Laboring Down: A Pretest-Posttest Educational Study

Kristen Eberlein, BSN, RN, DNP(c) - Primary Investigator

Robert Morris University
Abstract

The primary aim of this study was to determine the effectiveness of an educational video in increasing labor and delivery nurses’ knowledge of laboring down. The secondary study aim was to determine if the educational intervention affected nurses’ anxiety levels when caring for patients who are laboring down. Nurses took an anxiety measure test and a knowledge test before and after watching the educational video. The results of the difference in knowledge pre-intervention to post-intervention achieved statistical significance ($t = 3.22$, $df = 14$, $p = .006$). The mean number of correct answers increased from 5.87 ($SD = 1.96$) pre-intervention to 7.27 ($SD = 1.83$) post-intervention. The results of the difference in anxiety level pre-intervention to post-intervention did not achieve statistical significance. An educational video on laboring down effectively increased nurses’ knowledge; however, it was not effective in decreasing nurses’ anxiety level when caring for patients who are laboring down.

Key Words: laboring down, second stage of labor, passive phase of the second stage of labor, passive fetal descent, pretest-posttest
Introduction

Laboring down is also referred to as the passive phase of the second stage of labor. In recent years, laboring down has become a common labor management alternative that results in fewer adverse maternal outcomes, while not affecting fetal well-being (Schaffer et al., 2005). Laboring down encourages women to wait until they feel an urge to bear down before beginning pushing efforts. This differs from the traditional labor approach where obstetrical providers direct patients to begin pushing when 10 centimeters dilated regardless of the presence of a pushing urge. Administrators, educators, physicians, and clinical nurses in a large Western Pennsylvania healthcare system identified a lack of evidence-based nursing care guidelines for the nursing care of the laboring down patient. With a clinical practice gap identified, obstetrical experts formed an ad hoc committee to develop evidence-based nursing care guidelines for the laboring down patient and determine a plan to educate labor and delivery nurses in the 3 labor and delivery units contained within the healthcare system. The article outlines the process taken to develop a continuing education evidence-based video to instruct labor and delivery nurses in the care of the laboring down patient, development of knowledge assessment tool, and a pretest post-test the study aimed to determine if the educational video increased nurses’ knowledge of nursing care of the laboring down patient. A secondary aim of the study was to determine if the educational video decreased nurses’ anxiety surrounding the care of the laboring down patient.

Background

The second stage of labor is defined as the time between complete cervical dilatation and the birth of the infant. Immediately following the identification of complete cervical dilatation, many women are instructed to assume a lithotomy position and bear down using valsalva efforts against a closed glottis. These instructions often include commands for the woman to take a deep
breath at the onset of each contraction and hold it while sustaining the bearing-down effort to the count of 10. This pattern of breath-holding for 10 seconds and bearing down is repeated for the duration of each contraction. This approach is both active and directive. (Hanson & Osborne, 2014)

Research has demonstrated that these active-directive approaches do not lead to optimal maternal and neonatal outcomes. In addition, despite the long-held assumption that feeling an urge to push marks the onset of the second-stage, many women reach complete dilatation and experience no urge to bear down (Hanson, 2009). Recognition of this delay in the urge to push warranted a number of important scientific studies on this phenomenon, including the identification of optimal second-stage labor care practices. Translating research finding to clinical practice has been exceedingly difficult in many hospitals despite a plethora of scientific evidence that the physiologic approach to second-stage labor care results in improved maternal and neonatal outcomes (Hanson, 2006; Niesen & Quirk, 1997; Declercq, Sakala, Corry, & Applebaum, 2006; Declercq, Sakala, Corry, Applebaum, & Herrlich, 2013).

**Literature Review**

Much research suggests success with a protocol allowing nulliparous women to wait 2 hours or until the urge to push and allowing multiparous women 1 hour or until the urge to push (Chang et al., 2011; Hansen, Clark, & Foster, 2002; Mayberry, Hammer, Kelly, True-Driver, & De, 1999; Simpson & James, 2005). There are significantly fewer fetal heart rate decelerations when the fetus can descend passively when compared to closed-glottis pushing (Hansen et al., 2002; Simpson & James, 2005). Maternal fatigue is less when compared to immediate pushing when there is no urge to push (Chang et al., 2011; Hansen et al., 2002; Lai, Lin, Shey, & Gau, 2009). Risk of having an operative vaginal birth is less with delayed pushing until urge to push
when compared to pushing immediately at 10cm (Brancato, Church, & Stone, 2008; Fraser et al., 200; Roberts, Torvaldsen, Cameron, & Olive, 2004). Injuries to the structure and function of the pelvic floor are less likely when a passive second stage results in a decreased period of maternal expansive efforts (Devine, Ostergard, & Noblett, 1999). Delaying pushing and avoiding closed glottis pushing has been shown to decrease the risk of perineal injuries (Albers, Sedler, Bedrick, Teaf, & Peralta, 2006; Sampselle & Hines, 1999; Simpson & James, 2005). When compared to spontaneous bearing down efforts, coached pushing results in greater risk of stress incontinence, decreased bladder capacity, decreased first urge to void, and detrusor overactivity (Schaffer et al., 2005). There are no benefits for the mother and fetus to a policy involving immediate and continued pushing when compared to allowing a variable period of rest with spontaneous fetal descent (AWHONN, 2008). The active pushing phase is the most physiologically stressful part of labor for the fetus, so shortening pushing time can promote fetal well-being (Roberts, 2002; Simpson & James, 2005). Laboring down avoids maternal fatigue and the indeterminate or abnormal fetal heart rate patterns associated with sustained coached closed glottis pushing (Fraser et al., 2000; Hansen et al., 2002). Active pushing time is significantly decreased with delayed pushing (Brancato et al., 2008; Gillesby et al., 2010; Kelly et al., 2010; Simpson & James, 2005; Tuuli et al., 2012). Throughout passive and active second stage, a periodic assessment of the descent of the fetal presenting part via vaginal examination will provide important information about progress and will assist in guiding subsequent care.

Research suggests self-reported confidence does not indicate competence. In fact, research shows a poor correlation between self-reported confidence and objective evaluation measures (Kruger & Dunning, 1999). Self-reported confidence, as demonstrated by low anxiety surrounding a clinical situation, is not an accurate measure of competence (Bearnson & Wiker,
Nurses may lack insight into their knowledge deficit surrounding a new clinical intervention (Brinkman et al. 2015). To determine if the video was effective in increasing nurses’ knowledge about care of the laboring down patient and decreasing anxiety surrounding the care of the laboring down patient, the researcher conducted a pretest-post study.

**Methods**

The researcher used a quasi-experimental pretest/posttest design to evaluate the effectiveness of an instructional educational video designed to educate labor and delivery nurses about newly developed evidence-based laboring down nursing care guidelines. In addition, the researcher sought to determine if the video affected nurses’ confidence in caring for laboring down patients. The study was approved by the Institutional Review Board at the host academic institution as well as the Quality Improvement Department at the host healthcare system.

The potential participants were nurses working at a large Western Pennsylvania healthcare system’s labor and delivery units. There was no age restriction to participation. Inclusion criteria included the ability to read and write English. Participants had the right to withdraw at any time. Participants answered demographic questions to enable the researcher to describe the sample (Appendix A). The educational intervention was a 35-minute video recording. Based on learning objectives (Appendix B), the researcher developed and produced the didactic presentation which included 4 short recorded vignettes. The vignettes were filmed using actors to portray laboring down patients in different situations. At the end of each vignette, the speaker asked the participants to reflect on the vignette’s content. The researcher used the vignettes with the lecture material to accommodate different learning styles.
Pre and post-test anxiety was measured using the State-Trait Anxiety Inventory for Adults Short Form Y-1 (Appendix A). The anxiety tool has acceptable reliability and validity when correlated with the 20-item version of the State-Trait Anxiety Inventory for Adults (Marteau & Bekker, 1992).

As no tool existed measuring knowledge of nursing care of the laboring down patient, the researcher developed an evaluation tool (Appendix A). The researcher based the knowledge test construction on the same learning objectives (Appendix B) used to develop the educational intervention. To establish content validity, twenty questions were given to 4 experts in education and obstetrics. The questions were rated on a 1-5 scale with 1 being the least and 5 being the best reflection of the learning objectives (Appendix B). Only the questions rated 4 or 5 were chosen to be included in the knowledge test, resulting in a 10-question test (Appendix A). This produced a content validity index of 1 for the knowledge test. The best way to test reliability for the knowledge test is a test/re-test measure. As such, participants scored higher after the intervention, demonstrating reliability of the knowledge test.

The anxiety test, knowledge test, and educational video were delivered through a web-based software tool. To recruit potential participants, an email was sent out to all labor and delivery nurses at the 3 labor and delivery units in the healthcare system. The email containing a link to the study was sent to 152 labor and delivery nurses. The researcher sent email reminders to recruit potential participants. By clicking on the imbedded hyperlink, participants were directed to the pretest, the educational intervention, and finally the posttest. Participants took the anxiety test, the knowledge test, watched the 35-minute educational video and then took the anxiety test and knowledge test again. In an effort to increase sample size, participants received 1 continuing education credit for completing the study. In the survey, participants were asked to
enter their employee email address. The email address was needed to allow the continuing education certificate to be awarded. To protect the participants' identity, the researcher did not see the email addresses. The email address was removed from the data base prior to the researcher's data analysis. This was the only participant identifier used and was only known to the third party that is distributing the continuing education certificates. The third party distributing the continuing education certificates did not have access to any study data. Only the researcher had access to the results of pre-test and post-test answers. The researcher had no knowledge of who participated in the study, just the answers they selected.

**Results**

Fifteen participants completed the study, producing a 10% response rate, which is expected for online surveys. Three participants were from a rural facility and 12 were from an urban facility. One had an Associate’s degree, 2 had Master’s degrees, and 12 had Bachelor’s degrees. Nine participants had less than 5 years of experience as labor and delivery nurses, 4 had 6-10 years of experience, 2 had greater than 10 years of experience. Seven participants were from a facility that has less than 5000 deliveries per year and 8 were from a facility that has greater than 5000 deliveries per year.

The ten-item State-Anxiety Inventory Short Form Y-1 was used to assess participants’ state-related anxiety (Appendix A). Cronbach’s Alpha was .888 for pre-intervention and .903 for post-intervention. This exceeds the general benchmark of .70 for internal reliability. The ten-item State-Anxiety Scales (pre- and post-intervention) were summed to create an overall measure for anxiety. A paired t-test was conducted to evaluate potential changes from pre to post intervention. The results did not achieve statistical significance. A paired t-test was conducted to
evaluate changes in nurse’ anxiety levels when caring for the laboring down patient before and after the educational intervention. The results did not achieve statistical significance.

The ten-item knowledge tool was coded 1 = correct and 0 = incorrect. Next, the ten items (pre- and post-intervention) were summed to create an overall measure of knowledge. A paired $t$-test was conducted to evaluate potential changes from pre to post intervention. The results achieved statistical significance ($t = 3.22, df = 14, p = .006$). Specifically, the mean number of correct answers increased from 5.87 (SD = 1.96) pre-intervention to 7.27 (SD = 1.83) post-intervention. The results are also practically meaningful, as participant increased their correct answers by more than 1 (1.4).

A new variable, change in knowledge, was created by subtracting the summated pre-knowledge measure from the summated post-knowledge measures. Next, a simple linear regression model was conducted with change in knowledge as the outcome variable, and years of experience as the predictor. The model did not achieve significance.

There was one participant with an Associate Degree and two with Masters Degrees. Thus, the category sizes were not adequate for statistical analysis. The Bachelors and Masters holders gained, on average, 1.5 correct questions, whereas the single Associate Degree holder gained 0.0.

An independent $t$-tests was conducted with deliveries (< 5,000 and 5,000+) as the nominal variable and change in test score as the outcome. The test did not achieve significance.

Because there were 3 rural participants, the sample size was not adequate for statistical analysis. The urban participants gained, on average, 1.58 correct questions; whereas, rural participants gained less than 1.0 (M = 0.577).
Discussion

The primary aim of this study was to evaluate an educational intervention about a newly developed clinical protocol written to implement evidence-based second-stage labor nursing care. The secondary study aim was to determine nurses’ anxiety surrounding care of the laboring down patient pre and post intervention. The nurses were educated using a researcher developed video. Participants’ knowledge and anxiety levels were assessed using a pretest/posttest design.

The educational video was shown to be an effective tool to educate labor and delivery nurses on laboring down. On average, the participants increased their correct answers by 1 question from pretest to posttest.

The educational video was not shown to decrease labor and delivery nurses’ anxiety level when caring for patients who are laboring down. In general, the nurses did not perceive themselves being anxious when caring for patient who are laboring down. In other words, they had confidence in caring for these patients before watching the educational video. Interestingly, even though they were not anxious about caring for these patients, they still had room to gain more knowledge as evidenced by the change in pretest scores to posttest scores. This information is consistent with research that suggests self-reported confidence does not suggest competence. Does the saying “You don’t know what you don’t know” apply here? Nurses may perceive themselves as being confident because they did not know the information they were missing when caring for these patients. This study’s finding suggests the importance of objective measures to evaluate nurses’ knowledge of clinical practice changes.

Research Recommendations

Future research is recommended to obtain a larger sample size to increase the statistical strength of the data. Furthermore, the researcher recommends that future studies include a follow
up posttest at 3 and 6 month intervals to assess if participants retained learned knowledge. Additionally, future research might also explore if educational videos on other topics given to other groups of nurses proves to be effective as well. Further research on the subject of self-reported confidence and competence is warranted to explore why there is a disconnect between the two and what implications it might have in the future. Lastly, patient care outcomes after implementation of the laboring down guidelines should be evaluated to determine the effect on caesarian sections rates and maternal and infant complications.

**Limitations**

This study had several limitations. Despite aggressive recruitment efforts, the sample size was small; however, statistical significance was achieved for the difference in the knowledge test pre and post intervention. In addition, the knowledge tool was researcher developed, but content validity was established prior to use. Further psychometric testing is needed to establish stronger reliability and validity of the tool’s results. Lastly, there was no follow-up to determine if participants retained the knowledge learned from the educational video over time.

**Conclusion**

A gap in knowledge of laboring down was identified among labor and delivery nurses within a hospital system. An evidence-based educational video was created to fill this gap. The educational video was shown to be an effective tool to educate labor and delivery nurses on laboring down. It was not effective in decreasing nurses’ anxiety level when caring for laboring down patients.
References

Association of Women’s Health, Obstetric, and Neonatal Nurses (2008). Nursing care and management of the second stage of labor; Evidence-based clinical practice guideline (2nd ed.). Washington, DC.


Appendix A

Demographic Questions

1.) What is your age?

2.) What is your highest level of nursing education?

3.) Is your primary practice site a(n):
   a. Urban hospital
   b. Suburban hospital
   c. Rural hospital

4.) How many deliveries are there per year at your facility?

5.) In managing laboring patients, do you work with: (select all that apply)
   a. Certified Nurse Midwives
   b. Resident physicians
   c. Attending physicians

6.) How many years of experience do you have in labor and delivery?

7.) Do you have children?
   7a.) If yes, how many?
   7b.) Did you have vaginal births, cesarean births, or both?
Anxiety Tool

Self-Evaluation Questionnaire
STAIAD Short Form Y-1

Please provide the following information:
Name ___________________________ Date ____________ S ____________
Age ___________________ Gender (Circle) M F T ______

Directions: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best. Use the following scale:

NOT AT ALL – SOMEWHAT – MODERATELY SO – VERY MUCH SO

1. I feel calm ................................................................. 1 2 3 4
2. I am tense .................................................................... 1 2 3 4
3. I feel at ease .............................................................. 1 2 3 4
4. I am presently worrying over possible misfortunes ........ 1 2 3 4
5. I feel frightened ........................................................... 1 2 3 4
6. I feel nervous .............................................................. 1 2 3 4
7. I am jittery .................................................................... 1 2 3 4
8. I am relaxed .............................................................. 1 2 3 4
9. I am worried .............................................................. 1 2 3 4
10. I feel steady ............................................................. 1 2 3 4
Pretest-Posttest Questions

1.) Laboring down is also referred to as the:

   - Passive second stage of labor
   - Active second stage of labor
   - Onset of active labor
   - Time pushing begins

2.) When a woman is laboring down, the maximum time allowed before consultation with a second physician is required in a primiparous woman with an epidural is:

   - 2 hour
   - 3 hours
   - 4 hours
   - 5 hours

3.) When a woman is laboring down, the maximum time allowed before consultation with a second physician is required in a multiparous woman with an epidural is:

   - 2 hours
   - 3 hours
   - 4 hours
   - 5 hours

4.) At minimum, the laboring down patient is assessed by a midwife or physician every:

   - 15 minutes
   - 30 minutes
   - 1 hour
   - 2 hours
5.) During the active phase of the second stage of labor, the patient should be coached to avoid:

- Holding her breath for 10 seconds during each push
- Bears down as long as she can
- Considering other pushing positions
- Pushing 3-4 times with each contraction for 6-8 seconds each

6.) The nurse is caring for a G1P0 patient with an epidural who has been laboring down for 1 hour and has no urge to push. The nurse:

- Instructs the patient to begin actively pushing
- Continues the laboring down phase
- Turns off the epidural

7.) A G1P0 has been laboring down for 1 hour. The nurse knows the patient’s support person needs more education when he states:

- “Since she has been resting, her pushing time will be less”
- “It’s time for her to push now. This can’t be good for the baby.”
- “Laboring down results in less tears.”
- “She is at 10 cm, but we are waiting for her to feel the urge to push.”
- Calls for provider consultation

8.) When actively pushing, the nurse:

- Has the patient choose between pushing against an open or closed glottis
- Instructs the patient to push with an open glottis
- Limits maternal position changes
- Has the patient remain in a recumbent position
9.) After laboring down for 1 hour, a G1P0 patient has pushed for 3 hours. The supervising physician has evaluated the patient and believes she has made progressive change and vaginal delivery is imminent. The physician recommends to continue pushing. The nurse knows:

An assessment by a third physician is necessary

This is appropriate for this situation

This is not appropriate for this situation

A cesarean section or an operative vaginal delivery is needed

10.) An operative vaginal delivery is indicated:

When second stage is protracted

When immediate or potential fetal compromise is suspected

To shorten the second stage for maternal benefit

All of the above
Appendix B

Learning Objectives

1.) The participant will be able to manage a nulliparous or multiparous patient who is laboring down.
   - The participant will communicate with providers at appropriate time intervals.
   - The participant will understand fetal intolerance to laboring down.
   - The participant will be able to recognize labor progressing appropriately as determined by OB/GYN or Certified Nurse Midwife examination.
   - The participant will demonstrate knowledge of which laboring patients are candidates for laboring down

2.) The participant will understand the benefits of laboring down.

3.) The participants will understand the risks of laboring down.

4.) The participant will understand the difference between the active and passive phase of the second stage of labor.

5.) The participant will be able to utilize alternative pushing methods.

6.) The participant will demonstrate ability to make appropriate decisions concerning caring for a patient who is laboring down
   - The participant will demonstrate appropriate interventions when the FHR is non-reassuring
   - The participant will understand when to continue or discontinue laboring down