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Educating Nursing Staff on Evidence-Based Maternal Positioning to Promote Fetal Descent During the First and Second Stages of Labor

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**Educating Nursing Staff on Evidence-Based Maternal Positioning to Promote Fetal Descent
During the First and Second Stages of Labor**

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NURS 653 - Internship

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May 12, 2023

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Abstract

This project aims to educate labor and delivery nurses on evidence-based maternal labor positions that promote fetal descent in the first and second stages of labor. In a labor and delivery unit in the San Francisco Bay Area Silicon Valley region, there is a gap in nurse knowledge relating to labor positions. Evidence supports upright and flexible sacrum positions, along with frequent repositioning promotes shorter labor duration, decreased vaginal tearing, and decreased rate of cesarean section deliveries.

A quality improvement project was conducted through education implementation using evidence-based practices utilizing a PDSA cycle for a semester. Educational content was created in the form of handouts, and a demonstration video. To assess the efficacy of this project's educational impact, a pre-survey and post-survey was created and reached a 54% completion rate. The results of this project demonstrated an overall increase in nurse confidence, particularly in assisted squatting (131%), lunging (93%), and kneeling (74%). This project was limited in scope due in part to time constraints and nurse willingness to participate, however, results reinforce the need for continued nursing education and the role it has on increased nurse confidence in the labor and delivery unit.

Keywords: labour, labor, birthing positions, fetal descent, first stage, second stage, labor dystocia, cesarean, maternal position, failure to progress, cesarean section, c-section, nurse confidence, nursing education, quality improvement

Introduction

Cesarean section rates account for 33% of all births in the United States, an increase from 21% in the last 15 years (Let's Get Healthy California, 2022). Although a cesarean section can be a life-saving surgical intervention, it is an invasive procedure correlated with complications that result in negative outcomes for both mother and baby. Maternal complications include surgical site infection, risk of bleeding or postpartum hemorrhage, and blood clots. Babies born via c-section are at risk of developing transient tachypnea, a breathing issue causing fast breathing (Mayo Clinic, 2022). Health complications are not the only burden on families, but also the costs associated with birth. The cost of vaginal deliveries ranges from \$4,590 for Medi-Cal beneficiaries, to \$11,500 for those with commercial insurance. Cesarean sections are significantly more costly, from \$7,451 for those on Medi-Cal and \$18,800 for commercial insurance carriers (Let's Get Healthy California, 2022).

C-sections are medically necessary in various cases where the mother and neonate are at risk. Such times include when the baby is distressed, in breech or transverse positions. Also recommended for placenta previa concerns, umbilical cord prolapse, or labor dystocia. Labor dystocia is the failure to progress in labor, where fetal descent is stalled or slowed despite interventions to stimulate progression. Labor dystocia causes fetal distress and is the most common cause of cesarean section intervention (Mayo Clinic, 2022).

A correlation has been made between labor dystocia and a lack of maternal positioning (Zwelling, 2010). Nurses have a vital role in patient advocacy, and educating patients on different birthing positions is part of supporting care for positive labor outcomes. Nursing education is crucial in increasing confidence in knowledge for the implementation of birthing positions. Nurses utilizing evidence-based practices promote fetal descent and labor outcomes.

Problem Description

The setting of this project is a 16-bed labor and delivery unit in a county hospital in the South Bay Area. There are 79 nurses employed on the unit through three shifts, morning, evening, and nocturnal. An x amount is out on leave throughout the project. This unit is part of a larger birthing center that supports not only the birthing process but also the care of high-risk pregnancies and an educational program for breastfeeding amongst other family services.

The problem observed is the lack of standardized and continuing nursing education related to maternal birthing positions for the promotion of fetal descent. There is a varying educational background amongst the nurses, from ADN to MSN, and a wide range of nursing experience from new graduates to 30 plus years. Some nurses have taken off-unit education such as Spinning Babies, whereas some have only received new-hire training. The lack of structured education along with varying degrees of educational backgrounds and training not only provides for a range in confidence to support maternal positioning but also a range for the quality of care provided. There is a clear gap in knowledge that needs to be addressed in the form of educational interventions.

Metrics relevant to this project include nursing educational background, years of nursing experience, any off-unit education, rate of epidural patients, rate of cesarean sections, and nurse confidence to support patients into various birthing positions.

This project aims to assess and target the gaps in knowledge concerning birthing positions and the best way to present evidence-based practices to improve nurse confidence. The expectation is that by improving nurse confidence, better patient care will be seen in improved maternal and neonatal outcomes reflected as shorter labor duration, and decreased rates of both vaginal tearing and cesarean sections.

Available Knowledge

PICO Question

For labor and delivery nurses at a county hospital in the Bay Area (P), does providing education on maternal positioning during the first and second stages of labor compared (I) to no education (C) affect RN confidence on using various birth positing to promote fetal descent (O)?

Literature Synthesis

A literature search was conducted using the following databases: CINAHL, PubMed, and JBI. The keywords used to search through the databases were: *labour, labor, birthing positions, fetal descent, first stage, second stage, labor dystocia, cesarean, maternal position, failure to progress, cesarean section, c-section, nurse confidence, nursing education, quality improvement*. Limitations to the literature were relevancy to the last ten years (2012-2022) and primarily level I and level II resources, with one level III as supportive evidence. The literature search was limited to quantitative research only. These articles were evaluated using Appendix E of the John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal tool (2022). See Appendix B for the Evidence Evaluation Table.

The randomized controlled trial of Bick et al. (2017) was conducted across 41 United Kingdom hospitals that included a total of 3093 nulliparous women. Of that, 1556 women labored upright, and 1537 women labored lying down. The result of this study is that upright positions resulted in more spontaneous vaginal deliveries (Bick et al. 2017), that is, not requiring epidural or cesarean section intervention. This study also concluded that mothers using epidural analgesia had prolonged births, and thus upright positioned shortened labor duration. This randomized control trial was appraised at a Level I, with quality data and evidence to support the study.

The randomized control trial of Ganapathy (2012) included 200 primigravidae patients. They were placed in two groups at random, Group A of 100 women was placed in upright sitting positions, and Group B of 100 women was placed in lithotomy. The study concluded that sitting upright supported a shorter duration of 2 and 3rd stages of labor (Ganapathy, 2012). Mothers also gave fewer pain reports with lower pain rates. Higher APGAR scores were associated with the supported upright position indicating a benefit for both mother and baby. This study was appraised at a Level I.

The randomized control trial of Tussey et al. (2015) looked at the use and benefit of the peanut ball for laboring women using epidural analgesia. Data were assessed for 198 women, of which 107 used the peanut ball and 91 did not. The study found the use of a peanut ball shortened the first and second stages of labor, as is relevant to this paper's PICO and Aim Statement. This assistive device was also found to decrease the incidence of cesarean sections and decreased the length of labor (Tussey et al. 2015). This study was appraised at a Level I.

The systematic review of Kibuka et al (2021) analyzed the effects of maternal positions in childbirth. The sample included data from 15 randomized control trials for non-epidural labors. In addition, it assessed an additional 14 randomized control trials for cesarean sections. Upright positions were found to be more effective in reducing the duration of labor in women with no epidural analgesia (Kibuka et al. 2021). Reduced c-section rates were also seen among non-epidural upright positions compared to horizontal positions. This systematic review was appraised at a level II.

In a systematic review with meta-analysis by Lawrence et al. (2013), maternal positions and mobility are discussed as it relates to the first stage of labor. It included 25 randomized control trials and quasi-experimental studies. The analysis indicated that mobile and upright

mothers had a shorter duration of labor in the first stage, and pain was less likely. There was a decreased use of epidural analgesia and less likelihood of cesarean sections. Not an expected finding, but babies were less likely to be admitted into the neonatal intensive care unit (Lawrence et al. 2013). This review was appraised at a Level IIB.

In a quasi-experimental study by Hickey and Savage (2019), peanut ball use and position changes were analyzed on mothers laboring with epidural analgesia. The study included 343 participants, and 164 used a peanut ball. The study concluded that using a peanut ball not only shortened labor amongst mothers with epidural anesthesia but was also associated with lower cesarean section rates (Hickey & Savage, 2019). Due to a lack of randomization, the study was appraised as a Level IIB. Relevant to this project for its peanut ball use and representation of the chosen patient population that uses epidural analgesia.

In the meta-analysis by Huang et al. (2019), common maternal positions were compared in the second stage of labor. Multiple studies were analyzed and presented supporting evidence for the implementation of upright positions in the labour process compared to horizontal or lithotomy positions. Upright positions included sitting, squatting, and throne. It concluded that upright and lateral positions accelerated the second stage by 6.6 minutes in comparison to supine positions (Huang et al. 2019). The recommendation is to avoid lithotomy and supine positions at the risk of perineal trauma. This analysis was appraised as a Level III.

Rationale

This project was guided by Lewin's Change Theory. This theory addresses why and how change happens, utilizing its three stages of unfreezing, change, and refreezing (Barrow et al., 2023). An initial microsystem 5 P's assessment was done, and a root cause analysis concluded a gap in nurse knowledge and therefore lack of confidence in utilizing maternal positions. The change model was supported utilizing a Plan-Do-Study-Act (PDSA) cycle.

In the unfreezing phase, awareness of the problem needed to be made to increase the driving force for the change. For this phase, a meeting was established with the unit manager to assess buy-in and establish any barriers. Communicating to staff the low-cost intervention and positive outlook on both nurse confidence and education as well as improved patient outcomes was important to establish a project understanding. A combination of these efforts ensures a productive basis for change, as stakeholders are more inclined to participate if they are benefited from this change (Goodman, 2017). This phase includes the Plan stage of the PDSA cycle.

The change phase included training and active participation in behavior change. Students act as change agents, providing education in the form of handouts, video instruction, and demonstrations. The unit manager and charge nurses were identified as champions of change, to motivate cooperation and motivate participation (Barrow et al., 2023). This supports the change and diminishes barriers. Following education, a post-survey was given to assess a new level of knowledge and confidence. This phase includes the Do and Study stages of the PDSA cycle.

In the refreezing stage of Lewin's Change Theory, a new status is solidified. The data obtained supported a higher level of nurse education and confidence. The educational material is now to be used as onboarding unit training and continuing education as needed. Adopted as the new status quo for training on birthing positions to sustain the change (Barrow et al., 2023).

Global Aim Statement

We aim to increase nurse education for optimal birthing positions in the first and second stages of labor at a county hospital in the Bay Area. The process begins with conducting a microsystem assessment and collecting baseline data on the level of knowledge, confidence, and skills current nurses have for implementing evidence-based birthing positions. The process ends with educating nurses on evidence-based practices for positioning obstetric patients in the first and second stages of labor and evaluating the effectiveness of nurse education. By working on the process, we expect 1) increased knowledge, confidence, and skills among nurses on the evidence-based birthing positions for the first and second stages of labor, 2) increased use of evidence-based labor positions, and 3) reduced rates of cesarean births. It is important to focus on this quality improvement project now because we have identified the need to prioritize patient safety and reduce the risk of adverse birth outcomes, increased financial burden, and morbidity and mortality among obstetric patients and their babies.

Specific Aim

We aim to improve nursing staff confidence on evidence-based birthing positions at a county hospital in the Bay Area by 60%. By educating and training nurses on birthing positions that are most effective for fetal descent in the first and second stages, we expect an increase in nurse confidence.

Methods

Context

A quality improvement project aimed at improving Labor and Delivery nurse knowledge and confidence concerning maternal labor positions in the first and second stages of labor. This increase in knowledge and confidence through the implementation of education. A microsystem assessment was conducted using the 5 P's assessment tool, identifying the purpose, patients, professionals, process, and patterns as outlined by Nelson et al. (2007). The change was implemented utilizing Lewin's Change Theory.

Purpose

The microsystem is a labor and delivery unit part of a larger birthing center in a county hospital serving the South Bay Area region. The unit is comprised of 14-16 beds and roughly 79 nurses on three rotating shifts morning, evening, and nocturnal shifts. The microsystem supports patients in the antepartum and labor process and immediate newborn care before transfer into the postpartum comfort unit. The goal of the unit and nursing staff is to provide nursing care in the delivery of the baby, ensuring family-centered care and well-being with a strong focus on quality improvement and implementation of evidence-based practices,

Patients

The patient population is laboring mothers and babies. Mothers' ages vary greatly, from different cultural, ethnic, and socioeconomic backgrounds. A high percentage of the patient population is bariatric, with a BMI greater than 30 (Gelato & Scott, 2011). Over 90% of patients use epidural analgesia. Patients are assessed at a triage area and care includes fetal and fetal monitoring. Following birth, the mother and baby are assessed, and when both are stable transferred to postpartum care.

Professionals

The labor and delivery interdisciplinary care team includes physicians, doulas, obstetrician-gynecologists, neonatologists, nurses, and anesthesiologists. It is a teaching hospital where resident physicians and precepting nurses as well as student nurses are on shift participating in care in a limited capacity as part of the learning curriculum. Roles are clearly defined for communication and collaboration of care. Leadership roles important to this project included the unit charge nurse for respective shifts, the unit manager, and the clinical educator. Unit charge nurses are change champions promoting participation and lead liaison on unit between nursing students and nurses. Unit managers' role in daily operations of patient care and directing of nursing staff using evidence-based practices to establish standards of care supports the purpose of the project and its implementation. The clinical educator collaborated with the nursing students facilitating the projects execution and providing support for communicating digital education with the nursing staff.

Process

The microsystem processes include triage upon arrival to the unit. Currently a full head-to-toe, vaginal, and fetal assessment is done. Following triage, the patient is admitted. And scheduled for an induction, cesarean section, or supportive labor care. Mothers are frequently assessed for dilation and station, and continuous fetal monitoring. Immediately after birth, the newborn is assessed by Activity, Pulse, Grimace, Appearance, and Respiration (APGAR) scores (Simon et al., 2023). APGAR scores are taken at 5 minutes to assess the need for resuscitation. Vaginal exams are continued until the delivery of the placenta. Postpartum care begins and both mother and newborn are prepared for discharge to a recovery post-partum unit.

Patterns

The patterns included the initial unit huddle where assignments are made. Individual handoff reports and initial/final assessments are done. Other patterns in care are pain assessment and treatment as well as vaginal examinations and fetal monitoring to evaluate the need for intervention. One barrier in patterns is the varying degree of patient education about positioning and ambulation. Nurses will vary in their care at this time, based on their preference and the patient's preference. No standard practice.

Cost-Benefit Analysis

A cost-benefit analysis concluded the project's quality improvement benefit at a low cost. There is no cost to personnel as the nursing students conducted the project as educational internship hours for a Master's curriculum. There is no overtime, as pre-survey, education intervention, and post-survey interventions are done during shifts in between passing time. Google Forms were utilized for the surveys, a tool free of cost. The true cost of this project was the 100 pages of printed educational handouts. The assistive birthing devices such as a peanut ball and birthing stool are already located on the unit and available for use at no extra cost.

The benefit of this educational intervention is the low operational cost requiring little financial buy-in. When compared to the average c-section cost of \$13,125.5 compared to the average cost of \$8,045 for a vaginal birth as calculated from data provided in 2022 by Let's Get Healthy California. This low-cost intervention makes a big difference to both patients and the hospital which will absorb the bill for an uninsured or underinsured patient.

SWOT Analysis

The strengths of this project are the low cost of intervention, existing equipment, and availability of resources. It is low in time commitment, with 5 minutes for pre-survey, 10-15

minutes for education, and 5 minutes for post-survey. The project is supported by the staff developer, the clinical educator, and nurse champions. The hospital receives government funds allocated for quality improvement and evidence-based practices are mandated by the county.

The weaknesses of this project are the time constraints for implementation based on the onboarding delay and limited semester duration. A detailed timeline of the project is shown in Appendix C in the form of a Gantt chart. Labor is also an unpredictable process that warrants varying patient needs, and maternal position limitations.

This project can increase nurse knowledge about birthing positions, and therefore increase confidence in the ability to implement care and positioning. Patient outcomes can be improved, such as the progress of fetal descent, shorter duration of first and second stages of labor (Berta et al., 2019), and lower cesarean birth rates.

Threats to this project are the lack of evidence-based research on high-risk obstetric patients. The unpredictability of shift flow in the labor and delivery unit is also a threat to adequate education. Unless time is explicitly made for mandated birthing position education, adequate and 100% reach of nurses is unlikely.

Intervention

The intervention was to assess the gap in knowledge and implement nurse education on birthing positions for the support of fetal descent in the first and second stages of labor. All unit nurses including residents, traveling, and precepting, as well as charge nurses, unit managers, and clinical leaders, participated in this project. A meeting was held with the clinical educator to define the scope of the intervention and a plan was curated. Firstly, a pre-survey was made and conducted to obtain a baseline of nurse knowledge, this served as an assessment of the microsystem's educational needs. Three shifts were targeted, morning (0700-1530), evening

(1500-2330), and nocturnal (2300-0730). Of the 79 nurses employed on the unit, 57 completed the initial pre-survey.

Educational material was created such as flyer handouts (Appendix F), video demonstrations, and in-person instruction of varying labor positions with nurse participation. Positions supportive of labor progression and fetal descent include squatting, sitting, lunging, side-lying (Bueno-Lopez et al., 2019), and hands and knees. Upright positions and ambulation supported by forces of gravity and nature to work together, Ondeck suggests moving and repositioning frequently preferably walking around as much as possible (2019). This evidence was presented with educational content to support the teaching based on the findings and to reinforce what nurses were already actively doing in their practices.

Following education, a post-survey was conducted to assess the new level of knowledge based on the ability to teach, the clarity of the content, and the ability to replicate the teachings. This assessment gauged the new confidence in implementing the birthing positions supported by evidence. Of the original 57 that completed the pre-survey, 43 were able to complete the education and post-survey. Data analysis was conducted at this time.

Study of the Intervention

A pre-survey was conducted for a baseline data collection of nurse education and confidence using various birthing positions, their educational background, and off-unit training if any. Appendix G. Following education, a post-survey was conducted with the same metrics to assess the new level of confidence after receiving birthing position education. Percentages of each position and the associated level of nurse confidence to calculate the overall increased confidence level. Positions were studied and chosen based on the first and second stages of labor, and how assistive devices affected birthing positions knowledge. Nurse confidence was also

assessed as it relates to birthing position use when treating bariatric and patients utilizing epidural analgesia. Education was guided based on the pre-survey and the specific needs in educational training. Education was customized to the nurse's gap in knowledge, shortened the intervention eliminating redundant content, and focusing on content pertinent to the nurse's needs in education.

Measures

The positions and their associated confidence levels used as measures for calculating intervention efficacy include assisting patients to ambulate, kneeling position, lunging position, backward sitting position, and sitting position for the first stage of labor. Hands and knees, assisted squat, sitting position, side lying with peanut ball and throne for the second stage of labor.

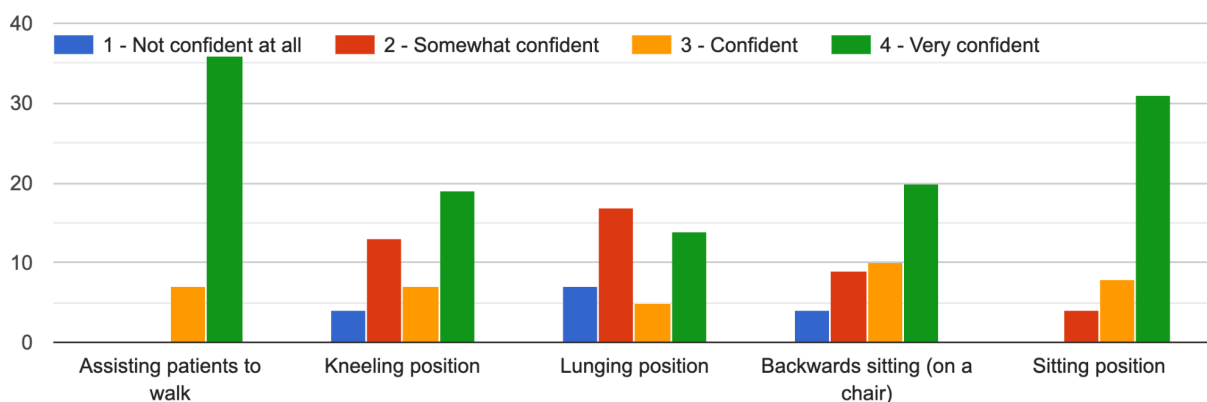
Confidence was measured based on a 4-point Likert scale, assessing confidence to position patients as 1- not confident at all, 2- somewhat confident, 3- confident, and 4- very confident. This was done to avoid answering the middle point to neither agree nor disagree at the recommendation of the unit manager from previous experience.

Results

Pre-Educational Survey Results

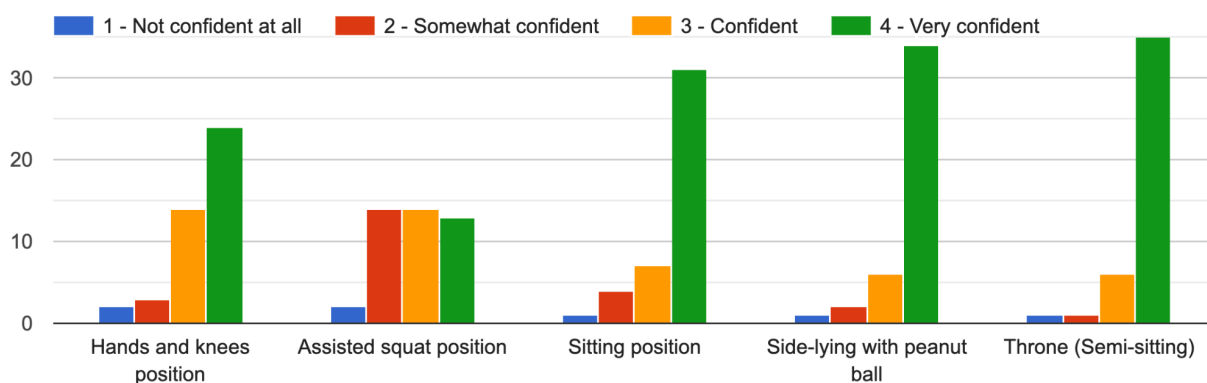
Stage 1

STAGE 1 LABOR: Describe your confidence level for each position or activity:



Stage 2

STAGE 2 LABOR: Describe your confidence level for each position or activity:

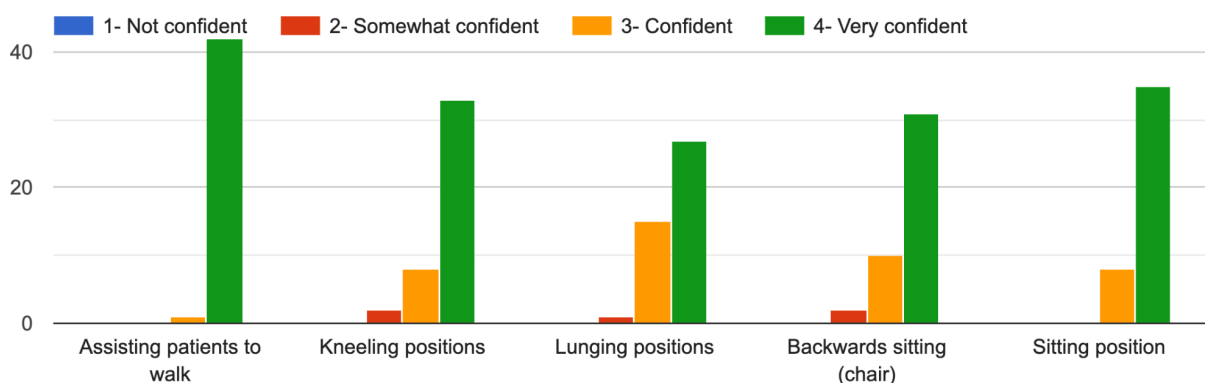


A total of 57 out of 79 nurses completed the pre-survey which outlined a need for education in kneeling position, lunging position in the first stages, and assisted squatting position in the second stage.

Post-Educational Survey Results

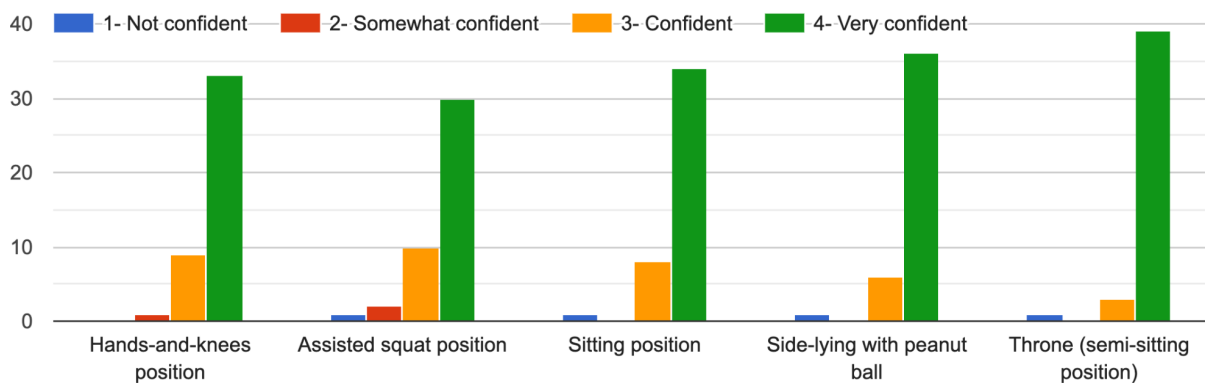
Stage 1

STAGE 1 LABOR: Describe your confidence level for each position or activity:



Stage 2

STAGE 2 LABOR: Describe your confidence level for each position or activity:



There is an overall increase in nurse confidence in all birthing positions. Positions with the largest increase in nurse confidence were assisted squat (131%), lunging (93%), kneeling (74%), and backward sitting (55%). The positions that did not show a large increase in confidence in the post-survey due to a high level of confidence in the pre-survey were side-lying with a peanut ball (6%), sitting (10%), throne (11%), and assisting patients to walk (17%).

Discussion

Interventions for continuing education are necessary to standardize education and ensure nurses have a standard baseline knowledge of evidence-supported birthing positions. A positive finding was that a large percentage of nurses were initially noted to be highly confident in birthing positions taught in this intervention. For these nurses, attention should next be drawn to patient time spent in evidence-supported birthing positions and frequency of position change. Barriers to positioning patients, regardless of nurse confidence, included the ability for continuous electronic fetal monitoring, patient comfort, or nurse preference. Patients are encouraged to use positions they feel comfortable with, but the effort should still be made to attempt to introduce the patient to evidence-supported positions to improve labor outcomes. This is especially true for higher-risk populations, such as the bariatric population, who may be more difficult to reposition but would benefit from non-supine birth positions and frequent repositioning.

Summary

Based on the chosen metrics of confidence of positions on a 4-point Likert scale, an overall increase of 44.75% in nurse confidence was observed, encompassing positions in both the first and second stages of labor. Although this fell below the projected aim, it is still a significant improvement, despite the time restrictions and barriers to reaching all nurses. This data was calculated from a total of 43 nurses (54.4%) that were given pre-survey, education intervention, and post-survey.

This change was successful due to the support from the nurse manager and clinical educator as well as the unit champions. This projects flexibility to the nurse's learning styles and

the unit dynamic allowed for participation. A longer time commitment to the project would allow for greater outreach and increased rapport among the nurses and unit staff for further cooperation. This project could benefit from another PDSA cycle to assess room for improvement.

Conclusions

This project proved to be continued evidence for the importance of a microsystem assessment and root-cause analysis. A knowledge gap was observed and the work supports the expectation that nursing education in birthing positions increased confidence and implementation of said positions. Birthing position education can be done in the form of onboarding module learning or in-person instruction for new hires and/or new graduate nurses in training. Continuing education can be provided at semi-annual to annual unit training. This standard of education dissemination can be provided in multiple modalities to fit different learning styles. An online module, video demonstration, and hand on training utilizing the educational handout as well as a mock patient for practicing the positions.

This project has opportunities for improvement and further expansion. This low-cost intervention motivates buy-in and promotes not only quality improvement but the incorporation of evidence-based practices for improved patient outcomes and decreased complications. It is a sustainable change for long-term implementation, with another PDSA cycle as needed for future gaps in knowledge. The next step could be to conduct a research study to assess if nurse education about the birthing position in the first and second stages of labor results in decreased cesarean section rates in addition to the expected increase in nurse confidence. This project's implications for practice are the significance of education in the nursing profession and the improvement of patient outcomes as a result.

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Appendix A: Statement of Determination

Student Project Approval: Statement of Determination

Title of Project

Educating Nursing Staff on Evidence-Based Maternal Positioning to Promote Fetal Descent During the First and Second Stages of Labor

Brief Description of Project:


Quality improvement project aimed at addressing a gap in knowledge. Education of evidence-based maternal birthing positions will be conducted with the goal of improving confidence in the implementation of supportive positions that promote fetal descent in the first and second stages of labor. This project will utilize tools in the scope of a Clinical Nurse Leader (CNL)

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used:

<http://answers.hhs.gov/ohrp/categories/1569>

This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Students may proceed with implementation.

Comments:

Signature of Supervising Faculty  (date) 5/23/23

Signature of Student  (date) 5/18/2023

Appendix B: Synthesis Table

Study	Design	Sample	Outcome	Evidence Rating
Huang, J., Zang, Y., Ren, L. H., Li, F. J., & Lu, H. (2019). A review and comparison of common maternal positions during the second-stage of labor. <i>International journal of nursing sciences</i> , 6(4), 460–467. https://doi.org/10.1016/j.ijnss.2019.06.007	A meta-analysis.	Multiple study ar	Evidence shows that upright positions contributed to accelerating the progress of second stage labor by 6.6 minutes compared to supine positions.	Level III
Kibuka, M., Price, A., Onakpoya, I., Tierney, S., & Clarke, M. (2021). Evaluating the effects of maternal positions in childbirth: An overview of Cochrane Systematic Reviews. <i>European journal of midwifery</i> , 5, 57. https://doi.org/10.18332/ejm/142781	Systematic review.	15 randomized control trials for non-epidural labor. 14 randomized control trials for C-sections.	Upright positions among women with no epidural analgesia had shorter labor duration. Same result not seen for women with epidural use. Reduced c-section rates among non-epidural upright positions compared to horizontal.	Level II
Lawrence, A., Lewis, L., Hofmeyr, G. J., & Styles, C. (2013). Maternal positions and mobility during first stage labour. <i>The Cochrane database of systematic reviews</i> (8). https://doi.org/10.1002/14651858.CD003934.pub3	Systematic review with meta analysis.	25 RCTs and quasi-experimental studies included	Women mobile and in upright positions had shorter first stage of labor and less pain resulting in reduces use of epidural, less likelihood of cesarean birth. Babies less likely to go to NICU.	Level IIB
Ganapathy, T. (2012). Childbirth in Supported Sitting Maternal Position. <i>International Journal of Nursing Education</i> , 4(2), 87–91.	Randomized control trial.	200 primigravidae. Group A(100) upright positions. Group B(100) lithotomy.	Sitting upright positions supported shorter duration of 2nd, 3rd stages of labor, fewer pain reports, higher APGAR scores.	Level I

<p>Bick, D., Briley, A., Brocklehurst, P., Hardy, P., Juszczak, E., Lynch, L., Macarthur, C., Moore, P., Nolan, M., Rivero-Arias, O., Sanders, J., Shennan, A., & Wilson, M. (2017). Upright versus lying down position in second stage of labour in nulliparous women with low dose epidural: BUMPES randomised controlled trial. <i>Bmj</i>, 359, j4471. https://doi.org/10.1136/bmj.j4471</p>	<p>Randomized control trial.</p>	<p>41 Uk hospital labour wards. 3093 nulliparous women. 1556 upright, 1537 lying down.</p>	<p>Upright positions resulted in more spontaneous vaginal births. Epidural births prolonged labour. Thus upright positions shortened labour.</p>	<p>Level I</p>
<p>Tussey, C. M., Botsios, E., Gerkin, R. D., Kelly, L. A., Gamez, J., & Mensik, J. (2015). Reducing length of labor and cesarean surgery rate using a peanut ball for women laboring with an epidural. <i>The Journal of perinatal education</i>, 24(1), 16-24. https://doi.org/10.1891/1058-1243.24.1.16</p>	<p>Randomized control trial.</p>	<p>107 used peanut ball. 91 no peanut ball.</p>	<p>Shorter first and second stage of labor. Decreased incidence of cesarean sections. Decreased length of labor.</p>	<p>Level I</p>
<p>Hickey, L., & Savage, J. (2019). Effect of Peanut Ball and Position Changes in Women Laboring With an Epidural. <i>Nursing for Women's Health</i>, 23 (3), 245-252. https://doi.org/10.1016/j.nwh.2019.04.004</p>	<p>Quasi-experimental</p>	<p>343 participants. 164 used peanut ball.</p>	<p>Shorter labor, and when used with epidural anesthesia is associated with lower c-section rates.</p>	<p>Level IIB</p>

Appendix C: Gantt Chart

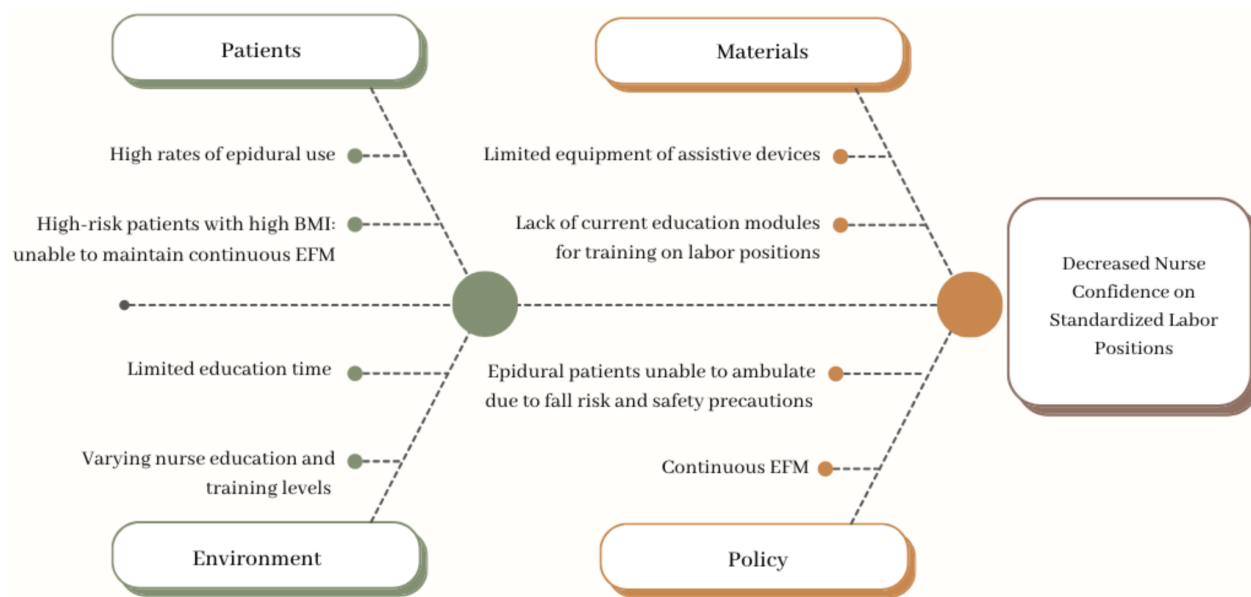
Gantt Chart Timeline

TASKS	START DATE	DUE DATE	DURATION	JANUARY				FEBURARY				MARCH				APRIL			
				WEEK				WEEK				WEEK				WEEK			
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Project Initiation																			
Project Initiation Team Meeting	1/23/23	1/31/23	2																
Literature Review and Research	2/1/23	2/18/23	5																
Project Planning																			
Survey Creation	2/19/23	3/1/23	3																
Meeting with Staff Developer	3/1/23	3/1/23	1																
Creation of Educational Handouts and Flyers	3/1/23	3/12/23	2																
Microsystem Assessment	3/8/18	3/17/18	2																
Project Implementation																			
Administer Pre-Survey	3/9/23	3/22/23	3																
Implementation of Nurse Education	3/13/23	4/14/23	4																
Birthing Positions Video Creation	4/16/23	4/21/23	1																
Project Evaluation																			
Administer Post-Survey	4/14/23	4/21/23	2																
Data Evaluation and Analysis	4/21/23	5/5/23	3																
Present Results to Unit Staff and Staff Developer	5/8/23	5/12/23	1																

Appendix D: SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • Low-cost intervention for equipment, education space, and resources • Relatively low time commitment • Support from the staff developer and nurse champions • County hospital: government funding for quality improvement initiatives and use of evidence-based practice is mandated by the county • Research and teaching hospital: resources and leverage to implement evidence-based quality improvement projects 	<ul style="list-style-type: none"> • Unpredictability of birthing process and patient needs: need for continuous electronic fetal monitoring restricts repositioning efforts • Time constraints for project implementation and nurse education • Limited supplies and equipment for birth
Opportunities	Threats
<ul style="list-style-type: none"> • Increase nurse knowledge and confidence on birthing positions that increase positive maternal outcomes during labor • Improve patient outcomes: progress fetal descent, shorten the duration of first and second stages of labor, lower rates of cesarean births • Contribute research and results to current existing literature 	<ul style="list-style-type: none"> • Lack of evidence-based research on high-risk obstetric patients • Unpredictable shift flow in the labor and delivery unit: nurses are unable to have scheduled time for education

Appendix E: Fishbone



Appendix F: Educational Handout

UNIVERSITY OF SAN FRANCISCO

Positions for 1st and 2nd Stages of Labor

Terminology

Upright Position:

Spine is over a 45 degree angle and vertical (Kibuka et al., 2021).



Flexible Sacrum Positions:

Birth positions that take body weight off of the sacrum (Edqvist et al., 2016). Promotes vaginal delivery and birth outcomes by allowing the pelvic outlet to expand more (Berta et al., 2019).

Non Flexible Sacrum Positions:

Birth positions that put body weight on the sacrum (Edqvist et al., 2016).



C-Curve (Spinal Flexion):

Curving the spine forward in flexion to better align the uterus with the pelvis and the fetal presenting part with the pelvic inlet (Zwelling, 2010).



References



Flexible Sacrum vs. Not Flexible Sacrum

Flexible Sacrum:

Upright positions

- Standing
- Kneeling
- Hands and knees
- Squatting/Assisted Squat
- Lunging

Side-lying

- Left and Right Lateral
- Sims/Modified Sims

Non-flexible sacrum:

- Supine
- Lithotomy
- Recumbent
- Semi Recumbent

Effects of frequent maternal position changes

- Shortens the duration of 1st and 2nd stages of labor
- Promotes progress of labor
 - Immobility decreases the baby's ability to engage into the pelvis, descend, rotate, and find the best fit.

Positions for 1st and 2nd Stages of Labor

STAGE 1

Epidural

Side-Lying /Lateral



Peanut Ball: less likely to result in a cesarean birth, shortens duration of 1st stage of labor.

Upright

Throne

No Epidural

Upright

Squatting (Assistive) Sitting



Kneeling



Ambulation



Lunging



Associated with shorter duration of 1st stage of labor and reduced cesarean births.

STAGE 2

Epidural

Upright

Sitting, Kneeling, Throne

Accelerates progress, facilitates stronger contractions, shortens duration of 2nd stage of labor.



(Throne with birthing seat)

These positions help the uterus contract stronger and more efficiently. Promotes optimal position for baby to pass through the pelvis faster.

Side-Lying/Lateral

Left or Right Lateral



At least a 30 degree incline results in more spontaneous vaginal births among nulliparous women.

Peanut Ball

Less likely to result in a cesarean birth compared to no peanut ball (taken out at full dilation and effacement). Shortens duration of 2nd stage of labor.

Sims/Modified Sims with Stirrup

Reduced cesarean births.



(Bueno et al., 2018)

No Epidural

Upright

Squatting, Sitting, Kneeling, Lunging, Standing

Shortens duration of 2nd stage of labor.

Hands and Knees

Lowers cesarean birth rates.



Appendix G: Pre and Post-Survey

SCVMC Labor and Delivery Birth Positions Survey

You have been invited to participate in an evidence-based quality improvement project on birth positions in labor and delivery. This online survey should take about 5-10 minutes to complete. Participation is voluntary, and responses will be kept confidential.

What is your name? *

Short answer text

What is your education level (certificate, ADN, BSN, MSN etc.) *

Short answer text

What positions do you usually assist patients to during the FIRST stage of labor? *

Long answer text

STAGE 1 LABOR: Describe your confidence level for each position or activity: *

	1 - Not confident a...	2 - Somewhat con...	3 - Confident	4 - Very confident
Assisting patients ...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kneeling position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lunging position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Backwards sitting ...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sitting position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What positions do you usually assist patients to during the SECOND stage of labor? *

Long answer text

STAGE 2 LABOR: Describe your confidence level for each position or activity: *

	1 - Not confident a...	2 - Somewhat con...	3 - Confident	4 - Very confident
Hands and knees ...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assisted squat po...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sitting position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Side-lying with pea...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Throne (Semi-sittin...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your confidence level when positioning the following patient types: *

	1 - Not confident a...	2 - Somewhat con...	3 - Confident	4 - Very confident
Epidural patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bariatric patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your confidence level when using the following assistive devices: *

	1 - Not confident a...	2 - Somewhat con...	3 - Confident	4 - Very confident
Peanut ball	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Squat bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sheet pulling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Birthing chair	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Birthing ball	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Are there specific positions that you would like to increase your confidence in?

Long answer text
.....

What current barriers, if any, exist that prevent you from increasing your confidence in maternal positioning?

Long answer text
.....

Prior to delivery and excluding vaginal exams, how often do you place the patient in lithotomy ^{*} position?

- Less than 25% of the time
- 25-50% of the time
- 50-75% of the time
- More than 75% of the time

Are you familiar with flexible sacrum positions versus non-flexible sacrum positions, and their ^{*} effects on fetal descent?

- Yes
- No

Have you received off-unit training on maternal positioning? (ie. Spinning babies class) ^{*}

- Yes
- No

SCVMC Labor and Delivery Post-Survey

You have been invited to participate in an evidence-based quality improvement project on birth positions in labor and delivery. This online survey should take about 5 minutes to complete. Participation is voluntary, and responses will be kept confidential. Please only complete this survey if you have taken the pre-survey and received the educational demonstration.

What is your first and last name? *

Short answer text

STAGE 1 LABOR: Describe your confidence level for each position or activity: *

	1- Not confident	2- Somewhat confi...	3- Confident	4- Very confident
Assisting patients ...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kneeling positions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lunging positions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Backwards sitting ...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sitting position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

STAGE 2 LABOR: Describe your confidence level for each position or activity: *

	1- Not confident	2- Somewhat confi...	3- Confident	4- Very confident
Hands-and-knees ...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assisted squat po...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sitting position	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Side-lying with pea...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Throne (semi-sittin...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your confidence level when positioning the following patient types: *

	1 - Not confident a...	2 - Somewhat con...	3 - Confident	4 - Very confident
Epidural patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bariatric patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Are you familiar with flexible sacrum positions versus non-flexible sacrum positions, and their effects on fetal descent? *

- Yes
- No

What could be improved for this current quality improvement project?

Long answer text
