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

Mary Ellen Barillas

School of Nursing and Health Professions, University of San Francisco

NURS653: Nurse Leader Role Synthesis

Dr. Nicole Beamish, DNP, MSN, RN

May 12, 2023
Abstract

This project aims to increase the confidence of nurses using birthing positions to aid with mobility to assist with fetal descent and decrease the duration of labor in the first and second stages of labor. Lack of mobility and increased duration of labor are associated with the use of cesarean sections, which is an invasive surgery with potential complications. A knowledge gap in a South Bay Area hospital exists in current evidence-based birthing positions. Recent evidence shows that flexible sacrum positions, which are any upright positions that take the weight off the sacrum, promote vaginal deliveries, and improve birthing outcomes. The proposed intervention of nurse education for standardization of birthing practices will increase the knowledge of nurses on birthing positions to reduce the rate of cesarean sections and improve maternal outcomes. A complete review of current literature was conducted as supporting evidence and pre-educational surveys were administered. Once pre-surveys were complete, live demonstrations of birthing positions with nurses were conducted. Post-educational surveys were used to analyze if there was an increase in nurse confidence for the birthing positions demonstrated. The results of the surveys indicated that nurse education was an intervention that increased confidence in birthing positions to help facilitate fetal descent and decrease the duration of labor.
Educating Nursing Staff on Evidence-Based Maternal Positioning to Promote Fetal Descent During the First and Second Stages of Labor

The rate of cesarean sections (c-sections) globally is on the rise and is a cause for concern. According to the World Health Organization (WHO, 2021) the rate of c-sections globally accounts for 1 in every 5 births and is only estimated to continue rising. In 2021, 32.1% of all live births were performed by c-section in the United States (March of Dimes, 2023). In comparison, the c-section rate in California as of 2021 was 30.8%, which is just slightly below the national rate (Centers for Disease Control and Prevention, 2023). Cesarean sections are essential for assisting in situations such as obstruction of labor, fetal distress, or abnormal fetal presentation for life-saving measures, although unnecessary c-sections may be harmful to the mother and infant (WHO, 2021). The complications associated with c-sections include venous thromboembolism, surgical site infection, and hemorrhaging (Burke and Allen, 2020).

Considering the rise of c-sections globally and the increased risk of maternal mortality and morbidity, there is room for improvement in prevention.

Recognized as one of the best hospitals in maternal care and taking part in reducing avoidable cesarean section rates, the hospital where this quality improvement project is being implemented has a current c-section rate of 23.9% (County of Santa Clara, 2021). Although this hospital’s current c-section rate is below the state and national average, there is still room for improvement to decrease maternal mortality and morbidity associated with c-sections. Although the lithotomy position or supine position has been frequently used during labor, the vertical or upright positions have been found to accelerate the stages of labor (Huang, Zang, Ren, et al., 2019). Encouraging mobility for birthing mothers in the first and second stages of labor has been found to help fetal descent and promote progression of labor (Ondeck, 2014).
The primary contact for patients during their hospital stay is their nurse. It is important for nurses to be fully knowledgeable about current evidence-based practices to educate their patients on the best birthing positions the patient could use during each stage of labor and whether the patient has an epidural or not. Providing nursing education could enhance skills, knowledge, attitudes, behavior, and the confidence of the nurse to implement evidence-based practice interventions (Sapri, Ng, Wu, et al., 2022). Therefore, educating nurses on the current evidenced-based birthing positions for each stage of labor could be beneficial for both the nurse and the patient.

**Problem Description**

The setting for the implementation of this project is a labor and delivery unit in a South Bay Area hospital. There are a total of twelve labor and delivery rooms, but up to sixteen beds, as some of the rooms could be converted into double bedrooms. On this unit, there is an operating room for cesarean sections and the unit is located beside the neonatal intensive care nursery. This hospital staffs 79 nurses throughout three different shifts, AM shift, PM shift, and NOC shift. The nurses on this unit have a wide range of educational levels, such as ADN, BSN, and MSN. There are varying levels of knowledge on the different birthing positions, depending on the experience and training of each nurse. Some of the nurses have elected to participate in additional certification birthing classes such as “Spinning Babies”.

Current evidence-based practices for birthing positions evolve and many nurses may not be up-to-date with current practices or may not be as accepting of changing their current practices. Due to this gap in knowledge, there is currently a lack of standardization of birthing positions for each stage of labor that assists with fetal descent at this hospital because of each nurse's varying knowledge and experience. By decreasing this gap in knowledge, nurses are able
to improve their confidence using several birthing positions, promote mobility during labor to help with fetal descent, improve maternal outcomes, and therefore decrease the rate of cesarean section.

**Available Knowledge**

**PICO Question**

For labor and delivery nurses in a South Bay Area County hospital, how does providing educational material on maternal positioning during the first and second stages of labor to promote fetal descent, compared to no education, affect the confidence in using various birthing positions to promote fetal descent?

**Search Strategy**

A complete systematic literature review was conducted in January of 2023 to collect literature to support the PICO question. The databases used to conduct this search included Cumulative Index to Nursing and Allied Health Literature Ultimate (CINAHL Ultimate), PubMed, Google Scholar, JBI, and EBSCO. To refine the search on birthing positions that contributed to fetal descent in the first and second stages of labor, the key search words used were *birthing positions, fetal descent, labor, stage 1, stage 2, failure to progress, cesarean section, maternal positioning, c-section, squatting position, lithotomy*. The inclusion criteria for the literature used as supporting evidence were articles within the years 2019 to 2023 to ensure the credibility and reliability of the most up-to-date data. After further review of the research available, the data was limited, and literature dated from 2010 until the present day had been used as supporting evidence. The articles were appraised using the John Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool. A total of eight peer-reviewed articles were appraised and indicated Level I and Level II evidence (See Appendix H).
Synthesis of Literature

Providing nurses with training surrounding the positions that promote fetal descent and progression of labor to reduce the incidence of cesarean sections requires a thorough analysis of current literature. An analysis of the current evidence-based birthing positions that support fetal descent and progression of labor in the first and second stages of labor with and without an epidural was conducted. The existing literature guided the development of this quality improvement project through hands-on training, educational flyers, and a video demonstration.

In the randomized controlled trial by Tussey et al. (2015) there were a total of 198 laboring women participating in the trial to determine whether using a peanut ball helped with the progression of labor and reduction of cesarean section rates. There were 107 women who used the peanut ball and 91 women that did not use the peanut ball. The article was appraised as a Level II and results indicated that using the peanut ball reduced the first stage of labor by twenty-nine minutes and reduced the second stage of labor by eleven minutes. The intervention of the peanut ball also resulted in a lower incidence of cesarean section in comparison to the non-intervention group.

The systematic and meta-analysis review by Berta et al. (2019) including 1,985 laboring women studied whether the upright and lateral positions allowed flexibility in the pelvis to promote fetal descent. The systematic and meta-analysis was conducted across eight studies, which included seven randomized controlled trials and one cross-sectional study. The article was appraised as a Level I and results indicated that the upright and lateral positions provided a reduction in the duration of the second stage of labor. Women using the flexible sacrum birthing position had a mean duration of 3.2 to 34.8 minutes.
In the randomized control trial by Ganapathy (2012) the study compared the supported sitting position and the lithotomy position. The study included 200 laboring women, half of whom performed the sitting position and the other half performed the lithotomy position during the second stage of labor. The article was appraised as a Level II and results indicated that the supported sitting position was associated with a shortened duration of the second stage of labor in comparison to the lithotomy position. This study also associated the supported sitting position with positive maternal outcomes such as minimal blood loss and fewer rates of instrumental delivery in comparison to the lithotomy position.

In the systematic review with the meta-analysis by Kibuka et al. (2021) there were 65 randomized control trials and quasi-experimental studies reviewed for optimal outcomes in laboring women in the upright position compared to the horizontal position. There was a total of 18,697 women included in this study. The article was appraised as a level II and results indicated that there was a shorter duration of the first stage of labor by one hour and 22 minutes as well as a reduction in cesarean sections in the laboring women in the upright position compared to the horizontal position. There was also a significant decrease in duration during the second stage of labor for women in the upright position.

In the quasi-experimental study by Hickey and Savage (2019) the intervention of the peanut ball with position changes was used to determine if it had any effects on the length of labor and incidence of cesarean section in laboring women with epidurals. There was a total of 343 participants, of which 164 were in the peanut ball intervention group and the rest did not use a peanut ball. The article was appraised as a Level II and the results indicated that the women in the intervention group were 50% less likely to have a cesarean section in comparison to the
control group. The study also indicated that the length of the second stage of labor was positively affected by the frequency of maternal position changes.

In the randomized controlled trial by Bueno-Lopes et al (2018) the study aimed to assess if the modified sims position increased the rotation to occiput anterior in a laboring woman who presented as occiput posterior position. The study recruited 120 women in labor that presented as occiput posterior, and they were randomized into the modified sims group or the control group. The study was appraised as a Level I and results indicated that 50.8% of laboring women in the modified sims position had a fetus rotate into the occiput anterior position while in the control group, only 21.7% of fetuses had rotated into the occiput anterior position. The study also indicated that the modified sims group had a higher vaginal delivery rate in comparison to the control group.

The systematic review by Zwelling (2010) indicated that laboring patients in the first and second stages of labor benefited from frequent maternal position changes and the upright position in comparison to the recumbent position. The study also indicated that the laboring women in the upright position had shortened stages of labor and after appraisal, the study was evaluated as a Level II.

The meta-analysis study by Lawrence et al. (2013) reviewed data from 5,218 laboring women across twenty-five trials to assess whether assuming the upright positions had any positive maternal outcomes in comparison to the recumbent positions. In laboring women assuming the upright position, the first stage of labor was approximately one hour and twenty-two minutes shorter than the laboring women in the recumbent position. The study also indicated that women in the upright position were less likely to have a cesarean section. This study was appraised as a Level I study after further review.
Rationale

To guide the implementation of this quality improvement project at the labor and delivery unit, Kurt Lewin’s conceptual framework will be used to assess the knowledge attained by the nurses in the labor and delivery unit. Lewin's theory has three concepts used to frame the work, which are driving forces, restraining forces, and equilibrium. The driving force is the push to force change, meaning that an intended outcome is pushed for an optimal outcome. Restraining forces are events or individuals that oppose the current change in question and prefer to continue with current practices. Lastly, equilibrium is when there are an equal amount of driving forces and restraining forces (Petiprin, 2020).

Lewin’s theory also has three stages, which are unfreezing, change, and refreezing. To begin, the unfreezing process involves finding a method to create a change that is found in current practice. In relation to this quality improvement project, this is identifying the need for education regarding birthing positions for nurses in the labor and delivery unit. To create this change, there needs to be an increase of driving forces to promote the change and get more individuals to understand why the change is necessary and beneficial. This is where creating an interdisciplinary team would be beneficial to have support from leadership to promote change in the unit. The change phase is where there is a change in behaviors, feelings, and thoughts by the individuals being affected by the change. These changes are hopefully a positive change leaning towards the change in question. The implementation of educational material and hands-on demonstration of birthing positions for nurses on the unit is intended to change the culture and current practices to the current evidence-based positions. The refreezing stage is where the change has been implemented into practice and is now the standard practice for the facility
Nurse education in the unit regarding the birthing positions in the first and second stages of labor will create standardization of the birthing practice and will in return decrease the incidence of cesarean sections over time.

**Specific Project Aim**

The aim of this evidence-based, quality improvement project is to improve the knowledge of nurses at a Bay Area County Hospital center by 60% by standardizing the birthing process by providing education and training to nurses regarding the birthing positions that are most effective for the different stages/phases of birth by May of 2023.

**Context**

**Microsystem Assessment**

The implementation of a quality improvement project begins with conducting a microsystem assessment. The microsystem assessment gathers data regarding the labor and delivery unit’s current standard of practice. To assess the unit, the 5 P’s framework was used to conduct the assessment. The 5 P’s framework includes purpose, patients, professionals, processes, and patterns (Nelson et al., 2007).

**Purpose**

The purpose of this microsystem is to provide care to birthing mothers and their babies in all stages of their pregnancy. The unit provides culturally competent care to all its patients as they serve a diverse community. The birthing unit strives to provide safe, high-quality care for all patients. They strive to achieve better health for all with compassion and provide accessible healthcare regardless of socioeconomic status and ability to pay (Santa Clara Valley Medical Center, 2023). Among other comprehensive services provided by the birthing center are
obstetrical consultation, prenatal care, genetic counseling, prenatal diagnosis, and newborn care (Santa Clara Valley Medical Center, 2023).

**Patients**

The labor and delivery unit is fully furnished to provide care to all birthing mothers. This birthing unit provides care to patients with high-risk obstetric complications, such as patients with high BMI, comorbidities including cardiovascular disease, high blood pressure, kidney disorders, diabetes mellitus, and pre-eclampsia. In many circumstances, patients from two neighboring hospitals are often transferred to this birthing facility due to the acuity and limited resources of other hospitals. The expectant mothers upon arrival to the facility are first seen in the triage area, where they and the baby are closely monitored to assess the expectant mother’s condition and determine the next steps. Depending on the circumstances, the mother could be transferred to one of the sixteen beds on the unit or sent home after having been monitored and assessed by a physician.

**Professionals**

The interdisciplinary team on this labor and delivery unit includes nurses, nurse leaders, staff developers, nurse managers, unit clerks, obstetrics technicians, radiologists, neonatal intensive care unit nurses, anesthesiologists, social workers, medical interpreters, lactation consultants, and labor-supporting individuals and respiratory therapists. The team is also equipped with specialty care physicians available to the patients such as OBGYNs, neonatologists, urologists, and cardiovascular physicians. Each member of the interdisciplinary team plays a vital role in providing essential care to each patient and their baby. The schedule of each member of the interdisciplinary team varies from working during the daytime, evening shift, or night shift.
**Process**

There are several processes that take place for laboring mothers to receive optimal care in the labor and delivery unit. Upon arrival at the labor and delivery unit, the patients are seen in triage for monitoring. Once the patient begins labor, they are admitted into a private room on the unit where the patient can deliver. The registered nurses complete frequent assessments during their shifts. This unit also utilizes the process of delayed cord clamping, which is clapping the cord of the baby for three minutes for the infant to be better acclimated to their environment upon birth. The doctors collaborate with nurses and the front desk to schedule cesarean sections for some birthing mothers due to life-saving circumstances. The obstetric technicians set up patient rooms and operating rooms. Once the mothers deliver the baby and the mothers are stable, the nurses discharge the patient onto the postpartum floor for further monitoring following the birth. Physicians collaborate with other specialty physicians to prioritize the safety of the baby and the patient.

**Patterns**

There are many patterns that are followed by the interdisciplinary team to maintain the workflow of the unit. At the beginning of the shift, the nurses have a staff huddle where the nurse manager gives a general description of the patients on the unit and the nurses decide amongst themselves who each patient's nurse would be for the day. After the morning huddle, the nurses have a handoff report from the prior shift to gain more understanding of each patient’s condition. The physicians on the unit also have their own huddle after the nurses where they determine treatment options for each patient. The nurses use EPIC for documentation of nursing education assessments of the patient on each shift. The nurses communicate with the multidisciplinary team for assistance with patient care.
**PDSA Cycle**

A plan-do-study-act (PDSA) cycle helps carry out the process of change and determine whether a change in the cycle needs to be made if the intended outcome is not reached for the future (Harris et al., 2018). A PDSA cycle was used to ensure that the intended goals of this project were met (See Appendix C).

**SWOT (strengths, weakness, opportunities, threats) Analysis**

A microsystem assessment includes the collection of a SWOT Analysis, which is a tool that identifies the strengths, weaknesses, opportunities, and threats of a microsystem (See Appendix B).

The strengths of incorporating this quality improvement project at this specific labor and delivery unit were that the unit provided an adequate amount of space to conduct hands-on demonstrations for the nurses to feel more confident with each birthing position. Increasing the education and confidence of the nurses on the unit would in return increase positive maternal outcomes during labor. Another strength of this project was that the implementation of the project was a relatively low-cost intervention, and the facility provided many of the resources or equipment to carry out the implementation of this project.

The weaknesses of this project include the limited time to implement the intervention in the unit. The availability of the nurses varied, on some days the unit was extremely busy, and it was difficult to interrupt the flow of the nurses to conduct the education. It was also a challenge to motivate the nurses to complete the pre-surveys as there were longer surveys being conducted by unit coordinators and the nurses would feel burnt out after taking it and working throughout the shift.
The opportunities associated with the project included that as a county hospital, the unit would be using mandated evidence-based practices, leading to positive patient outcomes. The hospital also receives government funding for the purchase of supplies such as peanut balls and other useful equipment. Lastly, the hospital serves as a unit that provides education to nursing students, and by practicing current evidence-based positions, students would be able to gain the skills and knowledge of current practices as well.

The threats associated with the implementation of the project include the lack of recent research on high-risk patients such as bariatric patients. There was also limited research on the unpredictability of the birthing process and the patient’s needs during labor, as well as the need for continuous fetal monitoring and how it affects the repositioning efforts of the patient. As previously mentioned, it was also difficult to conduct the implementation of the project due to the availability of the nurse during the shift.

**Cost Benefit Analysis**

A cost-benefit analysis was conducted and after further analysis, it was determined that the cost of the implementation of this project was relatively low. As part of their Master’s program, nursing students conducted a thorough literature review of the current evidence-based practices that supported the implementation of the project. The pre-surveys, education, and post-surveys were also conducted by the nursing students. The only cost associated with the education was the low cost of printing out the surveys and educational fliers (See Appendix G). There was also the option for the nurses participating in the surveys to conduct them through a free QR code that was generated for efficiency. Other materials that were used to conduct education such as peanut balls, hospital beds, and birthing balls were already supplied at the hospital. The only costs that were not accounted for were the time it took for nurses to complete the surveys and
educational training, which was approximately twenty minutes in total. If this project were to continue to develop in the future, a potential cost would be to cover the cost of the time it would take for the nurses to complete the surveys and educational training. Through nursing education, the nurses would be able to promote fetal descent and in return reduce the incidence of cesarean sections, creating a cost avoidance for the hospital.

**Intervention**

The timeline for the implementation of this project was projected to happen over the course of 16 weeks, from January 2023 through the end of April 2023 (See Appendix D). The intervention for this project consisted of providing education on birthing positions to nurses in the labor and delivery unit. Interventions included educational handouts, live demonstrations of positions, and a video of labor positions to facilitate future training modules. The educational handout included information such as positions to use during each stage of labor, the difference between the flexible sacrum and non-flexible sacrum positions, what positions to use in consideration for patients with and without epidural, as well as considerations for patients of high BMI.

The first two weeks of the project implementation consisted of meeting with the preceptor of the project to discuss the project and get familiarized with the concept of the project before meeting the interdisciplinary team. Nursing students used this time to conduct literature reviews and research current evidence-based practices for the first few weeks before meeting the nurse educator. Beginning the seventh week, the nursing students created pre-surveys and post-surveys to measure the confidence of the following birthing positions: ambulation, kneeling, lunging, backward sitting on a chair, sitting position, hands and knees, assisted squatting, side-lying with a peanut, and throne. The seventh week is also when the nursing students met with the
nurse educator on the unit and unit members to discuss the implementation of the project. During this week, the students also created the educational handout. During weeks ten and eleven, the microsystem assessment was conducted to gather more information on the unit. Between weeks ten to fifteen, the pre-surveys, live demonstrations, and post-surveys were performed for nurses. Weeks fifteen and sixteen consisted of the evaluation and analysis of the data collected from the surveys as a result of the intervention. Finally, at the end of week sixteen, a poster demonstration was presented during a monthly staff meeting to show the findings of the study and how impactful the project implementation was for the unit.

**Study of Interventions**

The measurement of this quality improvement project is guided by a PDSA model (See Appendix C). The PDSA model determines whether the intended goal of the intervention had been met or if further interventions are needed for the improvement of current practice. A secondary measurement of this project includes the pre-survey and post-surveys that determine the level of confidence of each of the nurses (See Appendix E and F). The pre-survey served as a baseline to determine the level of confidence in each of the birthing positions listed, as well as their level of degree in nursing, and their degree of confidence in assisting bariatric patients and patients with epidurals. The pre-survey also gauged how often nurses performed the lithotomy position during labor and if they had participated in off-unit training in maternal positioning. After the educational training was implemented, the post-surveys evaluated the level of confidence in each of the birthing positions demonstrated to the nurses. The post-surveys were similar to the pre-survey although a free-response option was provided for future suggestions for improvement for the implementation of this project.
Measures

The level of confidence of the nurses was measured using a four-point Likert Scale ranging from a level 1 (not confident at all) to a level 4 (very confident). In the first stage of labor, confidence in the following positions were measured: ambulation, kneeling, lunging, backward sitting, and sitting positions. In the second stage of labor, the confidence level was measured using the same scale except the following positions were measured: hands and knees, assisted squat, sitting, side-lying with a peanut ball, and the throne positions. There were also a few free-response questions used to gauge the degree of training achieved by each nurse, their level of confidence with bariatric and epidural patients, and continued education for birthing positions achieved. The post-survey was similar to the pre-survey but had only one free-response question for suggestions for improvements for further development of this project.

Results

The labor and delivery unit at this hospital consisted of seventy-nine nurses, with varying knowledge on birthing positions. Among the seventy-nine nurses, a total of fifty-seven nurses completed the pre-survey. Due to the availability of the nurses on the unit, only forty-three post-surveys had been collected. Therefore, the data of this project reflects a total of forty-three nurses, which is 54% of the nurses on the unit among three different shifts (AM, PM, and NOC). Approximately thirty-nine of the nurses on the unit obtained a Bachelor’s of Science in Nursing (BSN), while six obtained an Associate's Degree in Nursing (ADN), and only one obtained a Master’s of Science in Nursing (MSN). Of the forty-three nurses, 55.8% were unfamiliar with the flexible sacrum and non-flexible sacrum positions. Although, 53.5% of these nurses reported having taken off-unit maternal birthing position courses, such as the Spinning Babies class. The free-response questions regarding the current practices of the nurses showed that many used the
left or right side-lying position, lithotomy, and ambulation during the first stage of labor.

Lithotomy, side-lying, and throne positions were also common responses for the positions the nurses most frequently used during the second stage of labor. Barriers the nurses mentioned that affected their confidence in birthing positions included a lack of resources on the unit, patients with high BMIs, epidural patients, and language barriers. A more in-depth analysis of each birthing position was conducted and shown below.

As shown in Figures 1 and 2, there was a varying degree of confidence among all the birthing positions, although there were some outliers in birthing positions that were unfamiliar to many nurses. For the first stage of labor, approximately 40% of nurses were less than confident performing the kneeling position. Likewise, 44% of nurses were less than confident in performing the lunging position with their patients. Approximately 30% of nurses also did not feel confident in performing the backward sitting using a chair position. In the second stage of labor, 37% of nurses were less than confident performing the assisted squat position.

**Figure 1**

*Pre-survey Stage 1 Results*
After the implementation of education and live demonstration of birthing positions, there was an overall increase in nurse confidence in all birthing positions. As shown in Figures 3 and 4, the positions with the largest increase in nurse confidence were assisted squats (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 position (10%), throne (11%), and assisting patients to walk (17%).
Figure 3

Post-Survey Stage 1 Confidence Increase

![Bar chart showing confidence increase in the 1st stage of labor.](chart1)

Figure 4

Post-Survey Stage 2 Confidence Increase

![Bar chart showing confidence increase in the 2nd stage of labor.](chart2)
There was an overall increase in nurse confidence in all birthing positions after the implementation of the intervention. In considering the aim statement of the project which was to improve the knowledge of nurses at a Bay Area County Hospital center by 60%, the analysis showed that nurse confidence was improved by 44.75%. Although the goal may have not been achieved, this is a significant improvement in nurse confidence. Due to certain limitations in practice, the goal was not attained, but this will allow future leaders to look back on the PDSA cycle to see what changes or recommendations could be made to increase nurse confidence in all birthing positions as will be discussed below.

**Discussion**

The intervention proved to cause an increase in nurse confidence in birthing positions that could help reduce cesarean sections long term. In the development of a quality improvement project, there is always room for improvement.

**Limitations**

Barriers to positioning patients, regardless of nurse confidence, included the ability for continuous EFM, patient considerations, or nurse preference. Nurses encouraged patients to perform positions they feel most comfortable with, but efforts 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, that may be difficult to position but may benefit greatly from laboring in non-supine birth positions and frequent repositioning. With this population and epidural patients, even rotating positions in bed or implementing assistive devices such as peanut balls could help decrease the duration of labor. Another limitation experienced during the implementation of the intervention was the availability of the nurses due to the unpredictability of how busy the nurse would be during a
given shift. The unit also experienced difficulty due to staffing constraints, on a given day there could be up to ten nurses and this may not have been enough for the patients on the unit during a shift.

**Recommendations**

Based on the evaluation of the intervention, it is recommended to extend the duration of the educational period for the next cycle. A longer education implementation period could assist in accommodating staff shortages, which were identified as a barrier to collecting surveys and performing in-service education sessions. Additionally, it would allow longer processing time and reflection before taking the post-survey. Qualitative analysis of post-survey results also indicated a desire for more hands-on demonstrations with either a model or actual patients, as well as more posters in patient rooms. To address the availability of the nurse, it is recommended to schedule the nurses for mandatory simulations of birthing positions on an annual basis that could potentially serve as continuing education hours for nurses.

**Conclusion**

Implementation of nursing education proved to increase nursing confidence in birthing positions to decrease the duration of labor and improve maternal outcomes. Analyzing current practices and incorporating live demonstrations provided the nurses with the confidence to apply the positions taught into practice and provide laboring mothers with the knowledge and benefits of frequent repositioning during labor. For further development of this intervention, a longer implementation time is recommended to provide the nurses with uninterrupted time to conduct simulations of each birthing position and to assist with nursing shortages.
References


Less than 23.9% of first-time mothers were delivered by Cesarean section.


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: Providing educational training to nurses at a south Bay area hospital to improve nurse confidence in birthing positions in the first and second stages of labor.

Standardizing the birthing process will decrease duration of labor and increase maternal outcomes.

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

Signature of Student Maryella Barillas (date) 05/09/2023
## Appendix B

Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis

<table>
<thead>
<tr>
<th><strong>Strengths:</strong></th>
<th><strong>Weaknesses:</strong></th>
</tr>
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<tbody>
<tr>
<td>Increasing education and confidence in using birthing positions that increase positive maternal outcomes during labor, low-cost intervention, resources, equipment, and space are available for education</td>
<td>Limited time to implement the change, because we may be able to come in, but the staff/nurses may not have enough time on the shift to be educated and learn the new changes to be implemented</td>
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<tr>
<th><strong>Opportunities:</strong></th>
<th><strong>Threats:</strong></th>
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<tr>
<td>County hospital- use of evidence-based practice is mandated, leads to more positive outcomes, government funding and association with nursing schools for education, ○ There is current and up-to-date research being conducted on effectiveness of birthing positions</td>
<td>Lack of research on high-risk patients, unpredictability of birth and patient’s needs, need for continuous EFM- restricts repositioning efforts, difficulty reaching nurses due to conflicting availability</td>
</tr>
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Appendix C

Plan-Do-Study-Act (PDSA) Model

Plan
- Conduct research literature review table/annotated bibliography
- Create pre-survey and poster handout to have on the unit
- Create powerpoint education for us to reference for educating nursing staff
- Create handout for nurses with optimal birth positions for 1st and 2nd stages of labor
- Meet with nurse leader and discuss unit needs and conduct 5Ps/unit assessment

Do
- Provide nursing staff pre-survey
- Distribute handout to all nursing staff and conduct educational demonstration of birthing positions
- Collect post-intervention survey

Study
- Analyze data comparing pre- and post-surveys
- Present findings to nurses

Act
- Evaluate effectiveness of interventions
- Adjust and repeat PDSA cycle based on evaluations
- Find and research most requested birth positions for next educational intervention

PDSA Model
## Appendix D

### Gantt Chart

<table>
<thead>
<tr>
<th>TASKS</th>
<th>START DATE</th>
<th>DUE DATE</th>
<th>DURATION</th>
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<tr>
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<td>1/23/23</td>
<td>1/31/23</td>
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<td>Literature Review and Research</td>
<td>2/1/23</td>
<td>2/18/23</td>
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<td>Survey Creation</td>
<td>2/19/23</td>
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<td>3/12/23</td>
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<td>3/8/23</td>
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<td>3/22/23</td>
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<td>Implementation of Nurse Education</td>
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<td><strong>Project Evaluation</strong></td>
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<td>4/14/23</td>
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<td>Data Evaluation and Analysis</td>
<td>4/21/23</td>
<td>4/28/23</td>
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<td>Present Results to Unit Staff and Staff Developer</td>
<td>4/27/23</td>
<td>4/27/23</td>
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</table>
Appendix E

Pre-Survey

1. What is your first and last name?
2. What is your education level (certificate, ADN, BSN, MSN etc.)
3. What positions do you usually assist patients to during the FIRST stage of labor?
4. What positions do you usually assist patients to during the SECOND stage of labor?
5. Are there specific positions that you would like to increase your confidence in? (Optional)
6. What current barriers, if any, exist that prevent you from increasing your confidence in maternal positioning? (Optional)
7. Prior to delivery and excluding vaginal exams, how often do you place the patient in lithotomy position?
   a. Less than 25% of the time
   b. 25-50% of the time
   c. 50-75% of the time
   d. More than 75% of the time
8. Are you familiar with flexible sacrum positions versus non-flexible sacrum positions, and their effects on fetal descent?
   a. Yes
   b. No
9. Have you received off-unit training on maternal positioning? (ie. Spinning babies class)
   a. Yes
   b. No
10. STAGE 1 LABOR: Describe your confidence level for each position or activity:
    a. Assisting patients to walk
       i. Not confident at all
       ii. Somewhat confident
       iii. Confident
       iv. Very confident
    b. Kneeling position
       i. Not confident at all
       ii. Somewhat confident
       iii. Confident
       iv. Very confident
    c. Lunging position
       i. Not confident at all
       ii. Somewhat confident
       iii. Confident
       iv. Very confident
d. Backwards sitting (on a chair)
   i. Not confident at all
   ii. Somewhat confident
   iii. Confident
   iv. Very confident

e. Sitting position
   i. Not confident at all
   ii. Somewhat confident
   iii. Confident
   iv. Very confident

11. STAGE 2 LABOR: Describe your confidence level for each position or activity:
   a. Hands and knees position
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident
   b. Assisted squat position
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident
   c. Sitting position
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident
   d. Side-lying with peanut ball
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident
   e. Throne (Semi-sitting)
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident

12. Please rate your confidence level when positioning the following patient types:
   a. Epidural patients
      i. Not confident at all
      ii. Somewhat confident
iii. Confident  
iv. Very confident  

b. Bariatric patients  
i. Not confident at all  
ii. Somewhat confident  
iii. Confident  
iv. Very confident  

13. Please rate your confidence level when using the following assistive devices:  
a. Peanut ball  
i. Not confident at all  
ii. Somewhat confident  
iii. Confident  
iv. Very confident  

b. Squat bar  
i. Not confident at all  
ii. Somewhat confident  
iii. Confident  
iv. Very confident  

c. Sheet pulling  
i. Not confident at all  
ii. Somewhat confident  
iii. Confident  
iv. Very confident  

d. Birthing chair  
i. Not confident at all  
ii. Somewhat confident  
iii. Confident  
iv. Very confident  

e. Birthing ball  
i. Not confident at all  
ii. Somewhat confident  
iii. Confident  
iv. Very confident
Appendix F

Post-Survey

1. What is your first and last name?
2. STAGE 1 LABOR: Describe your confidence level for each position or activity:
   a. Assisting patients to walk
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident
   b. Kneeling position
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident
   c. Lunging position
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident
   d. Backwards sitting (on a chair)
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident
   e. Sitting position
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident
3. STAGE 2 LABOR: Describe your confidence level for each position or activity:
   a. Hands and knees position
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident
   b. Assisted squat position
      i. Not confident at all
      ii. Somewhat confident
iii. Confident
iv. Very confident
c. Sitting position
   i. Not confident at all
   ii. Somewhat confident
   iii. Confident
   iv. Very confident
d. Side-lying with peanut ball
   i. Not confident at all
   ii. Somewhat confident
   iii. Confident
   iv. Very confident
e. Throne (Semi-sitting)
   i. Not confident at all
   ii. Somewhat confident
   iii. Confident
   iv. Very confident

4. Please rate your confidence level when positioning the following patient types:
   a. Epidural patients
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident
   b. Bariatric patients
      i. Not confident at all
      ii. Somewhat confident
      iii. Confident
      iv. Very confident

5. Are you familiar with flexible sacrum positions versus non-flexible sacrum positions, and their effects on fetal descent?
   a. Yes
   b. No

6. What could be improved for this current quality improvement project?
Appendix G

Educational Flyer (Front)

Positions for 1st and 2nd Stages of Labor

Terminology

**Upright Position:**
Spine is over a 45 degree angle and vertical (Kikuba 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).

Flexible Sacrum vs. Not Flexible Sacrum

<table>
<thead>
<tr>
<th>Flexible Sacrum:</th>
<th>Non-Flexible sacrum:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upright positions</td>
<td>Supine</td>
</tr>
<tr>
<td>Standing</td>
<td>Lithotomy</td>
</tr>
<tr>
<td>Kneeling</td>
<td>Recumbent</td>
</tr>
<tr>
<td>Hands and knees</td>
<td>Semi Recumbent</td>
</tr>
<tr>
<td>Squatting/Assisted Squat</td>
<td></td>
</tr>
<tr>
<td>Lunging</td>
<td></td>
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<tr>
<td>Side-lying</td>
<td></td>
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<tr>
<td>Left and Right Lateral</td>
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<tr>
<td>Sims/Modified Sims</td>
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</tbody>
</table>

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.

References
Appendix G

Educational Flyer (Back)

UNIVERSITY OF SAN FRANCISCO

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

STAGE 2

Epidural

- Upright
  - Sitting, Kneeling, Throne
    - Accelerates progress, facilitates stronger contractions, shortens duration of 2nd stage of labor.
- Side-Lying / Lateral
  - Upright
  - Sitting, Kneeling, Throne
  - These positions help the uterus contract stronger and more efficiently. Promotes optimal position for baby to pass through the pelvis faster.
  - Left or Right Lateral
    - At least a 30 degree incline results in more spontaneous vaginal births among nulliparous women.

No Epidural

- Upright
  - Squatting, Sitting, Kneeling, Lunging, Standing
    - Shortens duration of 2nd stage of labor.
  - Hands and Knees
    - Lowers cesarean birth rates.
# Appendix H

## Literature Synthesis Table

<table>
<thead>
<tr>
<th>Study</th>
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<table>
<thead>
<tr>
<th>Design</th>
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<tbody>
<tr>
<td>Randomized control clinical trial</td>
</tr>
<tr>
<td>Systematic review and meta analysis. Eight studies with seven randomized control trials and one cross-sectional study.</td>
</tr>
<tr>
<td>Randomized Controlled trial</td>
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<table>
<thead>
<tr>
<th>Sample</th>
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<tbody>
<tr>
<td>1,985 laboring women</td>
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<tr>
<td>200 laboring women</td>
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</table>

<table>
<thead>
<tr>
<th>Outcomes</th>
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<tbody>
<tr>
<td>The laboring women that used a peanut ball during the first stage of labor resulted in a decrease of labor by 29 minutes in comparison to not using a peanut ball. The duration of the second stage of labor was also shortened by 11 minutes for the women using a peanut ball. Using a peanut ball also showed a less likely chance of a cesarean section.</td>
</tr>
<tr>
<td>Upright and lateral positions decreased the duration of the second stage of labor among laboring women. The upright positions helped the uterus contract stronger and more efficiently, allowing for the infant to pass the pelvis with ease.</td>
</tr>
<tr>
<td>Supported sitting position during the second stage of labor was associated with shorter duration of the second stage of labor in comparison to the supine lithotomy position. This study also showed positive maternal outcomes in comparison to the supine lithotomy position.</td>
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<table>
<thead>
<tr>
<th>Level of Evidence</th>
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<td>Level II</td>
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<td>Level I</td>
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<td>Level II</td>
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Three Cochrane systematic reviews with meta-analysis of 65 randomized control trials and quasi experimental studies

18,697 women

Women with no epidural utilizing upright positions compared to recumbent positions during the first stage of labor had significant reductions in cesarean birth rates. Laboring women without epidural reported significant results of shorter duration of the first stage of labor for upright positions compared to recumbent positions.


Quasi-experimental study

343 participants.

164 women in the peanut ball (PB) group

Removing the peanut ball after the placement of the epidural during the second stage of labor resulted in a 50% less likely chance of a cesarean section in comparison to the group of laboring women not using a peanut ball. This also resulted in a decreased duration of the first and second stages of labor due to the changing of birthing positions.


Randomized control trial

119 patients with epidural, n=59 in Sims position group, n=60 in free position group.

Sims positioning with upper leg on the stirrup led to an increase of spontaneous rotation of fetal head to occiput anterior compared to the free position group. The sims position group resulted in increased vaginal deliveries and lower cesarean births compared to the free position group.

Zwelling E. (2010). Overcoming the challenges: Systematic review

Laboring

The first and second stages of labor were shortened for
<table>
<thead>
<tr>
<th>Maternal movement and positioning to facilitate labor progress. <em>MCN. The American journal of maternal child nursing</em>, 35(2), 72–80. <a href="https://doi.org/10.1097/NMC.0b013e3181caeab3">https://doi.org/10.1097/NMC.0b013e3181caeab3</a></th>
<th>including randomized control trials</th>
<th>25 randomized quasi-controlled studies. N= 5,218 laboring women</th>
<th>The upright positions were found to have decreased first stages of labor as well as less likely of having cesarean sections in comparison to laboring women in the recumbent position.</th>
<th>Level I</th>
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