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Enhancing Nurse Confidence in Labor Pain Management and Respectful Maternity Care Through Implementation of the Coping with Labor Algorithm

Diane Johnson

Amy Murlowski

Elizabeth Mollard

University of Nebraska Medical Center

College of Nursing

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Enhancing Nurse Confidence in Labor Pain Management and Respectful Maternity Care Through Implementation of the Coping with Labor Algorithm

by

Diane Johnson, MSN, APRN-CNM

Amy Murlowski, BSN, RN

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DNP Program Faculty Academic Advisor

Elizabeth Mollard, PhD, WHNP-BC, CNM

Contents

Abstract

Objective: The objective of this project was to implement the Coping with Labor Algorithm in the labor and delivery setting and study its impact on nurse self-efficacy and on birthing persons' experiences.

Design: A quasi-experimental pre- and post-design was used for this project.

Setting: The project was conducted in a maternity unit with six labor beds located in the Midwest.

Methods: This project was conducted over twelve weeks. Twenty-five registered nurses were provided in-person education, access to educational materials, and training on how to use the Coping with Labor Algorithm. A pre-test was administered before the unit implementation of the project. Each labor room was supplied with a laminated copy of the algorithm for reference. Upon completion of the twelve-week project, registered nurses were given a post-survey to assess improvement in self-efficacy. Additionally, a unit-collected patient-reported experience measure (PREM) distributed by the Nebraska Perinatal Quality Improvement Collaborative (NPQIC) was utilized to evaluate patient perceptions related to respectful care, communication, decision-making, and overall satisfaction.

Results: There were no statistically significant differences in NSEQ and LSSQ scores based on age, years as a registered nurse, or years working in labor and delivery. While effect sizes suggested moderate to large practical differences, high variability and low small sample sizes likely contributed to the lack of statistical significance. Additionally, an overall increase was observed in patient-reported respect for healthcare choices and respectful treatment during their stay after implementing the Coping with Labor Algorithm.

Conclusion: The implementation of the Coping with Labor Algorithm showed promising improvements in nurse confidence and patient perceptions of respectful maternity care. Although

statistical significance was not achieved in self-efficacy and labor support scores across demographic groups, moderate to large effect sizes suggest meaningful, practical differences that merit further exploration. Importantly, the PREM survey revealed an increase in patients feeling their healthcare choices were respected throughout their stay, as well as overall respectful treatment during the study period. These findings highlight the potential clinical impact of structured, person-centered labor support interventions and underscore the importance of continued research in this area.

Recommendation: Future research should incorporate larger and more diverse samples to enhance statistical power and generalizability. Studies should also address unequal variances and thoroughly examine the influence of factors such as race, educational background, and overall nursing experience, including labor and delivery experience, on self-efficacy and labor support. Longitudinal designs are recommended to track changes in NSEQ and LSSQ over time. Additionally, integrating qualitative methods with quantitative data can provide deeper insights. Future studies should explore the relationship between labor and delivery experience and labor support skills and how these factors impact NSEQ and LSSQ within the context of the intervention. Emphasis should also be placed on evaluating the clinical significance of observed changes in these outcomes.

Labor pain is multidimensional, involving both physical sensations and emotional aspects that must be considered. The physical pain experienced during labor is often intense and challenging, but it is also accompanied by emotional components such as fear, stress, and anxiety. These emotional factors can significantly impact the overall experience of labor and should be included in pain management strategies to provide comprehensive support to the laboring person (Nori et al., 2023).

Labor pain can be difficult to manage since it increases throughout labor, and traditional pain scales do not incorporate the expected progression of pain and how the laboring person is coping. Understanding patient preferences, shared decision-making, and autonomy is crucial for pain management and respectful maternity care. Healthcare professionals need to understand how to support laboring persons and evaluate coping versus not coping with expected labor pains (Henrique et al., 2020). Teaching intrapartum nurses to evaluate and support laboring patients is key to enhancing birth satisfaction, respectful maternity care, adequate pain management, and reducing the fear of childbirth (Akbas, 2022).

Despite the significant focus on measuring labor pain and its management, there is a notable gap in research regarding the implementation of labor support strategies, such as the Coping with Labor Algorithm, and their impact on the birthing experience and respectful maternity care. This study addressed how these strategies influence both nurse self-efficacy and confidence in labor pain management and patient experiences of respectful maternity care, as reported on the unit-collected Patient Reported Experience Measure (PREM) survey.

Problem Statement

The research study was conducted in an urban labor, delivery, and postpartum unit with over 600 births annually. This unit employs twenty-five registered nurses, six obstetricians, four certified nurse midwives, and family practice physicians providing obstetric and delivery services. The unit serves a diverse population from various cultural, social, and ethnic backgrounds, which means that patients express labor pain in different ways, posing challenges for intrapartum nurses during pain assessment and in supporting coping with pain.

Labor pain can be difficult to assess and manage due to its complexity, being both physical and psychological, and differing across cultures. According to the Centers for Disease Control and Prevention (2020), 77% of patients choose epidural or spinal anesthesia during labor for pain management (NVSS - Birth Data). There are limited studies on whether nursing presence and support during labor can influence the decision to choose non-pharmacological or pharmacological pain management methods. Bohren et al. (2017) found that women receiving continuous one-on-one support were more likely to have spontaneous vaginal births and less likely to use intrapartum analgesia or report negative feelings about the birth experience.

Intrapartum nurses can feel overwhelmed when caring for laboring persons without proper education and tools for effective pain management. The Coping with Labor Algorithm, created by Certified Nurse Midwife Leissa Roberts, in 2008 and updated in 2010, allows nurses to assess coping during labor rather than rating pain on a traditional scale. This algorithm guides nurses to observe cues from the laboring person, ask about coping instead of pain, and assist in managing pain with pharmacological methods, non-pharmacological methods, adjustments to the physical environment, and addressing social and emotional concerns (Roberts, 2010). See Appendix A for the algorithm.

Traditional pain scales often fail to capture the multifaceted nature of labor pain, leading to a reliance on pharmacological methods and leaving nurses feeling unequipped to support laboring patients, especially in a unit with diverse patient needs. The implementation of the Coping with Labor Algorithm provides a structured framework for nurses to assess coping mechanisms, offering both pharmacological and non-pharmacological pain management strategies. This approach can enhance care quality, improve patient satisfaction, and ensure culturally sensitive support during labor.

Purpose

This research project evaluated the impact of using the Coping with Labor Algorithm on intrapartum nurses' self-efficacy and confidence in managing labor pain. Additionally, the project examined whether implementing the algorithm increased nursing support and improved patient experience of respectful maternity care, as measured by the unit-collected PREM survey. The project took place in a busy labor, delivery, and postpartum unit in the Midwest, primarily caring for patients at 36 weeks of pregnancy or greater. The specific aims of the study were as follows:

Aim 1: To provide education and resources on the Coping with Labor Algorithm and implementation process to registered nurses in a maternity unit.

Aim 2: To determine how implementing the Coping with Labor Algorithm impacts nurse self-efficacy and confidence in understanding and providing support for labor pain management.

Aim 3: To determine if the unit-collected PREM survey shows an improvement in patient experience of respectful maternity care after implementing the Coping with Labor Algorithm.

Aim 4: To investigate how intrapartum nurses "Nurse Self-Efficacy Labor Support Scale" and "Labor Support Scale" are associated with age, race, highest educational level, number of years as a registered nurse, and number of years working in labor and delivery.

Review of Literature

Labor Coping and Pain Management

The normal birth process includes pain, and there is a large focus on measuring labor pain but not on helping the laboring person cope with it. Unlike an injury where pain is constant and resolves once treated, labor pain increases in intensity and frequency throughout the birthing process. During active labor, pain occurs every 2-5 minutes, lasting for multiple hours, with contractions causing pain and pressure and periods of no pain between contractions.

Understanding pain assessment is the first step to pain management. Factors such as type, location, intensity, and duration should be included when assessing pain. Laboring persons should be allowed to choose the pain scale they find most accurate for communicating their pain level (Hakala et al., 2022). Providing patients with a clear understanding of pain assessment methods, including pain scale choice and measurement criteria, can facilitate non-pharmacological and pharmacological pain management options.

Labor pain is a physiological process, and inadequate pain management can lead to unfavorable maternal and fetal outcomes, affecting cardiovascular, respiratory, limbic, and neuroendocrine systems (Akbas, 2022). Physical exhaustion from labor pain can increase blood pressure, oxygen needs, and cardiac output. Fear and anxiety surrounding labor pain can raise stress hormones and reduce oxytocin release, physiologically contributing to prolonged labor and increased postpartum bleeding (Akbas, 2022).

Women who fear childbirth feel labor pain more significantly than those who do not (Henrique et al., 2020). Stress hormones from fear and anxiety decrease blood flow to the uterus and placenta, potentially causing fetal distress (Akbas, 2022). A woman's mindset plays a significant role in coping with labor pain. When laboring women are focused and present, they can better manage their pain (Whitburn et al., 2014; Rantala et al., 2022). Distractions such as noise and lights can negatively affect their coping ability (Whitburn et al., 2014; Rantala et al., 2022). Advocating for thorough pain assessment and fostering a mindset where labor pain is not feared can improve the coping experience (Whitburn et al., 2014; Rantala et al., 2022).

Nursing Management of Labor Pain

Childbirth is a significant part of a woman's life, and the birth experience can greatly influence birth satisfaction or trauma (Cisek et al., 2021). Intrapartum nurses can impact the birth experience positively or negatively (Maskálová et al., 2021). Providing physical and emotional support is crucial for a positive birth experience. Akbas et al. (2022) showed that holistic birth support strategies, including physical, emotional, informative support, and advocacy, correlate strongly with improved coping with labor pain, birth satisfaction, and reduced fear of childbirth.

Registered nurses play a key role in the birth experience in the United States. Equipping healthcare professionals with the appropriate tools and education to support laboring women is crucial. Registered nurses should educate patients on pain assessment methods, including numeric rating scales, visual analog scales, FACES pain scales, and verbal description scales. Proper education on pain assessment methods ensures understanding and supports pain management for both the patient and the nurse (Hakala et al., 2022, Rantala et. al., 2022).

Chance et al. (2018) found that implementing the Coping With Labor Algorithm can influence registered nurses' beliefs towards more physiologic rather than medically managed

births. Additional training in coping support can help nurses provide better support, increase nursing support frequency, and improve birth outcomes (Chance et al., 2018). Supportive care from intrapartum nurses enhances a laboring woman's ability to cope, improves birth satisfaction, and decreases adverse outcomes (Akbas, 2022; Mohammed et al., 2023; Chance et al., 2018).

Promoting Coping to Decrease Adverse Outcomes

A 2017 Cochrane study assessing ongoing labor support theorizes that support and comfort measures can significantly decrease physiological stress, anxiety, and fear, thereby improving labor outcomes (Bohren et al., 2017). These measures are crucial as they can enhance the labor pattern and reduce the need for a "cascade of interventions," which often include epidural analgesia, labor augmentation, and cesarean sections. The study highlights that continuous one-on-one support from trained labor companions, such as doulas or midwives, can create a calming environment that positively influences the birthing experience and outcomes.

Implementing coping strategies during labor, such as the use of the Coping with Labor Algorithm, can delay or eliminate the need for epidural analgesia, decrease the length of labor, and lower the risk of cesarean sections (Barreto Silva Gallo et al., 2018; Rodrigues et al., 2022; Smith et al., 2019). For instance, non-pharmacological pain relief methods, including breathing techniques, position changes, and massage, are integral components of these coping strategies. These methods not only help manage pain but also empower laboring women by providing them with a sense of control and participation in the birthing process.

Given that coping support can reduce the need for epidurals, shorten labor duration, and decrease the risk of interventions, including cesarean sections, promoting coping in labor through intrapartum nursing support has the potential to reduce these adverse outcomes. Intrapartum

nurses, when equipped with the right tools and training, can effectively support laboring women by recognizing signs of coping and distress and intervening appropriately to enhance comfort and reduce anxiety.

Additionally, studies have shown that women receiving continuous labor support are more likely to report higher satisfaction with their birth experience, which is closely linked to better postpartum outcomes (Hodnett et al., 2013). This increased satisfaction can also translate to reduced rates of postpartum depression and post-traumatic stress disorder (PTSD), contributing to overall maternal well-being.

By fostering a supportive environment and implementing structured coping strategies, intrapartum nurses can play a pivotal role in improving labor outcomes and promoting respectful maternity care. This approach not only addresses the physical aspects of labor pain but also considers the emotional and psychological needs of the laboring person, leading to a more holistic and positive birthing experience.

Promoting Coping in Labor as a Form of 'Respectful Maternity Care'

Disrespectful maternity care can manifest in various ways, such as ignoring the patient's pain and medical or psychosocial needs, enforcing unwanted medical procedures, overmedicating, and discriminating or humiliating based on race, age, ethnicity, gender nonconformity, or economic status (van der Waal & Mayra, 2023; World Health Organization, 2018). The World Health Organization (WHO) describes respectful maternity care as care that "maintains their dignity, privacy, and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labor and childbirth" (WHO, 2018). Cantor et al. (2024) expand on this, noting that respectful maternity care must honor the autonomy and preferences of the birthing individual.

Disrespectful maternity care can lead to distress, post-traumatic stress disorder (PTSD), postpartum depression, and care avoidance (Beck et al., 2013; Vedam et al., 2019). Factors such as race, low socioeconomic status, substance use, incarceration, or interpersonal violence increase the risk of mistreatment. For example, patients of color have reported that providers ignored their pain and anxiety and that they felt pressured to receive epidural anesthesia (Vedam et al., 2019). The WHO notes that a rights-based approach "depends on a just, as well as effective, health system" (2018). The WHO also proposes that offering pharmacologic and non-pharmacologic pain relief measures, including traditional and culturally appropriate options, may help address inequalities in birth care (2018).

Implementing the Coping with Labor Algorithm aligns with the principles of respectful maternity care by promoting individualized, patient-centered support during labor. This algorithm enables nurses to assess and support the laboring person's coping mechanisms rather than focusing solely on pain measurement. By incorporating both pharmacological and non-pharmacological pain management strategies, the Coping with Labor Algorithm ensures that the emotional and physical needs of the patient are addressed. This holistic approach fosters an environment where the laboring person's dignity, autonomy, and preferences are respected, ultimately enhancing the overall birthing experience and reducing the likelihood of negative outcomes associated with disrespectful care (Roberts, 2010; Chance et al., 2018).

Conceptual Framework

The study utilized the Plan-Do-Study-Act (PDSA) cycle framework, initially developed and refined by W. Edwards Deming (Moen, 2009). The "Plan" phase includes proposal development, unit and staff buy-in, and identifying measurement tools. The "Do" phase encompasses nurse training and pre/post-testing. The "Study" phase involves data review and

evaluation, including analysis of pre/post-testing and PREM surveys. The "Act" phase completes and restarts the cycle, recommending corrections or changes for ongoing improvement (Taylor et al., 2014; Moran et al., 2024). PDSA cycles are intended as small-scale, rapid assessments of process improvement, making it a natural fit for this project (Taylor et al., 2014).

Methodology

Design

A quasi-experimental pre and post-test design will be used for this project. Intrapartum nurses were educated on promoting coping in labor through the lens of this type of support as a form of respectful maternity care during a 30-minute face-to-face presentation conducted by the research team. A pre/post-test analysis of nurse beliefs related to birth practices and patient-reported experiences measured the impact of the education session's impact.

Labor Coping Education

The labor coping education component aims to enhance the skills and confidence of intrapartum nurses in managing labor pain by promoting coping in labor as a form of respectful maternity care and utilizing the Coping with Labor Algorithm. We conducted a comprehensive in-service training session to shift the focus from traditional numeric pain scales to a more holistic coping approach. The training session included detailed explanations of the Coping with Labor Algorithm, emphasizing the assessment of nonpharmacologic pain relief methods, emotional support, and effective communication techniques. Nurses participated in practical demonstrations and reviewed case studies to ensure they could use the Coping with Labor Algorithm effectively in real-world scenarios. Interactive discussions were held to address questions and promote engagement, ensuring the nurses were well-prepared to implement the new algorithm.

Coping in Labor Implementation

Upon completion of the educational training, we implemented the Coping with Labor Algorithm over 12 weeks. Nurses were instructed to integrate the Coping with Labor Algorithm into their routine practice, focusing on its use to assess whether laboring women are coping or not coping with labor pain. The algorithm provided a structured approach, guiding nurses through various nonpharmacologic interventions and support strategies to enhance coping. Regular check-ins and support from the DNP project team addressed any challenges and reinforced the use of the Coping with Labor Algorithm. Nurses reported referencing the laminated algorithm during active labor to guide their assessments, particularly during high-acuity shifts. The implementation improved respectful maternity care by providing more personalized and effective pain management strategies, ultimately enhancing the overall labor and birth experience for women.

Subjects

The research involved labor and delivery registered nurses as participants. To qualify, nurses were required to have an active Nebraska nursing license and currently be employed in the labor and delivery unit. Twenty-five labor and delivery registered nurses were eligible for the study, and thirteen registered nurses completed both the pre and post surveys. A statistical power analysis for sample size estimation was not performed due to the finite nurse sample. Upon consultation with the University of Nebraska Medical Center's IRB department, it was determined that IRB approval was not required for this project. Those who decide to take part will provide informed consent, will be given additional instructions regarding the testing and educational sessions, and will be provided a link to a pre-test survey.

Setting

This study occurred in the labor and delivery unit at a midwestern hospital. The unit has six labor rooms, six postpartum rooms, two low-intervention suites, and one operating room. This urban hospital serves a diverse population with over 600 births annually. The unit includes six obstetricians, four certified nurse midwives, and family practice physicians providing obstetric and delivery services.

Measures

Demographics

A demographic tool was administered to all participants. Demographic information that was assessed included age, race, highest educational level, number of years as a registered nurse, and number of years working in labor and delivery. Age, length of clinical experience, and gender have been shown to affect nurses' confidence (Rababa et al., 2022). Participant demographics are described further in Appendix D.

Nurse Confidence in Labor Pain Management Evaluation Tools

The Nurse Self-Efficacy Labor Support Scale (NSEQ) measured nurse self-efficacy and confidence with labor pain management. The NSEQ was developed by Davies and Hodnett (2002), which is based on social–cognitive theory and is the only scale used to assess nurse self-efficacy regarding labor support or maternity care (Page et al., 2021). The 14-item scale measured the nurse's self-efficacy and confidence using the following support techniques: reviewing birth plans, providing physical comfort, managing pain with nonpharmacologic methods, and providing physical, emotional, and informational support during labor (Page et al., 2021). Content validity of the scale was established by an expert panel of three obstetric nurses and a midwife. Cronbach's alpha coefficient of the scale was .98, and the test-retest correlation

was 0.93, demonstrating the reliability of the scale to measure self-efficacy for labor support (Davies & Hodnett, 2002; Page et al., 2021).

The Labor Support Scale (LSS) evaluated the frequency with which intrapartum nurses perform interventions and the nurses' perception of the effectiveness (Chance et al., 2018). The LSS, developed by Sleutel (2002), is designed to self-report the frequency of intrapartum nurses implementing birth interventions. It consists of 28 quantitative items measured by a 5-point Likert scale. For our study, the frequency subscale was utilized. The validity and reliability of the LSS have been thoroughly assessed through various methods, including the mean frequency score, Bonferroni post hoc tests, Cronbach α, item-total correlation, and internal reliability coefficients (Chance et al., 2018).

Patient Reported Experience Measure (PREM) Survey

The Nebraska Perinatal Quality Improvement Collaborative (NPQIC) Birth Equity Initiative Patient Reported Experience Measure (PREM) Survey was designed to gather comprehensive feedback on patient experiences during labor and delivery. This instrument was recently implemented at this midwestern hospital and offered to all birthing individuals. This instrument asks patients to evaluate various aspects of their care, such as their ability to participate in decisions, the attentiveness of the healthcare team, and whether their choices were respected. Respondents rate their agreement with statements on a Likert scale, covering areas like trust in the healthcare team, pressure to accept unwanted care, and overall respect and compassion received. The survey also explored if patients felt discriminated against based on race, ethnicity, sexual orientation, insurance type, or primary language. Additionally, it collected demographic information and details about doula support during pregnancy and labor, aiming to

enhance birth equity and improve the quality of maternal care (Birth Equity: Initiatives: NPQIC, 2024).

Findings

The first aim of this project was to provide education and resources on the Coping with Labor Algorithm to registered nurses on the maternity unit. Twenty-five registered nurses were educated during a monthly staff meeting. The education provided included the effective use of the Coping with Labor Algorithm, support techniques, documentation within the charting system, and the implementation process. All registered nurses were invited to complete pre- and post-survey.

The second and fourth aims of this project were combined during data interpretation. The second aim was to determine how implementing the Coping with Labor Algorithm impacts nurse self-efficacy and confidence by understanding how to effectively assess labor pain, including if the woman is coping or not coping, and provide appropriate interventions to manage labor pain. Thirteen out of twenty-five registered nurses (52%) completed both the pre and post surveys. The pre and post surveys collected included the “Nurse Self-Efficacy Labor Support Scale” (NSEQ) and the “Labor Support Scale” (LSSQ). The fourth aim was to investigate how intrapartum nurses’ scores on the “Nurse Self-Efficacy Labor Support Scale” and the “Labor Support Scale” are associated with age, race, highest educational level, number of years as a registered nurse, and years spent working in labor and delivery. See Appendix B for the “Nurse Self-Efficacy Labor Support Scale” and Appendix C for the “Labor Support Scale”.

After dichotomizing for age, race, education, years as a nurse, years as a labor nurse, and whether someone had previously taken a labor support course, the pre- and post-scores were

compared via independent sample tests. No differences were found for race, education, or having taken a previous labor course.

Age

When comparing for age, independent samples t-tests examined the differences in NSEQ and LSSQ between two age groups (20-35 and 36+). For the NSEQ, Levene's test indicated unequal variances between the age groups ($p = 0.014$). Consequently, the t-test with unequal variances assumed showed a non-significant difference between the younger and older age groups ($p = 0.222$). The effect size, Cohen's d, was -0.900, suggesting a large effect, though the confidence interval (-2.093 to 0.331) includes zero, consistent with the non-significant p-value. For the LSSQ, Levene's test showed no significant difference in variances between the age groups ($p = 0.323$), so equal variances were assumed. The t-test revealed no significant difference in '2011 change LSSQ' between the younger and older age groups ($p = 0.712$). The effect size, Cohen's d, was 0.264, indicating a small effect and the confidence interval (-1.103 to 1.614) also includes zero.

In summary, neither the changes in NSEQ nor LSSQ showed statistically significant differences between the 20-35 and 36+ age groups in this sample. While the effect size for NSEQ was large, the high variability and small sample size likely contributed to the non-significant result. The effect size for the LSSQ was small and also non-significant.

Years as a Registered Nurse

When comparing years as a registered nurse, the analysis compared two groups (0-5 and 6+ years) on changes in NSEQ and LSSQ. For changes within the NSEQ, Levene’s test for equality of variances indicated a significant difference in variance between the two groups ($p = 0.045$). As a result, Welch’s t-test, which does not assume equal variances, was used to assess

group differences. The results showed that the difference between the groups was not statistically significant (p = 0.141), suggesting no strong evidence of a meaningful difference in means.

The independent samples t-test for changes in the NSEQ showed no statistically significant difference between groups (p = 0.141), with a mean difference of -0.35102 and a confidence interval (-0.85782 to 0.15578) including zero. Effect sizes were moderate to large (Cohen's d = -1.093), suggesting practical differences despite statistical non-significance. For changes in the LSSQ, Levene's test was non-significant (p = 0.969), allowing the assumption of equal variances. The t-test also showed no significant difference (p = 0.276), with a mean difference of 0.45833 and a confidence interval (-0.44548 to 1.36214) including zero. However, effect sizes for LSSQ were notable (Cohen's d = 0.807), indicating a moderate to large effect.

Overall, while statistical significance was not achieved, effect sizes suggest potentially meaningful differences, warranting further investigation with a larger sample.

Years as a Registered Nurse Working in Labor and Delivery

In comparing years of working in labor and delivery and the survey tools, the statistical analysis showed differences between the two groups (0-5 and 6+), revealing some variation in means and standard deviations. Levene's test for equality of variances was significant (p = 0.011), indicating that variances were unequal, requiring the use of the "equal variances not assumed" t-test results. The independent samples t-test showed no statistically significant difference between the groups (p = 0.272), with a mean difference of -0.2381 and a confidence interval (-0.70253 to 0.22634) that included zero. Although effect sizes, including Cohen's d (-0.681, 0.593), suggest a moderate effect, the lack of statistical significance means these differences should be interpreted cautiously. Overall, the results do not provide strong evidence of a meaningful difference between the two groups. Appendices E and F show itemized mean

pre- and post-scores for the NSEQ and LSSQ, respectively, as well as each demographic's mean pre- and post-test scores. See Appendix G for a summary of the statistical analysis of the NSEQ And LSSQ results comparisons.

Patient Experience

The third aim of this project was to determine if the unit-collected PREM survey showed an improvement in patient experience of respectful maternity care after the implementation of the Coping with Labor Algorithm. The PREM survey is collected by the Nebraska Perinatal Quality Improvement Collaborative, which works with the maternity unit to collect data via QR code and report findings. Significant improvements were seen in patient perceptions of being respected, heard, and included in decision-making. The implementation of the Coping with Labor Algorithm appears correlated improvements in all patient experience metrics, with a 19% to 47% improvement across individual metrics. This included reduced reports of feeling pressured into care, as well as 100% agreement in healthcare teams respecting patient choices by the project's end. Data supports clinical relevance even without statistical testing due to small sample size (n=18), suggesting meaningful trends in patient-centered care improvements. See Appendix H for the complete table of results. These findings provide the foundation for interpreting how structured support tools may influence nurse confidence and perceptions of respectful care, as discussed in the following section.

Discussion

This project evaluated whether implementing the Coping with Labor Algorithm improved nurses' confidence and frequency of labor support behaviors, as well as patient's perceived experiences. While the statistical analyses did not yield significant differences across age, years of experience, or labor and delivery tenure, moderate to large effect sizes suggest the potential

for meaningful clinical differences. These trends may have been obscured by high variability and the small sample size, but represent that in clinical settings, even small improvements in nurse confidence or patient perceptions of care may translate into better communication, fewer interventions, or greater patient satisfaction.

Importantly, the patient-reported experience data showed consistent improvements in perceived respectful maternity care following implementation. These findings suggest that even when self-efficacy and support behaviors are not significantly different across demographics, the structured use of a labor support algorithm may enhance the quality of patient interactions and perceived autonomy in care. See Appendix H for complete data comparison table.

Several contextual factors likely influence how nurses provide labor support. These include the laboring person's chosen pain management strategy, unit staffing, and nurses' own beliefs and confidence in non-pharmacological pain management. Nurses with more experience may be better able to apply these strategies confidently and flexibly, as supported by existing literature (Barrett & Stark, 2010). Less experienced nurses, by contrast, may benefit from structured tools like the Coping with Labor Algorithm to build their confidence and skills.

Several factors influence how registered nurses support patients during labor, including the patient's choice of pain management, staffing levels, the opinions and beliefs of healthcare providers, and nurse self-efficacy and confidence. When a patient chooses a medicated birth, it can paradoxically lead to a decrease in the likelihood of continuous labor support, potentially affecting nurses' responses in post-survey evaluations. However, for women who opt for medicated birth, nurses play a vital role in assisting with in-bed positioning to facilitate labor progress and promote fetal well-being. They can also provide crucial comfort measures such as adjusting physical patient support tools, including pillows, exercise balls, peanut balls, squat

bars, etc., as well as facilitating position changes within the bed, and ensuring a generally comfortable environment. Furthermore, continuous reassurance and a calm presence from the nurse can help alleviate the anxiety that may arise due to the altered sensations and reduced mobility associated with medicated labor.

A study by Mohammad et al. (2023) highlighted that "the provision of continuous labor support may have minimized feelings of loneliness and provided reassurance." Notably, staffing ratios can significantly impact a nurse's ability to provide continuous one-on-one support, as they may be responsible for the care of multiple patients simultaneously. Nurses play a key role in communicating with the woman and her support partner about the progress of labor, any necessary interventions, and potential changes in the birth plan. They can advocate for the woman's preferences and help her feel informed and in control of her birthing experience, even when an epidural limits physical agency. Continuous labor support from a nurse can contribute to a more positive birth experience, potentially reducing the need for further interventions and promoting maternal satisfaction, regardless of the pain management choices made. Research consistently highlights the benefits of continuous support during labor, and these benefits extend to women who choose epidural analgesia.

An integrative review by Abikou et al. (2024) suggests that “some healthcare providers may not prioritize the use of non-pharmacological pain management (NPPM) because they do not believe pain relief is a primary concern during labor.” Societal cultural norms, beliefs, and misconceptions surrounding labor pain can also make it challenging for healthcare providers to consistently implement NPPM in healthcare settings (Abikou et al., 2024). If a provider favors medicated births over unmedicated births, nurses might be more inclined to offer pharmacological pain management options quickly.

The observation that nurses with less experience in labor and delivery may exhibit lower self-efficacy and confidence in managing labor pain non-pharmacologically compared to their more experienced colleagues has significant implications for patient care and the professional development of nursing staff. This disparity in confidence likely stems from a multitude of factors inherent in the process of gaining practical expertise.

Seasoned nurses have likely witnessed a wider range of labor patterns, coping mechanisms, and responses to various non-pharmacological interventions. This exposure allows them to develop a more nuanced understanding of what strategies might be effective in different contexts and to anticipate potential challenges. They have had the opportunity to refine their techniques through trial and error, learning from both successes and less successful attempts. This experiential learning builds a stronger sense of self-efficacy – the belief in one's ability to succeed in specific situations or accomplish a task. Increased experience often translates to greater familiarity with non-pharmacological techniques themselves.

The development of confidence is often intertwined with positive feedback and recognition from patients, colleagues, and supervisors. Experienced nurses have likely received more validation for their skills over time, reinforcing their belief in their abilities. They may also have developed a stronger sense of autonomy and trust in their clinical judgment, allowing them to implement non-pharmacological approaches confidently.

In contrast, less experienced nurses may lack this extensive practical background. They might have a foundational understanding of non-pharmacological methods from their education. Still, their limited exposure to diverse labor scenarios and fewer opportunities for hands-on application can hinder the development of strong self-efficacy and confidence. This can lead to a

greater reliance on pharmacological interventions, which may be perceived as more predictable or easier to manage, especially in challenging situations.

Barrett and Stark (2010) suggest that nurses with more experience providing labor care tend to develop greater confidence and competence compared to their less experienced counterparts. The chance to grow through lived experience plays a crucial role in shaping skilled and confident labor care providers. It underscores the importance of providing supportive environments and mentorship for novice nurses to gain the necessary experience, build their skills, and ultimately develop the self-efficacy and confidence needed to effectively utilize and advocate for non-pharmacological pain management strategies during labor. Addressing this experience gap is vital for ensuring that all laboring women receive comprehensive and holistic care, regardless of their chosen pain management methods. Taken together, these insights highlight both the promise and the limitations of implementing structured support tools in real-world labor and delivery settings.

Conclusion

We investigated the implementation of the Coping With Labor Algorithm for its impact on nurse self-efficacy (NSEQ) and reported labor support behaviors (LSSQ). The implementation of the Coping With Labor Algorithm showed promising improvements in nurse confidence and patient perceptions of respectful maternity care. Although statistical significance was not achieved in self-efficacy and labor support scores across demographic groups, moderate to large effect sizes suggest meaningful, practical differences that merit further exploration. Importantly, the PREM survey revealed an increase in patients feeling their healthcare choices

were respected and perceptions of respectful treatment throughout their stay during the study period.

Significance and Implications

Despite the lack of statistically significant differences in NSEQ and LSSQ changes between the younger and older nurse groups in this specific sample, several points regarding the findings warrant consideration. The large effect size observed for NSEQ, despite the statistically insignificant p-value, suggests a potential trend where age might influence the impact of the intervention on nurses' self-efficacy in providing labor support. The statistically insignificant findings for LSSQ across age groups, coupled with a small effect size, suggest that the intervention, as measured by the LSSQ, may not differentially impact reported labor support behaviors based on the age of the nurse in this sample.

However, it is important to acknowledge the limitations of self-reported data and the potential for other factors to influence these behaviors. These findings carry implications for the implementation of interventions like the Coping with Labor Algorithm. While this initial analysis on age does not provide strong evidence for tailoring the intervention based on this demographic, the potential trend in NSEQ warrants further exploration. Understanding if and how age influences a nurse's perceived ability to provide labor support is crucial for developing effective training and support strategies. The study underscores the importance of considering factors beyond age, such as experience level, when designing and implementing interventions to enhance nurses' labor support skills and self-efficacy.

Recommendations for Further Research

The following recommendations are made for future research based on the initial findings. An increase in sample size for future studies, aiming for a larger and more diverse

sample of nurses to increase the statistical power and allow for more robust conclusions regarding the impact of age and other demographic variables. When comparing age groups, future research should employ strategies to address the issue of unequal variances, such as using more robust statistical tests or employing matching techniques to create more comparable groups. The study's aim to investigate the influence of race, education, total years as a registered nurse, and years spent working in labor and delivery should be fully pursued. Analyzing these factors will provide a more comprehensive understanding of the characteristics associated with nurses' self-efficacy and reported labor support. Future research could benefit from longitudinal designs to track changes in NSEQ and LSSQ over time in response to the intervention, allowing for a better understanding of the long-term impact and potential age-related trajectories.

Supplementing quantitative data with qualitative methods, such as interviews or focus groups, could provide richer insights into the experiences and perceptions of nurses of different age groups regarding their self-efficacy and labor support practices. This could help explain the observed trends and nuances not captured by quantitative measures alone. Future research should thoroughly analyze the data between experience in labor and delivery and labor support skills to determine their impact on NSEQ and LSSQ in the context of the intervention. While statistical significance is important, future research should also focus on the clinical significance of any observed changes in NSEQ and LSSQ. Determining the magnitude of change that translates to meaningful improvements in patient outcomes and the quality of labor support provided is crucial.

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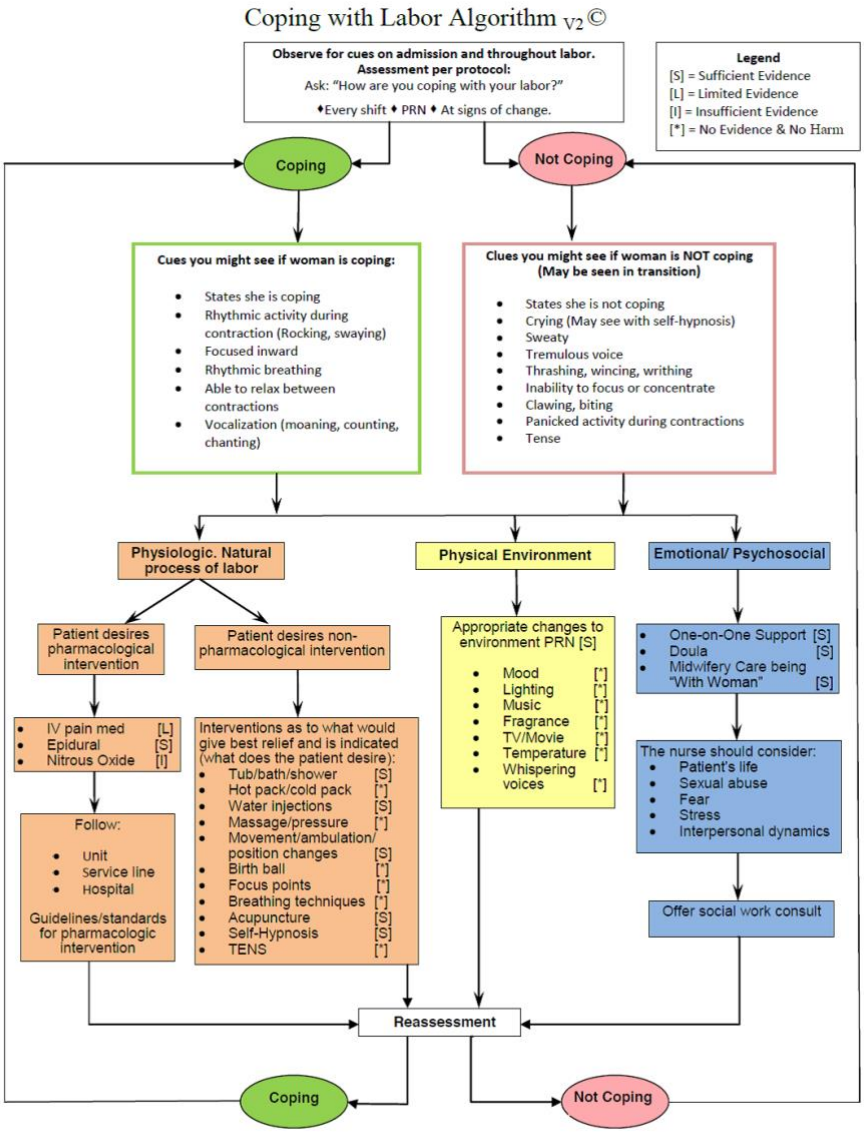
APPENDIX A

Coping with Labor Algorithm V2



Appendix B

Nurse Self-Efficacy Labor Support Scale

Confidential

Nurse Self Efficacy Labor Support Scale

Enhancing Nurse Confidence in Labor Pain Management	_____
Fill in the date you are completing this survey	_____
Participant Identifier: Use EPIC login numbers only Example: b98764a, use 98764	_____

How confident are you in your ability to use each of the following techniques for providing support to women in labor?

Review and discuss a woman's preferences (birth plans)	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree
Suggest alternative positions/movements	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree
Provide specific backache relief measures	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree
Know what to say or do for reassurance	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree
Be continually present with a woman in labor	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree

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Assist partner/friend in providing labor support	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree
Assist in breathing and relaxation techniques	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree
Explain what is happening about labor progress	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree
Deal with distress and panic situations	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree
Use non-pharmacological pain relief methods	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree
Accept a woman's behavior without judgment, even when her behavior is unusual or upsetting	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree
Please rate your skill in the following labor support techniques.	
Physical comfort measures -Backache relief measures -Non-pharmacological pain relief techniques	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree

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Emotional support -Presence -Coping mechanisms for distress and panic situations	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree
Information/advice -Labor progress	◯ Strongly Disagree ◯ Disagree ◯ Somewhat Disagree ◯ Neither Agree nor Disagree ◯ Somewhat Agree ◯ Agree ◯ Strongly Agree

Thank you for taking the Nurse Self-Efficacy Labor Support Scale!

Appendix C
Labor Support Scale

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Labor Support Scale

Enhancing Nurse Confidence in Labor Pain Management	_____
Fill in the date you are completing this survey	_____
Participant Identifier: Use EPIC login numbers only Example: b98764a, use 98764	_____
Rate the frequency with which you use each labor support intervention	
Use intermittent auscultation during part of all of the mother's labors.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Position laboring mothers in unusual or creative ways.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Give food to laboring women who are hungry.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Make suggestions for alternative pushing techniques.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Delay pushing when laboring mothers who are completely dilated have no urge to push.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Have laboring mothers who are not yet completely dilated push if they feel "pushy."	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Provide warmth for laboring mothers' comfort.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always

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Have mothers in your facility take warm showers during active labor.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Go with laboring mothers to walk.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Teach visitors efforts in helping mothers.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Teach visitors how to praise laboring mothers' efforts.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Praise visitors for their efforts in helping mothers.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Staying with laboring mothers while visitors take a break.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Intervene to prevent providers from performing interventions that laboring mothers don't want.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Work intensively with mothers who wish to avoid pain medications or epidurals.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always
Intervene when visitors are doing activities that you feel are unhelpful to mothers.	◯ Never ◯ Seldom ◯ Sometimes ◯ Frequently ◯ Always

Thank you for taking the Labor Support Scale!

Appendix D

Demographics Tables

Table C1 - Ages of Participants

Ages	Number of Nurses	Percent
20-35	6	46.2
36+	7	53.8
Total	13	100.0

Table C2 - Number of Years as a Registered Nurse

Years	Number of Nurses	Percent
0-5	5	38.5
6+	8	61.5
Total	13	100.0

Table C3 - Number of Years as a Labor and Delivery Nurse

Ages	Number of Nurses	Percent
0-5	6	46.2
6+	7	53.8
Total	13	100.0

Table C4 - Races of Participants

Race	Number of Nurses	Percent
White/Caucasian	12	92.3
Not White	1	7.7
Total	13	100.0

Table C5 - Level of Education

Degree	Number of Nurses	Percent
ASN	2	15.4
BSN	11	84.6
Total	13	100.0

Table C6 - Previously Taken a Labor Course

Taken Course?	Number of Nurses	Percent
No	6	46.2
Yes	7	53.8
Total	13	100.0

Appendix E

NSEQ Pre- and Post-Scores

NSEQ

Question	Mean Pre-Score	Mean Post-Score
1	1.08	1.15
2	1.92	1.46
3	2.38	1.77
4	2.08	1.38
5	1.77	1.38
6	1.62	1.38
7	1.69	1.31
8	1.46	1.23
9	2.15	1.62
10	1.92	1.54
11	1.62	1.54
12	1.77	1.54
13	1.92	1.31
14	1.85	1.15
Means	1.79	1.46

Mean Pre-/Post Change in the NSEQ
By Age

Age	Change
20-35	-0.49
36+	-0.18

Mean Pre-/Post Change in the NSEQ
By Number of Years as a Nurse

Years	Change
0-5	-0.51
6+	-0.16

Mean Pre-/Post Change in the NSEQ
By Number of Years as a Nurse
In Labor and Delivery

Years	Change
0-5	-0.42
6+	-0.19

Appendix F

LSSQ Pre- and Post- Scores

LSSQ

Question	Mean Pre-Score	Mean Post-Score
1	2.92	3.09
2	2.15	2.00
3	2.31	2.09
4	2.38	2.09
5	2.46	2.36
6	4.15	3.91
7	2.08	1.55
8	3.00	2.82
9	3.00	3.00
10	2.31	2.09
11	2.54	1.91
12	1.92	1.55
13	2.38	1.91
14	2.62	2.36
15	1.92	2.09
16	2.54	2.55
Means	2.52	2.34

Mean Pre-/Post Change in the LSSQ
By Age

Age	Change
20-35	-0.13
36+	-0.29

Mean Pre-/Post Change in the LSSQ
By Number of Years as a Nurse

Years	Change
0-5	-0.08
6+	-0.38

Mean Pre-/Post Change in the LSSQ
By Number of Years as a Nurse
In Labor and Delivery

Years	Change
0-5	-0.06
6+	-0.35

Appendix G

Summary of Statistical Analysis for NSEQ and LSSQ Comparisons

Comparison	Measure	Levene's Test (p)	T-Test (p)	Cohen's d	Mean Difference	95% CI	Effect Size Interpretation
Age (20–35 vs 36+)	NSEQ	0.014	0.222	-0.900	–	[-2.093, 0.331]	Large (not significant)
	LSSQ	0.323	0.712	0.264	–	[-1.103, 1.614]	Small (not significant)
Years as RN (0–5 vs 6+)	NSEQ	0.045	0.141	-1.093	-0.35102	[-0.85782, 0.15578]	Large (not significant)
	LSSQ	0.969	0.276	0.807	0.45833	[-0.44548, 1.36214]	Large (not significant)
Years in L&D (0–5 vs 6+)	NSEQ	0.011	0.272	-0.681	-0.2381	[-0.70253, 0.22634]	Moderate (not significant)
	LSSQ	0.849	0.468	0.491	0.29167	[-0.59173, 1.17507]	Moderate (not significant)

Appendix H

Patient-Reported Experience Trends

Patient perceptions related to respectful care, communication, decision-making, and overall satisfaction prior to and following the implementation of the Coping With Labor Algorithm.

	Comparison Period				Comparison Period Average	Study Period		Trend Summary
Survey Item	**April**	**May**	**June**	**Sept**		**Oct**	**Nov**	
My healthcare choices were respected	50%	67%	63%	100%	70%	100%	100%	↑
I felt heard by my healthcare team	50%	67%	75%	100%	73%	100%	100%	↑
I could take part in decisions about my care	50%	67%	75%	100%	73%	100%	100%	↑
I trusted the healthcare team	50%	33%	75%	100%	64.5%	100%	67%	↑
Communication & background understanding	50%	67%	75%	100%	73%	100%	100%	↑
Introductions and role were explanation by my team	50%	33%	75%	100%	64.5%	100%	67%	↑
I was asked permission before exams/ treatments	50%	67%	75%	100%	73%	100%	100%	↑
I felt pressured into accepting care that I did not want	67%	50%	33%	38%	47%	0%	0%	↓
Overall respect during stay *	—	—	—	—	—	73% Strongly Agree 27% Agree		—
Respect during labor & delivery*	—	—	—	—	—	78% Strongly Agree 22% Agree		—

* Data collected during October and November only.