process progresses. The average length of a labour contraction is 45 to 90 seconds. As the labour process moves along, the contractions get more painful.

Both pharmaceutical and non-pharmacological methods of pain control during labour are available. Birth ball therapy is one of the non-pharmacological approaches that is simpler and safer. One of the non-pharmacological techniques that can be used to lessen labour discomfort is birth ball therapy.<sup>9,10</sup>

The use of a birth ball is said to reduce discomfort, anxiety, and the need for pethidine during labour, facilitate foetal head drop and rotation, shorten the time spent in the first stage of labour, and improve maternal happiness and wellbeing. The primary concern is its safety because there have been no negative effects associated with its use. A strategy or process should be created to guarantee that the birth ball is used in the best possible and safest possible ways.

The majority of the stated advantages of the birth ball, however, were descriptive, and up to this point, its use has not been investigated or reviewed using impartial research techniques. The birth ball appeared to be gaining popularity as a substitute for traditional methods of labour pain treatment.<sup>11</sup>

As a result, one of the difficulties faced by women, their families, and their healthcare providers is trying to think about the pain and how to overcome it. The term "physiological delivery" refers to the new perspective that has emerged in recent years on the management of childbirth using physiological strategies worldwide. It is described as a style of vaginal birth that is safer for expectant mothers who are in labour wards without medical assistance and in an anxiety-free environment and in which the mother's hormone system augments the delivery. Because of this, there is a propensity to use non-pharmacological pain-relieving techniques to lessen the discomfort of delivery.<sup>12,13</sup>

## 2. Materials and methods

A quantitative research approach was adopted for the present study with experimental pre test and post test control group. The independent variable was birthing ball and dependent variable level of discomfort and dilatation of cervix . The present study setting was selected as per needs and criteria. The setting were the maternity hospital from Sangli -Miraj and Kupwad corporation area. A population is the entire aggregation of cases that meet a designated set of criteria.

In this study the population consists of primigravida mothers who are in first stage of labour. Inclusion criteria was women with cervical dilatation from 2cm, women who are willing to participate in the study, women Older than 20 years whereas the exclusion criteria was complicated pregnancy requiring close monitoring and restricted mobilization, woman with use of pharmacodynamics for cervical dilation, Planned for caesarean section and Foetal malpresentation. Sample size is 40 in which 20 experimental and 20 control. The sampling method used was non-probability purposive sampling method. Informed written consent was obtained from the mothers prior to conducting the study. Official permission was taken from concerned authorities. The investigators discussed the study with obstetrics from particular hospitals .

In experimental group administration of birthing ball technique for 15-20 mins for three times at 2cm, 4cm, and 6cm dilatation to reduction in level of discomfort along with early facilitation of cervical dilatation.

The data collection tool included demographic tool, assessment of cervical dilatation and assessment of level of discomfort during first stage of labour. After an extensive review and study of literature, books and journals were done before developing the tool as well as discussion with guide is done and experts opinion also taken and the tool was developed under the guidance of the guide to collect the data.

To ensure the content validity of the tool was submitted to experts along with demographic data, observation checklist with suggested corrections needed changes were done with guide discussion and final tool was prepared.

Institutional ethical committee, meeting was held in Bharati Vidyapeeth Deemed to be University College of Nursing, Sangli and the research proposal was approved. Permission was obtained from private hospitals based on the objectives of the study, frequency, percentage, mean, SD, were calculated to pre and post test score.

### 3. Results and Discussion

Table no .1: Frequency & Percentage distribution of Demographic Variables. N=20+20

Demographic variables	Experimental group		Control group	
	<i>f</i>	%	<i>f</i>	%
<b>Age( in years)</b>				
21-25 years	11	55%	8	40%
26-30 years	9	45%	10	50%
31-35 years	0	0%	2	10%
<b>Week of gestation</b>				
36-38 weeks	13	65%	12	60%
38-40 weeks	7	35%	8	40%
<b>Do you have any knowledge about birthing ball?</b>				
No	17	85%	19	95%
Yes	3	15%	1	5%
<b>Source of information</b>				
Internet	2	10%	1	5%
Hospital	1	5%	0	0%

**Age :**Table no.1 indicates that the most of the primigravida women in experimental group (55%) had age 21-25 years and control group(50%) belongs to the age group of 26-30 years .

**Week of gestation:**Data represented that most of primigravida mothers in experimental group (65%) and control group (60%) are from 36-38 week of gestation.

**Knowledge regarding birthing technique :**According to data collected in experimental group 15% of them knew about birthing ball. In control group 5%of them knew about birthing ball.

**Source:**In experimental group (10%) of them had information about birthing ball from internet and (5%) of them had information from hospital. In control group (5%) of them had information about birthing ball from internet.

Table 2: Pre-intervention and post-intervention discomfort score among women in first stage of labour in group. experimental and control group.

Groups		Discomfort score			
		Minimum	Maximum	Mean	Std. Deviation
Experimental group	Pre-test	15	19	17.5	1.192
	Post-test 1	11	15	13.3	1.129
	Post-test 2	9	12	10.25	1.164
	Post-test 3	6	10	7.75	1.333
Control group	Pre-test	14	18	16.25	1.12
	Post test 1	17	19	17.70	0.66
	Post-test 2	17	19	18.15	0.59
	Post-test 3	18	19	18.65	0.49

In experimental group, the maximum discomfort score in pre-test was observed as 19 which was reduced to 10 after the third post-test. In pre-test, the mean score of discomfort was observed as 17.5 which was reduced to 7.75 in the third post-test.

In control group, the maximum discomfort score in pre-test was observed as 18 which was increased up to 19 after the third post-test. In pre-test, the mean score of discomfort was observed as 16.25 which was increased to 18.65 in the third post-test.

Table 3: Pre-intervention and post-intervention dilatation of cervix (2-8 cm in hours) among women in first stage of labour in experimental and control group.

Groups	Dilatation (in cms)	Time taken for dilatation of cervix from 2cm to 8cm (in hrs)			
		Minimum (in hr)	Maximum (in hr)	Mean	Std. Deviation
Experimental group	2 to 4 cm	2.25	5.17	3.94	0.73
	4 to 6 cm	1.50	3.50	2.37	0.61
	6 to 8 cm	1.00	4.00	2.60	0.75
Control group	2 to 4 cm	3.75	7.00	5.60	1.03
	4 to 6 cm	1.92	4.00	3.18	0.50
	6 to 8 cm	2.00	5.75	3.35	1.00

Pre-intervention dilatation of cervix was 2cm which was also considered as baseline data. In experimental group, Minimum timing for dilatation from 2 to 4 cm was 2.25 hrs, and mean timing was  $3.94 \pm 0.73$ . Total mean duration for dilatation from 2 to 8 cm was  $8.92 \pm 0.82$  hours

In control group, Minimum timing for dilatation from 2 to 4 cm was 3.75 hrs, and mean timing was  $5.60 \pm 1.03$ . Total mean duration for dilatation from 2 to 8 cm was  $12.13 \pm 1.26$  hours

Table 4: Comparison of post intervention discomfort score among women in first stage of labour in experimental and control group.

Discomfort	Group	Mean	Std. Deviation	T	p value
post-test 1	Experimental group	13.3	1.129	-15.069	0.000
	Control group	17.7	0.657		
post-test 2	Experimental group	10.25	1.164	-27.097	0.000
	Control group	18.15	0.587		
post-test 3	Experimental group	7.75	1.333	-34.334	0.000
	Control group	18.65	0.489		

Above table shows the comparison of pre test and all post-tests, regarding mean discomfort score in experimental and control group.

In all the post-tests, it was observed that mean discomfort score was significantly higher in women of control group. ( $p < 0.001$ ) This means, the women, who received the intervention of birthing ball, observed less discomfort as compared to those who did not receive the intervention.

Table 5: Comparison of post intervention cervical dilatation among women in first stage of labour in experimental and control group. N=

Dilatation (in cm)	Group	Mean	SD	t	p value
Form 2 to 4	Experimental group	3.94	0.73	-5.871	0.000
	Control group	5.60	1.03		
From 4 to 6	Experimental group	2.37	0.61	-4.539	0.000
	Control group	3.18	0.50		
From 6 to 8	Experimental group	2.60	0.75	-2.697	0.011
	Control group	3.35	1.00		
Total time for dilatation from 2 to 8 cm	Experimental group	8.92	0.82	-9.567	0.000
	Control group	12.13	1.26		

Above table explains the mean difference in hours of regarding cervical dilatation between experimental and control group. There was statistically significant difference in time taken for dilatation in experimental and control group.

The mean time required in women of experimental group, who were given the birthing ball, for dilatation was significantly less than for the women of control group. This Indicates that for early dilatation, or to reduce the duration, birthing ball is effective among women in first stage labour.

#### 4. Conclusion

The study findings revealed that using a birthing ball technique effectively decreased discomfort levels and aided cervical dilatation. The experimental group of women who received birthing balls experienced less discomfort and expressed a high level of satisfaction with the treatment.

Midwives could be encouraged to utilise the birthing ball as a pain management technique during labour because it is a non-invasive process and has no negative impact on the woman or the fetus.

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#### Conflicts of interest

There are no conflicts of interest.

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