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The effects of spinning babies® on nulliparous, term, singleton, vertex (NTSV) cesarean rates: A clinical trial

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Abstract

This research sought to understand the relationship that continuous labor support and the Spinning Babies® program could make on decreasing the NTSV Cesarean rates at a metropolitan hospital. A quasi-experimental research design examined the self-efficacy labor support and NTSV rates of individual nurses for 12 months before implementation of the Spinning Babies® program and for one year following the intervention. All women admitted to the labor and delivery unit, expressing a desire to have a vaginal delivery were included in the research and offered the Spinning Babies® model of care. A paired samples t-test was conducted on all pre and post intervention data, including individualized NTSV cesarean rates and perceived self-efficacy in providing appropriate care to laboring mothers. Statistically significant results ($p < .001$) were displayed for individual nursing NTSV Cesarean rates and for individual nurses and their perceived self-efficacy in providing support for their laboring mothers.

Keywords: Spinning Babies, labor support, self-efficacy, cesarean rates

Introduction

The Association for Women's Health, Obstetric and Neonatal Nurses (AWHONN) has made continuous labor support a top priority for perinatal nurses to provide safe care that is evidence-based and can lead to better birth outcomes ^[1]. Research has shown that women who are provided continuous labor support by a trained registered nurse (RN) have shorter labors, decreased incidence of cesareans, a decreased need for oxytocin or analgesics, and increased satisfaction during their birth experience ^[2]. With the cesarean rates for nulliparous, term, singleton, vertex (NTSV) moms, anywhere between 24%-40% and a rolling average of 29% at the research hospital, leadership identified an opportunity to improve birth outcomes and decrease the incidence of cesareans, while improving maternal satisfaction with their birth experience.

Materials and Methods

Historically, many hospitals have not developed a policy or standard of practice in the support of laboring mothers. This has led to individualized cares based on the nurse's knowledge gained during orientation or hours worked and experience alone and can lead to inconsistent education for patients. As obstetrics has evolved from nurses being the director of the birth process to empowering families to make decisions based on information ^[3], the nurse needs resources and education on how to best provide support for the mother through position changes and understanding how position changes affect the pathophysiology of the birthing process to promote vaginal deliveries. Instead, orientation to obstetrics often focuses on the equipment, reading fetal monitor strips, and interventions when the baby is not tolerating labor.

In research by Edmonds and Jones ^[4], nursing practices and clinicians could be partially responsible for cesarean birth rates. Clinicians at the bedside make the majority of decisions and can greatly influence the patient's decisions, as well as through their interactions and communication with physicians, which can heavily influence physician decisions. The authors found nurses consistently negotiated for additional time in labor or additional

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interventions, such as laboring down, hydrotherapy, and position changes with the physicians. Experienced labor nurses felt they could influence physicians and employ communication that could influence physician decisions [4]. This skill in communication could be developed through experience and perceived comfort levels with obstetrical practices. One could hypothesize that providing the necessary education and skills to the labor and delivery nurses could increase their self-efficacy in providing labor support, increasing communication with providers, and thereby decreasing the NTSV rates.

A meta-analysis conducted by Najafi, Roudsari, and Ebrahimipour [3], revealed that continuous labor support could shorten labor by 2.8 hours and decrease the use of obstetrical equipment significantly. Continuous labor support also encouraged the staff to have open communication with the patient and their support person, increasing the likelihood the patient took responsibility for their labor and that the staff respected and followed the wishes of the patient. The American College of Obstetrics and Gynecology (ACOG) supports the need for shared decision making through their *Effective Patient-Physician Communication* guideline that is also endorsed by the Agency for Healthcare Research and Quality (AHRQ) [5].

In Gams, Neerland, and Kennedy's [6] research, NTSV rates were positively trending down by a 10% reduction after implementation of intermittent auscultation, a labor lounge, and continuous labor support. The authors found that laboring in an upright position, decreased the first stage of labor by two hours and the number of women who required augmentation of labor was decreased, as well as the chances of having a cesarean birth. In a review of data by Roberts and Woolley [7], women who remained supine in labor experienced greater maternal adverse outcomes, longer labors, and an increase in likelihood for a cesarean birth. The authors found that the longer a woman pushes or bears down, the more likely they are to experience a tightening of the pelvic floor and pelvic muscles, prohibiting the descent of the fetus. The upright position tended to shorten the second stage of labor and decrease the need for cesareans. This research supports the need for education and skills training to understand the pathophysiology of labor and the descent of the fetus, which would greatly benefit the labor and delivery nurses and subsequently the patients. Therefore, Spinning Babies® was chosen to provide that education and incorporate various position changes into the laboring process to ensure the baby is properly aligned for a successful vaginal delivery and decreasing the cesarean rate. Labor support can be defined as an intentional act of caring and assisting women during labor and birth [8]. Labor support can include advocacy, emotional support, informational support, and perceived support felt by the laboring mother. Emotional support can further be broken down to include hands-on tactics, support of patient's wishes, such as intermittent monitoring, and availability of nurses through adequate staffing. Nursing models that utilize tactics such as LaMaze® and Spinning Babies® are ways to support the physiological birth process and offer labor support to mothers [8]. In addition, the Promoting Comfort in Labor bundle put out by the American College of Nurse Midwives has also been shown to support the training of nurses in labor support, including the use of equipment, education, and updating of policies within the facility. In research around the bundle, there was a

statistically significant (15%) reduction in NTSV cesarean rate [9].

Self-efficacy, originally defined by Bandura [10] is the belief "that one can successfully accomplish a task", which is developed from one's past experiences, accomplishments, verbal persuasion, or emotional arousal. The Spinning Babies class provided hands-on practice of various positions, as well as knowledge recollection throughout the teaching. Participants were able to recall education with a group quiz and discussion at the conclusion of the class.

The Spinning Babies® model of care encourages position changes, labor support, and understanding on the pathophysiology of the newborn descent into the birthing canal. The eight-hour class aims to demonstrate various position changes to optimize the physical relationship between the descending fetus and the birthing patient's pelvis. Position changes in labor have led to a decrease in labor length, decreased pain, an increase in contraction strength, greater fetal descent, and ultimately a decrease in cesarean births [11]. Currently, there is no peer reviewed published research on how Spinning Babies® can empower nurses to gain self-efficacy in their labor support and utilize techniques to promote vaginal deliveries without surgical interventions. Further it is not known if or to what extent the Spinning Babies approach could affect the NTSV rate.

Objective

It is not known if or to what extent the Spinning Babies® approach could affect the NTSV rate in a metropolitan hospital. The research questions are:

1. What is the impact on nurse's perceived self-efficacy in their ability to provide care that supports descent of the fetus through the pelvis to laboring patients after completing the Spinning Babies class?
2. What is the effect of Spinning Babies education on the NTSV rate among all laboring women interested in vaginal deliveries.

A quasi-experimental design was used to evaluate if the independent variable (Spinning Babies) affects the dependent variable (Self-efficacy and NTSV rates). This research was conducted in an 18-bed Labor and Delivery unit, with six OB Emergency beds and 30 Mom Baby beds in a large metropolitan hospital in southwest Florida, which will be referred to as the primary research setting. The hospital also has a secondary site, where nurses were invited to the Spinning Babies education, but were not included in the research. The primary research unit averages more than 4,500 deliveries a year and has had a minimum of 5% growth over the last five years. The Labor and Delivery unit employes around 125 nurses, all of whom care for laboring patients and rotate between labor and delivery, the Obstetrics Emergency Care Center, and Antepartum unit.

All women, including high-risk, preterm, term, and post term laboring patients admitted to the labor and delivery unit in this hospital, expressing a desire to have a vaginal delivery were included in the research and offered the Spinning Babies® model of care, the independent variable. Therefore, all patients regardless of gestational age or parity were given the opportunity to experience the Spinning Babies approach, which has become the standard of care and did not require an informed consent. Laboring women who identify with a mental or physical handicap were excluded from the research due to the possibility of being

unable to move patients in positions necessary during labor and the understanding of the reasons but were still offered continuous labor support as a standard of care. Human subjects were protected from harm by staff, leadership, and providers by offering safe, effective care that is evidence-based and provided anonymity by utilizing visit numbers in place of any demographic information for data review.

For the purposes of this study, NTSV was defined as nulliparous women at term with a single vertex fetus presenting to the hospital for a vaginal delivery. All outcomes were collected on patients that met criteria of NTSV and the nurses who took care of them from February 28, 2023 to March 1, 2024. Only nurses who had attended a Spinning Babies class in February 2023 and were employed through March 1 2024, were included in the research.

A review of the race/ethnicity of the patient population can be found in Table 1 in the appendices. During the research period of March 2023 through February 2024, 1,565 birthing patients were identified as NTSV patients. Of those patients, 35 (2.2%) participants were non-Hispanic Asian, 131 (8.3%) identified as non-Hispanic African American, 1,136 (73%) identified as non-Hispanic Caucasian, and 263 (16.8%) identified as other. Three hundred twenty-two (20.5%) participants identified as Hispanic.

An a-priori power analysis was performed using an effect size of 0.5, a power of 0.95 and an error of probability of .05, which identified a minimum number of 45 patients needed in the study group each month. Historically, more than one hundred patients meet the NTSV definition each month, and 50-75 nurses are employed on the unit.

Upon approval from the Institutional Review Board, data collection began as the Spinning Babies training days concluded on February 28, 2023. Nursing staff, as well as certified nurse midwives were invited to attend the training sessions. Upon completion of the training, an optional learning module was shared with staff to reiterate content taught and provide a written and visual presentation to review for continual refreshers for staff. If a patient received a minimum of 50% of their active labor hours with a nurse who had attended the Spinning Babies training and met the NTSV criteria, they were included in the data set. Those who did not meet this requirement, were excluded from the research data. Data collection continued to be collected and analyzed monthly for one year after the initiation of the project, which was March 1, 2024. This time allowed trained nurses the ability to gain proficiency and experience in using their new continuous labor support model and processes. Data was analyzed on a regular basis for outliers, discrepancies, adverse events, and gaps to course correct if necessary, during the research. Data collection was completed through completed documentation within the electronic medical record. Nursing documentation includes time spent at the bedside, attempted position changes, and delivery outcomes. This data was compiled from a report ran by Information Technology monthly and analyzed to establish means, NTSV rates, and time spent at the bedside. A paired samples t-test was completed on the continuous interval variables collected.

To measure the nurse's self-efficacy in providing labor support, the Self-Efficacy Labor Support Scale was given before instruction by the Spinning Babies instructor. The Davies Self-Efficacy Labor Support Scale is a 14-item questionnaire that is based on a 7-point Likert scale. A Cronbach's alpha coefficient score of .98 was found in

Davies and Hodnett's ^[12] research indicating high reliability of the Labor Support Scale. All nurses utilized their employee number as a unique code that maintains anonymity and confidentiality within the group. The same scale was sent to all participants one week following the class to measure the changes in their confidence level and ability to provide well-informed care to their laboring patients.

Results

In the initial training, 76 nurses, one physician and 5 certified nurse midwives attended a full day of Spinning Babies training. Despite the training being mandatory, several nurses were absent due to being exposed to COVID, maternity leave, and some expressing intent to leave the organization. In the year after the training, five nurses have left the unit and several nurses have been added due to volume. A second annual class has been approved by the hospital and was held in April 2024 for those who did not attend the initial class. In total, 51 nurses from the primary campus were included in the data collection each month. The secondary campus nurses were included in the Self-Efficacy Scale but were not included in the monthly NTSV Cesarean rates due to inability to obtain data for pre-intervention analysis.

Nurses at the primary campus range in age from 22-62 years of age and have been working labor and delivery anywhere from 2 months to over 40 years. All nurses initially trained were female and the racial make-up of the nurses was mixed and included Caucasian, African American, Hispanic, and Asian (See Table 2).

All nurses from the main and secondary campus were given the self-efficacy scale prior to the start of Spinning Babies. The nurses utilized their employee number to identify and enable matching of surveys for the post class data collection. All nurses from both campuses were given the scale four weeks post intervention and matched by employee number. The mean in the pre-class survey was 79 and the post-class survey mean was 93. A paired samples t-test was run with the means and on each individual nurses returned survey (See Table 3). With a confidence interval of 95% this showed a statistically significant ($p < .001$) change in the nurses perceived ability to care for laboring mothers, providing the necessary support to encourage vaginal deliveries.

Retrospectively all nurse deliveries at the primary campus were reviewed and NTSV cesarean rates were figured monthly, identifying a percentage rate each month and then an annual average for each nurse. At the conclusion of one year, 51 nurses were identified to have a full year of data before the Spinning Babies® class, attended the class, and remained on the unit one year after the class, allowing the ability to analyze a complete data set pre and post class. The deliveries were filtered to meet the criteria of nulliparous, term, singleton, and vertex, and the nurse was given credit for a vaginal delivery of she attended at least 50% of the labor with the mother. Collectively, these 51 nurses averaged an NTSV cesarean rate of 27.2% prior to the Spinning Babies® class. One year after the class, the cesarean rate of this group of nurses dropped to 13.96%. A paired samples t-test compared the means as a group and individually, which showed statistically significant results ($p < .001$) in both situations with a confidence interval of 95% (See Table 4).

Coincidentally, the length of stay for all birthing patients was calculated for six months prior to the Spinning Babies class and found to be 2.5 days. Following one year of implementation, the length of stay for all birthing patients was calculated as 2.2 days. This decrease in length of stay coincides with the increase in vaginal deliveries, decreasing

the longer length of stays for cesarean deliveries. Often postpartum patients were being held on the labor and delivery unit waiting on discharges on the mother baby unit. Decreasing length of stay aids the unit in room turnaround, allowing more patients to have a private room sooner after delivery, leading to higher patient satisfaction.

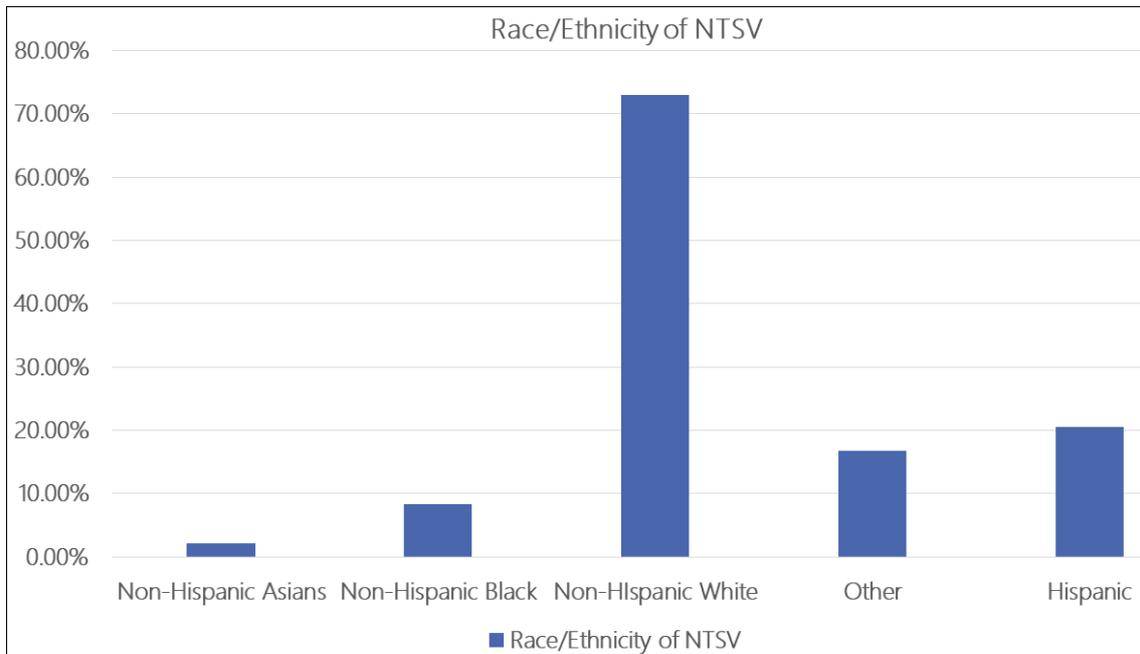


Fig 1: Race/Ethnicity of all NTSV in research period.

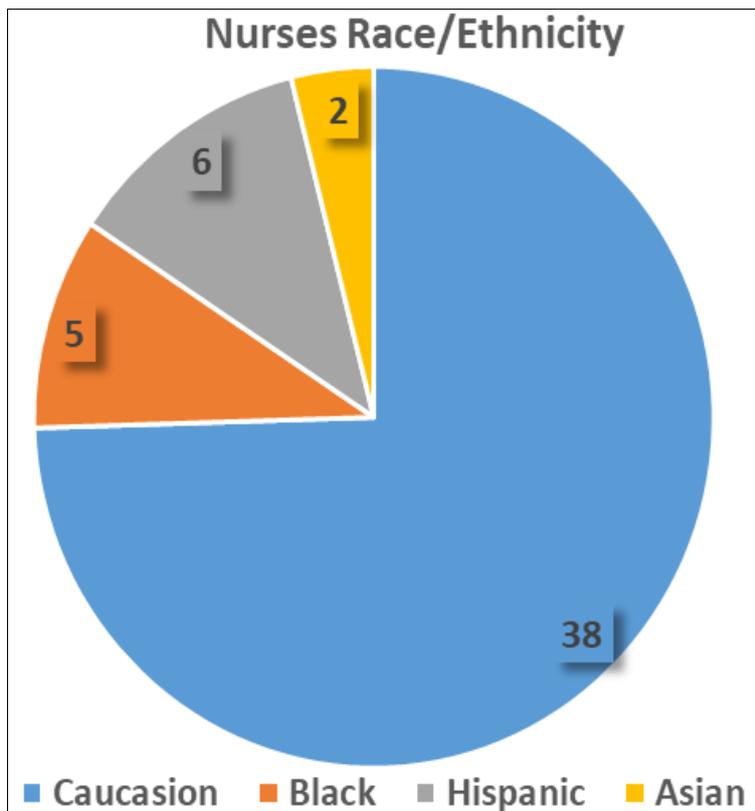


Fig 2: Race/Ethnicity of Nurses included in Research.

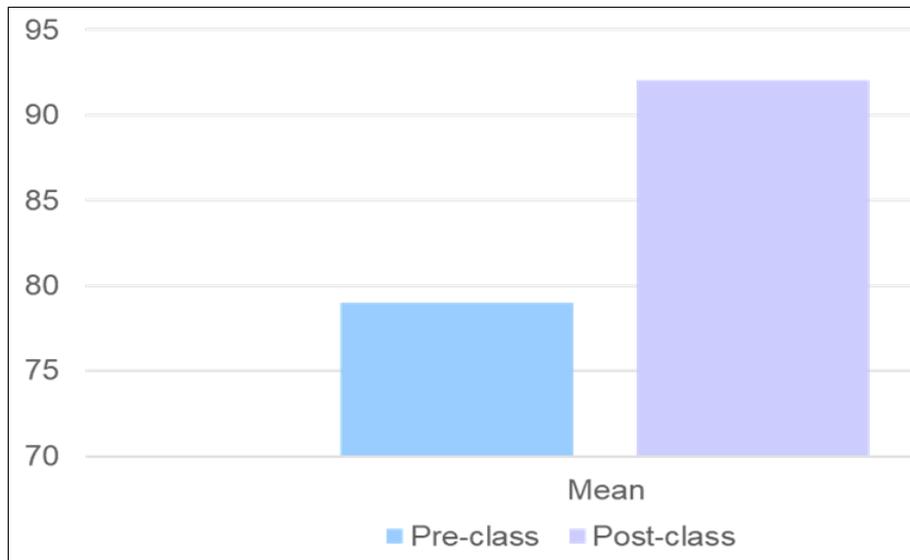


Fig 3: Paired samples t-test representing mean scores of Self-Efficacy in Nurses

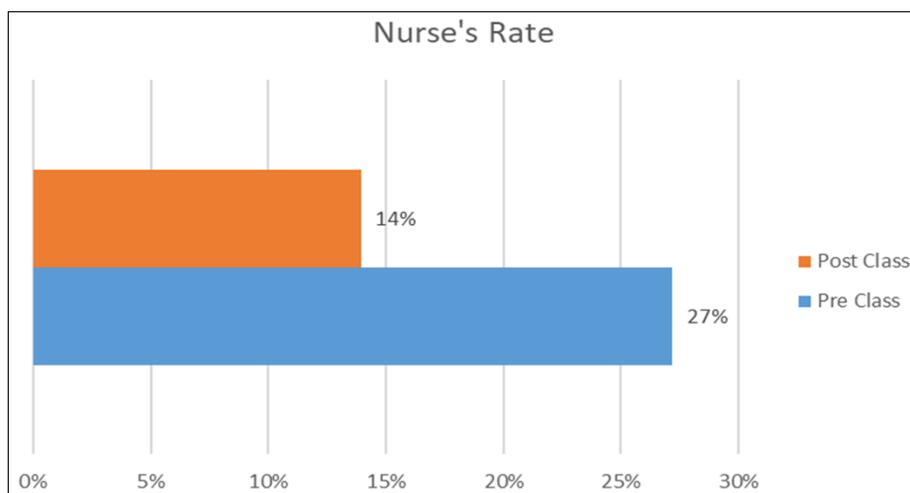


Fig 4: Paired samples t-test comparing mean NTSV Cesarean rates pre and post Spinning Babies

Conclusion

The main objective for this research study was to give the nurses the appropriate tools and resources to aid them in providing safe, requested labor support for all laboring mothers. In doing so, the nurses met the laboring mothers wishes to experience a vaginal birth, decreased cesarean rates, and potentially decreased long term sequelae from an operative delivery.

The nurses gained a perceived self-efficacy in recognizing when a mother might need assistance in labor positions and felt confident in providing those labor position changes. As an added benefit, the NTSV cesarean rate dropped significantly and has been maintained for 12 months after the initial class. Nurses maintained their motivation and engagement in assisting patients in being involved with labor and birth, which led to more laboring patients delivering vaginally. A second annual class will be offered to those unable to attend the first class or are new employees to the main campus.

The Spinning Babies® class provided hands on practice, as well as education on maternal/fetal positions and normal descent of the fetus within the pelvis. Anecdotally, the nurses believe the 8-hour class, coupled with hands-on practice, and then witnessing the position changes work on their patients have encouraged them to continue to use the

program and were the main reasons for the success in the NTSV cesarean rates.

Discussion

There are various other organizations offering continuous labor support and should be evaluated for effectiveness within each individual organization. Due to the large number of new to nursing and new to labor and delivery nurses this hospital employed at the time of the class offering, Spinning Babies was evaluated and found to meet the needs of the staff.

From this research, it is evident that hands-on, continuous labor support offered by the nurse for laboring patients can make a difference in patient outcomes. Nurses have gained self-efficacy and confidence that grows with each patient outcome that ends in a vaginal delivery. Patient satisfaction scores have improved in the labor and delivery unit, as well as staff nurse satisfaction. Leadership conducted stay interviews with staff and a large majority of nurses expressed their appreciation for sending them to a class that improved their nursing skills.

The NTSV rates are reported to many reporting agencies, which are available for public viewing. The difference in rates for the last three years is available on many websites and is often cited by birthing patients. Their choice in

healthcare is affected by patient outcomes and the primary hospital site is committed to continue with their efforts in improving patient outcomes. Thereby, providing the safest care for patients, limiting complications, and healthcare costs.

Further research is needed on the importance of continuous labor support and in providing 1:1 labor care. Understanding the qualitative aspects of nurses and birthing patients experience with continuous labor support would provide an aspect that coupled with this quantitative research could provide a well-developed view of positive outcomes, as well as identify opportunities for improvement.

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Conflict of Interest

Not available

Financial Support

Not available

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Appendices

