The Use of the Peanut Ball on Nulliparous Women Laboring With An Epidural

By

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Dedications

This scholarly project is dedicated to my beloved family for giving me all the inspiration and support I needed to accomplish this goal. You all were my strength in this journey, and I hope I have made you all proud.

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Abstract

Pain is a stressful experience, and women should choose the best therapeutic relief during labor. Although epidural is beneficial, it may prolong the length of labor for nulliparous women and result in increased instrumental deliveries or cesarean sections (C-sections). Labor and delivery nurses are expected to help parturient patients with epidural change positions using the peanut ball to promote labor progress and reduce further complications. Still, there were inconsistencies in this practice due to no approved peanut ball policy. The purpose of this Doctor of Nursing Practice (DNP) project was to create an evidence-based policy on using the peanut ball in the labor and delivery department and providing the nursing staff education on safe and consistent usage guidelines. The use of the peanut ball is an evidence-based approach used to reduce labor duration in nulliparous women, which can reduce cesarean or instrumental delivery. This evidence-based practice (EBP) project was indicated to improve the knowledge, confidence, and consistency of the safe use of the peanut ball on laboring parturient patients with an epidural at Saint Barnabas Medical Center (SBMC). The principal investigator (PI) measured the efficacy through statistical data obtained from labor and delivery nurses who participated in the Pre-and Post-Test, and Post-Education Survey of the Net Learning-Educational Platform of SBMC. Descriptive statistical analyses of the collected data established that nurse education on the approved peanut ball policy enhanced knowledge, confidence, and consistency of the peanut ball usage.

Keywords: Labor and delivery nurses, nurse education, peanut ball policy, epidural, postural changes, duration of labor, mode of delivery.

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The Use of The Peanut Ball on Nulliparous Women Laboring With An Epidural

Chapter I: Introduction

Discomfort is a traumatic experience linked to the body's various components, and a laboring woman's experience with pain differs due to social, cognitive, psychological, and physiological factors (Kibuka & Thornton, 2017; Sitras et al., 2017). A woman's decision for pain control throughout labor may depend on her previous experience during childbirth, fear, and anxiety, among other factors (Kibuka & Thornton, 2017; Sitras et al., 2017). Women should choose the best therapeutic relief during labor (Sitras et al., 2017). Epidural is an effective pharmacological intervention for labor pain, and it is considered tolerable and safe to both the laboring woman and fetus. Some studies have indicated that epidural is more effective than other methods of management (Sitras et al., 2017; Kibuka & Thornton, 2017).

An epidural may prolong the length of labor for nulliparous women and result in increased instrumental deliveries or cesarean sections (Hung, & Liu, 2015; Sitras, et al., 2017; Kibuka & Thornton, 2017). Continuous change in position and a more upright position using a peanut ball (see Appendix A) during labor promote labor progress (Payton, 2015). During labor, the peanut ball use enhances the fetal passage, decreasing the length of labor, improving comfort, satisfaction, and reducing the need for instrumental or cesarean section birth (Payton, 2015). The peanut ball's current use is related to the Pezzi ball's origin, which was formed in the early 1960s by Aquilino Cosani, an Italian plastics manufacturer (Payton, 2015).

A peanut ball is an inflatable peanut-shaped ball made of durable non-latex rubber intended for use as an exercise tool to aid positioning and therapeutic activities (see Appendix A; Klump, 2017; Payton, 2015). The peanut shape provides better control and improves stability; it

helps sustain an upright posture, promoting movement, supporting fetal head descent (Klump, 2017; Payton, 2015). The peanut ball is, on average, 40 to 70 centimeters in size (see Appendix A). These different sizes are recommended for other patients based on their height. The 40cm sized peanut ball is recommended for women who are under 5′ 3; 50cm is for women who are 5’3 ″ to 5’6 ″; 60cm is for women who are 5’7 ″ or taller; while 70cm and above is only used to sit on and straddle (see Appendix A; Lythgoe, 2014). Therefore, the standard recommendation is using the 45 cm sized peanut ball (Lythgoe, 2014). The peanut ball placed between a woman's legs in labor keeps the pelvis open because its form provides posture control and steadiness (see Appendix B; Klump, 2017; Payton, 2015).

I had worked in the labor and delivery department for the past three years, which was when the manager introduced the peanut ball to the department. I explored the peanut ball further and was intrigued by the peanut ball's effects when used appropriately on a parturient patient with an epidural. However, I noticed that the nursing staff utilized the peanut ball inconsistently on parturient patients with an epidural. This unpredictable usage includes infrequent use of the peanut ball on nulliparous patients with an epidural, such as using the peanut ball only when the patient’s cervical dilatation is above 8 cm dilated, fully dilated, or not using the peanut ball at all. This discrepancy of use made me investigate further to promote the peanut ball's appropriate and safe use. During my exploration, I found no guidelines on using the peanut ball to encourage staff members' consistency. Therefore, this project aims to create an evidence-based policy on using the peanut ball in the labor and delivery department and providing the nursing staff education on safe and consistent usage guidelines.

Background and Significance

The use of epidural in laboring nulliparous women can increase labor length, arrest the first stage of labor, and delay the present part's descent during the second stage of labor. The above consequences lead to increased instrumental deliveries and cesarean sections (c-section; Hung & Liu, 2015; Kibuka & Thornton, 2017; Simarro et al., 2017 & Souza et al., 2019). In the United States, cesarean section rates increased at least 40% for all term gestational ages (each completed week 37–41 and 42 weeks or more) from 1997 through 2009 (Osterman & Martin 2014). Rates increased more than 60% for each week, 37 through 39 during this time (Osterman & Martin 2014). In 2011, one in three pregnant women delivered via cesarean delivery in the United States (Osterman & Martin 2014). This rapid increase in cesarean birth rates since 1997 with no clear evidence of related decreases in maternal or neonatal morbidity or mortality has raised significant concern about this mode of delivery (Caughey et al. & American College of Obstetricians and Gynecologists, 2014; Osterman & Martin 2014). Martin et al. (2018) and Tussey et al. (2015) also noted a significant national increase of cesarean delivery to 32.0 % in 2017 from the initial rate of 4.5% in 1965 . This project is being carried out at Saint Barnabas Medical Center, a non-profit major teaching hospital with about 600 beds located in Livingston, New Jersey. The rate of cesarean delivery in New Jersey is about 12% higher than the national rate in 2017 (New Jersey State Health Assessment Data [NJAHAD], 2019). New Jersey's cesarean birth rate in 2017 was approximately 36%, which is the 4th highest in the United States (NJAHAD, 2019; Midwives of New Jersey [MNJ], 2019). Kitchenman (2015) reported that most doctors or hospitals recommend cesarean sections because it is more convenient to schedule. They are thus acting more in their interests than that of their patients (Kitchenman, 2015). In 2018, the high C-section rate in New Jersey, raised concerns due to complications, such as

increased infection rate, reactions to anesthesia, postpartum hemorrhage, hysterectomy and possible disseminated intravascular coagulation (Klump, 2017; Tussey et al., 2015). Kitchenman (2015) reports that a rise in cesarean birth rates has caused increased maternal complications previously mentioned and mounting healthcare costs due to the price for cesarean delivery and length of hospital stay for mothers. The United States has one of the highest birthing costs globally, and the total average hospital bill for United States births varies depending on the kind of delivery (Elflein, 2019). In 2013, the average cost of an uncomplicated vaginal birth was about 32 thousand US dollars, and the price for a normal cesarean section birth was near 51 thousand US dollars at that time (Elflein, 2019).

The cesarean delivery rate of 34.9 in 2018 in New Jersey ranks the 5th in the nation (Centers for Disease Control and Prevention [CDC], 2020). Healthy People 2020 set the goal for (NTSV) cesarean delivery rate to be no more than 23.9% of births (Mercier & Kwan, 2018). New Jersey's NTSV cesarean rate does not meet the Healthy People 2020 target of 23.9 percent (CDC, 2020). In the meantime, the increased cesarean section poses higher risks of maternal complications when compared to vaginal delivery (Mercier & Kwan, 2018). Midwives of New Jersey (2019) believe that pregnancy and childbirth are normal processes, and women should be permitted to advance naturally with a strict observation by her care provider. The Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN) also promotes the peanut ball's use on laboring women with an epidural to reduce NTSV cesarean delivery. This organization ensures that nurses support maximum patient-centered care, such as using the peanut ball for postural change based on evidence-based practice (AWHONN, 2019).

Needs Assessment

The increased duration of labor and the need for instrumental delivery and cesarean section has been found to relate to arrested labor progress (Hung, & Liu, 2015; Kibuka & Thornton, 2017; Simarro et al., 2017 & Souza et al., 2019). Epidural administration to women in labor is believed to lengthen the duration of labor resulting in more instrumental deliveries or cesarean section rate due to reduced uterine muscle contractions and decreased postural changes (Hung, & Liu, 2015; Kibuka & Thornton, 2017; Simarro et al., 2017 & Souza et al., 2019). The average length of labor for a primigravida is roughly about 10-14 hours (Simarro et al., 2017 & Souza et al., 2019). The baseline data from the 2019 obstetric scorecard of the labor and delivery unit at the site facility shows the NTSV rate of 26.27 %, which is 2.37 % higher than the Healthy People target. Studies suggest that frequent position change with a more upright position (such as standing, sitting, squatting) during labor with the peanut ball may help with promoting labor progress (Hung, & Liu, 2015; Kibuka & Thornton, 2017; Simarro et al., 2017 & Souza et al., 2019).

The organizational leadership structure for the labor and delivery unit at the project site consists of a nurse manager and nurse educator. Approximately 85 nurses, including two charge nurses for each shift (day and night), 56 full-time nurses, 14 per diem nurses, and 11 part-time nurses, are employed in this unit. The nursing leadership, physicians, and managerial team of the unit embraced the project and supported the change.

Labor and delivery nurses are expected to help patients with postural changes using the peanut ball to promote labor progress. There are clean 45 cm sized peanut balls covered with a large plastic bag in each labor and delivery private room available for each patient. A patient's gown or bed sheet is tied around the ball to protect the patient's legs from the plastic bag and

provide comfort. Usually, all patients should receive education on the peanut before using it. The peanut ball is then placed between the consented patient's legs after epidural administration for postural changes. Standard care involves turning patients from side to side in a semi-or-high fowler's position every 1-2 hours. The nurse removes the peanut ball when the cervix becomes fully effaced and dilated, passive descent has occurred, and when the patient is ready to push. The peanut balls are cleaned with antiseptic wipes and bagged between each patient's use.

Nevertheless, I noticed that the nursing staff did not consistently use the peanut ball on parturient patients with an epidural. Most nurses use the peanut ball on nulliparous patients with an epidural only when the patient's cervical dilatation is above 8 cm dilated, fully dilated, or did not use the peanut ball. This discrepancy of use made me investigate further to promote the peanut ball's appropriate and safe use. During my exploration, I found no guidelines on using the peanut ball to promote staff members' consistency.

A SWOT analysis that relates to the objective and identifies the internal (strengths and weaknesses) and external factors (opportunities and threats) will be used to specify the process. The overall evaluation of achieving the SWOT analysis objective will require adequate support from the department managerial team, clinical providers, and nurses. A mission-driven facility will help promote the necessary evidence-based change. Decreasing the duration of labor and NTSV cesarean delivery in nulliparous women improves epidural use during labor. The ongoing Covid-19 pandemic has been an immediate crisis nationwide. This pandemic has been a threat to this project. The clinical site where the project is being conducted placed the COVID-19 plague as the hospital's top priority during its peak period in the state (March to June 2020). The project's weakness is decreased stakeholder support for the ongoing project as the unit manager

and other leadership personnel assisting me with this project are currently busy trying to address the current COVID-19 crisis.

Problem Statement

The failure of a nulliparous woman to effectively progress in labor after an epidural leads to more instrumental deliveries and increased cesarean sections, which can result in increased maternal and neonatal morbidity and mortality (Hung, & Liu, 2015; Kibuka & Thornton, 2017; Simarro et al., 2017 & Souza et al., 2019). Cesarean section is major abdominal surgery with various potential complications. Maternal mortality and morbidity are higher in the cesarean section than vaginal delivery due to anesthesia, bleeding, and infection (Tussey et al., 2015; Zandvakili et al., 2017). The use of peanut ball is an evidence-based approach used to reduce labor duration in nulliparous women, which can decrease maternal morbidity or mortality associated with cesarean or instrumental delivery (Klump, 2017; Kibuka & Thornton, 2017; Tussey et al., 2015 & Payton, 2015). However, the lack of a peanut ball policy leading to the peanut ball use's inconsistency failed to promote its benefits.

Project Aim

This project aims to create a policy on using a peanut ball in the labor and delivery department. After the policy's approval, the project focused on improving the nursing staff's knowledge of the policy and promoting the consistency of the peanut ball's safe use within four weeks. The understanding of the policy was assessed utilizing a pre and post-test evaluation. Approximately two weeks after the education, the principal investigator determined the nurse's confidence and consistent use of the peanut ball based on the approved policy via a post-education survey.

The project objectives are as follows:

- Improve the nurse's knowledge and understanding of the policy and peanut ball use, as evidenced by an average passing score of at least 80% on the post-test.
- Increase the nurse's confidence level for using the peanut ball based on the approved policy, as evidenced by an average Likert score of 3.0 or higher on the post-education survey.
- Increase the nurse's consistency of using the peanut ball based on the approved policy, as evidenced by an average Likert score of 3.0 or higher on the post-education survey.

Clinical Question/PICO

Conducting a sound DNP project necessitates active measures to assess, implement, and evaluate the study. For nurses working in the labor and delivery unit (P), how does the implementation of a peanut ball policy (I) compared to no policy (C) affect the knowledge, confidence, and consistency of the nurses to use the peanut ball (O)?

Congruence with Organizational Strategic Plan

The clinical site for conducting the DNP project is Saint Barnabas Medical Center (SBMC), Livingston New Jersey. Employees of Saint Barnabas Medical Center endeavor to deliver compassionate care, health care excellence, and superior service for patients and their families in the community, to be nationally recognized at the forefront of improving health and healthcare delivery (Saint Barnabas Medical Center [SBMC], 2019). Furthermore, at SBMC, we ensure our patients' safety by continually demonstrating our exceptional communication values, outstanding teamwork, professional integrity, accountability, innovation, and resilience (SBMC, 2019). We strive to become a high-reliability organization (SBMC, 2019). Saint Barnabas

Medical Center has long been recognized to provide excellent patient care and delivers more than 5,800 babies annually (SBMC, 2019). The peanut ball's utilization of laboring nulliparous women with an epidural has been found to improve labor progress by most labor and delivery nurses, residents, and attending physicians. A written and approved policy on using the peanut ball for postural change on parturient women with epidural and appropriate staff education will promote adequate knowledge, confidence, facilitate consistency of its use and encourage proper documentation by the nurses when used. Thus, making this project aligns with SBMC's mission, vision, and values to deliver compassionate care, health care excellence, and superior service for the patients.

Synthesis of Evidence

Search Strategy

The PI conducted a comprehensive literature search to find existing relevant articles for answers related to the clinical question using PubMed, CINAHL Plus, Google Scholar, Cochrane database of a systematic review, and EBSCOhost research databases. The databases provided comprehensive results related to the clinical question with links to the related articles, and the custom range was between 2014- 2020. The databases were searched using the applicable Medical Subject Heading (MeSH) terms, including all sub-headings and the application of related words. The keywords used to explore the databases were nurses working in labor and delivery, pregnant women, nulliparous women, labor, duration of labor, the first stage of labor, the second stage of labor, progress of labor, labor pain, pain management, epidural, postural change, peanut ball, birth ball, labor exercises, mode of delivery, cesarean section, vaginal

delivery, instrumental deliveries, vacuum delivery, forceps delivery, obstetric outcome, and perinatal outcome.

The inclusion criteria used to limit my search were free full text, available references, research articles, review, peer-reviewed, randomized controlled trials, prospective cohort studies, retrospective cohort studies, publication dates within custom range, primigravid singleton women, request for pain relief, intervention for the epidural, use of the peanut ball by nurses, evidence-based practice, exact phrase, and English language. Exclusion criteria included were all complicated pregnancies, age <20 and > 40 years old, and incomplete data. The PI considered a total of 79 studies. After reviewing the title and abstract, only 23 research articles were assessed as potentially relevant, as they related to my keyword search and eliminated the rest. The PI utilized only 21 studies for this study because they corresponded to the inclusion criteria.

Synthesis of Evidence

In comparing the studies to each other, the most evident similarity is epidural analgesia analysis on laboring women. This evidence includes the effects of epidural on the modes of delivery and benefits of the consistent use of a peanut ball for postural changes among nurses to reduce the length of labor, instrumental delivery, and cesarean section rates. Zhang et al. (2017) explained that epidural is a clinically useful way of administering analgesia in labor to relieve the pain during childbirth. However, the administration of an excessive drug dose reduces uterine contraction significantly, arrest labor progress and may be associated with an increased risk of cesarean delivery (Bannister-Tyrrell et al., 2014; Zhang et al., 2017). Bannister- Tyrrell et al. (2014) recommended that further research be done to investigate the extent that epidural

analgesia in labor influences cesarean delivery rate and effective management strategies to decrease this rate for women who choose epidural for pain relief in labor.

Similarly, Aweda et al. (2016) explained that epidural is hugely beneficial for pain relief in labor. Still, the supposed effects on labor and mode of delivery may impact its use in clinical practice. Tussey et al. (2015) explain that the peanut ball use on women laboring with epidural analgesia is an evidence-based approach to reducing primary cesarean section rate and labor duration. Their study supports that using the peanut ball is an effective nursing intervention to promote labor progress and support vaginal birth for women laboring under epidural analgesia. Klump (2017) reports that the peanut ball improves a successful vaginal delivery, shortens labor duration, increases comfort during labor, and reduces cesarean section rates. Payton (2015) believed that the peanut ball promotes labor progress, and she explained a more prolonged second stage relates to limited movement during labor. Payton further explained that using a peanut ball encourages postural change, reduced pain, and promotes fetal descent (2015).

Zaky (2016) found a positive correlation between using a birth ball for pelvic rocking exercise and labor progress. This outcome causes decreased duration length of labor, promotes cervical dilation and fetal head descent. Simarro et al. (2017) explained that there were more normal vaginal deliveries and less instrumental deliveries and cesarean section rates. They also believed a reduction in the length of the second stage of labor occurred (Simarro et al., 2017). Kibuka & Thornton (2017) reinforced that epidural use can prolong labor duration, increase the need for instrumental delivery, and hinder bearing down reflex. They explained that instrumental deliveries are associated with increased uterine prolapse, urinary incontinence, or painful sexual intercourse (Kibuka & Thornton, 2017). Simpson & Lyndon (2017) believed that labor and

delivery nurses influence whether some women have a cesarean. Their study shows that labor and delivery nurses have an active interventional role in helping a laboring woman with postural changes using the peanut ball to avoid a cesarean section and promote vaginal delivery (Simpson & Lyndon, 2017). Tussey et al. (2015) stated several benefits related to position changes with the peanut ball after an epidural administration, including decreased length of labor and fetal descent. Their study supported the peanut ball application thirty minutes after an epidural administration and the benefit of postural changes on laboring patients every 1-2 hours by the nurses (Tussey et al., 2015). They suggested that appropriate nursing education promoted the implementation of a practice change. This change includes offering all laboring women with an epidural a peanut ball. This peanut ball was received by the patients who expressed satisfaction with the non-invasive, non-pharmacological intervention that promoted their comfort and potentially prevented childbirth complications following an epidural administration (Tussey et al., 2015). Likewise, Outland and Alvarado (2020) supported that nurses should use the peanut ball for postural changes every 1-2 hours or at the patient's request.

On the contrary, Mercier and Kwan (2018) believed that the peanut ball's use precisely in the active phase of labor does not appear to shorten labor duration, reduce cesarean delivery rates in nulliparous patients. Nevertheless, they found no harmful effect and supported its use to promote maternal comfort and encourage postural changes. Roth et al. (2016) explained that there was no substantial change in the length of first stage labor for multiparous women with an epidural who used the peanut ball and that its use did not alter the duration of pushing during the second stage of labor. Hung and Liu (2015) explained that the epidural effect varied in nulliparous and multiparous women. They found no impact on maternal and perinatal outcomes.

Aweda et al. (2016) disclosed that epidural use in labor is associated with prolonging the first stage of labor but did not have findings supporting that it prolongs the second stage of labor.

Furthermore, their findings revealed no connection between the use of an epidural and increased risk for cesarean delivery in the multiparous women (Hung & Liu, 2015). However, they supported that epidural prolongs labor duration and increases the risk for operative vaginal delivery (Hung & Liu, 2015). Ghahiri and Khosravi (2015) clarified that despite all the benefits of vaginal birth, emergency cesarean section delivery could decrease maternal and neonatal outcomes. They recommended that clinical providers assess the impact and delivery method that is safe and most beneficial for the patient and their offspring (Ghahiri & Khosravi, 2015). Caughey et al. and American College of Obstetricians and Gynecologists [ACOG] (2014) explained that it is crucial to balance the risk associated with cesarean section. Therefore, healthcare providers should understand and practice safe ways to prevent the overuse of cesarean deliveries, especially primary cesarean sections (Caughey et al. & ACOG, 2014). Most of the articles used for this synthesis were supportive, non-supportive, or inconclusive. The majority of the authors did not discuss the strengths and weaknesses of their research. However, some advantages include randomized control studies, large sample size, and high intrapartum epidural frequency in their population (Roth et al., 2016; Tussey et al., 2015). The weaknesses and gaps discussed were mainly about the nurse to patient ratio as the number of labor patients, available staff, lack of adequate knowledge, and written guidelines for safe use.

Similarly, most nurses fail to assist the laboring patient with an epidural by using the peanut ball to facilitate appropriate pelvimetry to allow for rotation and descent of the fetus (Klump, 2017; Payton, 2015). Most limitations include small sample size, limited study to assess

the nurses' knowledge of the use of the peanut ball, and its effect on its consistency. There was no mention of the peanut ball's sizes or the length of time a woman was in an upright position (Roth et al., 2016; Sitras et al., 2017; Stulz et al., 2018; Tussey et al., 2015). Mirzakhani et al. (2015) explained that it is vital that providers pursue different strategies to decrease cesarean delivery and promote vaginal delivery. They suggested that birthing ball exercises are a practical, non-pharmacological, and cost-effective approach to achieve this goal (Mirzakhani et al., 2015). Hickey and Savage (2019) indicated that the peanut ball might be a successful nursing intervention to decrease the cesarean section rate. Frequent position changes have been linked to decreased length of labor. They emphasized that initial and ongoing staff education, prenatal education classed, and incorporation of this education in orientation classes for newly hired nurses are essential to sustain this evidence-based practice change and promote the most favorable birth outcomes (Hickey & Savage, 2019).

On average, the peanut ball sizes are between 40- 70cm (see Appendix A), and most studies failed to mention the dimensions of the peanut ball utilized in their study (Lythgoe, 2014). Lythgoe (2014) stated that most experienced peanut ball users advise either the 45 cm or 55 cm sized peanut ball. She explained that the peanut ball's size is measured from the floor to the highest point on one of the bigger ends (see Appendix A; Lythgoe, 2014). Furthermore, she described that most patients who refused or did not like the peanut ball did so because they felt it was too big (Lythgoe, 2014). Therefore, the standard recommendation is using the 45 cm sized peanut ball (Lythgoe, 2014). This size is currently in use at the clinical site where this project is conducted. Different postural positions were recommended (see Appendix B), with the two

leading positions including the semi-reclined with a leg on the ball and the other leg resting to the side of the peanut ball.

In contrast, the second position is the side-lying or semi-prone, with the ball's upper leg (Lythgoe, 2014). The nurses can use the ball so that the leg rests around the narrower part or is supported with both the knee and ankle resting on it (Lythgoe, 2014). However, the right position is centered on the patient's comfort level (Lythgoe, 2014). Outland and Alvarado (2020) endorsed that the peanut ball is, on average, 45 by 80 cm in size. They explained that the peanut ball was placed and positioned within 30 minutes of epidural anesthesia initiation, who chose to use it (Outland & Alvarado, 2020). Based on their review, they changed the protocol slightly with group B streptococcus patients. The nurses delayed the peanut ball's use four hours after they administered the first dose of antibiotics. Based on expert opinion at the clinical site where this project is conducted, this practice is not included in the peanut ball policy and not presently practiced. Tussey et al. (2015) explained that nurses should not use the peanut ball on women with preeclampsia who require magnesium sulfate and had intrauterine infection signs. Also, nurses should exclude patients with a category three fetal heart tracing, indicating the fetus may be hypoxia or acidotic. Nurses should also exclude laboring patients with a fractured pelvis history from using the peanut ball based on expert opinion. Even though prior studies recommend nurses to help laboring patients change their position with the peanut ball every 1- 2 hours (Tussey et al., 2015; Outland & Alvarado, 2020), the recommended duration for positioning at the clinical site based on expert opinion is every 1-1.5 hours.

Theoretical Framework

Change is unavoidable in health care. Change denotes the process of modifying or substituting current knowledge, skills, attitudes, policies, or practices. A significant problem particular to health care is that almost two-thirds of all change projects fail for many reasons, such as poor planning, unmotivated staff, poor communication, or excessively frequent changes (Barrow et al., 2020). All healthcare providers have a role in ensuring significant change. Using best practices derived from change theories can help enhance the odds of success and subsequent practice improvement (Barrow et al., 2020). Rogers' diffusion of innovations (five-stage change theory) serves as the framework for this project.

Roger's five-stage change theory includes the following stages: Stage 1: Knowledge denotes the exposure to the new idea, stating the purpose for the change, how it will occur, and who will be involved. The PI brought the need for a peanut ball policy to the labor and delivery department manager. After several corrections, editing, and delay by the ongoing COVID-19 pandemic, a peanut ball policy (see Appendix C) was approved by the unit board of directors. Registered nurses in the labor and delivery department will receive education on the newly created peanut ball policy virtually to promote knowledge on the guidelines for the peanut ball's safe use. Stage 2: Persuasion denotes convincing employees to accept change by relaying essential information. The PI obtained appropriate consent (see Appendix D) from the labor and delivery nurses participating in the study before taking the pre and post-test assessment (see Appendix E), indicating their willingness to accept change through education. Stage 3: Decision explains that the individual weighs the idea's value and decides whether to adopt or reject it. Approximately two weeks after the virtual education, a post-education survey (see Appendix F) was conducted to evaluate if the change has been adopted. Stage 4: Implementation of the

change regularly as the organization progresses to accommodate the change. Stage 5: Confirmation denotes the adoption of the change by the individual who resolves their decision to continue the innovation and may use it to maximum use (Agency for Clinical Innovation [ACI], 2015; Nursing World, [n.d.]). A recommendation was offered to the unit manager to permanently implement this change due to constant turnover among the nursing staff by promoting the policy's continuing education. This education should be included in a new employee orientation program, annual competency sessions and made available to anyone who needs it to remind, motivate, and ensure that nurses follow the approved guidelines on the peanut ball's safe use.

Registered nurses (RN) in labor and delivery play a substantial role in providing care and information during this period. The RN collaborates with pregnant women in labor to assess and implement an individualized care plan based on the woman’s needs, desires, and expectations. Roger’s five-stage change theory can be a framework for providing continuous personalized care, support, and promoting the use of a peanut ball during labor based on the written guideline.

Chapter II: Methodology

Project Design

The project design is an evidence-based practice (EBP) project indicated to improve the quality of healthcare and patient outcomes (Horntvedt et al., 2018). EBP denotes a deliberate use and application of different knowledge resources, including published studies in conjunction with clinical expertise, patient values, and preferences (Horntvedt et al., 2018). Quality improvement is an efficient approach to analyzing practice performance and improving its performance to improve efficiency, patient safety, or clinical outcomes (Silver et al., 2016). Quality improvement involves a combined effort among health care staff and stakeholders to identify and handle problems in the healthcare system (Silver et al., 2016).

Setting

The project is conducted at Saint Barnabas Medical Center, a non-profit major teaching hospital with about 600 beds located in Livingston, New Jersey. The labor and delivery unit has 18 private labor, delivery, and recovery rooms, with one peanut ball available in all rooms. Standard infection control precautions are used to maintain cleanliness between each patient. This unit also consists of four operative rooms and ten post-anesthesia care units. The number of births per year by the obstetrics and gynecological department is approximately 5 900 births. The department is considered a regional perinatal center to manage high-risk pregnancies to diverse socioeconomic, religious, and racial patient populations. Neonatal care includes a Level II Neonatal Intensive Care Unit and Newborn Born Nursery.

Population

The unit's organizational structure consists of the manager, nurse educator, approximately 85 nurses, two charge nurses for each shift (day and night), 56 full-time nurses, 14 per diem nurses, and 11 part-time nurses. The target population includes about 25 labor and delivery nurses, about 30% of the total of 85 nurses participating in the project voluntarily. Inclusion criteria include all nurses currently working on the unit with any level of experience. Exclusion criteria include nurses out on medical disability or family leave. The nurse participation in the surveys will be voluntary; however, the education was enormously encouraged by the unit manager and nurse educator through multiple modes.

Tools

Tools used in the project were pre-test, post-test (see Appendix E), and post-education surveys (see Appendix F). The tools were self-created under the supervision of the primary practice mentor and faculty mentor. The tools mentioned above were reviewed and approved by the Committee on the Use of Human Subjects in Research (CUHSR) at Bradley University and the Institutional Review Board of Saint Barnabas Medical Center, where the project was conducted. The tests and post-education surveys were completed by the labor and delivery nurses. The pre and post-tests were created in these formats to help identify pre-existing and post-education knowledge and deliver the required educational content.

Project Plan

Labor and delivery nurses are expected to help patients with postural changes using the peanut ball after an epidural administration to promote labor progress. There was no approved guideline or policy to promote the peanut ball's safe use and improve nursing staff consistency. Roger’s Five-Stage Change Theory is utilized as a guide for the project plan to provide

continuous personalized care, support, and promote the use of a peanut ball during labor centered on the approved policy.

Stage 1

The first stage of Roger's five-stage change theory is knowledge. Knowledge denotes the exposure to the new idea, stating the purpose for the change, how it will occur, and who will be involved (ACI, 2015; Nursing World, [n.d.]). The project's initial step was bringing up the need for a policy to promote the safe use of the peanut ball and consistency to the nursing manager, who advised that I should come up with a written plan. With the collaboration of the manager, the PI developed a peanut ball policy. The department manager, educator, and the assistant director of nursing services reviewed the procedure multiple times, as the process was reiterative. Several corrections and changes were completed to meet the patient population's needs, such as adopting the 30 minutes for the peanut ball placement after an epidural administration once the patient is comfortable to ensure immediate postural changes that would enhance labor progress.

Similarly, some studies recommended turning or changing the patient's position every 1-2 hours (Tussey et al., 2015; Outland & Alvarado, 2020). However, based on expert opinion, after reviewing the peanut ball policy, the labor and delivery department manager suggested that the policy reflects a 1-1.5 hourly position change to enhance labor progress. After multiple revisions, corrections, and modifications, the manager submitted the draft policy to the departmental medical director for review and approval. The medical director reviewed the written draft policy and advised that the PI include that physicians can exclude patients from using the peanut ball at their discretion. The draft was updated with the necessary revisions and resubmitted on February 25, 2020. Shortly after the submission of the peanut ball policy draft on February 25, 2020, we

experienced the COVID-19 pandemic in the state of New Jersey. The epidemic caused a delay in the policy's approval because measures to fight and reduce the ongoing pandemic spread was the hospital's priority. Finally, the hospital controlled the spread of the virus, and the inpatient admissions reduced in June. The department's medical director reviewed the policy, the PI made final minor corrections, and the departmental chair approved the peanut ball policy on June 24, 2020 (see Appendix C).

Stage 2

The second stage, persuasion denotes convincing employees to accept change by relaying essential information (ACI, 2015; Nursing World, [n.d.]). The next step is to educate the labor and delivery nurses on the approved policy. Email recruitment and consent (see Appendix D) was sent out to labor and delivery nurses at Saint Barnabas Medical Center (SBMC) after an IRB approval from the school and clinical site. The email consent informed the nurses of the newly approved policy's voluntary virtual education for the peanut ball's safe use. The email contents include the topic of the project, IRB approval, informed consent, and where the nurses would complete the virtual education. The email also notified participants of the pre, post-test (see Appendix E) and post-education survey (see Appendix F), the date for the commencement of the education, the duration required for completion, and stakeholders' contact information. Interested and willing participants were encouraged to participate in the program. Participants received the instruction via the Net Learning software program at SBMC to disseminate educational services over the internet to the staff. The voluntary virtual education was a thirty-minute PowerPoint presentation (see appendix M). The presentation began with pre-test questions to assess the initial knowledge of labor and delivery nurses. The questions were designed to be short,

containing five items each. The nurses completed the pre-test questions before the start of education. The pre-test questions assessed the participants' prior knowledge of the safe use of the peanut ball. After completion of the pre-test, the peanut ball policy's teaching was provided. The education included the purpose of the peanut ball policy, criteria of patients that can use the peanut ball and excluded patients, the peanut ball policy, procedure to use the peanut ball, and images on postural position with the peanut ball. Also, documentation of the peanut ball use in the EHR (Cerner), infection control, the peanut ball policy location, and post-test questions to assess if the nursing staff acquired knowledge was included. The post-education survey questions were launched separately on the Net Learning software (see appendix M). The project liaison collected these test results anonymously. The nurses did not include any identifying information before, during, and after completing the net-learning education on the new approved policy on the peanut ball's safe use.

Stage 3

The decision, which is the third stage of Roger's five-stage change theory, explains that the individual weighs up the value of the idea and decides whether to adopt or reject it (ACI, 2015; Nursing World, [n.d.]). Two weeks after the virtual education, an electronic post-education survey (see Appendix F) was conducted to evaluate the nurse's confidence level and consistency for using the peanut ball based on the approved policy. The data collection began after the completion of the education and survey. The PI collaborated with the virtual program team member via phone or email, who remotely logged in to the educational platform of net learning weekly to review, collect, and compute the pre and post-test education responses. Also, the PI obtained evaluated data from the project liaison via email two weeks after implementation. The

Net Learning software assessed each participant's response, and the software depicted the data in a tabular form. The data collected was uploaded, evaluated, and analyzed utilizing a Microsoft Excel Spreadsheet for statistical analysis. The PI used Microsoft Excel to create a chart that analyzed the data in a structured format that keeps all individual information separate but allows for easy compiling to make results simpler to view for readers.

Stage 4

Implementation of the change regularly as the organization progresses to accommodate the change is the fourth stage (ACI, 2015; Nursing World, [n.d.]). The awareness and knowledge acquired from the virtual education will enable the labor and delivery nurses to implement this change reliably and effectively document the peanut ball use on patients in the electronic health record as recommended in the approved policy. Therefore, the nurses would use the 45 cm sized peanut ball thirty minutes after an epidural application on laboring parturient patients without any maternal or fetal contraindications. The nurses would change their positions every 1-1.5 hours recommended on the policy (see attached peanut ball policy in Appendix C).

Stage 5

The final stage, confirmation, denotes the adoption of the change by the individual who resolves their decision to continue the innovation and may use it to maximum use (ACI, 2015; Nursing World, [n.d.]). The final step is reporting the project's findings to the clinical site's Inquiry Council to indicate its completion. The labor and delivery department maintains the peanut ball policy; the policy is reviewed annually. A recommendation was offered to the unit manager to permanently implement this change due to constant turnover among the nursing staff by promoting the policy's continuing education. This education was suggested to be included in a

new employee orientation program, annual competency sessions, and made available to anyone who needs it to remind, motivate, and ensure that nurses follow the approved guidelines on the peanut ball's safe use.

Measured Outcomes

The projected outcomes of the project are as follows:

- Improve the nurse's knowledge and understanding of the policy and peanut ball use, as evidenced by an average passing score of at least 80% on the post-test.
- Increase the nurse's confidence level for using the peanut ball based on the approved policy, as evidenced by an average Likert score of 3.0 or higher on the post-education survey.
- Increase the nurse's consistency of using the peanut ball based on the approved policy, as evidenced by an average Likert score of 3.0 or higher on the post-education survey.

Procedures for Data Collection

Data collection (see Appendix G and H for tools) for the project commenced in August of 2020 for four weeks. The PI collaborated with the virtual program team member via phone and email, who remotely log in to the educational platform of net learning weekly to review, collect, and compute the pre and post-test education responses. Also, the PI obtained the post-education survey responses two weeks after the implementation. The Net Learning software assessed each participant's response, and the software depicted the data in a tabular form. The data collected was uploaded, evaluated, and analyzed utilizing a Microsoft Excel Spreadsheet for statistical analysis. The PI used Microsoft Excel to create a chart that analyzed the data in a structured

format that keeps all individual information separate but allows for easy compiling to make results simpler to view for readers.

Evaluation and Sustainability Plan

The PI implemented a written and approved policy (see Appendix C) to permanently use the unit's peanut ball. A voluntary net learning education module that included pre/post questions was provided to the nursing staff to evaluate learning outcomes with an above 30% response rate as previously expected. After the program, the PI would share the results with the Inquiry Council and labor and delivery department leaders. My recommendation to the labor and delivery department manager was for the peanut ball policy education to be included in continuing education. This education should be included in a new employee orientation program, annual competency sessions and made available to anyone who needs it to remind, motivate, and ensure that nurses follow the approved guidelines on the peanut ball's safe use.

Timeline

Meeting with the stakeholders began in May 2019 to consider and develop the project details. Over the next several weeks, a literature review followed in conjunction with live emails, phone conversations with the departmental leaders, mentors, and course instructor to discuss the problem. The PI initiated the PICO question and developed a project plan. The PI began implementation in late summer 2020, and data collection was completed in September 2020.

Data Analysis

The quantitative data collected from the pre-and post-test education (see Appendix G) and post-educational survey (see Appendix H) was analyzed utilizing Net Learning Software and Microsoft Excel. The Net Learning software assessed each participant's response, and the

software depicted the data in a tabular form. The PI utilized Microsoft Excel to create a chart to analyze the data results for readers' simpler view. The obtained data was reviewed and discussed with my mentor, who is also the project liaison, to avoid errors.

Institutional Review Board/Ethical Issues

The Nursing Education Department has already granted permission for this process (see appendix I). The PI presented a research proposal to the Inquiry Council of Saint Barnabas Medical Center. This department did an internal review, and the project liaison submitted the request to the IRB of the hospital for evaluation. The approval was obtained on January 9, 2020, with an IRB ID number 20-01 (see Appendix J). An amendment to the IRB was requested to include staff education and obtaining consent from the staff. The PI received approval on June 26, 2020 (see Appendix J). The information collected was de-identified aggregate data stored in a personal passworded computer accessible only to the researcher for the proposed time frame after completing this project. There were no disclosures of participants’ private and sensitive information in this project. This measure protects the participants' confidentiality and complies with the Health Insurance Portability and Accountability Act (HIPAA) policies within the organization (see Appendix K). The Committee on the Use of Human Subjects in Research (CUHSR) reviewed the project proposal and approved the project with a CUHSR number 20-046-Q on August 13, 2020 (see Appendix L).

Chapter III: Organizational Assessment and Cost-Effectiveness Analysis

Organizational Assessment

The clinical site is a non-profit major teaching hospital providing the highest quality acute and prenatal care for high-risk pregnancies. Patients who desire to deliver at Saint Barnabas Medical Center seek to have an exceptional birthing experience that this hospital offers. The center has modern facilities and highly skilled health care professionals that provide family-centered quality health care services to ensure a healthy and happy hospital experience.

Readiness for Change

The labor and delivery nurses drive the peanut ball's use and are motivated to use it based on its effectiveness. The physicians also request the service of the peanut ball on their patients where necessary. The peanut ball required intervention on the unit, but there was no policy guiding its use. A peanut ball policy was created and approved with the nurse manager's support, the nurse educator, assistant director of nursing services, and the unit's medical director. Implementing this guideline promoted this project’s success with appropriate staff education, adherence, and willingness to change.

Barriers and Facilitators to Implementation

The facilitators in implementing this project were the project leader, team members, and department leaders. The nurse manager and the department director were incredibly supportive and have so far offered professional assistance for this project's ongoing success. Barriers to implementing this project are potential biases on the staff's use of the peanut ball due to no guidelines on its use and inadequate education. Most importantly, due to the ongoing COVID-19 pandemic, my project was not necessarily a priority, causing a delay in the departmental leader's

written policy's approval despite multiple communication by the project leader and lead mentor. These reasons and some other personal reasons led to a change in my project. The PI focused on virtual staff education via net learning, including pre and post questions and post-implementation surveys.

Risks and Unintended Consequences

Potential hazards include a lack of commitment to the project through an inappropriate collaboration of the team members. Unintended consequences include the nurses' bias of the peanut ball and failure to document the electronic health record's peanut ball use. Another unintended consequence is staffing constraints resulting in increased nursing staff workload. Thus, leading to infrequent patient education and inconsistent use of the peanut ball to reposition the parturient laboring patient with an epidural.

Cost Factors

Cost factors for this research were structured in two ways, monetary and time (see Appendix N). The actual project had no high financial costs except for stationery items, such as data sheets that acted as tools. However, the project leader and primary mentor/project liaison incurred volunteered time charges. Several hours were spent gathering, evaluating, and implementing the data.

Budgetary Needs

The PowerPoint presentation was administered to labor and delivery nurses at no cost to the participants. The nursing staff voluntarily completed the education, pre and post-test questions, and follow-up survey virtually at their convenience either at home or on the unit when they were on duty and did not receive any additional pay for this program. It was difficult to

determine the participants that completed the program at home or at work. Generally, the nurses are paid in accordance with the standard daily rate from the institution. At the $35/hour, pretax rate of the nurses at this facility for half an hour. If compensated, each nurse was estimated to make $17.5 for a cumulative total of $1,050 for 60 participants. Data collection sheets were printed from the email received from the SBMC project Liaison and logged. Minimal fiscal requirements were needed for printing 16 pages of the emailed data received from the project liaison for a total cost of $0.80 black/white page (see Appendix N).

Cost Avoidance

There was minimal incurred cost and no form of compensation in implementing this project. This project received no financial grant or financial assistance from any funding agency in the public or stakeholder donation. Presently, the department has enough peanut balls stocked in each room. So, there was no need to purchase additional peanut balls. Microsoft Excel was utilized for data analysis to avoid additional costs. Professional help was offered in kind by my team members. The project liaison assisted with data collection from learning software utilized by the hospital. If compensated for time volunteered for this project, the amount would equate to a significant cost for each team member, totaling an approximate $13,204 amount for all; Ndidiamaka Ezuma would have been compensated with $9,429, and Leslie Wright-Brown $3,775 (see Appendix N). However, a decline in NTSV cesarean section rates will reduce the length of hospital stay for mothers and reduce overall healthcare costs.

Chapter IV: Results

Analysis of the Implementation Process

The project's implementation process was incredibly challenging as the process had to be altered and modified in several ways due to the ongoing COVID-19 pandemic and the PI's life circumstances at that time. The hospital's IRB approved this project (see Appendix J) and CUHSR at Bradley University (see Appendix L) before implementation. The implementation was previously intended to be done during a live three-day morning huddle with both night and morning nurses (participants) to capture 30% of the entire nurses or more. Staff education was supposed to be provided with contributions, feedback, and more in-person interaction. Participants would have completed the pre-test questionnaire, post-test, and post-implementation survey evaluations immediately live following each health education session and after the program, respectively.

The above situation was not feasible due to the COVID 19 hospital restrictions and the mandated social distancing policy. The PI implemented the project virtually through the Net learning education software utilized by the hospital. The participants could complete the education at their pace and availability within four weeks. A member of the Net learning team (the project liaison) launched the program on August 25, 2020. The implementation was intended to be completed in 4 weeks. However, some technical errors occurred during the enrollment of the survey questions. Most participants could see only one question 5 instead of the entire five survey questions even after the IT team resolved the problems. This challenge led to a delay in the electronic submission of responses. The program was taken down and relaunched; an additional one week was apportioned to the participants to submit all their survey

responses. The pre-test, post-test, and post-education survey evaluations were collected from each participant and were analyzed by the Net learning software to assess participants' level of education, knowledge, and understanding of the peanut ball policy.

The participants were all labor and delivery nurses who showed interest and willingness to participate in the project. Ninety-four nurses were enrolled in the Net learning module to participate in the peanut ball policy education for the four weeks. Of the 94 nurses registered, 59 to 60 participants completed the pre-test questions, 59 participants completed the post-test questions. There were technical problems with the survey question when the project liaison created it, so only one question was available. However, when the PI realized the error and reported it to the project liaison, the survey was taken down, edited, and participants were re-enrolled. Before this issue, some participants had already completed the survey. The PI discussed with the project liaison to eliminate the thirty-one participants that only answered the fifth question to ensure appropriate and complete data. The project liaison was advised to run data for the thirty-five participants who completed the entire survey evaluation questions. As per the project liaison, it was difficult to indicate which participant completed the pre-test, post-test, and survey questions.

The timing was very substantial in this project. The project, which was initially designed to be completed in four weeks, required some accommodations to submit pending responses. An additional one week was allotted to the participants to submit all tests and survey responses after the program. The allotted extra week was to accommodate the variations in participants' job schedules, lives, and because of the pandemic. During this implementation process, the lessons discovered are that people's priorities vary, and to work with people, to

achieve an outcome, gentle reminders and patience are crucial to enable their cooperation and timely participation. People have different perceptions and principles, which might affect their decisions in life, which they make based on what is more valuable and beneficial to them at any given time. An additional lesson learned is that change is constant, irrespective of the cause. During this project, the changes that occurred comprised of unforeseen factors based on personal, social, health, organizational, and general circumstances.

Analysis of Project Outcome Data

The total number of participants utilized during the data collection stage was 94. Sixty participants completed the pre-test, but only 59 participants completed the post-test evaluation. However, the PI obtained 35 responses in the post-education survey questions due to the technical challenge that occurred during the launching leading to the majority of participants viewing only the fifth question and was unable to view items 1 to 4. The IT team resolved the problem; however, there were no changes to the 31 participants who had already completed and submitted the survey questionnaire. The variables used to evaluate the peanut ball policy's efficacy include but are not limited to the peanut ball benefits, use, excluded patients, duration of position change during its use, and when the nurses should use the peanut ball.

Pre-Test and Post-Test Questions Evaluations

The Pre-Test Questions were completed before the start of peanut ball policy education and were used to assess the participants' prior knowledge of the peanut ball's safe use. The PI included the same questions for Post-Test Questions, which were completed after the peanut ball policy education. It was used to assess the participants' post-education knowledge of the peanut ball's safe use.

Question: 1. *Which of the following is a benefit of the peanut ball to a patient laboring with an epidural?* All the participants, 60 (100%) who completed the Pre-Test Evaluation, chose the correct option C; the peanut ball's benefit to a patient laboring with an epidural was to enhance fetal descent in a vertex presentation (see Table 1). For this same question in the Post-Test Evaluation, one participant did not answer the question. Therefore only 59 participants responded to this question. Fifty-eight participants (98.3%) choose the correct option C; the peanut ball's benefit to a patient laboring with an epidural was to enhance fetal descent in a vertex presentation, indicating a 1.69 % decline (See Table 2; Figure 2).

Table 1

Pre-Test Question: 1. Which of the following is a benefit of the peanut ball to a patient laboring with an epidural?

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%
					60	100		
	1	%	2	%	3	%	4	%
LABOR & DELIVERY					60	100		
Org Totals and Percentages:					60	100		
Ques Totals and Percentages:								

Table 2

Post-Test Question: 1. Which of the Following Is a Benefit of the Peanut Ball to a Patient?

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%
LABOR & DELIVERY	1	1.69			58	98.31		

	1	%	2	%	3	%	4	%
	1	1.69			58	98.31		
Org Totals and Percentages:	1	1.69			58	98.31		
Ques Totals and Percentages:								

Question: 2. *The peanut ball can be used for the following when used appropriately?* Fifty-six (94.92%) participants answered correctly with option D; all the above indicates that the peanut ball could be used for postural changes on the bed, promote labor progress, and promote maternal comfort (see Table 3). For this same question in the Post-Test Evaluation, 57 (96.61%) participants answered the question correctly, indicating a 1.69 % improvement (See Table 4; Figure 2).

Table 3

Pre-Test Question: 2. The Peanut Ball Can Be Used for the Following When Used Appropriately?

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%
LABOR & DELIVERY			3	5.08			56	94.92

	1	%	2	%	3	%	4	%
			3	5.08			56	94.92
Org Totals and Percentages:			3	5.08			56	94.92
Ques Totals and Percentages:								

Table 4

Post-Test Question: 2. The Peanut Ball Can Be Used for the Following When Used Appropriately?

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%
LABOR & DELIVERY	1	1.69	1	1.69			57	96.61

	1	%	2	%	3	%	4	%
	1	1.69	1	1.69			57	96.61
Org Totals and Percentages:	1	1.69	1	1.69			57	96.61
Ques Totals and Percentages:								

Question: 3. *Which patients should be excluded from using the peanut ball?* Fifty-two (86.67) participants chose the correct option E, which included answers A, B, C, a history of a fractured pelvis, category III fetal heart tracing, and signs of intrauterine infection (see Table 5). For this same question in the Post-Test Evaluation, 56 (94.92%) participants choose the correct option showing an 8.25% improvement (see Table 6; Figure 2).

Table 5

Pre-Test Question: 3. Which Patients Should be Excluded From Using the Peanut Ball?

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%	5	%
LABOR & DELIVERY	8	13.33							52	86.67

	1	%	2	%	3	%	4	%	5	%
	8	13.33							52	86.67
Org Totals and Percentages:	8	13.33							52	86.67
Ques Totals and Percentages										

Table 6

Post-Test Question: 3. Which Patients Should be Excluded From Using the Peanut Ball?

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%	5	%
LABOR & DELIVERY	3	5.08							56	94.92

	1	%	2	%	3	%	4	%	5	%
	3	5.08							56	94.92
Org Totals and Percentages:	3	5.08							56	94.92
Ques Totals and Percentages:										

Question: 4. *Based on the new peanut ball policy, how often are nurses expected to change laboring women's positions with the peanut ball?* Only 15 (25%) participants answered correctly by choosing option B, every 1-1.5 hours (see Table 7). Surprisingly, the exact number of participants (15) answered option C; every 1-2 hours. In comparison, 48 (81.36%) responded to this question correctly in the Post-Test Evaluation, indicating a 56.36% improvement (see Table 8; Figure 2).

Table 7

Pre-Test Question: 4. Based on the New Peanut Ball Policy, How Often are Nurses Expected to Change Laboring Women's Positions With the Peanut Ball?

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%
LABOR & DELIVERY	2	3.33	15	25.00	15	25.00	28	46.67

	1	%	2	%	3	%	4	%
	2	3.33	15	25.00	15	25.00	28	46.67
Org Totals and Percentages:	2	3.33	15	25.00	15	25.00	28	46.67
Ques Totals and Percentages:								

Table 8

Post-Test Question: 4. Based on the New Peanut Ball Policy, How Often are Nurses Expected to Change Laboring Women's Positions With the Peanut Ball?

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%
LABOR & DELIVERY	3	5.08	48	81.36	4	6.78	4	6.78

	1	%	2	%	3	%	4	%
	3	5.08	48	81.36	4	6.78	4	6.78
Org Totals and Percentages:	3	5.08	48	81.36	4	6.78	4	6.78
Ques Totals and Percentages:								

Question: 5. *Based on the new peanut ball policy, the peanut ball should be used on a patient following an epidural administration in which of the following?* Fifty-Three (88.33%) choose E, which includes answers A, within 30 minutes with no contraindications, and C once the patient is comfortable (see Table 9). For this same question in the Post-Test Evaluation, 53 participants (89.93%) choose the correct option, showing a 1.6 % improvement (see Table 10; Figure 2).

Table 9

Pre-Test Question: 5. Based on the New Peanut Ball Policy, the Peanut Ball Should be Used on a Patient Following an Epidural Administration in Which of the following?

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%	5	%
LABOR & DELIVERY	1	1.67	1	1.67	5	8.33			53	88.33

	1	%	2	%	3	%	4	%	5	%
	1	1.67	1	1.67	5	8.33			53	88.33
Org Totals and Percentages:	1	1.67	1	1.67	5	8.33			53	88.33
Ques Totals and Percentages:										

Table 10

Post-Test Question: 5. Based on the New Peanut Ball Policy, the Peanut Ball Should be Used on a Patient Following an Epidural Administration in Which of the following?

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%	5	%
LABOR & DELIVERY	5	8.47			1	1.69			53	89.83

	1	%	2	%	3	%	4	%	5	%
	5	8.47			1	1.69			53	89.83
Org Totals and Percentages:	5	8.47			1	1.69			53	89.83
Ques Totals and Percentages:										

The pre-and post-test scores were summarized with a bar chart illustrating the percentage scores for each of the five pre and post-test questions (see Figure 1). Similarly, the post-test scores' overall progress was represented on a bar graph (see Figure 2). Likewise, overall progress on the pre-and post-test scores was shown on a bar chart with the average pretest scores of 78.98% and an average post-test score of 92.21% (see Figure 3). These findings revealed a successful staff education.

Figure 1

Pre and Post Test Scores Summary

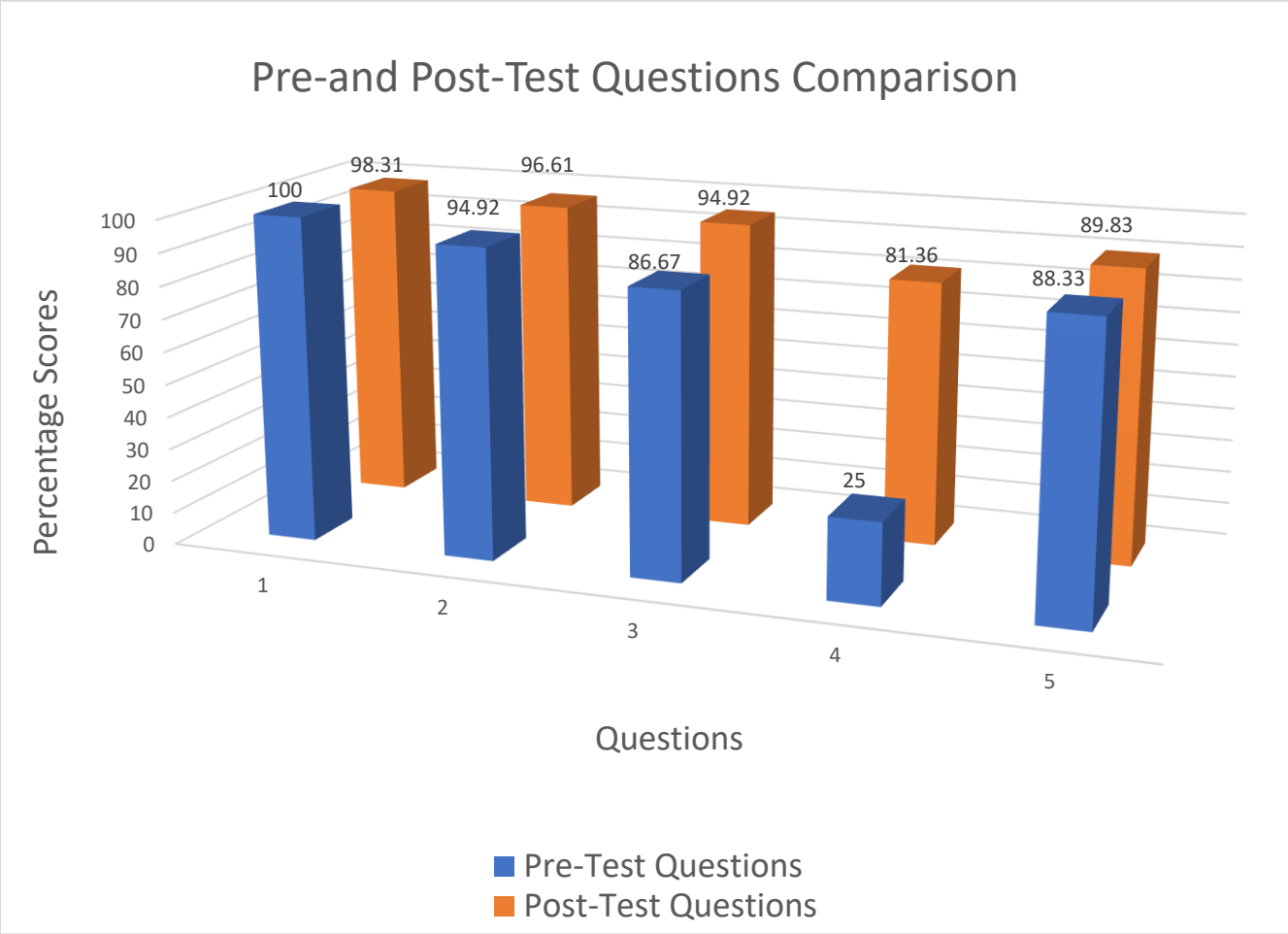


Figure 2

Percentage Progress on Post-Test Scores

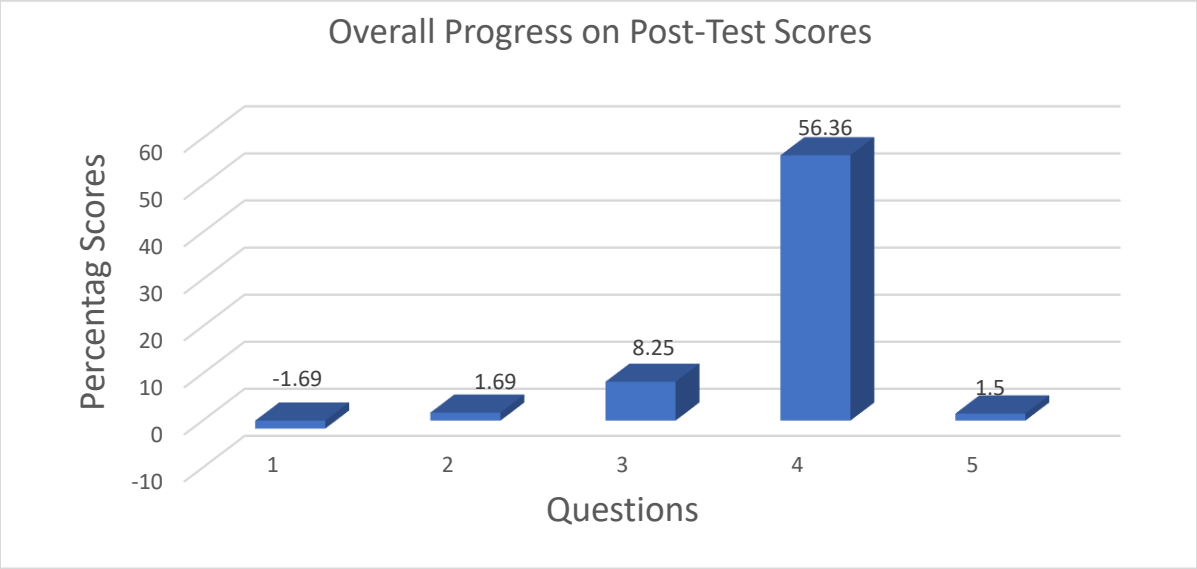
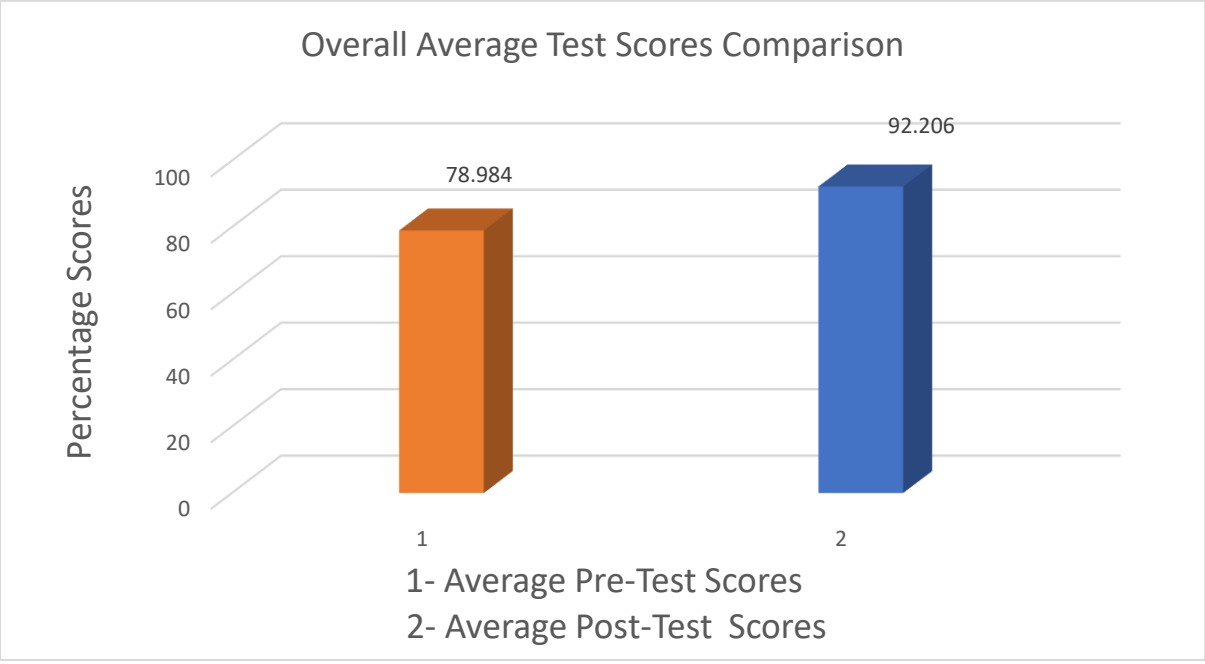


Figure 3

Percentage Average Progress on Pre- and Post-Test Scores



Post Education Survey Evaluations

Question 1: *I document the peanut ball use on the electronic health record (EHR) when used on my patients.* Twenty-eight (80%) participants reported always, 5 (14.29%) reported often, and only 2 (5.71%) reported that they sometimes do, which revealed consistency of the use of the peanut ball and its documentation with a 3.0 and greater Likert score (see Table 11; Figure 4).

Table 11

*Question 1: I Document the Peanut Ball Use on the Electronic Health Record (EHR) When Used on my Patients***.**

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%	5	%
LABOR & DELIVERY					2	5.71	5	14.29	28	80.00

	1	%	2	%	3	%	4	%	5	%
					2	5.71	5	14.29	28	80.00
Org Totals and Percentages:					2	5.71	5	14.29	28	80.00
Ques Totals and Percentages:										

Question 2: *I educate my laboring patients with an epidural on the use of the peanut ball.* Twenty-five (71.43%) participants responded that they always educate their patients, 8 (22.86%) participants and only 2 (5.71%) participants responded that they sometimes educate their laboring patients on the use of the epidural. These empirical findings indicate patient education consistency about using the peanut ball with a 3.0 and greater Likert score (see Table 12; Figure 4).

Table 12

Question 2: I Educate my Laboring Patients With an Epidural on the Use of the Peanut Ball.

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%	5	%
LABOR & DELIVERY					2	5.71	8	22.86	25	71.43

	1	%	2	%	3	%	4	%	5	%
					2	5.71	8	22.86	25	71.43
Org Totals and Percentages:					2	5.71	8	22.86	25	71.43
Ques Totals and Percentages:										

Question 3: *I feel confident in using the peanut ball safely based on the approved guidelines.* Regarding this question, 18 (51.43%) participants responded that they strongly agree, while 15 (42.86%) participants responded that they agree that they feel confident. Only 2 (5.71%) stated that they neither agree nor disagreed. This result indicates an increased confidence level for using the peanut ball based on the approved guidelines, as seen with a 3.0 and greater Likert score (see Table 13; Figure 4).

Table 13

Question 3: I Feel Confident in Using the Peanut Ball Safely Based on the Approved Guidelines.

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%	5	%
LABOR & DELIVERY					2	5.71	18	51.43	15	42.86

	1	%	2	%	3	%	4	%	5	%
					2	5.71	18	51.43	15	42.86
Org Totals and Percentages:					2	5.71	18	51.43	15	42.86
Ques Totals and Percentages:										

Question 4: *I consistently use the peanut ball for patients based on the peanut ball policy.* Seventeen (48.57%) participants agree that they always use the peanut ball for their patients based on the peanut ball policy; 13 (37.14%) participants strongly agree, while 5

(14.29%) participants had a neutral response. This result indicates the increased consistency of the peanut ball use based on the policy evident with a 3.0 and greater Likert score (see Table 14; Figure 4).

Table 14

Question 4: I Consistently Use the Peanut Ball for Patients Based on the Peanut Ball Policy

Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%	5	%
LABOR & DELIVERY					5	14.29	17	48.57	13	37.14

	1	%	2	%	3	%	4	%	5	%
					5	14.29	17	48.57	13	37.14
Org Totals and Percentages:					5	14.29	17	48.57	13	37.14

Question 5: *Having a peanut ball policy in the labor and delivery department will promote the peanut ball's consistent use on eligible patients?* Fifteen (41.67%) participants agree with this question; 14 (38.89%) participants strongly agree, 5 (13.89 %) participants had a neutral response. This result indicates that the policy will promote the peanut ball's consistent use, as evidenced by a 3.0 and greater Likert score (see Table 15; Figure 4).

Table 15

Question 5: Having a Peanut Ball Policy in the Labor and Delivery Department will Promote the Peanut Ball's Consistent Use on Eligible Patients?

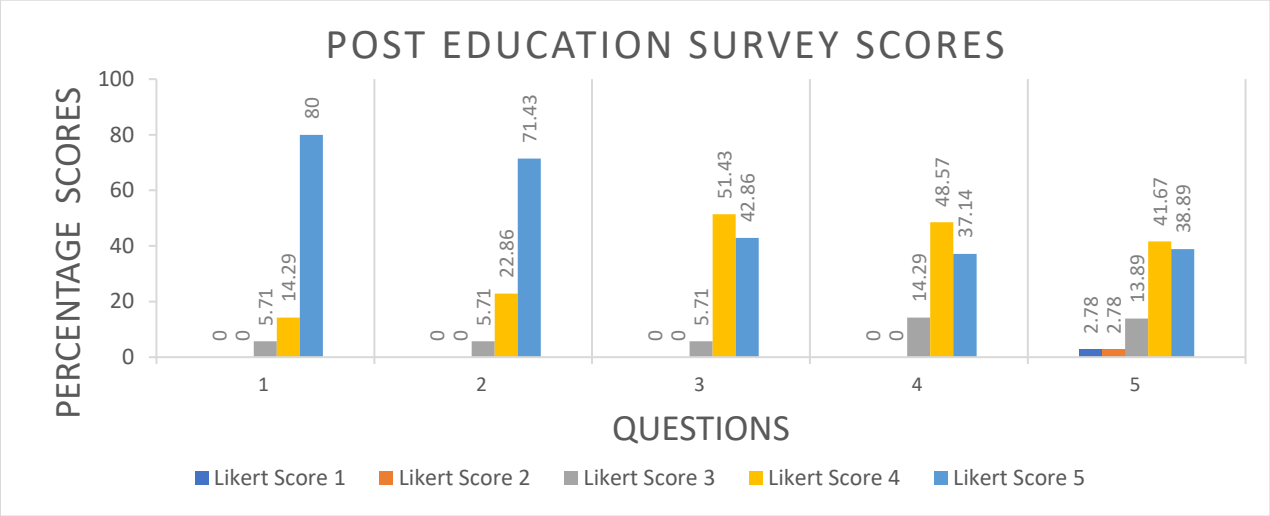
Organization: SAINT BARNABAS MEDICAL CENTER

	1	%	2	%	3	%	4	%	5	%
LABOR & DELIVERY	1	2.78	1	2.78	5	13.89	15	41.67	14	38.89
Org Totals and Percentages:	1	2.78	1	2.78	5	13.89	15	41.67	14	38.89

Ques Totals and Percentages:	1	%	2	%	3	%	4	%	5	%
	1	2.78	1	2.78	5	13.89	15	41.67	14	38.89

Figure 4

Post Education Survey Evaluation



Chapter V: Discussion

Summary of Major Findings and Outcomes Linked to SMART Objectives

Objective One

Improve the nurse's knowledge and understanding of the policy and peanut ball use, as evidenced by an average passing score of at least 80% on the post-test. The PI achieved this objective. The average pretest responses revealed that about 92.91% of the participants expressed knowledge and understanding of the peanut ball policy education, compared to 78.98% who gave correct answers to the pretest question. This outcome did show the success of staff education (see Figure 3).

Objective Two

Increase the nurse's confidence level for using the peanut ball based on the approved policy, as evidenced by an average Likert score of 3.0 or higher on the post-education survey. All participants successfully realized the second objective. The PI utilized question three of the post-education survey; *I feel confident using the peanut ball safely based on the approved guidelines* for this evaluation. The entire thirty-five (100%) participants' responded to Likert scores of 3.0 to 5.0, demonstrating a successful outcome (see Figure 4).

Objective Three

Increase the nurse's consistency of using the peanut ball based on the approved policy, as evidenced by an average Likert score of 3.0 or higher on the post-education survey. Several participants achieved the third objective. The PI utilized questions four and five of the post-education study for this review. The entire 35 (100%) participants' responses to question 4, *I consistently use the peanut ball for patients based on the peanut ball policy,* indicated Likert

scores of 3.0 to 5.0. Only 68 (88.3%) participants responded to question 5: *Having a Peanut Ball Policy in the Labor and Delivery Department will Promote the Peanut Ball's Consistent Use on Eligible Patients?* Which showed Likert scores of 3.0 to 5.0. Still, these findings revealed a successful outcome (see Figure 4).

Limitations

There are some limitations involved in this project plan. First, the study had a small sample size (n=94). The PI limited the project to only labor and delivery department nurses in a single facility (SBMC) within the hospital network. The original number of enrolled nurses was ninety-four nurses, but only sixty nurses participated in the project. Thirty-five nurses relatively participated in the survey due to some technical challenges. The post-test (only 59 out of 94 participants answered questions 3, 4, 5) responded to the questions (see Tables 5, 6, 7, 8, 9, and 10). The technical disputes that affected the survey questions that made questions 1 to 4 not available to some participants may have influenced this project's results. Thirty-one participants completed and submitted the survey responses before the PI identified the error. Thus, these thirty-one participant could not complete questions one to four of the post-education survey evaluation and were eliminated from the project. Also, there was no related Pre-Education Survey that directly correlates with the Post-Education Survey. Thus, the PI made no comparison. Moreover, the PI was informed by the project liaison that it is not feasible to verify which participant responded to the program's entirety.

Although the survey measured specific staff outcomes, it did not control all the factors influencing these outcomes. There are varying time ranges between epidural placement and peanut ball application included in the policy. The PI did not strictly control practice variation

among labor and delivery nurses; that is, nurses were still given the option to place the peanut ball based on the patient's desire, comfort, and at the physician's discretion. Another limitation was the inability to control all confounding variables during the implementation stage, such as lack of motivation. Some participants wanted the module to be included in the clinical ladder program. The participants were disappointed that the hospital did not recognize the project as part of the clinical ladder program.

Furthermore, COVID-19 pandemic's existence impacted the project by limiting participants' complete involvement in the project. Some nurses were out on leave, and some chose not to participate, causing a decline in participation from the 94 nurses enrolled for the project. There was a time constraint for participants to complete both the Net Learning education module and the survey, as most nurses would prefer to complete this education onsite. The organization could consider providing more learning time for nurses to participate in more virtual educational sessions. Therefore, utilizing the applicability of the descriptive statistical evaluated outcomes in a different clinical setting or within the hospital network (Robert Wood Johnson Barnabas Health) should be weighed carefully.

Deviations from Project Plan

Specific changes occurred with the original project plan. There was a delay with the implementation of the project and other factors that influenced the completion. The PI postponed the peanut ball policy education's anticipated start date several times due to delayed approval of the peanut ball policy, project, Bradley's IRB, and the ongoing COVID-19 pandemic. The mandatory social distancing and prohibition of social gatherings influenced the project implementation, leading to virtual staff education instead of a live presentation during morning

huddles at the labor and delivery department. The PI modified the procedure and activities of the project plan to accommodate virtual learning and communication.

Implications

Additional studies, review, and development are required to promote the peanut ball policy's continuity and improvement. How can labor and delivery nurses be motivated to continue the safe use of the peanut ball on laboring patients with an epidural? How can labor and delivery nurses be held accountable when they do not follow the peanut ball policy? How often should the peanut ball policy education be conducted to ensure that current evidence-based knowledge and practices are implemented?

Practice Change

The peanut ball policy is now a possession of the labor and delivery department of SBMC, New Jersey. The PI recommended the unit leadership to include the peanut ball policy education as part of the continuing education for L&D nurses. The peanut ball policy education has been proposed to be included in the new employee orientation program, annual competency sessions, and made available to anyone who needs it. Also, to remind, motivate, and ensure that nurses follow the approved guidelines on the peanut ball's safe use. Enactment of frequent follow-ups and reiterations of maintaining nurse’s consistency on the safe use of the peanut ball and addressing the nurse’s feedback in the subsequent education is essential. Ways to motivate and encourage the nurses to comply with the policy must also be addressed.

Nurses are to be encouraged to improve their functional skills. However, nurses' education should be based on strong evidence-based guidelines in alleviating pain during labor. Educating nurses will help meet their patients' needs and raise the reputation of the organization

in the community. Continuous labor and delivery nurses' education promotes knowledge acquisition, empowerment, confidence, and consistency of the peanut ball use. Therefore, the labor and delivery department must support and sustain the nurses' skills and competence through continuous peanut ball education.

Future Research

This study's findings demonstrate the peanut ball policy education's potential to improve the knowledge, confidence, and consistency of the peanut ball use. Nevertheless, there is always room for improvement, even in these areas. Future studies should address the peanut ball use's effectiveness based on the policy, with a larger sample controlling more potential confounders over six months. Additional research could include a quality improvement study on the effect of teaching parturient patients about using the peanut balls during labor over one year.

Integration of the peanut ball use and its impact on labor can begin with the childbirth nurse educators demonstrating the peanut ball to childbirth classes. Nurses in labor and delivery units can educate on its benefits in labor-management classes. Also, education can be incorporated into the nursing orientation and annual nursing competency programs. This awareness and knowledge could reduce bias, facilitate dissemination and adoption of innovative peanut ball use on both nurses, and labor women with an epidural. There must be a periodic evaluation of the policy for future improvement based on the most recent evidence-based guideline, which must be tested for validity and reliability. The results from this project will be made available to the inquiry counsel committee of SBMC by the PI during one of their monthly meetings. The peanut ball policy can be implemented at other Robert Wood Johnson’s Barnabas

Health (RWJBH) locations. Changes to the policy can be updated by these locations as needed to suit the various health organizations.

Nursing

Nurses are vital facilitators in health care settings. Patients' healthcare needs and interdisciplinary plan of care are directly impacted by nurses' ability to make clinical decisions, critical thinking, ensuring the effectiveness of the patient's overall outcome (Mason et al., 2015). By implementing this project, the PI was able to achieve the ability to boost nursing knowledge of the policy, confidence, and consistency of the peanut ball use. Thus, improving the outcome of parturient patients laboring with an epidural.

During admissions of parturient patients and before any peanut ball use on the unit, nurses should include education on its effects and outcomes. Providing more learning time for nurses to participate in more virtual in-service evidence-based educational sessions would update their professional knowledge and skills and improve the best clinical practices for fulfilling various tasks and responsibilities.

Health Policy Change

When standardizing the new peanut ball policy, it is vital to consider a few things. The regulatory issues related to this project involve patient-nurse interactions through education, behavioral and attitudinal conduct of labor and delivery nurses working at SBMC, and all stakeholders involved with staff education in the institution should be aware of this innovation to ensure success. It is the goal of hospitals to provide quality patient care and improve patient outcomes. They standardize this practice based on the regulatory bodies such as the Center for Medicare and Medicaid Services (CMS) and the Joint Commission (TJC) at the state and

national levels by ensuring the nursing staff's continuous education. Hospitals strive to adhere to these standards and achieve quality care through educated and knowledgeable nursing staff; this includes new graduate nurses in the labor and delivery department. It is vital to consider the financial implication regarding staff education, as all nursing staff education must be thoughtfully planned and funded by the institution.

Simpson and Lyndon (2017) explained that labor and delivery nurses have an active interventional role in helping a laboring woman with postural changes using the peanut ball to avoid a cesarean section and promote vaginal delivery. A decline in NTSV cesarean section rates will reduce the length of hospital stay for mothers and reduce overall healthcare costs. The peanut ball policy ensures the peanut ball's safe use on laboring parturient patients with an epidural. There is a poster with the different positions that the peanut ball can be used during labor. Nurses should utilize these visual aids when incorporating peanut ball education in their patient’s plan of care. Thus, promoting the patient’s knowledge and acceptance of the peanut ball use. This project can extend to the entire RWJBH network, other hospitals, birthing centers in the regions throughout New Jersey, and a broader level if proven successful. Thus, benefitting many other nursing staff, patients, and communities in the general population.

Chapter VI: Conclusion

Value of the Project

The outcome and recommendation elicited from this project to health care and practice are of great importance in improving the nursing staff knowledge, confidence, and consistency of the peanut ball use in SBMC and the more extensive RWJBH network. Nurses are crucial implementers in health care settings and must be empowered through evidence-based in-service education to improve patient outcomes. Adequate knowledge of the peanut ball policy is vital in enhancing the effect of parturient patients laboring with an epidural and should be emphasized. Labor and delivery nurses have an active role in assisting laboring women who received epidural with postural changes using the peanut ball to reduce cesarean section and instrumental delivery rates and promote vaginal delivery (Simpson & Lyndon, 2017).

This project yielded a positive outcome, i.e., labor and delivery nurses at SBMC practice the peanut ball's safe use based on the approved policy. The project results directly improving parturient laboring patient care and have increased the knowledge of labor and delivery nurses. The need to sustain or maintain this practice's continuity is essential by conducting more continuing education for existing labor and delivery nurses annually and including this education in the new employee’s orientation program.

Doctor of Nursing Practice (DNP) Essentials

The DNP *Essentials* guide the advanced practice nurse (APN) through foundational competencies and are incredibly beneficial to all APNs. The PI incorporated all eight Doctorate of Nursing Practice (DNP) *Essentials* into this capstone project (American Association of

Colleges of Nursing [AACN], 2006; Moran et al., 2020). *Essential 1: Scientific Underpinnings for Practice*: The literature review, integration of research, and understanding and incorporating a conceptual framework enhanced the ability to utilize the knowledge from the science-based theories and evidence-based practice as a guide for the capstone project plan. *Essential II: Organizational and Systems Leadership for Quality Improvement:* The PI employed leadership and communication skills to develop a peanut ball policy/guidelines and practical strategies to educate labor and delivery nurses on the peanut ball's safe use laboring women with an epidural. *Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice:* The application of Evidence-based practice (EBP) yields better patient outcomes and is an integral component of safe and effective quality patient-centered care. Integrating EBP into healthcare delivery maintains an optimal professional nursing practice. The use of information technology broadened my knowledge of the methodologies. It enabled my involvement in a collaborative knowledge-generating study with the stakeholders to improve healthcare outcomes by inspiring labor and delivery nurses to provide effective patient-centered care to laboring women with an epidural.

Essential IV: Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care: Patient care focuses on developing new concepts and knowledge in healthcare technology. Technological growth in clinical applications is the current trend in healthcare. It is needed to communicate crucial components required to advance patient care outcomes on laboring women with an epidural through appropriate postural changes using the peanut ball. *Essential V: Health Care Policy for Advocacy in Health Care:* Nurses advocate for their patients daily. This DNP project has undoubtedly enhanced the PI’s

leadership skills by developing and approving healthcare policies that foster quality improvement via effective communication, grit, and active participation at the clinical facility where the PI conducted this project. *Essential VI: Inter-Professional Collaboration for Improving Patient and Population Health Outcomes:* The DNP project aided the PI to collaborate and communicate effectively with intra-professional and interprofessional teams within the organization in the implementation of procedures to improve health care delivery and patient outcomes through appropriate nursing staff education on the newly approved peanut ball policy. *Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health:* Assessing care delivery approaches and interventions such as the use of a post-education survey to evaluate consistency and confidence of the use of the peanut ball on parturient patients laboring with an epidural aided in improving this population's health outcomes. *Essential VIII: Advanced Nursing Practice:* All the components in *Essential* VIII are crucial for an APN. The PI utilized this necessary to develop and sustain a therapeutic relationship with stakeholders. The PI also applied an advanced level of clinical judgment to educate team members on using evidence-based practices such as using the peanut ball to improve laboring patient outcomes with the approved policy on the use of the peanut ball.

Plan of Dissemination

Plan for dissemination includes a formal virtual PowerPoint presentation to the faculty, project team, and peers at Bradley University to complete the Doctoral degree. Additionally, the PI will submit this scholarly project to the DNP Doctoral Project Repository for future DNP students. Likewise, the PI will discuss the outcomes of this project with members of the inquiry

counsel committee of SBMC during one of their monthly meetings and submit a copy for continued education of the nursing staff at SBMC and RWJBH network.

Attainment of Personal and Professional Goal

Regardless of the several impediments and delays encountered during this project, the PI completed the project, which is one of the requirements for completing her doctorate, and has passed the certification boards. Completion of this DNP project has allowed the PI to become a productive nurse practitioner. The PI learned a lot and attained professional growth through the implementation of this project. Similarly, the PI developed excellent interactive skills, collaboration, managerial and team-based professionalism with the stakeholders to complete this project. Consequently, boosting confidence in my career.

Furthermore, the PI learned conflict resolution skills during this process by overcoming barriers by applying effective strategies. The PI utilized evidence-based practices (EBPs) and their impact on nursing care, evaluated current practices, and recognized areas for improvement that pertain to patient safety and quality of care. Changing an already existing behavior is incredibly challenging. However, nurses could achieve a consistent behavioral change with effective communication and effective strategies on the peanut ball policy. Enhancing favorable patient outcomes is the most important reason for this project. The knowledge and skills attained from this project will be beneficial in the future as my career role advances in nursing practice, as I become a competent advanced practice nurse.

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Appendix A

Peanut Ball Size Measurement and Recommendations

40cm – Recommended for women who are under 5′ 3

50cm – Recommended for women who are 5’3 ″ to 5’6 ″

60cm – Recommended for women who are 5’7 ″ or taller

70cm – Only to sit on and straddle

Appendix B

Postural Positions with the Peanut Ball

The two top pictures show a patient in the side-lying or the semi-prone position, with the upper leg on the ball, while the two bottom pictures show a patient in the semi-reclined position with a leg on the peanut ball and the other leg to the side of the peanut ball.

Appendix C

Peanut Ball Policy

BARNABAS HEALTH
Saint Barnabas Medical Center
L&D POLICY AND PROCEDURE

TITLE: Guidelines for Safe Use of the Peanut Ball in Labor and Delivery Unit.
POLICY: Safe Use of the Peanut Ball
EFFECTIVE DATE: June 2020

Signed copy on file

APPROVED BY: Richard C. Miller, MD **DATE:** 6/24/20
: Sheila Gilbert **DATE:** 6/24/20
: Lynne Holmes, CO **DATE:** 6/24/20

ATTACHMENTS:

PURPOSE: To provide the Labor and Delivery staff with guidelines on the safe use of the peanut ball.

DEFINITIONS:
Peanut Ball: A peanut ball is made of durable, non-latex material shaped like a peanut shell, where the middle circumference is smaller than the ends. A peanut ball is used to provide women with a positioning aid that has been shown to shorten the length of the second stage of labor significantly. Also, the cesarean rate for those that used the peanut ball was statistically lower than for those women who did not use the peanut ball.

QUALIFICATIONS: RN's and Licensed practitioners.

CRITERIA: All laboring patients with the exclusion of fractured pelvis, signs of intrauterine infection, and Category III fetal heart tracing or at the discretion of the physician.

POLICY:
1. The Labor and Delivery (L&D) RN will promote the safe use of the peanut ball for all laboring women with or without epidural analgesia for who would benefit from a positioning aid while in bed.

2. The peanut ball may be used with both external and internal electronic fetal monitoring equipment.

3. The peanut ball is not to be used for positioning out of bed (i.e., floor, chair).

4. Peanut balls should be properly inflated.

5. Before use, the RN will explain the safe use of the peanut ball as a labor support mechanism for a position change to the patient and family.

EQUIPMENT: Peanut ball

BARNABAS HEALTH
Saint Barnabas Medical Center
L&D POLICY AND PROCEDURE

PROCEDURE:

1. The L&D RN will explain the safe use of the peanut ball as a labor support mechanism for a position change to the patient and family, before its use.
2. Remove the peanut ball from the plastic bag and tie a drawsheet around the ball to prevent discomfort from the peanut ball resting against the woman's legs.
3. The peanut ball is placed between the woman's legs within 30 minutes of receiving an epidural, once the patient is comfortable, or whenever needed for positioning while in bed.
4. Assist patient with turning or changing their position and adjusting the peanut ball every 1–1.5 hours.
5. The peanut ball may be removed when the cervix of the woman is completely effaced and dilated, passive descent has occurred, and she is ready to push actively.

DOCUMENTATION:

1. Document the use of peanut ball in the electronic health record (EHR) labor flowsheet under the OB Intrapartum band- Peanut ball.

INFECTION CONTROL: Standard precautions

1. The peanut ball will be disinfected before and after each patient's use using the hospital-approved disposable germicidal wipes according to the manufacturer's instructions, to reduce the risk of healthcare-associated infections.
2. Clean peanut balls will be covered with a plastic bag and stored in the labor room.

SAFETY: Standard Precautions

ORIGINAL DATE:

REVIEWED: REVISED:

REFERENCES:

Tussey CM, Botsios E, Gerkin RD, Kelly LA, Gamez J, Mensik J. (2015). Reducing length of labor and cesarean surgery rate using a peanut ball for women laboring with an epidural. *Journal of Perinatal Education*, 24(1), 16-24.

AUTHOR:

LOCATION: Employee Portal – Policy and Procedures (Labor and Delivery).

Appendix D

Project Recruitment and Participant Consent Email

Dear Labor and Delivery Registered Nurse

You are invited to participate in a quality improvement project entitled "The Use of the Peanut Ball on Nulliparous Women Laboring with An Epidural." I, Ndidiamaka Ezuma, RN, BSN, RNC-OB, am the project leader. The project has been reviewed and approved by the Saint Barnabas Medical Center Institutional Review Board (IRB) to protect human subjects. Your participation in this project is voluntary. You may choose not to take part or leave the project at any time. Participation in this project will not affect your standing in the hospital. If you decide to participate in this project, you will be asked to complete a Net Learning module consisting of a pre-test, a review of a summary of the peanut ball use policy/procedure, and a post-test. Please endeavor to complete the module within one week from the date of the email. Approximately two weeks after education, you will receive an email inviting you to complete a very brief post-implementation Net Learning questionnaire to assess policy implementation questions, etc. Completion of the Net Learning module content and surveys should take no more than 30 minutes.

If you choose to participate in the project, your responses will be kept confidential. The data from these surveys will be collected and analyzed in the aggregate. No names of individuals will be included in the resulting reports. Logging in to Net Learning and completing the Peanut Ball Module (includes the pre-and post-test and follow-up survey) implies consent for participating in this project. After the project, the de-identified data will be deleted within six months.

Questions about this project may be directed to the project leader: Ndidiamaka Ezuma, at 862-205-9843 or the project advisor in charge: Dr. Karin Smith, at 309-677-4588. I sincerely appreciate your kind help and time to participate in this project.

If you have any further questions about your participation in this EBP project or your rights as a participant, please contact the Saint Barnabas Medical Center's Institutional Review Board Chairperson, Dr. Russell Langan, MD at 973-322-5781 or Committee on the Use of Human Subjects in Research (CUHSR) at 309-677-6877.

Appendix E

Pre-test and Post- Test Questions

1.) Which of the following is a benefit of the peanut ball to a patient laboring with an epidural?

a) Fetal distress

b) Maternal exhaustion

c) Enhance fetal descent in a vertex presentation

d) Delay labor progress

2.) The peanut ball can be used for the following when used appropriately? Select all that apply.

☐ Postural change on the bed

☐ The peanut ball can be used for all the provided options

☐ Sit on the floor and straddle on a patient with an epidural

☐ To promote the progress of labor

☐ Maternal comfort

3.) Which patients should be excluded from the use of the peanut ball? Select all that apply.

☐ History of a fractured pelvis,

☐ Category III fetal heart tracing

☐ Signs of intrauterine infection

☐ Category I fetal heart tracing

4.) Based on the new peanut ball policy, how often are nurses expected to change laboring women's positions with the peanut ball?

a) 2-3 hours

b) 1-1.5 hours

c) 1-2 hours

d) Hourly

5.) Based on the new peanut ball policy, the peanut ball should be used on a patient following an epidural administration in which of the following? Select all that apply.

☐ Within 30 minutes with no contraindications

☐ For positioning out of bed (i.e., floor or chair)

☐ Once the patient is comfortable

☐ Maternal bradycardia

Appendix F

Post-Education Survey

1. I document the peanut ball use on the electronic health record (EHR) when used on my patients.
    i. Never
    ii. Rarely
    iii. Sometimes
    iv. Often
    v. Always
2. I educate my laboring patients with an epidural on the use of the peanut ball
    i. Never
    ii. Rarely
    iii. Sometimes
    iv. Often
    v. Always
3. I feel confident in using the peanut ball safely based on the approved guidelines.
    i. Strongly disagree
    ii. Disagree
    iii. Neutral/ Neither agree nor disagree
    iv. Agree
    v. Strongly agree
4. I consistently use the peanut ball for patients based on the peanut ball policy.

i. Strongly disagree

ii. Disagree

iii. Neutral/ Neither agree nor disagree

iv. Agree

v. Strongly agree

5. Having a peanut ball policy in the labor and delivery department will promote the peanut ball's consistent use on eligible patients?

i. Strongly disagree

ii. Disagree

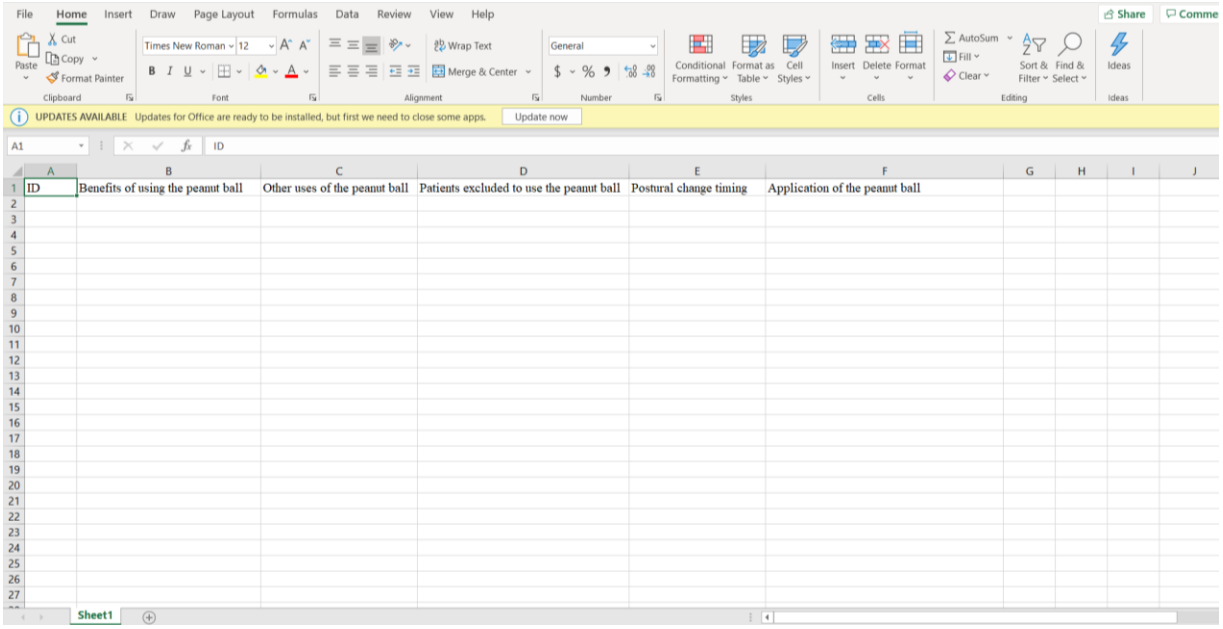
iii. Neutral/ Neither agree nor disagree

iv. Agree

v. Strongly agree

Appendix G

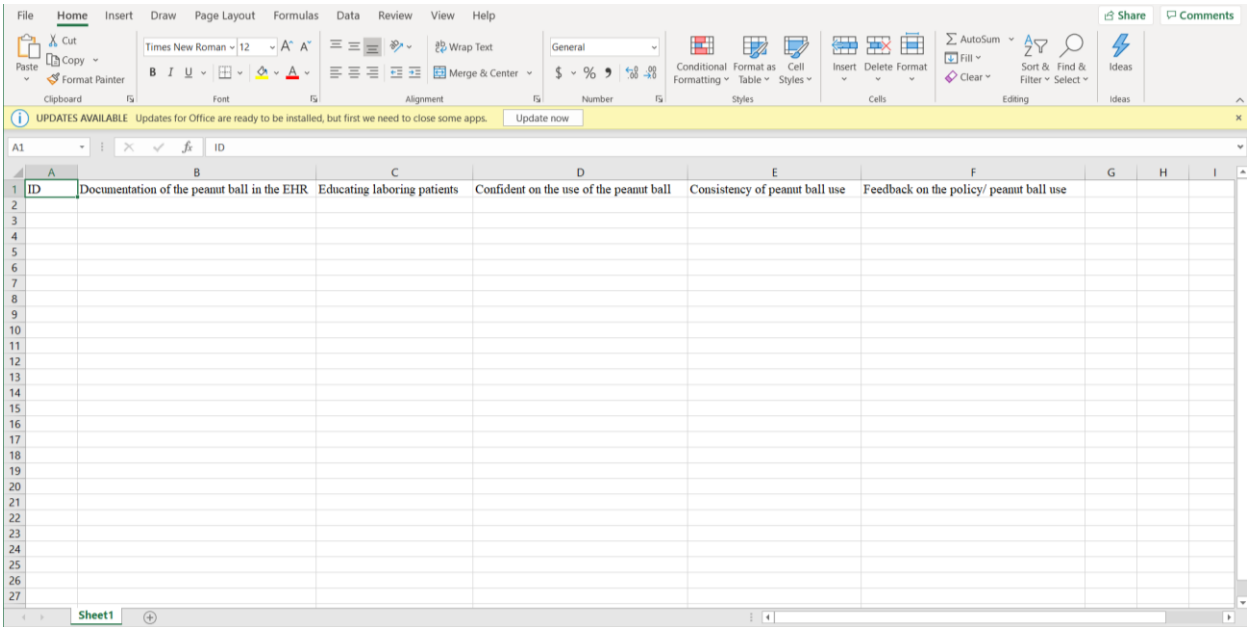
Data Collection Sheet for Pre and Post Questions



ID	Benefits of using the peanut ball	Other uses of the peanut ball	Patients excluded to use the peanut ball	Postural change timing	Application of the peanut ball

Appendix H

Data Collection Sheet for Post Education Survey



ID	Documentation of the peanut ball in the EHR	Educating laboring patients	Confident on the use of the peanut ball	Consistency of peanut ball use	Feedback on the policy/ peanut ball use

Appendix I

Email Approval Letter from the Department of Nursing Education and Research

Fox, Naomi <Naomi.Fox@rwjbh.org>
Attachments
Mon, September 9, 1:53 PM
to me

Hi Didi:
You are approved to be in SBMC as a student by me. Please review the attached PP and circle your answers to the quiz, write your name on the quiz and drop it off with one of the educators or me. Then you will be able to get a student ID again if you do not have one.

Thank You

Naomi Fox MSN, RN, CCRN Director – Nursing Education and Research

Saint Barnabas Medical Center I 94 Old Short Hills Road | Livingston | NJ 07039

(973.322.5563 | Cell: 862.210.4749 |* naomi.fox@rwjbh.org

Appendix J

IRB Approval and Modification Letter

Saint Barnabas Medical Center | RWJBarnabas HEALTH

Stephen P. Zieniewicz, FACHE
President and Chief Executive Officer

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

PI Name:	**Ndidiamaka Ezuma, RN, BSN, RN-C**
Co-Investigator(s):	N/A
Study Title:	The Use of the Peanut Ball on Nulliparous Women Laboring with an Epidural
Sponsorship:	N/A
Multi-Institutional :	N/A
Risk Determination:	Minimal
Type of Review:	Expedited [Category 5]
IRB ID Number:	**20-01**

The Saint Barnabas Medical Center Institutional Review Board reviewed and approved the initial application submitted for the above-titled submission using the expedited review process. Approval for this study was granted on **January 09, 2020**.

1. The Saint Barnabas Medical Center administrative policy and procedures – (IRB policy 178) states: "investigators are responsible for reporting Adverse Events and Unanticipated Problems indicated in the content of the protocol. Investigators will report adverse events to the IRB and the study sponsor. On-Site Serious Adverse Events and Unanticipated Problems: The Principal Investigator must submit notification either by fax or email as soon as possible but no later than forty-eight (48) hours of the Principal Investigator becoming aware that there has been an on-site adverse event. Thereafter, the Principal Investigator must submit the Adverse Event Reporting Form and any additional documentation to the IRB Office within five (5) business days. Off-Site adverse events (external sponsor generated safety reports including those under a data safety monitoring board review) within thirty (30) calendar days of the Principal Investigator receiving the adverse event report(s) from the sponsor." **N/A**
2. No changes are to be made to the approved protocol without the prior review and approval of the Institutional Review Board. All changes (e.g., a change in procedure, change in consent form, number of participants, new recruitment materials, study instruments, etc.) must be prospectively reviewed and approved by the IRB before they are implemented.
3. No further contact with the Institutional Review Board is required unless you plan to make significant changes to the approved protocol.
4. The Principal Investigator is required to submit a final report to the IRB Office at the completion of the project.
5. This is a retrospective and prospective data collection study.
6. Item approved: HIPAA Tool 3 – Application for IRB Waiver of HIPAA Privacy Authorization

Russell C. Langan, M.D., FACS
Institutional Review Board Chairperson

1/14/20
Date

94 Old Short Hills Road
Livingston, NJ 07039

Saint Barnabas Medical Center | RWJBarnabas HEALTH

Stephen P. Zieniewicz, FACHE
President and Chief Executive Officer

June 26, 2020

Ndidiamaka Ezuma, RN, BSN, RN-C
Labor and Delivery
Saint Barnabas Medical Center
94 Old Short Hills Road
Livingston, NJ 07039

RE: IRB Study Number: 20-01

Protocol Title: The Use of the Peanut Ball on Nulliparous Women Laboring with an Epidural

Dear Ezuma:

The Saint Barnabas Medical Center Institutional Review Board reviewed and approved the document(s) as submitted for the study identified above.

Expiration: **N/A**
Our Internal #: 8676
Type of Change: (Other)
Expedited: Yes
Date of Approval: 6/26/2020
Date Received: 6/23/2020

Action: Approved

Description:
Change in Study Procedure:
- This project was modified to include participant's consent for a net-learning education with pre and post questions, and a post-education survey electronically.

Items approved:
Project Recruitment and Participant Consent E-Mail; Guidelines for Safe Use of the Peanut Ball: Pre and Post-questionnaire; Post-Education survey (electronically); Project Plan (pages 4&5) - version date: 1/2019

N. Peter Zauber, M.D.
Co-Chairman, Institutional Review Board

7/1/20
Date

94 Old Short Hills Road
Livingston, NJ 07039
973.322.5000
rwjbh.org/saintbarnabas

Major teaching affiliate of Rutgers New Jersey Medical School

Appendix K

Application of IRB Waiver of HIPAA Privacy Authorization

[TOOL NO. 3]

SAINT BARNABAS MEDICAL CENTER

APPLICATION FOR IRB WAIVER OF HIPAA PRIVACY AUTHORIZATION

Date Request Submitted	Date Records Required
December 20, 2019	January 1, 2019- December 31, 2019

Department from which Records are Requested
Labor and Delivery

Name of Principal Investigator (Printed)	Title	Clinic/Division/Department	Phone Ext.
Ndidiamaka Ezuma, RN, BSN, RN-C	RN	Labor and Delivery	25350
Other Researchers:			**Pager #:**

In order for the IRB [Privacy Board] to grant a waiver of the HIPAA Privacy Authorization requirement, the IRB [Privacy Board] must be satisfied that your project involves no more than minimal risk to the privacy of individual participants and meets all the criteria listed below.

A. The project has an adequate plan to protect subject identifiers from improper use and disclosure as described below. Examples of elements that should be included in an adequate plan are noted below: (Put an "X" by all that apply and add any other privacy protections in your plan.

- x Only authorized persons will be granted access
- x Only authorized persons may enter and view study data
- x Passwords and system identifications will not be shared
- x Physical security of the workstations/files will be maintained
- x Adequate back-up plan is in effect
- x Staff are trained on the data entry system and importance of security procedures
- x Workstations with the database will not be left unattended
- ____ Additional protections:

B. Investigators are required to only obtain the minimum necessary data in order to achieve the goals of the research. Briefly describe the PHI for which use or access is requested and justify why the data you are obtaining is the minimum necessary to achieve the goals of the research.

The data collected will be de-identified aggregate data will be stored in a personal pass worded computer accessible only to the researcher. There are not any disclosures of patients' private and sensitive information in this project. This measure is to protect the patient's confidentiality and comply with the Health Insurance Portability and Accountability Act (HIPAA) policies within the organization until the completion of the project.

C. The project has an adequate plan to destroy the participant identifiers at the earliest opportunity consistent with the conduct of research, unless retention is required for reasons of health, research, or law. **Please explain when/if the participant identifiers will be stored or retained.**

There are not any disclosures of patients' private and sensitive information in this project.
There are no participant identifiers that will be stored or retained.

Printed: 4/03

[TOOL NO. 3]

D. Explain why the research could not practically be conducted without the waiver.

The research cannot be practically conducted without the waiver because the researcher needs to protect the patient's confidentiality and comply with the Health Insurance Portability and Accountability Act (HIPAA) policies within the organization.

E. **Explain** why the research could not practicably be conducted without access to and use of the individual's identifiable health information.

There are not any disclosures of patients' private and sensitive information in this project. Thus there are no Patient's identifiable health information.

F. Information about data/specimens will not be used or disclosed to any other person or entity, except as required by law, for authorized oversight of the research study, or for use in future IRB approved research. Please affirm your acceptance below with your signature.

N/A

By signing below you will also provide assurance that my research team and I will comply with the use and disclosure restrictions described above, and that:

- The protected health information will not be reused or disclosed to any other person or entity, except as required by law, for authorized oversight of the research study, or for other research for which the use or disclosure of protected health information would be permitted by the Saint Barnabas Medical Center Policies concerning Uses and Disclosure of Protected Health Information Created for Research that Includes Treatment.

Signature of Principal Investigator — Date: 12/26/19

(Institutional Review Board [Privacy Board] Signature/Date — Stamp of Approval) 1/9/20

Appendix L

CUHSR Approval

BRADLEY University

DATE: 13 AUG 2020

TO: Ndidiamaka Ezuma, Karin Smith
FROM: Bradley University Committee on the Use of Human Subjects in Research

STUDY TITLE: The Use of the Peanut Ball on Nulliparous Women laboring with An Epidural
CUHSR #: 20-046-Q
SUBMISSION TYPE: Initial Review

ACTION: Approved
APPROVAL DATE: 13 AUG 2020
REVIEW TYPE: Quality Assurance

Thank you for the opportunity to review the above referenced proposal. The Bradley University Committee on the Use of Human Subject in Research has determined the proposal to be NOT HUMAN SUBJECTS RESEACH thus exempt from IRB review according to federal regulations.

The study has been found to be not human subject research pursuant to 45 CFR 46.102(l), not meeting the federal definition of research (not contributing to generalizable knowledge). Please note that it is unlawful to refer to your study as research. A waiver of documentation of consent is granted.

Your study does meet general ethical requirements for human subject studies as follows:

1. Ethics training of project personal is documented.
2. The project involves no more than minimal risk and does not involve vulnerable population.
3. There is a consent process that:
    - Discloses the procedures
    - Discloses that participation is voluntary
    - Allows participants to withdraw
    - Discloses the name and contact information of the investigator
    - Provides a statement of agreement
4. Adequate provisions are made for the maintenance of privacy and protection of data.
5. Your study is exempt for HIPAA regulations in that you will not be accessing patient data.

Please submit a final status report when the study is completed. A form can be found on our website at https://www.bradley.edu/academic/cio/osp/studies/cuhsr/forms/. Please retain study records for three years from the conclusion of your study. Be aware that some professional standards may require the retention of records for longer than three years. If this study is regulated by the HIPAA privacy rule, retain the research records for at least 6 years.

Be aware that any future changes to the protocol must first be approved by the Committee on the Use of Human Subjects in Research (CUHSR) prior to implementation and that substantial changes may result in the need for further review. These changes include the addition of study personnel. Please submit a Request for Minor Modification of a Current Protocol form found at the CUHSR website at https://www.bradley.edu/academic/cio/osp/studies/cuhsr/forms/ should a need for a change arise. A list of the types of modifications can be found on this form.

While no untoward effects are anticipated, should they arise, please report any untoward effects to CUHSR immediately.

This email will serve as your written notice that the study is approved unless a more formal letter is needed. You can request a formal letter from the CUHSR secretary in the Office of Sponsored Programs.

Committee on the Use of Human Subjects in Research – 100 Kauffman
1501 W Bradley Ave.
Peoria, IL 61625

Appendix M

Guidelines for Safe Use of the Peanut Ball on Labor and Delivery.

GUIDELINES FOR SAFE USE OF THE PEANUT BALL ON LABOR AND DELIVERY.

Ndidiamaka Ezuma

A Directed Scholarly Project Submitted to the
Department of Nursing in the Graduate School of
Bradley University in partial fulfillment of the requirements for the
Degree of Doctor of Nursing Practice
Peoria, Illinois
2020

BRADLEY University

A PEANUT BALL

BRADLEY University

PRE-TEST QUESTIONS

1.) Which of the following is a benefit of the peanut ball to a patient laboring with an epidural?

- Fetal distress
- Maternal exhaustion
- Enhance fetal descent in a vertex presentation
- Delay labor progress

2.) The peanut ball can be used for the following when used appropriately? Select all that apply.

- Postural change on the bed
- The peanut ball can be used for all the provided options
- Sit on the floor and straddle on a patient with an epidural
- To promote the progress of labor
- Maternal comfort
- None of the above

3.) Which patients should be excluded from using the peanut ball? Select all that apply.

- History of a fractured pelvis
- Category III fetal heart tracing
- Signs of intrauterine infection
- Category I fetal heart tracing
- All of the above

BRADLEY University

PRE-TEST QUESTIONS CONT.

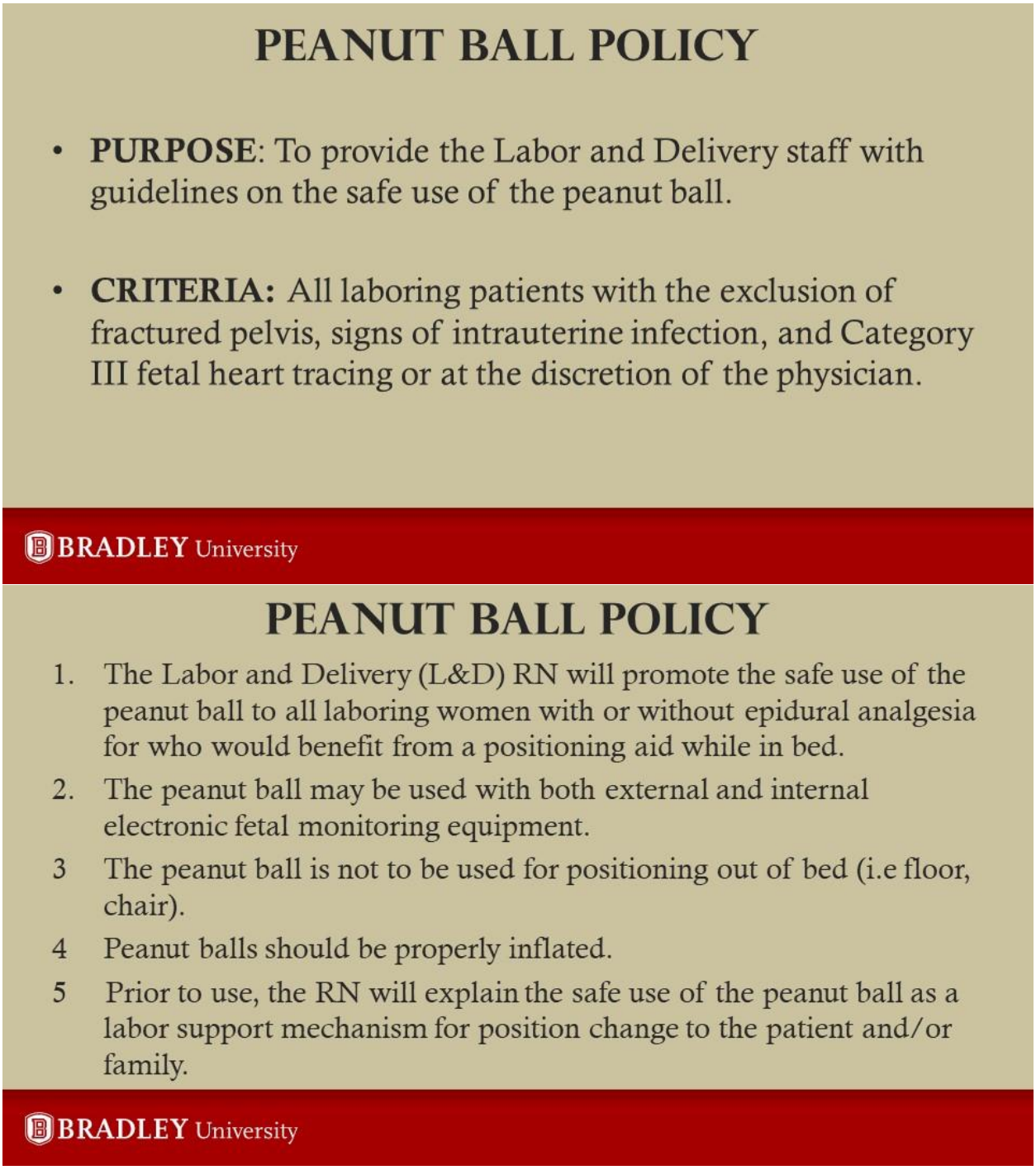
4.) Based on the new peanut ball policy, how often are nurses expected to change laboring women's positions with the peanut ball?

- 2-3 hours
- 1-1.5 hours
- 1-2 hours
- Hourly

5.) Based on the new peanut ball policy, the peanut ball should be used on a patient following an epidural administration in which of the following? Select all that apply.

- Within 30 minutes with no contraindications
- For positioning out of bed (i.e., floor or chair)
- Once the patient is comfortable
- Maternal bradycardia

BRADLEY University

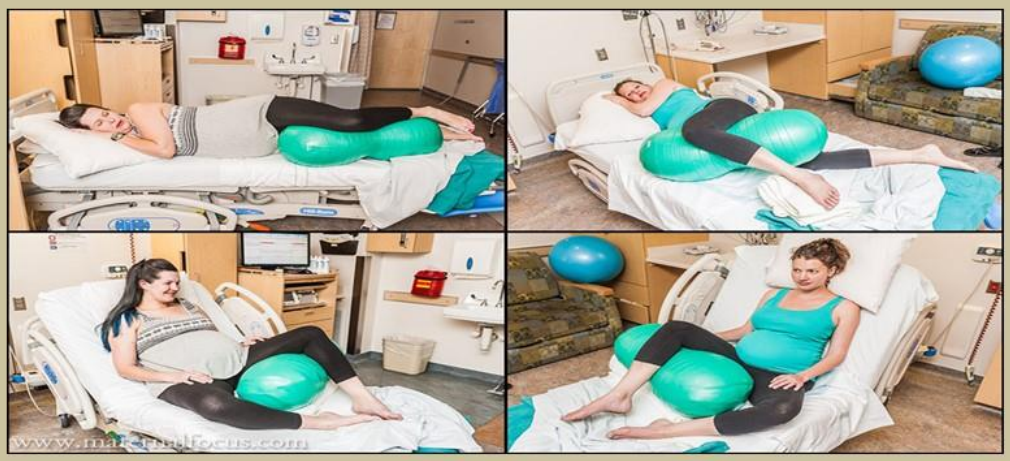

PEANUT BALL POLICY
• PURPOSE: To provide the Labor and Delivery staff with guidelines on the safe use of the peanut ball.
• CRITERIA: All laboring patients with the exclusion of fractured pelvis, signs of intrauterine infection, and Category III fetal heart tracing or at the discretion of the physician.
BRADLEY University
PEANUT BALL POLICY
1. The Labor and Delivery (L&D) RN will promote the safe use of the peanut ball to all laboring women with or without epidural analgesia for who would benefit from a positioning aid while in bed.
2. The peanut ball may be used with both external and internal electronic fetal monitoring equipment.
3 The peanut ball is not to be used for positioning out of bed (i.e floor, chair).
4 Peanut balls should be properly inflated.
5 Prior to use, the RN will explain the safe use of the peanut ball as a labor support mechanism for position change to the patient and/or family.
BRADLEY University

PROCEDURE:

- Remove the peanut ball from the plastic bag and tie a drawsheet around the ball to prevent discomfort from the peanut ball resting against the woman's legs.
- The peanut ball is placed between the woman's legs within 30 minutes of receiving an epidural, once patient is comfortable, or whenever needed for positioning while in bed.
- Assist patient with turning or changing their position and adjusting the peanut ball every 1–1.5 hours.
- The peanut ball may be removed when the cervix of the woman is completely effaced and dilated, passive descent has occurred, and she is ready to actively push.

BRADLEY University

POSTURAL POSITIONS WITH THE PEANUT BALL



BRADLEY University

DOCUMENTATION:

1. Document the use of peanut ball in the electronic health record (EHR) labor flowsheet under the OB Intrapartum band- Peanut ball.

BRADLEY University

INFECTION CONTROL

Standard precautions

- To reduce the risk of healthcare-associated infections, the peanut ball will be disinfected before and after each patient's use using the hospital-approved disposable germicidal wipes according to the manufacturer's instructions.
- Clean peanut balls will be covered with a plastic bag and stored in the labor room.

BRADLEY University

LOCATION

Employee Portal – Policy and Procedures (Labor and Delivery).

BRADLEY University

POST TEST QUESTIONS

1.) Which of the following is a benefit of the peanut ball to a patient laboring with an epidural?

- Fetal distress
- Maternal exhaustion
- Enhance fetal descent in a vertex presentation
- Delay labor progress

2.) The peanut ball can be used for the following when used appropriately? Select all that apply.

- Postural change on the bed
- The peanut ball can be used for all the provided options
- Sit on the floor and straddle on a patient with an epidural
- To promote the progress of labor
- Maternal comfort
- None of the above

3.) Which patients should be excluded from using the peanut ball? Select all that apply.

- History of a fractured pelvis
- Category III fetal heart tracing
- Signs of intrauterine infection
- Category I fetal heart tracing
- All of the above

BRADLEY University

POST TEST QUESTIONS CONT.

4.) Based on the new peanut ball policy, how often are nurses expected to change laboring women's positions with the peanut ball?

- 2-3 hours
- 1-1.5 hours
- 1-2 hours
- Hourly

5.) Based on the new peanut ball policy, the peanut ball should be used on a patient following an epidural administration in which of the following? Select all that apply.

- Within 30 minutes with no contraindications
- For positioning out of bed (i.e., floor or chair)
- Once the patient is comfortable
- Maternal bradycardia

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POST EDUCATION SURVEY

1. I document the peanut ball use on the electronic health record (EHR) when used on my patients.

i. Never
ii. Rarely
iii. Sometimes
iv. Often
v. Always

2. I educate my laboring patients with an epidural on the use of the peanut ball

i. Never
ii. Rarely
iii. Sometimes
iv. Often
v. Always

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POST EDUCATION SURVEY CONT.

3. I feel confident in using the peanut ball safely based on the approved guidelines.
i. Strongly disagree
ii. Disagree
iii. Neutral/ Neither agree nor disagree
iv. Agree
v. Strongly agree
4. I consistently use the peanut ball for patients based on the peanut ball policy.
i. Strongly disagree
ii. Disagree
iii. Neutral/ Neither agree nor disagree
iv. Agree
v. Strongly agree

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POST EDUCATION SURVEY CONT.

5. Having a peanut ball policy in the labor and delivery department will promote the peanut ball's consistent use on eligible patients?
i. Strongly disagree
ii. Disagree
iii. Neutral/ Neither agree nor disagree
iv. Agree
v. Strongly agree

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Thank You
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Appendix N

Pre-Tax Budget

Item	**Amount**	**Cost Per Page** (Black & White)	**Supply Costs**
Pre-Test & Post Data Sheet	8 pages	$0.05	$0.40
Post-Implementation Survey Data Sheet	8 pages	$0.05	$0.40
Volunteer	**Hours**	**Cost Per Hour**	**Anticipated Total Wages**
Labor and delivery nurses 60 Participants	0.5		$17.5 per staff $1,050
Leslie Wright-Brown	75.5	$50	$3,775
Ndidiamaka Ezuma	224.5	$42	$9,429
Cumulative Total of Anticipated Project Costs			***$14,254.80***