IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

# IMPACT OF SCHEDULED PEANUT BALL POSITIONING ON LABOUR OUTCOMES AMONG PRIMIPAROUS WOMEN RECEIVING EPIDURAL ANALGESIA: A PILOT RANDOMIZED CONTROLLED TRIAL

**PARVEEN NATHER[1], DR. POONGODI[2], DR. ANANDH[3], DR. ASEEN[4], DR. SEEMA[5]**

[1]PhD Scholar, Nursing, Sri Balaji Vidyapeeth, Puducherry, India
[2]Associate Professor, Kasturba Gandhi Nursing College, Puducherry, India
[3]Research Mentor, Hamad Medical Corporation, Doha, Qatar
[4]Research Collaborator, India
[5]Anesthetist, Hamad Medical Corporation, Doha, Qatar

***Abstract:***

Background:
The use of peanut balls among women receiving epidural analgesia during labour has increased in recent years. Preliminary randomized controlled trials conducted internationally have demonstrated clinically and statistically significant findings related to labour progress and maternal and fetal outcomes. However, limited evidence is available regarding the feasibility of implementing scheduled peanut ball positioning protocols within the Women's Wellness and Research Center (WWRC), Qatar.

Aim:
This pilot study aimed to evaluate the feasibility of conducting a randomized controlled trial assessing the impact of scheduled peanut ball positioning on labour outcomes among primiparous women receiving epidural analgesia.

Methods:
A pilot randomized controlled trial was conducted in the Labour and Delivery Unit at the Women's Wellness and Research Center, Hamad Medical Corporation, Doha, Qatar. Primiparous women in active labour receiving epidural analgesia were screened for eligibility and randomized into intervention and control groups. The intervention group received scheduled positioning with a peanut ball using predefined maternal positions throughout labour, while the control group received routine labour care. Feasibility outcomes included recruitment rate, participant adherence, acceptability of the intervention, randomization process, and completeness of data collection procedures. Maternal and neonatal outcomes were also preliminarily explored.

Results:
The pilot study demonstrated that recruitment, randomization, intervention implementation, and outcome data collection were feasible within the WWRC labour room setting. Participants tolerated the scheduled positioning protocol well, and adherence to position changes was achievable during labour management. Preliminary observations suggested potential benefits related to labour progression and maternal comfort; however, the pilot study was not powered to determine statistical significance for clinical outcomes.

Conclusion:
The findings support the feasibility of conducting a future fully powered randomized controlled trial evaluating scheduled peanut ball positioning among primiparous women receiving epidural analgesia in Qatar. The pilot study provided valuable insight into operational processes, participant compliance, and implementation strategies necessary for the definitive trial.

*Index Terms— Peanut Ball, Epidural Analgesia, Labour Outcomes, Primiparous Women, Maternal Positioning, Randomized Controlled Trial, Obstetric Nursing*

## I. INTRODUCTION

Labour pain management through epidural analgesia is widely practiced in modern obstetric care due to its effectiveness in reducing maternal discomfort during labour. Despite its benefits, epidural analgesia may contribute to reduced maternal mobility, prolonged labour duration, malposition of the fetus, and increased rates of instrumental or cesarean delivery. Therefore, interventions that support optimal maternal positioning and labour progression are increasingly important in obstetric practice.

The peanut ball is a peanut-shaped physiotherapy ball designed to support maternal positioning during labour, especially among women receiving epidural analgesia. The use of peanut balls has gained popularity internationally because it may assist in pelvic opening, fetal descent, maternal comfort, and labour progression. Several studies have suggested that peanut ball positioning may shorten labour duration and improve maternal and neonatal outcomes.

Although peanut ball positioning is increasingly practiced globally, evidence regarding its implementation and feasibility in Qatar remains limited. At the Women's Wellness and Research Center (WWRC), Hamad Medical Corporation, Doha, Qatar, there is currently limited local evidence regarding scheduled peanut ball positioning among primiparous women receiving epidural analgesia. Therefore, this pilot study was conducted to evaluate the feasibility of implementing scheduled peanut ball positioning and to support future large-scale randomized controlled trials within the labour room setting.

## II. RESEARCH METHODOLOGY

### 2.1 Study Design

A pilot randomized controlled trial design was adopted to evaluate the feasibility of scheduled peanut ball positioning among primiparous women receiving epidural analgesia during labour.

### 2.2 Study Setting

The study was conducted in the Labour and Delivery Unit at the Women's Wellness and Research Center (WWRC), Hamad Medical Corporation, Doha, Qatar.

### 2.3 Population and Sample

The target population included primiparous women admitted in active labour who received epidural analgesia for pain management. Participants were screened according to eligibility criteria and randomized into intervention and control groups.

Inclusion Criteria

- Primiparous women
- Singleton pregnancy
- Cephalic presentation
- Gestational age ≥37 weeks
- Women receiving epidural analgesia
- Women in active labour

Exclusion Criteria

- Multiple pregnancy
- Non-cephalic presentation
- High-risk obstetric complications
- Contraindications to vaginal delivery
- Maternal refusal to participate

### 2.4 Sampling Technique and Randomization

Eligible participants were recruited through labour room screening. Randomization was performed using sealed opaque envelopes and REDCap-generated allocation procedures. Participants were assigned either to the intervention group or control group.

2.5 Intervention

Women in the intervention group received scheduled positioning using a peanut ball throughout the first and second stages of labour after epidural analgesia became effective. The peanut ball size was selected according to maternal body habitus and comfort.

The scheduled positioning protocol included:

- Right lateral position
- Left lateral position
- Semi-sitting position
- Taylor sitting position

Position changes were generally performed every 30 minutes according to maternal comfort and labour progress. Maternal vital signs and fetal heart monitoring were continuously assessed during the intervention.

The control group received routine labour care without scheduled peanut ball positioning.

2.6 Data Collection

Data collection was conducted using structured data collection forms developed by the Principal Investigator. Maternal and neonatal outcome data were collected from labour room records and patient documentation.

Maternal Outcomes

- Duration of first stage of labour
- Duration of second stage of labour
- Mode of delivery
- Oxytocin augmentation
- Perineal trauma
- Estimated blood loss

Neonatal Outcomes

- Apgar score at 1 and 5 minutes
- NICU admission
- Cord blood analysis

2.7 Feasibility Outcomes

The pilot's study evaluated:

- Recruitment feasibility
- Participant adherence to scheduled positioning
- Acceptability of intervention
- Feasibility of randomization process
- Completeness of data collection procedures

2.8 Ethical Considerations

Ethical approval was obtained from the Medical Research Center (MRC), Hamad Medical Corporation, Doha, Qatar. Written informed consent was obtained from all participants prior to enrollment. Participants had the right to withdraw from study at any stage without affecting their care.

III. RESULTS AND DISCUSSION

The pilot study demonstrated that conducting a randomized controlled trial involving scheduled peanut ball positioning among primiparous women receiving epidural analgesia was feasible within the WWRC labour room setting. Recruitment procedures, intervention implementation, and data collection processes were successfully achieved during the pilot phase.

Participant adherence to scheduled maternal positioning was acceptable, and most women tolerated the intervention well. Labour room staff were able to support maternal position changes safely while maintaining fetal monitoring and maternal comfort.

Preliminary observations suggested potential improvements in labour progression and maternal comfort among women using peanut ball positioning. However, the pilot study was not powered to determine statistical significance regarding maternal or neonatal outcomes.

The pilot findings support progression toward a future definitive randomized controlled trial with a larger sample size to evaluate the clinical effectiveness of scheduled peanut ball positioning during labour.

Results According to Pilot Study Objectives

| Objective | Results |
|---|---|
| 1. To determine the number of women willing to be randomized into either the intervention group or the control group | A total of 75 women were screened. Among them, 30 women (40%) met the eligibility criteria, consented, and were randomized into the study. 15 participants (50%) were allocated to the intervention group and 15 participants (50%) to the control group. |
| 2. To assess the suitability of the proposed primary and secondary outcome measures to inform sample size calculation and statistical powering for a future definitive RCT | Maternal and neonatal outcome data were successfully collected from 28 participants (93%). Missing or incomplete outcome data were identified in 2 participants (7%). |
| 3. To assess participants' adherence to the scheduled peanut ball positioning protocol | Among the intervention group participants, 13 women (87%) completed the scheduled positioning protocol as planned, while 2 women (13%) had partial adherence due to rapid labour progression or maternal discomfort. |
| 4. To evaluate the feasibility of completing the intervention during the first and second stages of labour | The intervention was successfully completed throughout the first and second stages of labour in 12 participants (80%). Partial completion occurred in 3 participants (20%) due to emergency interventions or rapid delivery progression. |
| 5. To assess the completeness of maternal and neonatal outcome data collection | Complete maternal and neonatal outcome data were obtained from 28 participants (93%), while minor missing data were identified in 2 participants (7%). |
| 6. To determine the completion rate of the satisfaction survey tools | Satisfaction surveys were completed by 27 participants (90%), while 3 participants (10%) did not complete the survey due to early discharge or fatigue. |
| 7. To identify practical challenges associated with implementing the intervention within the labour room setting | Practical challenges were identified in 6 cases (20%), including staff workload, rapid labour progression, maternal discomfort, emergency procedures, and difficulties maintaining scheduled positioning times. Despite these challenges, the intervention remained feasible in 24 participants (80%). |

Overall Feasibility Findings

The pilot study demonstrated acceptable recruitment, randomization, intervention adherence, intervention completion, data collection, and satisfaction survey completion rates. The findings support the feasibility of progressing toward a future fully powered randomized controlled trial.

## IV. CONCLUSION

The pilot randomized controlled trial demonstrated that scheduled peanut ball positioning among primiparous women receiving epidural analgesia is feasible within the WWRC labour room environment. Recruitment, randomization, intervention delivery, and outcome data collection were successfully implemented. The study findings provide important operational and methodological guidance for conducting a fully powered randomized controlled trial evaluating maternal and neonatal outcomes associated with peanut ball positioning during labour.

## ACKNOWLEDGMENT

The authors would like to acknowledge the support provided by the Labour and Delivery Unit staff, Women's Wellness and Research Center, Hamad Medical Corporation, Doha, Qatar. Special appreciation is extended to all participants who contributed to this pilot study.

**References:**

1. Kamath, P., Pai, M. V., Noronha, J. A., Shenoy, R. P., Yesodharan, R., D'Souza, S. R., ... & George, A. (2026). A randomized controlled trial on the effectiveness of peanut ball device during labor on maternal outcomes and stress levels. Journal of Education and Health Promotion, 15(1), 91.DOI: 10.4103/jehp.jehp_1916_24

2. Kamath, P., Pai, M., Shenoy, R., Karkada, S., D'souza, S., & Noronha, J. (2022). Effectiveness of a peanut ball device during labour on maternal and neonatal outcomes: protocol for a randomized controlled trial. F1000Research, 11, 717. https://doi.org/10.12688/f1000research.109537.2

3. Ozkececi, F., & Guvenc, G. (2026). The Effect of Peanut Ball Use on the Labour Process and Maternal—Neonatal Outcomes in Parturient Women with High Maternal Body Mass Index: A Randomized Controlled Trial. International Journal of Nursing Practice, 32(2), e70144. https://doi.org/10.1111/ijn.70144

4. Alan Dikmen, H., Gönenç, İ. M., & Ataş, A. N. (2025). Effects of peanut balls are used on perceived labor pain, fatigue, and mother's perception of childbirth: a randomized controlled trial. Archives of gynecology and obstetrics, 311(6), 1579-1589.

5. Çankaya, S., Alan Dikmen, H., & Ataş, A. (2025). The effect of peanut ball use on labor memory, labor satisfaction, delivery length, and neonatal APGAR score: a randomized controlled trial. Postgraduate Medicine, 137(5), 368-378.

6. Makvandi, S., Karimi, L., Larki, M., & Sahebkar, A. (2025). Investigation of the effects of peanut ball during labor: An updated systematic review and meta-analysis. European Journal of Midwifery, 9, 10-18332.

7. Delgado, A. M., da Silva, R. D. C. B., de Medeiros, P. J. A., de Souza Melo, R., & de Oliveira, A. L. B. (2022). Peanut ball use for reducing maternal fatigue during labor: protocol for a randomized clinical trial. Research, Society and Development, 11(11), e436111133852-e436111133852.

8. de Sena Fraga, C. D., de Araújo, R. C., de Sá, L., Bertoldo, A. J. S., & Pitangui, A. C. R. (2024). Use of a peanut ball, positioning and pelvic mobility in parturient women shortens labour and improves maternal satisfaction with childbirth: a randomised trial. Journal of Physiotherapy, 70(2), 134-141.