



EFFECTIVENESS OF BIRTHING BALL TECHNIQUE ON PAIN DURING FIRST STAGE OF LABOR & SELECTED FETO MATERNAL PARAMETERS AMONG PRIMI GRAVIDA MOTHERS

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ABSTRACT

Introduction : Birthing ball is a large air filled rubber ball which is strong enough to support the weight of the mother. It helps in widen and flex the pelvic bone and joints and helps the baby to descent into birth canal more easily and also helps in the strengthening the muscles of the pelvic floor, which is responsible for the pushing stage of childbirth. The present study aims to evaluate the effectiveness of birthing ball technique on the pain & selected feto maternal parameters of the latent phase of labor among primigravida mothers.

Methods : A true experimental design with pre test – post test control group design with multiple observation was used. Sixty primigravida mothers admitted in antenatal ward of KNH, Shimla, for safe confinement were recruited for the study. All the mothers who meet the sampling criteria and willing to participate were selected and randomly assigned to experimental and control group. Informed consent is obtained prior to data collection. Teaching regarding use of birthing ball was given to the mothers in the experimental group during antenatal period including guided practice for two day and they were helped to use birthing ball during labour for 20 min per hour for three hours. Pain level, duration of uterine contraction and fetal heart rate was monitored in both groups before and after intervention.

Results : The level of pain of the experimental group was significantly lower than the control group each time following the intervention (2.57+/- 1.52 vs 4.57+/- 0.87;p<0.001, 3.10+/-1.24 vs6.40+/-1.03 ;p<0.001, 3.60+/-1.22 vs 7.73+/-0.82 ;p<0.001). The mean duration of of uterine contraction was found longer in experimental group (p<0.001). No significant difference was observed. The mothers of experimental group was highly satisfied by the use of birthing ball and they were likely to use in future pregnancy.

Conclusion : Finding of the present study shows that using birthing ball helps to reduce labor pain and progress of selected feto maternal parameters . It helps in acceleration of labor. It is a method of providing comfort during labor. The birthing ball is a non invasive procedure and has no adverse effects on the mother and the fetus and hence the midwives could be encouraged to use this as a pain relief method during labor.

Keywords : Birthing ball, labour pain, Selected feto maternal parameters , Primigravida mother

Introduction (Overall introduction can be made better)

Pregnancy is the most beautiful period in a women's life, it is the blessing of God. Every mothers should have to enjoy this wonderful period & their labor process as well. But most mothers thinks labor pain and childbirth process as most severe and painful event of a woman's existence^{1,2}. As labor progress the intensity of uterine contraction by intrauterine pressure increase progressively being 40-50 mm Hg at peak in first stage of labor and 80 – 100 mm Hg in second stage. At the onset of labour, the pain occurs intermittently characterizes as abdominal aches¹⁰ pelvic pain¹¹ and backache¹². One thing that women remembered about labour pain is a very high intensity pain¹³. Some medication or pharmacological therapies effective in reduction of labor pain but they have several side effects²⁴. In addition to this the use of Ayurveda and other home medicine has been also reported to relieve labour pain²⁵. Many research studies have proved that ambulation in the first stage of labor has many benefits like improving comfort of the mother, helping for ease of labor by easy descent of baby under gravity, but the pain of uterine contractions make ambulation difficult for the women³⁴, for providing comfort during labor in sitting positions birthing ball is used in many birthing centers. It also helps the fetus to remain in upright position during labor. The birth ball comforts and strengthens lower back pelvis is better supported and symmetrical. Mother able to sit upright helps the abdomen be a hammock for the baby to settle in an anterior position when the mother's ligaments & fascia are balanced and she hasn't waited too long. Doing rotation on the ball can help to get the baby's head on the cervix. The curve give a slight counter pressure to the slightly engorged vulva during labor. It also helps to widen the pelvic while doing pelvic rocking exercises, which helps the descent down. 1963 for neurodevelopment treatment birthing ball was introduced as a physical therapy. Perez and Simkin in 1980 developed as childbirth tool. Perez explained in 2001 that the birth ball have many advantages during pregnancy and during labor also by producing optimal positioning and pain reduction during contraction while eliciting non habitual movement³

The present study intends to use of birthing ball were found to be effective to improve maternal outcome and there was no harm to the baby, use of the birth ball is safe and offers women an alternate means of pain management in labour. The clinical implementation of a birth ball exercise could be an effective tool for parturient women to reduce labor pain, there is a considering significance of promoting vaginal delivery among women, performing birthing ball exercise is recommended as a useful, non pharmacological and in expensive strategy for reducing c- section rate.

Materials and methods

The study used an true experimental approach with pre test – post test control group design with multiple observation.

SETTING

All the primigravida mothers in antenatal ward admitted for safe confinement, and full fills the inclusion and exclusion criteria were selected,

Random allocation of sample was done on the basis of lottery method. Sixty chits were prepared and explained properly, mother have to pick one chit accordingly she will allocate to experimental or control group.

After obtaining informed consent from the participants, background performa was fill by the mothers and collected. Antenatal teaching on, use of birthing ball, position and different ways of using birthing ball were taught in antenatal period itself. Participants were allowed to practice birthing ball in antenatal period. At the time of labor when the mother is having average uterine contraction 20-40 sec, they were allowed to sit on the birthing ball. Pain level which is measured by numerical pain rating scale, duration of uterine contraction will be assessed by placing hands on mother abdomen and fetal heart rate was assessed by cardiotocography in both groups before and after use of birthing ball. Birthing ball intervention is giving for 20 minutes per hourly up to three hours and pre & post assessment of pain & selected feto maternal parameters was done both before and after intervention for 10 minutes.

Findings

Background information

Majority women in experimental group (66.6%) and control group (33.4%) were in age group of 21-25 yrs. 63.4 % in experimental & 56.7% control were having higher secondary education. Majority were home maker (90% experimental group and 30% in control group). The p value calculated shows that groups were homogenous & there is no significance relation with any of demographic variables.

Distribution of primigravida mothers based on clinical data

All the women attended more than 4 antenatal visit (100%) in both groups, none of them received any pain management during labor (100%) Majority of them were in gestational age 38 completed weeks (80.0 %, 76.6%) in both control and experimental group respectively.

: Effect of birthing ball on labor pain

Mean score of pain is assessed in both group with the help of numerical pain rating scale

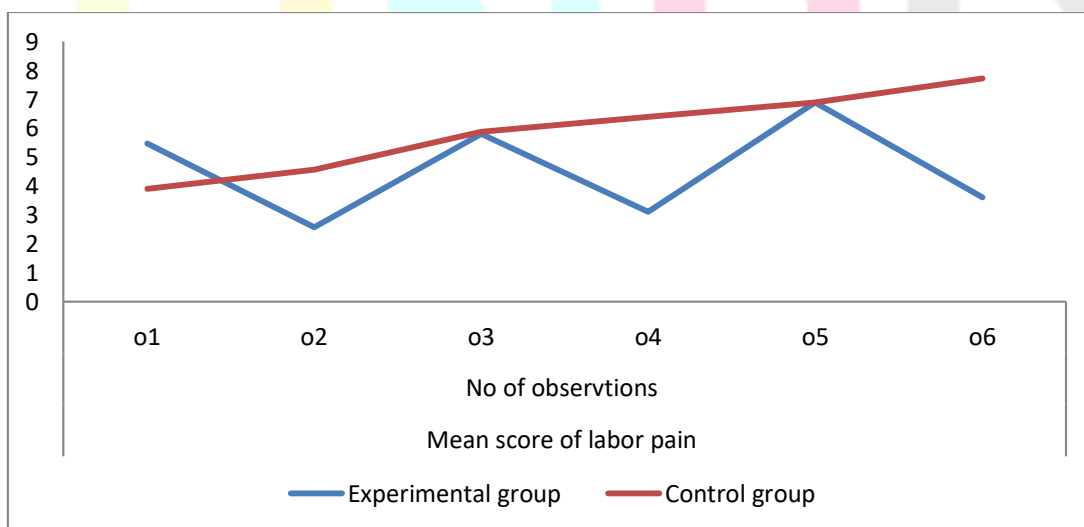


Figure 4.1: Line graph showing mean pain score among experimental and control group

Figure4. 1 the line graph shows that there is a steady increase in the level of pain in the control group , where as in the experimental group there is a drop in the pain score from pretest to post test

Table 4.3 : Comparison of mean pre test & post test score of labor pain between experimental and control group

		Labor pain score			
		Experimental group n= 30	Control group n= 30	t- value	p- value
		Mean \pm SD	Mean \pm SD		
Session 1	Pre test 1	5.47 \pm 1.38	4.90 \pm 1.09	4.86	0.00
	Post test 1	2.57 \pm 1.52	4.57 \pm 0.87	6.34	0.001**
Session 2	Pre test 2	5.80 \pm 1.34	5.87 \pm 1.30	0.19	0.84
	Post test 2	3.10 \pm 1.24	6.40 \pm 1.03	11.1	0.001**
Session 3	Pre test 3	6.90 \pm 0.96	6.90 \pm 1.06	0.01	1.00
	Post test 3	3.60 \pm 1.22	7.73 \pm 0.82	15.3	0.001**

Table 4.4: Comparison of mean difference of pain score from pre test (O₁) & post test (O₆) pain score of between experimental and control group

Group	O ₁ Mean score	O ₆ Mean score	Mean \pm SD	t- value	p- value
Experimental group n= 30	5.47 \pm 1.38	3.60 \pm 1.22	1.86 \pm 1.47		
Control group n= 30	4.90 \pm 1.09	7.73 \pm 0.82	3.83 \pm 0.87	2.66	0.001**

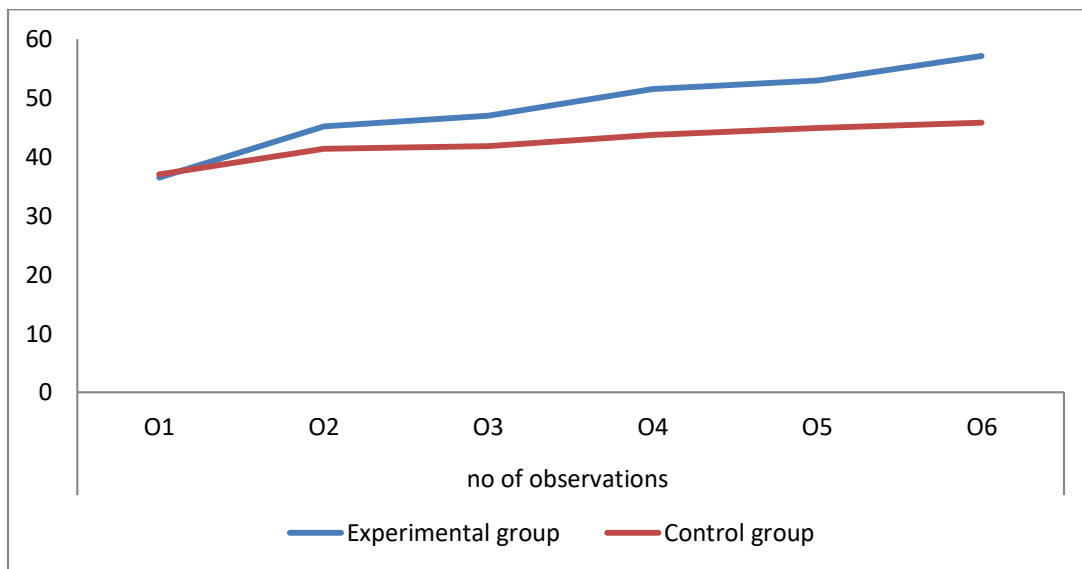
Section C : Effect of birthing ball on selected feto maternal parameter

Figure 4. 2 shows that there is raise in the duration of uterine contraction in both group but average duration of uterine contraction was significantly increased in experimental group as compared to control group

Table 4. 5: Comparison of mean pre test & post test score of duration of uterine contraction between experimental and control group.

		Duration of average uterine contraction			
		Experimental group n= 30	Control group n= 30	t- value	p- value
		Mean \pm SD	Mean \pm SD		
Session 1	Pre test 1	35.6 \pm 7.27	36.6 \pm 6.6	0.55	0.58
	Post test 1	45.2 \pm 1.86	41.4 \pm 1.52	8.64	0.001**
Session 2	Pre test 2	47.0 \pm 2.18	41.8 \pm 1.97	9.68	0.001**
	Post test 2	51.5 \pm 1.65	43.7 \pm 1.932	16.7	0.001**
Session 3	Pre test 3	53.0 \pm 1.93	44.9 \pm 1.15	19.7	0.001**
	Post test 3	57.1 \pm 4.20	45.8 \pm 1.92	13.3	0.001**

Table 4.6: Comparison of mean difference from pre test (O₁) & post test (O₆) score of duration of uterine contraction between experimental and control group

Group	O ₁ Mean score	O ₆ Mean score	Mean \pm SD	t- value	p- value
Experimental group n= 30	35.6	57.1	21.4 \pm 7.77		
Control group n= 30	36.6	45.8	10.1 \pm 6.97	2.00	0.001**

Section C₂ : Effect of birthing ball on fetal heart rate

Fetal heart rate of both group was measured with intervention of birthing ball in experimental group and without intervention in control group with the help of CTG

Figure 4.3 shows that fetal heart rate in both groups.

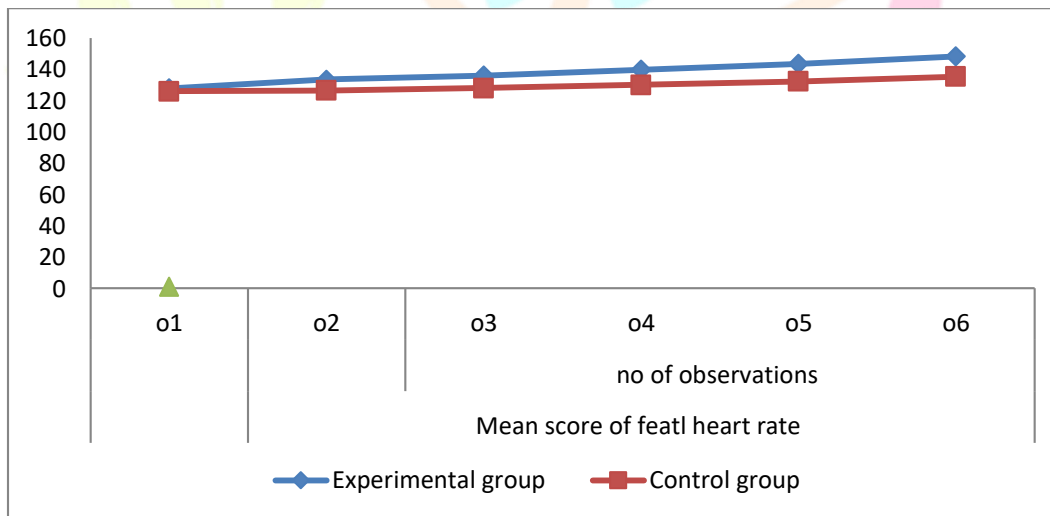


Figure 4.3 :Line graph showing mean score of fetal heart rate

Figure 4.3 shows that in experimental group fetal heart rate was significantly increased after giving intervention as compared to control group

fetal heart rate in experimental group is significantly increase after giving intervention of birthing ball at p value is < 0.001 as compared to control group which is measured by cardiotocography.

Conclusion

The result of the study showed that birthing ball will helps to reduce labor pain and progress of selected fetomaternal parameters. It helps in acceleration of labor. It is a method of providing comfort during labor.

Primigravida mothers in experimental group had less pain and higher duration of uterine contraction as compared to control group which is significant at p value < 0.001 . The mothers of experimental group was highly satisfied by the use of birthing ball and they were likely to use in future pregnancy. Research studies conducted on effectiveness of birthing ball in reduction of pain perception & childbirth experiences in primigravida shows that there were highly significant difference found between study and control group at $p < 0.001^{72}$. A randomized control trial was done on effectiveness of birth ball exercises on labor pain reduction and childbirth satisfaction on expectant mothers, 42 samples were in study group & 32 were in control group. Mothers of study group are instructed to use birthing ball as per their comfort during labor. Findings of the study suggest that birthing ball shows significant relationship in improvement of pain & child birth satisfaction p value 0.05^{73} . Another randomized control trial was done on effectiveness of peanut ball on labor pain and rate of vaginal birth. 107 sample were taken in study group and 92 were in control group . results reveled that mother who used peanut ball during contraction were having 29 min shorter duration of first stage and 11 min shorter duration were noted in second stage of labor p value $< .001$ & there were also low incidence of cesarean surgery ($OR = 0.41, p = .04$)⁷⁵. A research randomized controlled clinical trial done on hydrotherapy& the Swiss ball in labor from 2013 to 2014 on 128 women. Results shows that there was statistically significantly increase in the frequency, duration and fetal heart rate with the hydrotherapy ($p = 0.025$) as well as with the use of swiss ball ($p < 0.001$)⁷⁸. The findings of the present study highlights that birthing ball is an effective tool for labor pain reduction and progress of selected fetomaternal parameters .

Conflict of interest

The investigator has no conflict of interest.

Source of funding

The study is funded by self.

Ethical clearance

Ethical clearance was obtained from the Institutional Ethics Committee of Akal College of Nursing. Participation was based on willingness and written informed consent was obtained from all participants.