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# Prevention and Management of Postpartum Hemorrhage

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# Walden University

College of Health Sciences

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Lisa Medoh

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2017

Abstract

Prevention and Management of Postpartum Hemorrhage

by

Lisa N. Medoh

MSN, Walden University, 2014

BS, Liberty University, 2012

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

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## Abstract

Postpartum hemorrhage (PPH) remains a major traumatic event that can occur after delivery. All expectant women are considered to be at risk of PPH and its effects. PPH is a preventable condition and primary interventions including active management of the 3rd stage of labor, use of uterotonics, and uterine massage. Analysis of the project site showed that PPH affected approximately 15% of all deliveries that occurred between 2014 and 2015. The overarching aim of the project was to determine how a nursing-focused educational intervention would affect staff nurse knowledge regarding PPH to decrease the incidence rate. The goal of the project was to develop an educational module for obstetric and postpartum nurses about prevention and management of PPH, decrease the PPH incidence rate from 15% to 10%, and evaluate the obstetric and postpartum nurses' attitudes toward the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) guideline used to decrease the risk of PPH. Bandura's social learning and self-efficacy theories were used to guide the development and implementation of the educational intervention. A paired *t* test was used to analyze the differences in the staff nurses' knowledge of PPH before and after the educational intervention. The group's mean score preintervention was 53.65% and 90% postintervention, representing a 36.35% increase in the knowledge scores. The PPH rate decreased from 15% to 0% after implementation of the project. Social change will occur through a better understanding of the physiology of PPH and the positive adaptation of the use of AWHONN guidelines in managing PPH as such, may decrease mortality.

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## Dedication

This project is dedicated to my darling husband, Noel Medoh, my lovely children, Rosemary, Ugo Noel junior, and Uche, my grandchildren, Angel and Victor, and my siblings, Harrison and Jennifer. Who without their love, encouragement, and support, reaching my goal would not have been possible. I will not forget to remember my late parents Mr. and Mrs. Mabel Gabriel. Although you departed when I was very young, your memory remained in me.

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## Table of Contents

List of Tables .....	v
List of Figures .....	vi
Section 1: Nature of the Project .....	1
Introduction.....	1
Background/Context .....	3
Problem Statement .....	6
Purpose Statement.....	7
Project Objectives .....	7
Project Question.....	8
Evidence-Based Significance of the Project .....	8
Reduction of Gaps.....	10
Implications for Social Change in Practice.....	12
Definition of Terms.....	14
Assumptions and Limitations .....	15
Project Assumptions.....	15
Project Limitations.....	16
Summary .....	16
Section 2: Review of Literature and Theoretical/Conceptual Framework .....	18
Introduction.....	18
Search Strategy .....	18
Specific Literature.....	19



Postpartum Hemorrhage .....	19
Management of Labor.....	22
Teamwork.....	24
Communication.....	25
General Literature .....	28
Communication.....	28
Teamwork .....	29
Conceptual Models/Theoretical Frameworks .....	31
Summary.....	33
Section 3: Methodology.....	34
Introduction.....	34
Project Design/Methods.....	34
Population and Sampling .....	35
Data Collection.....	35
Instrumentation .....	38
Pre-and Posttests .....	38
Educational Component .....	38
Perception of PPH Educational Program .....	39
AWHONN Guidelines .....	39
Protection of Human Subjects .....	40
Data Analysis .....	40
Project Evaluation Plan.....	41

Summary .....	42
Section 4: Findings, Discussion, and Implications .....	43
Introduction.....	43
Summary and Evaluation of the Findings.....	43
Characteristics of the Participants.....	44
Project Objective 1.....	46
Project Objective 2.....	48
Project Objective 3.....	49
Discussion of Findings in the Context of Literature.....	50
Implications.....	53
Policy.....	53
Practice.....	54
Research.....	55
Social Change .....	55
Project Strengths and Limitations.....	57
Strengths.....	57
Limitations.....	58
Recommendations for Remediation of Limitations in Future Work.....	58
Analysis of Self.....	58
As Scholar.....	59
As Practitioner.....	61
As Project Developer.....	62

Future Professional Development.....	63
Summary.....	64
Section 5: Scholarly Product.....	65
Poster Presentation.....	65
References.....	66
Appendix A: AWHONN Guidelines.....	86
Appendix B: Demographic Form.....	87
Appendix C: Pretests/Posttests Multiple Choice Questions.....	88
Appendix D: Questionnaire to Determine Respondents' Perceptions' of PPH	
Educational Program.....	92
Appendix E: PPH PowerPoint Educational Module.....	94
Appendix F: Project Site Approval.....	95

## List of Tables

Table 1. Participants' Demographic Characteristics.....	45
Table 2. Paired Sample Test Results.....	48
Table 3. Attitude of Obstetric and Postpartum Nurses Regarding PPH Guidelines .....	50

List of Figures

Figure 1. Knowledge test mean scores.....47

## Section 1: Nature of the Project

### **Introduction**

Postpartum maternal morbidity is one of the most common unexpected outcomes of childbirth. The anticipated outcome is that the baby and the mother are discharged from the delivery unit without any obstetric complications. Nevertheless, the World Health Organization (WHO), United Nations (UN), United Nations International Children Fund, United Nations Population Fund, and World Bank Group estimate that about 303, 000 maternal deaths took place in the year 2015 with developing world accounting for 99% of the global maternal deaths (WHO, UNICEF, UNFPA, World Bank and the United Nations Population Division, 2015). Postpartum hemorrhage (PPH) is the leading cause of maternal death, both in developed and developing countries and accounts for approximately 30% of all global maternal deaths (Mathai, Gülmezoglu, & Hill, 2007). The goal of the project was to develop an educational module for obstetric and postpartum nurses about prevention and management of PPH, as well as decrease the PPH incidence rate from 15% to 10% at the project site.

Although maternal mortality rates have been declining at a steady rate in developed countries, postpartum bleeding remains one of the main causes of maternal mortality and morbidity in the United States. Statistics available on the public domain suggest that approximately 8% of maternal deaths in the United States are caused by PPH (Bingham, & Jones, 2012). The direct pregnancy related maternal death rate is approximately 7 to 10 women per 100,000 live births (Callaghan, Kuklina, & Berg,

2010). Globally, PPH affects approximately 5% of all deliveries and more than 50% of PPH related deaths are preventable (Leduc et al., 2009; WHO, 2012).

Most countries located in the sub-Saharan Africa and Southern Asia have maternal mortality rate of more than 1,000 women per 100,000 live births. The latest report by the American College of Obstetricians and Gynecologists (2013) estimates that one woman dies every 4 minutes while giving birth. Most of the PPH related deaths take place within 4 hours following delivery, indicating that they are a result of inadequate management of the third stage of labor. Nonfatal excessive bleeding can lead to further complications such as anemia and pituitary infarction, conditions linked to poor lactation, and organ damage due to hypotension and shock (Leduc et al., 2009).

PPH is an obstetrical emergency that takes place following cesarean or vaginal delivery. Prevention can be achieved through timely diagnosis, provision of essential resources and equipment, and correct management of the third stage of labor. PPH can be classified into two categories: primary and secondary PPH. Primary PPH (early PPH) takes place within the first 24 hours following delivery, whereas secondary or delayed PPH transpires after 24 hours to 12 weeks following delivery (Belfort, 2013).

PPH can also be described as the loss of  $\geq 500$  ml following vaginal delivery or  $\geq 1,000$  ml following caesarean delivery (AWHONN, 2015). The definition has been problematic in primary care settings, with reports indicating that obstetric physicians are likely to underestimate the amount of blood lost (Calvert et al., 2012). Although the aforementioned descriptions of PPH are in line with the WHO guidelines for PPH, it is important to highlight that PPH refers to not only the blood loss, but also related signs

and symptoms such as hypovolemia signs (low oxygen saturation, oliguria, tachycardia, and hypotension).

PPH has numerous potential causes, but the most common cause is uterine atony, accounting for approximately 80% of all maternal deaths (Belfort, 2013). As highlighted earlier, PPH is one of the most preventable causes of maternal morbidity and mortality. The high prevalence rates, particularly in the developing world, suggest the need for evidence-based practices in management and prevention of PPH. It is important for health care practitioners, particularly the obstetric nurses, to be equipped with the right knowledge and skills to meet patient needs. Oladapo et al. (2009) found inadequate implementation of the guideline recommendations for labor management in the nursing profession, suggesting disconnecting between the recommended and the actual practice. Adoption and implementation of guideline recommendations for PPH prevention and management can result in declined PPH rates.

### **Background/Context**

PPH can be categorized as an abnormality of uterine atony, retained placental or genital tract lacerations (Belfort, 2013). Factors' contributing to PPH includes lack of fundal massage to prevent uterine atony, which can lead to hemorrhages and delayed administration of Pitocin immediately after delivery. At the Project site, there were also difficulties with the staffing assignments in that the nursing staff ratio to the number of patients was high. For instance, one nurse was assigned to two women in active labor without complications, and one to was assigned to two to three women in obstetric triage.



One nurse ratio was to care for four couplets on postpartum unit and one to three women with antepartum complications in stable condition.

The project site employed new nurses with no previous labor and delivery experience. The nurses had an orientation of 12 weeks before being placed on the unit and were expected to carry a full patient assignment. Eight weeks of orientation for nurses with Medical-Surgical experience, and ongoing in-service, was done for all newly hired labor and delivery nurses up to 6 months. Immediately after orientation, the newly hired labor and delivery nurses were expected to care for high-risk obstetrical patients using the related equipment. Labor and delivery nurses must be knowledgeable regarding early recognition of signs and symptoms, prevention, and management of PPH, including the knowledge and skill development of visual estimation of blood loss (Ruth & Kennedy, 2011).

There are nursing responsibilities that can significantly reduce the incidence of PPH; however, these duties were not carried out appropriately at the project site labor units. For example, routine inspection of the vagina and perineum to identify a genital laceration is essential because a sphincter laceration may go unnoticed by the obstetrician and may lead to PPH. Observation should include monitoring blood pressure and pulse, fundal tone and position, and vaginal blood loss every 15 minutes (Leduc et al., 2009). Blood loss is typically assessed by weighing all perineal pads hourly and evaluating the lochia for clotting. The labor and delivery nurses claimed they are performing these important roles; however, their actions have been insufficient in preventing PPH.

Smith (2014) stated that fundal massage following childbirth helps in preventing PPH by keeping the uterus contracted. The labor and delivery nurses should massage the fundus immediately after delivery and every 15 minutes for the next 2 hours. Because of the high patient-to-nurse staffing ratios, the nurses were not able to be at the postpartum woman's bedside frequently. A related factor that contributed to the increased rate of PPH was the fact that Pitocin was not given immediately after delivery to stimulate uterine contractions and minimize the risk of bleeding after delivery. Intravenous administration of Pitocin to stimulate uterine contraction after childbirth is the standard of care for the prevention of PPH (Woiski et al., 2015). The labor and delivery nurses at the hospital complained that their high workload prevented them from accomplishing all their nursing responsibilities related to care of the postpartum woman.

As mentioned previously, there were also problems with the nurse-to-patient ratios in the postpartum area. It was not uncommon for one nurse to be assigned to three laboring patients who are at the same stage of dilatation. When the women delivered within the same timeframe, it was difficult to provide consistent postpartum care to each of the women. The Association of Women's Health, Obstetric and Neonatal Nurses' (AWHONN's) 2010 staffing guidelines recommend one nurse be assigned to care for one postpartum woman immediately after birth to help her recover (AWHONN, 2010). A staffing ratio of one nurse to one postpartum woman should continue for 2 hours or longer if complications such as PPH are encountered (Backer & Hunter, 2013). The current staffing pattern at the project site was that one nurse was assigned to three postpartum women.

### **Problem Statement**

According to AWHONN (2010), two to three deliveries in the United States lead to death of the woman due to obstetric complications. African-American women are three to four times more likely to die during delivery compared with women of other races. Moreover, every 10 minutes a woman in the delivery room almost dies due to obstetric complications, with an estimated 2.9% of women giving birth in the United States experiencing excessive bleeding. In other words, approximately 125,000 women giving birth in the United States are affected by PPH on annual basis (AWHONN, 2010). In the past two years, the rate of PPH in the United States has increased by 26% and is one of the nations where maternal mortality rates have been increasing (Callaghan, Kuklina, & Berg, 2010). Between 2014 and 2015, approximately 15% of all deliveries at the labor and delivery unit at project site resulted in PPH.

A possible explanation for the incidence of PPH is the lack of educational interventions targeting obstetric staffs on PPH signs, prevention, and management. Ruth and Kennedy (2011) asserted that PPH is a life-threatening problem that requires skills and understanding to recognize a change in the patient's condition. Labor and delivery nurses continuously miscalculate blood loss after delivery, which could lead to delay in providing care during PPH (Leduc et al., 2009). The lack of a clear description of symptoms and rapid communication to the physician can delay timely diagnosis and appropriate intervention. Therefore, successfully treating postpartum women with PPH depends on the early recognition of blood loss and the clinical symptoms.

### **Purpose Statement**

The purpose of the project was to develop an educational program to educate labor and delivery and postpartum nurses to detect and manage PPH. The program reviewed prevention strategies, signs and symptoms, and nursing management of PPH. Postpartum nurses were taught to provide care and used treatment standard according to the hospital developed protocols and procedures that described early warning signs of a change or deterioration in a patient's condition. These nurses were given education specific as to when further evaluation of postpartum woman was required, and when to obtain assistance from obstetricians (The Joint Commission, 2010). The nurses were instructed as to what information should be given to educate patient and family on how to seek support for signs of a PPH. It was expected by the project leader that improved knowledge and skills lead to a decline in PPH incidence consequently reducing maternal morbidity.

### **Project Objectives**

The overarching aim of this evidence-based project was to develop an educational module for teaching obstetric nurses about prevention, early identification, and management of PPH. The second objective was to decrease PPH incidence rate from 15% to 10% at the project site. Both the labor and postpartum nurses participated in PPH drills, which prepared them to respond to situations involving PPH. Simulation-based training was an appropriate proactive approach used to reduce errors and risk in obstetrics, and improve teamwork and communication, while giving the nurses various transferable skills to improve their performance (Singh & Nandi, 2012). During the

hemorrhage drill, a simulated PPH scenario was conducted by the project leader to identify important deficiencies in the labor and delivery and postpartum nurses' understanding and performance, with no risk to patients. The third objective was assessing the obstetric nurses' attitude toward guideline use in the prevention and management of PPH on implementation of the educational intervention.

### **Project Question**

Given the objectives of the project, I developed the following question: How will a nursing focused PPH prevention and management educational program affect the PPH rate at project site? I used the PICOT (Population, Intervention, Comparison, Outcome and Time) format in developing the project question. The population of interest was the nurses working in the labor and delivery units, while the intervention of interest was the educational program. The participants completed a test at the beginning and at the end of the program, and the performance before and after the implementation of the intervention was compared to determine if there was improved knowledge. The outcome of interest was an improvement in knowledge and skills, and a reduction in PPH incidence rate. The evidence-based project was implemented within 1-month duration.

### **Evidence-Based Significance of the Project**

PPH is the leading cause of maternal mortality and morbidity. PPH occurs in approximately 4% of all vaginal deliveries and is responsible for more than 25% of all the maternal delivery death (WHO, 2012). At the project site, 2% of postpartum women experienced PPH in December 2015. Approximately 54% to 70% of the PPH associated

mortality occurrences are preventable and obstetric mistakes are the main factor contributing to PPH associated death (Della-Torre et al., 2011).

Andreatta, Gans-Larty, Debpuur, Ofosu, and Perosky (2011) found that an immediate assessment and initiation of treatment for women experiencing PPH was associated with an 85% decrease in complication. The researchers evaluated the effect of simulation based training on the capability of obstetric nurses in performing bimanual compression in PPH management. The simulation-based training involved three skilled and 14 nonskilled obstetric nurses, and there was improvement in bimanual uterine compression skills, though not statistically significant. The researchers concluded that early identification of bleeding and timely treatment of the underlying cause of the hemorrhage by labor and delivery nurses is essential to improving maternal outcomes. The goal of developing this project was to increase obstetrics and postpartum nurses' knowledge in recognizing and managing PPH promptly. Recognizing the risk during labor can decrease PPH and improve the patient outcome.

According to California Department of Public Health (2011), the 2002-2003 pregnancy-related mortality review report stated that 70% of the obstetric hemorrhage-related deaths had a stronger or better chance of being prevented. In 2008, 1 year after the mortality reviews began, the California Maternal Quality Care Collaborative performed a baseline survey of hemorrhage practices in California hospitals to serve as an addition to the mortality evaluation data (Bingham, & Jones, 2012). Of the 173 hospitals that participated, 40% reported that they did not have any hemorrhage protocol, and 70% reported that they did not perform drills, and if they did run drills, the obstetricians did

not regularly engage in the drills. Using a quality improvement approach based on the best available evidence, a plan could be developed to include gathering PPH data and evaluating the effectiveness of the plan based on process and outcome of information. Developing effective team effort, quality improvement initiatives, and implementation in recognizing imminent PPH and prompt intervention is important to decrease PPH associated injuries and deaths (Bingham & Jones, 2012).

### **Reduction of Gaps**

PPH is one of the most common obstetric maternal complications and is among the three most common etiologies of maternal death globally. Its incidence is increasing and it affects 1% to 5% of all the deliveries (Bingham & Jones, 2012). Atony, the main cause of PPH, is responsible for approximately 80% of PPH.

The World Health Organization (WHO) currently recognizes the associated risk factor with PPH as increasing maternal age, fetal macrosomia, primiparity, multiple gestations, previous Caesarean section, prolonged labor, fibroids, and episiotomy. However, many women present with these risk factors and do not develop a PPH. Therefore, the recommended practice is that women should benefit from active management of the third stage of labor, the only intervention known to prevent PPH (Kongnguy, Mlava, & Broek, 2009). The gaps consist of labor and delivery nurses not massaging the fundus properly to prevent uterine atony, which can lead to blood loss. Second, the obstetricians prolonged induction of labor longer than 2 days. Third, there was a delay in the administration of Pitocin to the patient immediately after child birth for uterine contraction.

Guidelines for the Active Management of the Third Stage of Labor (AMTSL) recommend administration of uterotonic agents, mostly oxytocin, within 1 minute after delivery of a baby; controlled cord traction to remove the placenta; and fundal massage following delivery of the placenta, with palpation of the uterus after every 15 minutes to evaluate the need for continued massage for the 2-hour period following delivery of placenta. Oxytocin is commonly administered intravenously to stimulate contraction of the uterus and to reduce the risk of bleeding following delivery (WHO, 2012). Empirical evidence indicates that AMSTL reduces the risk of PPH by approximately 66% United States Agency for International Development (USAID, 2015). Factors leading to PPH include inadequate knowledge regarding the management of the third stage of labor and low levels of experience among the newly hired obstetric and postpartum nurses. Moreover, there was inadequate adherence to the recommended PPH prevention practices, including immediate administration of correct oxytocin dosage following delivery.

Close surveillance of the uterine tonus has been recommended for all patients in the delivery room for timely detection of postpartum uterine atony (WHO, 2014). The hospital recently employed new obstetric and postpartum nurses with little labor management and delivery skills who were orientated for 8 to 12 weeks. The nurses had expressed concerns in taking care of high risk obstetric patients, especially given the high patient to nurse ratios. The recommendations from AWHONN (2015) noted that each obstetric and postpartum nurse should not be responsible for more than one woman during the first hours postpartum. Currently, each nurse attends to three postpartum



women, despite having little experience in taking care of a postpartum patient. The educational intervention for PPH prevention and management increased the nurses' knowledge on symptoms, signs, and risk factors associated with PPH, and they were able to adhere to the AWHONN recommendations for PPH prevention and management.

### **Implications for Social Change in Practice**

Providing a comprehensive educational program related to decreased PPH at the project site assisted obstetric and postpartum nurses in reinforcing their knowledge about PPH prevention and management. Moreover, the program assisted in improving their teamwork and communication skills. Empirical research on PPH prevention and management indicates that teamwork and effective communication affect the quality of care provided to obstetric patients. Cornthwaite, Edwards, and Siassakos (2013) claimed that positive patient outcomes in the delivery room depend on the extent to which teamwork and effective communication skills are employed and sustained by each team member.

Likewise, Leonard, Graham, and Bonacum, (2004) found that approximately 70% of patient injuries in the health care sector were associated with inadequate communication and teamwork. To demonstrate the severity of these incidences, approximately 75% of patients' deaths were attributed to inadequate teamwork and communication amongst staff (Leonard et al., 2004). Effective communication and teamwork are imperative in hospital units to improve patient outcomes (Leonard et al., 2004).

The project emphasized effective communication and teamwork skills. To be specific, the project leader emphasized closed loop communication, rather than open

loop, in the management of both anticipated and unanticipated PPH. All the obstetric and postpartum nurses were encouraged to immediately call for assistance in the event of a clinical complication, including PPH, irrespective of their position in the unit. The project also promoted the use of standardized language and the role of each nurse be made clear in case of an anticipated or unanticipated PPH, as well as during PPH drills. Closed-loop communication ensured effective communication in the delivery unit by providing clear, concise, and precise information on what should be done to avoid misunderstandings (Madden, Sinclair, & Wright, 2011).

Closed-loop communication and team work in prevention and management of PPH have been endorsed by key authorities in the nursing sector. Cornthwaite, Edwards, and Siassakos (2013) found that inexperienced nurses can have differing perceptions and opinions on what should be done in case of an emergency. Effective teamwork and communication ensure that each team member has a common mental model and that there is increased capability of providing and monitoring the right intervention (Madden et al., 2011). Effective communication and team work lead to positive social change in the organization by creating a well understood and organized plan for PPH prevention and management, and facilitating reduction of foreseeable errors to improve postpartum care.

Likewise, promoting a culture of safety and employing transformative leadership skills encourages each team member to speak up in case of safety concerns. Leonard et al. (2004) asserted that power distance or hierarchy of power in the health care sector can inhibit some health care providers, particularly inexperienced nurses from speaking up

about safety concerns. The project leader employed transformative leadership skills to flatten the hierarchy and made it easy for the newly recruited nurses to speak up about safety concerns to reduce unnecessary PPH risks. The approach has been supported by Cornthwaite et al. (2013), who claimed that authoritarian leadership style creates unnecessary medical risks by preventing junior staff from speaking up, leading to undesirable patient outcomes.

The project also promoted positive social change by encouraging trained nurses to transfer the skills and the knowledge acquired to their colleagues within the unit with substantial assistance from the project developer. Moreover, the obstetric and postpartum nurses were encouraged to provide patient-centered care and educate patients on how to recognize PPH symptoms and risk factors, and how to seek PPH care. The improved knowledge lead to a reduction of PPH rates and improved patient education on how to seek support for PPH.

### **Definition of Terms**

Understanding the concepts of this project requires the following definitions of terms:

*Fundal massage*: A technique used to manipulate the uterus after delivery of the fetus and placenta through the abdominal wall to stimulate the uterus to contract (Hofmeyr, Abdel-Aleem, & Abdel-Aleem, 2013).

*Health belief model (HBM)*: The model that provides explanation and prediction of health behaviors (HBM, 2012).

*Hemodynamic instability*: Unstable blood pressure as in hypotension due to PPH (Tharpe, Farley, & Jordan, 2013).

*Hysterectomy*: The surgical removal of the uterus (Anderson, 2007).

*Placenta*: An organ that allows the fetus to absorb nutrients and oxygen from the mother (Schuiling & Likis, 2013).

*Postpartum hemorrhage (PPH)*: A condition in which a woman evidences loss of blood of 500 ml or more within the first 24 hours after delivery (AWHONN, 2015).

*Prolonged labor*: Labor lasting 20 hours or more in primigravida or more than 14 hours in multipara (Schuiling & Likis, 2013).

*Uterine atony*: A loss of tone in the uterine musculature causing PPH (Schuiling & Likis, 2013).

*Uterine tapenade*: The use of balloons inserted into uterus and inflated to mollify or block refractory hemorrhaging (Schuiling & Likis, 2013).

## **Assumptions and Limitations**

### **Project Assumptions**

My assumptions included educating labor and delivery and postpartum nurses on the importance of recognizing the signs and symptoms of PPH, with prompt intervention to help prevent its occurrence. My second assumption was that after providing labor and delivery nurses with training and education, they competently massaged the fundus every 15 minutes for the next 2 hours after delivery. My third assumption was that the nurses used the information learned to provide care during PPH incidence. My fourth assumption was that the nurses' workload allowed them to fully take clinical

responsibility for each postpartum patient in a timely manner. My fifth assumption was that the obstetric nurses were able to initiate Pitocin intravenous administration to provide fundal contraction and help prevent PPH (Atukunda et al., 2014).

### **Project Limitations**

I have identified several limitations of this project. One limitation was that the obstetrical and postpartum nurses were not mandated to acquire continuing training. However, inexperienced nurses are inspired to acquire training and education in the care of women at risk for PPH. A second limitation was the nurses' resistance to change, such that not all nurses followed the practices recommended by the project initiative, which could have led to undesirable outcomes. A third limitation was related to time and availability of resources, because there were no educators who provided the educational intervention necessary to manage PPH.

### **Summary**

In Section 1, I discussed the context of the problem in with regard to PPH at the project site. Approximately 15% of all deliveries result in a PPH in the postpartum unit at the project site, because most of these patients have history of substance abuse, multiple gestations, and history of fibroids and multiparty. As a result, the project site obstetric nurses were provided with education program on PPH prevention and management. The goal of the developed QI project was to increase the obstetrical and postpartum nurses' knowledge on recognizing and managing PPH promptly. Educating perinatal nurses on identification of PPH risk factors, signs, and prevention, and conducting regular postpartum drills, helped improved obstetrical outcomes. The educational intervention

has positively affected social change in the project site by promoting team work and improving PPH awareness among labor and delivery and postpartum nurses.

## Section 2: Review of Literature and Theoretical/Conceptual Framework

### **Introduction**

My aim in this literature review is to provide an overview of the evidence and support needed by discussing evidence-based practice and guidelines used for the management of PPH. Furthermore, a literature review in a project provides context, confirms the need for new research, and demonstrates the writer's ownership of the literature (Polit & Beck, 2012). As I indicated in the previous section, PPH is one of the most common traumatic events that can occur after delivery. As a result, the overriding aim of the practice initiative was to develop an educational intervention to instruct obstetric and postpartum nurses on how to detect, prevent, and manage PPH at the project site. My purpose in Section 2 is to review both general and specific literature on the identification, prevention, and management of PPH. In addition, I present the theoretical framework that I used in the development of this project.

### **Search Strategy**

In my literature search, I focused on reading, processing, analyzing, synthesizing, and summarizing information to efficiently determine the relevance of the literature materials reviewed (Polit & Beck, 2012). The databases that I searched included CINAHL, Cochrane Library, PubMed, Google Scholar, and Medline. Within these databases, I searched the following key words: *PPH* or *PPH*, *postpartum management*, *treatment*, *prevention*, *risk factors*, *complications*, *PPH education*, *timing of cord clamping*, *evaluation of blood loss*, *hemostasis algorithms*, *communication*, and *teamwork*. The search was limited to the English language and full-text articles published

between 2006 and 2016. A total of 25 journal articles were identified through the literature search process and 20 of these articles were used to discuss PPH prevention, management, and risk factors.

### **Specific Literature**

Leduc et al. (2009) analyzed PPH-specific clinical aspects to offer guidelines that could support the obstetric and postpartum nurses in the detection and management of PPH. In this regard, the study team has rated the evidence quality with the usage norms mentioned by the Canadian Task Force on Preventive Health Care (Leduc et al., 2009). The avoidance of PPH involves active management of the third stage of labor (AMTSL) practices to reduce the risk of PPH. In addition, administration of a 10 IU dose of oxytocin intramuscularly was recommended to avoid PPH in vaginal deliveries suspected to be at low-risk. Oxytocin should be administered following the delivery of the anterior shoulder. Subsections developed to discuss the literature include PPH, management of labor, importance of teamwork, and communication.

### **Postpartum Hemorrhage**

PPH is an obstetrical emergency that occurs following cesarean or vaginal delivery. PPH one of the main causes of maternal morbidity and mortality in both low and high-income countries, though the absolute mortality risk is significantly lower in the high-income countries (Mousa, & Alfirevic, 2015).

Mehrabadi et al. (2012) found that the PPH incidence rate had increased by 27% between 2000 and 2009 in a Canadian population of postpartum women who delivered between 2000 and 2009. The increase was attributed to atony of the uterus necessitating



108 women undergoing hysterectomies. The data on PPH rates were retrospectively obtained from the British Columbia Perinatal Data Registry, a database that contains information for approximately 99% of all deliveries in the province. The findings from the study suggest that uterine atony is a major cause of PPH, and knowledge about the etiology of PPH is essential in my evidence-based project. However, the study had inherent methodological limitations. The study collected data from a large perinatal data registry that could have some transcription and coding errors. Another limitation relates to PPH diagnosis, because estimation of the blood loss during delivery was not standardized within the study period.

According to Mousa and Alfirevic (2015), uterine atony is the most common cause of PPH. Placental fragments or retained placental tissue may lead to uterine atony. Trauma to the birth canal can also contribute to excessive bleeding due to lacerations. Kasap et al. (2016) also reported that the incidence rate of PPH was 2%, of which the main etiology was uterine atony (50%), followed by placental previa (22%), vaginal lacerations (19%), and coagulation disorders (5%). Kasap et al. (2016) indicated that uterine atony is the main cause of PPH thus primary interventions for PPH management should be aimed at sustaining a contracted uterus postpartum. The study design was a retrospective descriptive case series; thus, it was not possible to assess a temporal relationship (Mousa and Alfirevic, 2015). Kasap et al. (2016) supports the project by providing evidence about the most common causes of PPH and how they can be managed or prevented.

Similarly, Callaghan et al. (2010) reported that the prevalence of PPH has been increasing at an alarming rate in the United States (U.S). Between 1994 and 2006, the incidence of PPH increased by 26% which was attributed to uterine atony. Upon conducting multivariable logistic regressions, the researchers found that the increase in PPH incidence rate within the study period could not be attributed to changes in types of delivery, multiple births, age or chronic illnesses such as diabetes and cardiovascular disease. The study was limited using different definitions and methods to determine PPH rates. The study did not have a uniform definition of clinically meaningful PPH and different tools for estimation of blood loss were used suggesting that the prevalence rate may have been underestimated. The prevalence of PPH at the project site during 2014/2015 was 15%, a rate that higher than the national average, thus suggesting a strong need for an intervention to address the phenomenon.

A population based study by Sheiner et al. (2005) reported that placenta remains, failure of the woman to progress in the second stage of labor, placenta accrete, birth canal lacerations, instrumental delivery, gestational age newborn weighing greater than 4000 grams, hypertensive disorders of pregnancy, and intensification of labor using oxytocin as the main risk factors for PPH. The population study involved 154, 311 women who delivered at a tertiary health care facility. In addition, the study had adequate controls of PPH following delivery, thus there was less likelihood for underestimation of the blood volume lost or misdiagnosis of PPH. However, the study had an inherent limitation of using a retrospective design. Thus, there is a possibility of missed data and loss of control over significant variables. Failure to progress during the second stage, vacuum extraction

and hypertensive disorders were identified as the main risk factors for severe PPH thus special attention should be given to women presenting the risk factors following delivery to reduce PPH incidence rate at the study site.

Cohain (2012) compared the PPH management practices at two hospitals located in a rural setting. The researcher reported that the hospital providing educational materials to obstetric staff regarding PPH diagnoses, prevention and management responded correctly to PPH 78% more times to PPH as compared to the other hospital. The findings suggest that an educational intervention is needed for reduction of PPH incidence rates. The study explored the effectiveness of an educational interventional in two rural hospitals, thus applicability of the findings may be limited to rural or underserved areas. The literature review supports that educational interventions have a positive effect in improving PPH management practices in hospital settings.

Similarly, Thompson, Brown, and Treanor (2010) reported that an educational program describing the risk factors, diagnoses, symptoms, appropriate interventions and case scenarios for PPH was effective in reducing the incidence of PPH. Following the development and implementation of the educational intervention, the obstetric staff felt empowered and could handle PPH emergencies more effectively. The findings suggest that an educational intervention is a potential solution to PPH and results in improved patient safety in maternity units.

### **Management of Labor**

According to the WHO (2012), PPH is commonly treated through the administration of uterotonic drugs, fundal massage and active management of the third

stage of labor. Belfort (2013) notes that timely fundal massage by obstetric nurses is effective in reducing complications associated with PPH. Leduc et al. (2009) analyzed the specific clinical aspects related to PPH to offer guidelines that could support obstetric and postpartum nurses in the detection and management of PPH. The study team rated the quality of evidence with the usage norm (meaning acceptable standards) mentioned by the Canadian Task Force on Preventive Health Care (Leduc et al., 2009). It was found that a decrease in the incidence of PPH involved active management of the third stage of labor (AMTSL) practices. In addition, administration of Pitocin was recommended to avoid PPH in vaginal deliveries suspected to be at low-risk for hemorrhage. The study provides evidence based practices for prevention and management of PPH, which are essential for reduction of PPH incidence rate through the proposed DNP project. Delayed administration of Pitocin was one of the main factors contributing to increased rate of PPH at the project site labor unit.

A systematic review found that PPH was associated with signs of hypovolemia and a quick response to blood loss by the obstetric staff was effective in reducing the complications (Pacagnella et al., 2013). The systematic review involved 30 studies presenting data on clinical signs and triggers in the management of postpartum bleeding. Most of the studies (87%) were carried out in the U.S and none of the study was carried out in the developing world. However, the findings from the review should be interpreted cautiously; 70% of the studies included did not provide adequate details on the health status of the patients, nor was the inclusion criteria clearly stated. Moreover, 63% of the studies included did not provide details regarding the techniques used in PPH assessment.

The study findings are consistent with the idea that quick response by skilled obstetric staff is essential in reducing PPH incidence rate.

Montufar-Rueda (2013) found that 70% of PPH were caused by atony of the uterus. Out of 281 deliveries involving severe PPH, there were 8 maternal deaths (3.6%) and this was associated with inadequate skills and knowledge pertaining to transfusion therapy. All women who died during delivery had experienced inadequate management of PPH, with 80% of these women experiencing poor management in fluid resuscitation and transfusion of blood products. The study was carried out in more than one clinical center improving the statistical power and the strengths of the results obtained. The findings suggest that early diagnoses of PPH and adequate PPH management skills are essential for reduction of the maternal morbidity and mortality associated with PPH. Therefore, it is essential for obstetric staff to be aware of the various etiologies and risk factors for PPH, and have adequate knowledge and expertise to respond to and contain PPH emergencies.

### **Teamwork**

In the delivery rooms, simulation based training should involve all health care providers taking care of the mother and her child. The team can be large and intricate depending on the nature of simulated events, and can involve a wide range of health care providers (certified midwives, nurses and clinicians) from various specialists such as pediatrics, anesthesia, and obstetrics. Empirical evidence indicates that simulation based training leads to improved patient outcomes, which consequently raises the morale of obstetric and other nurses providing care to the mother and her newborn. A retrospective

cohort study carried out in a large tertiary maternity unit in the UK by Siassakos et al. (2009) reported that following simulation team based training, there was significant improvements in management of cord relapse due to improved adherence to recommended guidelines. The limitations of the study were purely methodological; the study relied on past data thus the validity of the results might have been lowered by the availability and accuracy of the data available. The study provides evidence that SBT leads to improved clinical outcomes, thus supporting the development of SBT training program at the project site to manage PPH.

Andreatta et al. (2011), found that an immediate assessment and initiation of treatment for women experiencing PPH was associated with an 85% decrease in PPH. The researchers evaluated the effect of simulation based training on the capability of obstetric nurses in performing bimanual compression in PPH management. It was concluded that early identification of bleeding and timely treatment of the underlying cause of the hemorrhage by labor and delivery nurses is essential to improving maternal outcomes. The goal of developing the DNP scholarly project was to increase delivery and postpartum nurses' skills and knowledge on recognizing and managing PPH promptly. Recognizing the risks during labor can decrease PPH and improve patient outcomes.

### **Communication**

There should be clear and timely communication in the labor and delivery wards among team members. The Situation, Background, Assessment and Recommendation (SBAR) is an example of a communication strategy that may be used in delivery rooms to manage PPH. The technique can be introduced to obstetric nurses through simulation

based training. The nurses can be debriefed about the communication technique until they feel comfortable while using the highly standardized and effective technique (Dadiz et al., 2013). Poor communication in the obstetric departments has been associated with debilitating perinatal events resulting in increased morbidity and mortality (Dadiz et al., 2013). Dadiz et al. (2013) explored the effectiveness of an interdisciplinary simulation based training (SBT) program in improving communication in the delivery room. Both pediatric and obstetric teams (n=228) took part in the research which was carried out in a three-year period. The simulations were videotaped and assessed using a validated 20-item checklist of effective communications practices. The scores at the beginning of the project were compared with checklist scores at the end of the project. The analysis showed improvements in effective communication skills of obstetric nurses during the actual deliveries ( $P < 0.005$ ). The findings support the development of SBT program to improve communication skills among obstetric staff. Effective communication in the delivery room may mitigate complications associated with PPH leading to improved patient outcomes.

Other types of communication tools that can be used in delivery and labor unit to manage or prevent PPH include closed-loop communication, the check backs and call outs. Closed loop communication ensures that there is effective communication in the delivery room by providing clear, concise and precise information. Effective communication is achieved by repeating the information heard to avoid any form of misunderstandings. A check-back is a closed-loop communication strategy which involves the used to verify and validate information. The team used check-back to verify

that they received care instructions and confirm the understanding of symptoms to manage during PPH. A call-out is an approach used to communicate a life-threatening situation during an emergent incident. Calling out in these situations enabled the team to anticipate and prepare for important proceedings during PPH. One important aspect of a call-out is designating the information to a particular staff.

Closed loop communication and teamwork in prevention and management of PPH have been endorsed by key authorities in the nursing sector. Phipps et al. (2012) note that inexperienced nurses can have differing perceptions and opinions on what should be done in case of PPH, and effective teamwork and communication ensures that each team member has a common mental model of a situation and facilitates flow of information. The researchers explored the effectiveness of SBT in improving patient outcomes as well as communication in obstetric units, and there were improvements (from 57% to 72%) in dimensions of communication after the implementation of SBT. However, the post-SBT staff response rate was lower compared to the pre-SBT evaluation, and this might have impacted on the findings reported. Ineffective communication was one of the problems facing the project site obstetric unit, and the findings reported by Phipps et al. (2012) support introduction of SBT program to improve communication in obstetric units.

Weaver, Dy, and Rosen (2014) evaluated the effectiveness of team based training in acute care settings. The systematic review involved 26 studies investigating the effectiveness of team training in different contexts. The outcomes of interest included teamwork behaviors, knowledge, quality indices and patient outcomes. Half of the studies included reported statistically significant changes in teamwork behaviors, including



communication. Moreover, ten studies included in the review found significant effects in clinical care processes which led to improved patient outcomes such as reduced morbidity, and mortality. The main limitation of the review is that most of the studies included had limited sample size, and weak study designs lowering the quality of the evidence presented. The systematic review supports that effective team-training interventions offer positive effects on patient outcomes.

### **General literature**

#### **Communication**

Empirical research on PPH management indicates that teamwork and effective communication have an impact on the quality of care provided to obstetric patients. Leonard et al. (2004) found that about 70% of patient injuries in the health care sector were associated with inadequate communication and teamwork. To demonstrate the severity of these incidences, about 75% patients' deaths were attributed to inadequate teamwork and communication. The findings indicate that effective communication and team work are imperative in hospital units for improved patient outcomes.

According to Deering, Auguste, and Lockrow (2013), there should be a clear and effective communication process in labor and delivery rooms, and the role of each obstetric personnel should be made clear. Daniels et al. (2012) recommends that obstetric nurses should be trained in principles of shared decision making through effective communication and team work. Fransen et al. (2015) identified optimal teamwork behavior, including prioritizing and determining the task of each member, sharing of knowledge and evaluation of plans as the most recommendable practices in neonatal care.

The findings have been supported by the arguments raised by Deering, Auguste, and Lockrow (2013) who claim that inculcating teamwork behaviors can significantly improve teamwork and quality of care provided in delivery and labor units.

### **Teamwork**

In the healthcare sector, simulation-based training refers to the use of patient models to train health care providers about the various processes associated with the provision of health care to patients. Simulation-based training has been endorsed as an excellent way of developing interdisciplinary teamwork behavior skills. The training allows every member of the team to have an opportunity to consider their responsibilities and those of the other team members while at the same time improving their skills as practitioners (Phipps et al., 2012).

Phipps et al. (2012) evaluated the adoption of a labor and delivery unit program which involved SBT. The project was carried out within an 18-month follow-up period, and the training program was associated with improved team-work and communication. The assessment carried out at the end of the study demonstrated a relationship of clinically and statistically significant decreases in obstetrical adverse outcomes upon implementation of SBT. There were also improved rates of patient satisfaction. The project was implemented in a hospital obstetric department recording about 9,200 births each year. Two hundred and fifty-six staff members (72%) took part in the project and the data were collected prior to commencement of the project and compared with subsequent data gathered at the end of the one-year study period.

The high participation rates in simulation-based training meant that a large proportion of obstetric staff underwent a shared learning experience, thus ensuring that each obstetric staff had a shared understanding and a frame of reference for the interventions provided (Phipps et al., 2012). There was also congruence between the aims of the project and the vision of the health care facility where the project was conducted leading to optimal institutional support. However, the post-SBT staff response rate was lower compared to the pre-SBT evaluation, and this might have impacted on the findings related to patient safety culture. The findings support the development of an SBT program to improve teamwork and communication skills among staffs working in obstetric units.

Draycott et al. (2009) reported a reduction from 9.3% to 2.0% in neonatal injury following simulation based training of nurses. The retrospective observational study findings indicate that training of all maternity staff can result in improved management and health outcomes of newborns affected by shoulder dystocia. The study compared the management of neonatal injury before and after the introduction of an educational intervention on shoulder dystocia. There were 20,635 births within the pre-training period and 18,585 deliveries within the post-training period and the reduction in neonatal injury was statistically significant. The data suggests that practical training of nurses is an effective method of optimizing outcomes in patients experiencing obstetric complications.

Riley et al. (2011) found that simulation based training reduced the incidence of perinatal morbidity by 37% in the hospitals that had adopted simulation based training

program. Generally, the perceived culture of safety and staff morale was significantly higher among all the hospital staff exposed to the TeamSTEPPS training program with simulation as compared to the control groups. The finding indicates that interdisciplinary simulation based training can lead to improved clinical outcomes.

### **Conceptual Models/ Theoretical Frameworks**

Evidence-based practice models guide nursing practice to make patient care decisions based on clinical knowledge and the best practices reported in the literature (Royse, Thyer, & Padgett, 2015). Adoption of evidence-based practice ensures that all nurses have up to date knowledge and can provide the best clinical interventions in a systematic approach. According to Farrelly (2012), improved knowledge is the main concept behind provision of care based on best existing evidence. The theoretical models that will be used to guide the current evidence-based project are the Bandura's Self-Efficacy Theory and the Social Learning Theory.

Self-efficacy is described as the belief that one has the essential capabilities to perform certain activities to generate a designated level of performance to achieve set goals (Bandura, 1994). Perceived self-efficacy impacts how people think, feel and motivate themselves towards achieving set goals (Bandura, 1997). The self-efficacy theory suggests that a strong sense of self-confidence improves human performance in various ways. In this case, obstetric nurses with a strong sense of self-efficacy are more likely to provide skilled postpartum care. Individuals with a high level of confidence in their skills approach a problematic task as a challenge that needs to be mastered, rather

than a personal threat that should be avoided. Such a stance promotes inherent interest in participation in various activities (Bandura, 1994).

The self-efficacy theory provides the basis for motivation and reduction of the negative outlooks associated with reiterated failures resulting in improved personal achievements. The theory maintains that individuals with a strong sense of efficacy sustain strong commitment and heighten their efforts even in the face of poor performance. Such individuals attribute low performance to inadequate knowledge or expertise which is acquirable. There is evidence suggesting a positive relationship between high levels of self-efficacy, and improved knowledge (Hsu et al., 2007). Though it is not clearly stated, self-efficacy theory suggests that individuals can determinedly develop, change or control their behavior, an assumption that is based proposition that self-efficacy can be improved through education, skill acquisition, and self-influence. The project educational intervention improved obstetric nurse confidence and competence in PPH management by promoting acquisition of essential PPH management skills, and reflective thought, which led to reduced PPH incidence rate.

Bandura's social learning theory maintains that people learn by observing the behaviors, outlooks and the outcomes of behaviors demonstrated by others (Bandura, & Walters, 1977). The social learning theory has been used in a broad range of nursing research focusing on key clinical aspects of nursing such as nurse competency and care education (Bahn, 2001). In the project, obstetric nurses watched simulation videos which demonstrated recommended techniques on PPH prevention and management. The simulation-based training led to a reduced PPH incidence rate and improved patient

outcomes. According to Bandura's social learning theory, learning is accomplished when the demonstrated behavior is retained by attention, retention, motivation and motor reproduction (Bandura, 1977).

### **Summary**

The literature reviewed provides strong support for an educational intervention to improve obstetric nurses' knowledge and skills in diagnoses, prevention, and management of PPH. The review also suggests that lack of educational intervention on PPH can be associated with poor patient outcomes in maternity units. The project emphasized effective teamwork and communication to ensure that each obstetric staff have a shared understanding of PPH and was capable of providing and monitoring the right intervention at the right time leading to reduced postpartum morbidity. The project was supported by Bandura's Self-Efficacy theory and the Social Learning theory to improve skills and knowledge among the obstetric nurses at the project site to support the development of the evidence-based project.

## Section 3: Methodology

### **Introduction**

The project educational intervention was aimed at preventing and managing the incidence of PPH at the labor and delivery and postpartum unit at the project site. Challenges in the labor and postpartum units at the project site with respect to PPH suggested a need for an evidence-based intervention to promote patient safety and improve postpartum outcomes. In Section 3, I describe the methodology used to develop and implement the educational intervention. In this evidence-based project, I used a quasi-experimental design in which I administered pretest and posttest questionnaires to the newly hired obstetric and postpartum nurses to evaluate their understanding and self-confidence about PPH. In Section 3, I discuss the participants, practice setting, data collection and analysis, evaluation plan, and ethical considerations.

### **Project Design/methods**

I used a quasi-experimental research design. According to Rockers et al. (2015), a quasi-experimental design is a suitable technique that can be used to explore the effect of a particular variable in clinical settings. Moreover, the technique is suitable for projects where randomization is not an option (Kontopantelis et al., 2015).

I developed the educational intervention on PPH using the quality improvement approach. The main reason for the use of the quality improvement approach to design the educational intervention was to promote change in the delivery unit. Moreover, the approach is more in line with the problem that has been identified and offers a more flexible structure compared with traditional research approaches. According to Stausmire,

(2014), quality improvement programs do not increase risks to patients and the programs are adaptive. The main advantage of the approach is that it gives an institution an opportunity to evaluate a problem more closely and develop solutions to it (Kaplan, Provost, Froehle, & Margolis, 2012). In the project initiative, it was not possible for the project leader to have a cohort and a control group to test the effectiveness of the educational intervention; thus, the performance of the obstetric staff on management of PPH at the beginning of the program was compared with their performance on management of PPH at the end of the program.

### **Population and Sampling**

The target population in this project was the obstetric and postpartum nurses working at the delivery unit at the project site. The labor/delivery and postpartum units have approximately 25 nurses of varying age, educational attainments, and work experience. The age ranges between 31 and 60 years (90%), and work experience ranges from 0 to 30 years (10%). The aim was to decrease PPH incidence rate from 15% to 10% at the project site. The obstetric and postpartum nurses demonstrated the ability to handle PPH drills in response to situations involving PPH. Training was not mandatory and was done during work hours. Simulation-based training was an appropriate proactive approach to decreasing mistakes and risk in obstetrics and postpartum nurses, and improving communication, teamwork, and performance.

### **Data Collection**

I developed an educational intervention to reduce PPH incidences through conducting a retrospective review of PPH data at the project site delivery and labor unit. I used the



data collected from the electronic health records to calculate the PPH incidence and found that 15% of all deliveries at the unit led to a PPH. These findings suggested the need for an evidence-based intervention to address the problem. On received approval from the Walden Institutional Review board (IRB), I administered the pretest for obstetric and postpartum nurses on the units.

I obtained data regarding the PPH incidence rate from the medical records department through retrospective chart review of electronic health records of postpartum patients. The medical records department staff retrieved the records of the patients diagnosed with PPH 3 months before the start of the educational program, and then 1 month after the completion of the program. The records provided deidentified data on the incidence of PPH.

The participants were scheduled on the staffing sheet to take the pretest, SBT training, and post-test. The conference room had the capacity to have 20 participants at one time. Before the pretest, the participants completed a demographic questionnaire (Appendix B). I administered the pretest in the labor and delivery conference room with a paper and pencil (Appendix C) and I gave the participants 1 hour to complete the test, and they returned the test to an envelope in front of the room subsequently sealed until data analysis. I assigned all the participants a unique identifying number recorded on the pretest and posttest questionnaire. I used the pretest questionnaire as a baseline for the educational intervention. I kept the data log that had the identification of the participant and ID number in a locked file cabinet in the locked manager's office and destroyed it after data analysis.

After completion of the pretest, I conducted the training, and the participants watched a 30-minute SBT training video on PPH management. I presented the educational module in a PowerPoint and emphasized PPH etiologies, diagnoses, prevention, management, and the role of nurses based on the PPH prevention and management guidelines developed by AWHONN (Appendix A). The video demonstrated proper uterine massage for PPH prevention (Healthcare Simulation South Carolina, 2013). I showed the video after delivering the PowerPoint presentation on prevention and management of PPH. I played the 30-minute video in the conference room where I conducted the educational program.

The post-tests (Appendix C) was administered at the end of the educational intervention in the conference room. The participants were given an hour to complete the posttest using paper and pencil, and returned the test to the envelope at the front of the room. The envelope was sealed after all participants have submitted the tests until time for data analysis.

After the educational session, the nurses were asked to complete the questionnaire, Perception of PPH Educational Program, which examined their attitudes towards the demonstrated practices (Appendix D). The nurses completed the questionnaire after completing the post-test and returned the questionnaire to an envelope at the front of the room. The envelope was sealed after all participants have submitted the tests until time for data analysis. The questionnaire was anonymous.

The results of the pre- and post-tests was entered into an Excel spreadsheet and imported into the Statistical Package for Social Sciences (SPSS) version 21 to analyze the

data. The pre- and post-test group scores was compared for the entire group to determine changes in attitudes and knowledge with regards to recommended practices for PPH prevention and management. The PPH incidence rate for the three-month period prior to and one-month period after the educational intervention was calculated to determine if there was a decrease in the incidence of PPH one-months after the educational program as compared to the incidence of PPH for the three-months prior to the educational program.

### **Instrumentation**

#### **Pre-and Post-tests**

Practice knowledge of the nurses was determined through a questionnaire containing twenty multiple choice questions (MCQs) on PPH (Appendix C). Specifically, the tests contain questions used to evaluate the level of the participants' knowledge in PPH prevention, management, and the role of nurses in treating PPH. The questions were selected from Amy's student nursing study blog which is a site that provides great education information to nursing students (Student Nursing Study Blog, 2015). In total, there were 54 MCQs, and 20 questions were selected based on their relevance to the current project.

#### **Educational component**

To create an EBP, the PPH training program was developed using AWHONN guidelines. The educational module focused on identification of PPH risk factors and signs/symptoms, PPH management, and the role of nurses in preventing and managing PPH. The participants were requested to watch one video on PPH management which

was created by Healthcare Simulation South Carolina based on AWHONN guidelines to demonstrate appropriate PPH management techniques (Healthcare Simulation South Carolina, 2013).

### **Perception of PPH Educational Program**

The purpose of this questionnaire was to determine the nurses' willingness to adopt and implement the modeled proper fundal massage techniques (Appendix D). The questionnaire items were modified by addition of a four-point Likert scale and new questions to suit the purpose of the project. The obstetric and postpartum nurses' attitudes were determined through responses to the items using "strongly agree," "agree," "neither agree nor disagree," "disagree," and "strongly disagree" No permission is required for instrument.

### **AWHONN Guidelines**

AWHONN recommends administration of uterotonics in the active management of the third stage of labor for all births. Oxytocin is the uterotonic agent of choice and can be administered as 20 units diluted in 500 ml normal saline as an intravenous bolus or as ten units intramuscularly. A minimum infusion time of four hours should be provided. Continuation after four hours should continue for r women who have given birth through caesarean delivery or those at high risk of PPH. Oxytocin is the uterotonic agent of choice; it can be administered as 10 units intramuscularly or as 20 units diluted in 500 mL normal saline as an intravenous bolus, and can safely and effectively be given to the mother with the delivery of the baby or after the delivery of the placenta (AWHONN,

2014). The body also recommends controlled cord traction, close surveillance of uterine tonus, and uterine massage after the delivery of the placenta (Appendix A).

### **Protection of Human Subjects**

Once IRB approval was received from Walden University and the project site, all obstetrical and postpartum staff was informed about the intent of the DNP project. All the participants were guaranteed anonymity during completion of the pre-test and post-test questionnaires using an identification number known only to the participant and the project leader. The PPH data from the medical records, the pre-test, post-test and questionnaire was kept in a filing cabinet in a private locked office. The data was entered and analyzed on a password protected laptop to preclude unauthorized access to the data.

### **Data Analysis**

The main question for the qualitative improvement initiative project was “How will a nursing focused PPH prevention and management educational program impact the PPH rate at the project site? Details captured on the demographic form were used to describe the characteristics of the participants. The pre-test and post-test scores on PPH management were compared to determine if there was a change in knowledge and attitudes to PPH. The Statistical Package for the Social Sciences (SPSS) version 21 was used to analyze the data by computing the aggregate group means score and percentages.

A t-test was used to determine the association between the pre- and post-test results on PPH management with a p-value of  $< 0.5$  statistical significance (Good & Good, 2013). Statistically significant values indicated a change in obstetric and postpartum nurses’ knowledge and attitudes towards PPH management practices.

Statistically significant reductions in PPH incidence rate indicated a positive practice change. The data captured by the Perception of PPH Educational Program questionnaire testing nurse attitudes towards the demonstrated practice was analyzed using descriptive statistics including means and percentages to determine the willingness of nurses to apply the knowledge acquired to improve patient outcomes.

### **Project Evaluation Plan**

The purpose of project evaluation was to determine if the goals and objectives of the project were accomplished and to reveal insights about how the project may be improved (Grembowski, 2015). The main purpose of the practice improvement initiative was to develop an educational intervention to decrease the incidence of PPH based on the best evidence to instruct the obstetrical and postpartum nursing staff how to recognize, diagnose, prevent and manage postpartum bleeding.

The baseline knowledge and PPH incidence rate was established through the pre-test before the beginning of the program, and improved knowledge scores and reduced PPH rate at the end of the program indicated effectiveness of the program. The Bandura's social learning theory suggests that determining the baseline knowledge assists in establishing changes in learning behavior (Bandura, 1977). In essence, the project evaluation plan was used to determine if the initial objectives were met by comparing the knowledge scores at the beginning and at the end of the program, and to determine the impact of the program on PPH rates at the project site obstetric and postpartum units by comparing PPH data before and after the implementation of the project.

### **Summary**

The current section discussed the design, implementation and evaluation of the educational module. The DNP project utilized a quasi-experimental research design and the target population was the obstetric and postpartum nurses working at the delivery unit at the project site. Upon receiving approval from the Walden Institutional Review board (IRB), I administered the pre- and post-tests at the beginning and the end of the program respectively. Data regarding the PPH incidence rate was obtained through retrospective chart review of electronic health records of postpartum patients three months prior to the start of the educational program, and then one-month after the completion of the program. The educational program was developed based on recommended practices by AWHONN and the pre-test and post-tests was used to evaluate the impact of the intervention on knowledge acquisition. Moreover, PPH incidences before and after the implementation was compared to further evaluate the outcomes of the intervention.

## Section 4: Findings, Discussion, and Implications

### **Introduction**

The primary purpose of this DNP project was to develop and implement an educational program for the prevention and management of PPH to improve the knowledge, skills, and confidence of nurses in recognizing and managing the condition. I developed this educational module based on AWHONN guidelines and best available evidence in the existing literature. I implemented the project within a 1-month duration. I collected the pretest and posttest data and analyzed them to determine the effectiveness of the program. In Section 4, I present an analysis of the findings of the DNP project, as well as discussions of the findings in the context of the literature and theoretical framework. I also address implications for practice, policy, and social change, as well as the strengths and the limitations of the project.

### **Summary and Evaluation of the Findings**

The project question was: How will a nursing focused PPH prevention and management educational program effect the PPH rate at the project site? I had three objectives to address the question. The first objective was to develop an educational module for teaching obstetric nurses about prevention, early identification and management of PPH. The second objective was to decrease the PPH incidence rate from 15% to 10% at the project site. The third objective was to assess the obstetric nurses' attitudes towards guideline use in the prevention and management of PPH upon implementation of the educational intervention.



### **Characteristics of the Participants**

There were 25 obstetric and postpartum nurses working within the maternal-child department. Training was not mandatory and the nurses could choose to complete the questions or not. Fifteen nurses agreed to complete the pretest and posttest multiple test questions. The ages varied from 31 years to 60 years. The average age and the standard deviation of the participants who completed the quality improvement training was 40.27 and 8.82, respectively. The educational level of the participants varied from license practical nursing (LPN) (1), associate degree in nursing (ADN) (2), baccalaureate degree in nursing (BSN) (10), and masters of science in nursing (MSN) (2). The participants' years of experience in nursing varied from 6 years to 30 years, whereas years of experience working as a postpartum and or obstetric nurse varied from 1 years to 19 years. All the participants were permanent obstetric and postpartum nurses, with the exception of one temporary nurse (Table 1).

Table 1

*Participants' Demographic Characteristics*

Variables	Level	Frequency
Age (years)	31-40	7 (46.7%)
	41-50	3 (20.0%)
	51-60	5 (33.3%)
Highest level of education	ADN	2 (13.3%)
	BSN	10 (66.7%)
	MSN	2 (13.3%)
	Others (LPN)	1 (06.7%)
Years of experience as a nurse	6-10 years	6 (40.0%)
	11-20 years	6 (40.0%)
	21-30 years	3 (20.0%)
Years of experience as a labor/delivery or postpartum nurse	0-2 years	2 (13.3%)
	3-5 years	4 (26.7%)
	6-10 years	4 (26.7%)
	>10 years	5 (33.3%)
Employment status	Permanent	14 (93.3%)
	Temporary	1 (06.7%)

*Note.* ADN, Associate Degree in Nursing; BSN, Baccalaureate Degree in Nursing; MSN, Masters of Science in Nursing; LPN, License Practical Nursing.

**Objective 1: To develop an educational module for teaching obstetric nurses about prevention, early identification and management of PPH.**

The overarching goal of this project was to improve nurse knowledge, skills, and competence so that there would be fewer complications related to PPH at the practice site. To promote the positive outcomes, an educational module was developed (Appendix E) and implemented at the project site. Nurses are crucial to provision of quality and safe care to postpartum patients because they spend more time at the bedside, and with the patients, when compared to other health care professionals (Kordi et al., 2015).

Therefore, evaluating the knowledge and the skills of the nurses in managing and preventing PPH is essential because it sheds light on the type of information needed to improve nurse' understanding and competence to reduce the severity of PPH complications.

The twenty-question knowledge test questions were validated as per Polit and Beck (2012) guidelines for determining the validity of test questions. The content validity was reviewed by a panel of experts in maternal and postpartum care. The pre-and post-test questions contained the same 20 MCQs testing the knowledge of the nurses before and after the implementation of the program. There was a significant improvement in group knowledge and skills scores after the implementation of the evidence and theory-driven educational program ( $p < 0.05$ ). The group's mean score pre-intervention was 10.73 (53.65%) and 18 (90%) post-intervention (Figure 1), representing a 36.35%

increase in the knowledge scores following the implementation of the educational program. The highest possible score on the knowledge and skills test was 100%.

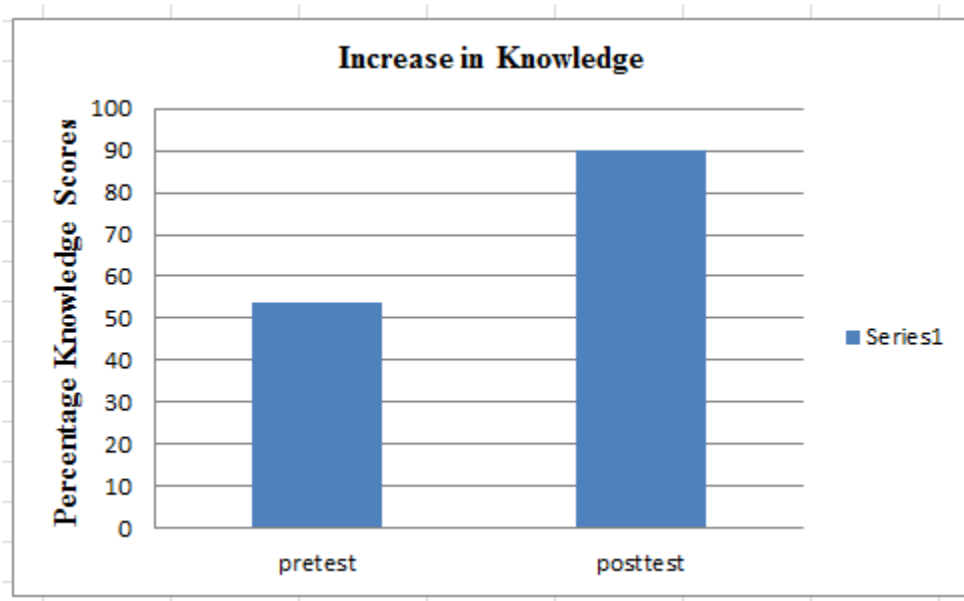


Figure 1. Knowledge test mean scores.

Individual test questions on knowledge were assessed for changes in percentage scores. Responses on nine questions improved from 40% to 70%. These questions related to etiology, symptoms, and management of PPH. Two questions showed no changes in score as there was 100% correct prior to and after implementation of the educational program. A paired t-test showed that the improvements in the pretest and posttest were statistically significant ( $t(14) = -15.05$ ,  $t_{15}$ ,  $p = .000$  with alpha set at 0.05) (Figure 2). Therefore, it can be concluded that the evidence and theory based education program was effective in improving nurse knowledge on PPH care.

Table 2

*Paired Sample Test Results*

<b>Paired Samples Test</b>							
Paired Differences					t	df	Sig.
					(2tailed)		
	Mean	Std Deviation	Std Mean	95% Confidence Interval of the Difference			
				Lower	Upper		
Pair Pretest	-7.26667	1.86956	.48272	-8.30199	-6.23134	-15.054	14 .000
1 Posttest							

**Objective 2: To decrease the PPH incidence rate from 15% to 10% at project site.**

Data collected at the end of year 2015 showed that the PPH incidence rate was 15%. All expectant women were at risk of PPH and were managed according to AWHONN guidelines during the implementation period of the educational program. Active management of the third stage of labor was used as the main tool of PPH prevention for all women who gave birth at the hospital. There were approximately 100 vaginal and cesarean deliveries one month following the implementation of the program and no PPH incidence took place (0%). The data suggests that the educational program was effective in promoting practice change which led to zero PPH rates following the implementation of the program.

**Objective 3: To assess the obstetric nurses' attitude towards guideline use in the prevention and management of PPH upon implementation of the educational intervention.**

Generally, the nurses who took part in this project had positive attitudes towards the use of AWHONN guidelines and their significant role in saving the lives of women experiencing PPH. The participants' attitudes towards the applicability of the guidelines was exceptional, with only two participants (13%) not strongly agreeing with the statement that nurses should follow the guidelines protocols in managing PPH (Table 3). However, there was an improvement in the attitudes of all participants strongly agreeing that nurses should follow the AWHONN guideline protocols for the management of PPH after implementation of the project.

Table 3

*Attitude of Obstetric and Postpartum Nurses Regarding PPH Guidelines*

Statement	Likert scale response (4, strongly agree)	Participants strongly agreeing ( <i>n</i> = 15)
Importance of guidelines in saving women's lives.	100%	15
Training on PPH is essential.	100%	15
Most maternal mortalities are preventable.	100%	15
Nurses should follow obstetric emergency protocols.	87%	13
Applying the knowledge on work environment.	100%	15
Importance of teamwork.	100%	15
Importance of communication.	100%	15

*Note.* PPH, Postpartum Hemorrhage

### **Discussion of Findings in the Context of Literature**

As to the findings, the knowledge, skills, and attitudes of the nurses working at the project site labor/delivery and postpartum units improved significantly following the implementation of the theory and evidence-based educational program. Assessing and managing a life-threatening condition like PPH requires adequate knowledge and skills. Nurses with improved knowledge and skills have a higher level of self-efficacy, thus improving their ability to provide safe and quality care to postpartum patients. The increased self-efficacy, knowledge and skills have the potential to reduce PPH related complications and mortality (Sathiyalatha, 2015).

Training has been found to reduce students' level of anxiety and stress in emergency situations (Kordi et al., 2015). Training on practical skills, such as diagnosis and management of PPH and related processes have been found to improve mental preparedness and confidence in the ability of the student to implement the acquired clinical skills effectively (Kordi et al., 2015; Imam et al., 2012). In addition, the use of student-centered approaches that allow them to play an active role in their learning has been found to improve their level of knowledge, skills, and self-confidence (Erfanian et al., 2009).

The findings of this practice initiative are consistent with those of Birch et al. (2007). Birch and colleagues compared the effects of simulation-based training on the management of PPH. There were statistically significant improvements in the knowledge and self-confidence of the participants in the after the educational intervention as compared to the incidence of PPH and the nurses' knowledge of the management of PPH before the education. Kordi et al., (2015) conducted a pre-and post-intervention web-based training program on PPH involving 44 midwifery students. Statistical analysis showed significant improvements in their self-confidence related to the management of PPH management one month following the implementation of the project. Consistent findings were also reported by Kumar et al. (2016) who found that educational programs (both simulation and didactic) for the prevention and management of PPH led to significant improvements in the knowledge of obstetric nurses. The above studies reinforce that educational interventions on prevention and management of PPH have the



potential to bring significant improvements in the knowledge and ability of obstetric and postpartum nurses to decrease the incidence of PPH.

Bandura's self-efficacy theory provided the theoretical framework for this project. Self-efficacy refers to the beliefs in one's ability to perform a certain act and produce a desirable outcome (Bandura, 1994). Self-efficacy or self-confidence is a predictor of behavior change, as people are likely to attempt behaviors that they feel confident in performing. Those with a high level of self-efficacy are more likely to view challenging tasks as something to be mastered rather than avoided, while people with a low self-efficacy circumvent difficult tasks because of the belief that they are beyond their capabilities (Bandura, 1994). Bandura described four main sources of self-efficacy, with the most significant being performance mastery. Emotional, social persuasion and vicarious experiences are also other sources of self-efficacy (Bandura, 1997). Applying the basic principles of Bandura's social learning and self-efficacy theories, provided a framework for the educational intervention that led to improved knowledge and skills among the nurses, consequently improving their confidence in following the recommended prevention and management technique for PPH. The high self-efficacy was derived from performance accomplishments and verbal persuasion during the implementation of the evidence and theory based educational intervention. By increasing the knowledge and the skills of the postpartum nurses through the educational intervention, the nurses developed more positive attitudes to the use of AWHONN guidelines for PPH and felt more competent in managing and preventing postpartum complications.

## **Implications**

### **Policy**

Doctoral prepared nurses have the knowledge, skills, and competence required to apply evidence to clinical practice, enabling them to be influential advocates for various healthcare-related policies (Zaccagnini & White, 2011). Policies in the health care sector contribute in the framework of care delivery whether they are institutional or governmental standards (Terry, 2015). In the end, the policies can have positive effects by facilitating the provision of safe and quality care, or have negative implications leading to poor patient outcomes.

The current quality improvement project was aimed at improving obstetrical nurses' knowledge and skills in the management and prevention of PPH. The project facilitated the implementation of evidence-based guidelines at the bedside leading to reduced PPH related complications at the project site. The use of evidence-based guidelines is an example of how a doctoral prepared nurse can influence the development and implementation of policies aimed at improving provision of care at the bedside.

Postpartum bleeding is a leading cause of maternal morbidity and mortality (WHO, 2012), and adherence to guideline recommendations is of utmost importance to reduce PPH related complications and deaths. It is recommended that health care organizations should have policies in place to promote implementation of evidence-based guidelines to recognize and manage PPH at the bedside. Regular drills should be conducted to ascertain the obstetrical and postpartum nursing staff are prepared to handle obstetric emergencies. Reducing the incidence rate and the severity of PPH complications

is in line with the mission and vision of the project site and is one of the priorities of AWHONN (AWHONN, 2010, 2015).

### **Practice**

The problem of postpartum bleeding is of state, national, and global significance (Say, Chou, Gemmill, Tunçalp, Moller, et al., 2014). The current evidence-based and theory-driven project aimed at improving the nurses' knowledge, skills, and confidence in preventing and managing PPH. There was a statistically significant improvement in nurses' levels of knowledge and their role in preventing and managing PPH. The findings of the quality improvement project reinforce that an evidence-based educational module on PPH enhances the ability of obstetric nurses to recognize the deteriorating signs of PPH, perform assessments, and manage PPH in a timely manner to prevent/decrease complications.

Bedside nurses play a vital role in the management and prevention of PPH. They are typically the first health care providers to arrive at the bedside of the patient in case of an emergency like PPH (Della-Torre et al., 2011; Jacobs, Lockwood, & Barss, 2011). Equipping the nurses with knowledge and skills required to make suitable decisions in emergency situations is key to improved patient safety and outcomes (Zaccagnini & White, 2011). It is recommended that other postpartum units should implement similar programs to reduce complications and mortality rates related to PPH. It is essential to prevent PPH related complications by improving health knowledge and adherence to the guidelines to prevent tragedies that can occur due to PPH complications. Obstetrical and

postpartum nurses need to be ready to integrate best available evidence along with nursing practice to reduce the morbidity and incidence of maternal deaths due to PPH.

### **Research**

The findings of the practice initiative are consistent with existing evidence in the literature examining the effectiveness of training programs on improving the knowledge, skills, attitudes, and confidence of postpartum nurses to PPH management (Kordi et al., 2015; Kumar et al., 2016; Santhinatha, 2015). Future research is needed to ascertain if the effects of the educational programs informed by the current evidence and guided by theory remain for the long-term as staff leave and are replaced with new nurses. The current project was implemented within a one-month period, and a longer timeframe is essential to evaluate the impact of the educational programs in the long-run. A longer timeframe would strengthen the findings of this project, and the outcomes could be used to further improve outcomes all women at risk of PPH.

### **Social change**

Nurses constitute approximately 80% of the health care workforce (Wilson, Whitaker, & Whitford, 2012), and are in most cases the first point of contact with obstetric patients. Nurses who are supported through educational endeavors are introduced to the latest best evidence that is essential in improving practice by addressing practice problems in the health care sector (Chism, 2015). As a result, nurses have an improved ability on a broader spectrum to provide quality and safe care to patients leading in the way to promoting positive social change.

The current project promoted positive social change in the organization by replacing non-evidence-based practice with EBP guidelines by promoting adherence to the recommended practices in preventing and managing PPH. The comprehensive educational program reinforced the knowledge and skills of obstetric and postpartum nurses in the prevention and management of PPH. Moreover, the program emphasized on effective communication and teamwork skills which are crucial to the provision of quality care to obstetric patients (Cornthwaite et al., 2013).

Most importantly, the educational intervention led to a decrease in the severity of PPH related complications. Reducing PPH complications has the potential to have a positive impact on the hospital and the society in general. The hospital benefited from improved knowledge, skills, and competence required for prevention and management of PPH, which decreased PPH related complication.

Improved maternal health is essential to any household function and survival, thus the project also promoted positive social change at the society level. The project had a positive impact on maternal morbidity and mortality rates. By decreasing the PPH incidence rate (there was no PPH incidence following the implementation of the project), the project directly reduced any morbidity or mortality that could have been as a result of excessive bleeding of women who gave birth at the project site. There are also positive effects on the neonate as the mother may have less obstetrical complications and be available to engage in breastfeeding, kangaroo care and rooming-in, which has long term positive neurological impacts on the neonate. Increased bonding is also important for the mother-baby dyad.

## **Project Strengths and Limitations**

### **Strengths**

A significant strength of the practice initiative was that the educational program had strong institutional support. The director of public health programs and the manager of labor and delivery/post-partum units provided constant support at all phases of the project implementation. Another strength of the project was its relevance to the organization. The educational program was implemented at a time when the obstetrical and postpartum nurses needed knowledge of PPH and related complications, as the care facility was aware that the current practices at the labor and delivery units might not have been as effective as they were supposed to be. The educational intervention led to improved knowledge and skills of how to prevent and manage PPH leading to reduced PPH related complications. Consequently, postpartum women were more likely to receive safe and effective care if they experienced postpartum bleeding.

A third strength of the project was that it was built on a foundation of evidence-based practice and the use of theory. The adoption of evidence-based practice ensures that obstetric and postpartum nurses have up to date knowledge, skills, and can competently provide the best clinical interventions that will help prevent and manage PPH when it occurs (Royse et al., 2015). A comprehensive literature review was carried out and it validated an educational intervention as an evidence-based approach to improving knowledge and skills of obstetric nurses in the prevention and management of PPH, the practice problem at the project site. Moreover, the project was conceptualized and developed based on Bandura's Self-efficacy, which was a relevant theory for the

practice problem at the project site. Improved knowledge and skills led to improved self-efficacy of the nurses in providing care to women at risk of PPH. The use of theory to guide this project demonstrates the ability of the project leader to meet the core educational skills of a doctorate nurse which is integration of theory and research evidence to improve nursing practice and patient outcomes (Zaccagnini & White, 2011)

### **Limitations**

Despite the strengths discussed above, the DNP quality improvement project had various limitations. A small sample size of participants from the obstetrics and postpartum units was used and the completion of the questionnaires was not compulsory. There are 25 labor/delivery and postpartum nurses, but only 15 of them agreed to complete the pretest and posttests. The decreased in the number of participants was due to the fact that some nurses were on vacation during the implementation of the project, and training was not compulsory for those who were present. According to Faber and Fonseca (2014), small sample size can prevent the findings from being generalized. Samples should not be too small or excessive (Faber and Fonseca, 2014).

### **Recommendation for Remediation of the Limitations in future work**

The project demonstrated outcomes from the implementation of educational program done at the project site women services, however, several limitations have been identified with this initiative. One limitation is that the obstetric and postpartum nurses are not mandated to attain the educational program. Future recommendation for continuing education should be made compulsory for obstetrical and postpartum nurses'. The PPH educational program can be incorporated into orientation classes so new hires

would have information as they began their roles. Secondly, there are no educators for obstetrical and postpartum units. Future project initiatives should focus on providing nursing educators who will use AWHONN guidelines for continuing education require to evaluate the role of nursing in prevention and management of PPH, and measuring aspects of improved patient outcome. The Educational modules that incorporate evidence based guidelines and theoretical approaches that equip the nurses with knowledge, skills, and self-confidence in providing education related PPH should be developed for a better patient outcome.

### **Analysis of Self**

The DNP program has given me a chance to focus on practice problems in nursing from a unique point of view. Nurses are responsible for the provision of safe patient care. Nursing is a field of caregivers, teachers, and transformational leaders (Institute of Medicine, 2004). I feel that I have grown as a nurse practitioner, a nurse scientist, and as a nursing leader. The development and the implementation of the DNP project have contributed to my self-discovery as a nurse, team member and project leader. I have come to fully appreciate the diverging roles of nursing leaders and the knowledge and the skills required to be an effective leader. The purpose of this section is to provide an analysis of self as a scholar, practitioner, and a project developer.

### **As a scholar**

Boyer (1996, cited in Hofmeyer, Newton, & Scott, 2007) contributed to the debate on research versus teaching by advocating four aspects of scholarship: discovery, teaching, integration, and application. Doctorally prepared nurses are expected to



demonstrate improved ability to translate research findings into practice and to critically apply theory to solve problems in the health care settings (Institute of Medicine, 2011). Society benefits through the scholarship of teaching and integration when nurses develop critical thinking skills and an improved ability to apply theory and evidence to solve everyday practice problems (Newton, & Scott, 2007)

As a doctorally prepared nurse, I have developed a wealth of knowledge that will be used to improve the safety and the quality of care provided to patients. The integration and the application of best practices have been demonstrated through the development and the implementation of the current project. The application of theory to practice is one of the essential features of a doctorate prepared nurse (Institute of Medicine, 2011).

The DNP program gave me an opportunity to address a substantial practice problem impacting patient outcomes. As a scholar, I learned and developed essential problem-solving skills, including using systematic methods to search and appraise evidence to support the development of a project. The process of completing this project has also increased my knowledge and understanding of research and leadership roles as well as the need for professional development. While completion of this project seemed to be an insurmountable task due to the numerous revisions involved in writing the dissertation, reaching the overall goal has made it a worthwhile endeavor. My writing skills have greatly improved and I am now comfortable writing in Standard Academic English. I acknowledge that the process of completing this scholarly project has improved my scholarly growth by providing with a platform to nurture my competence,

leadership skills, and ability to apply evidence to solve a practice problem which will be imperative in my future roles as doctorate nurse.

### **As a practitioner**

The changing demands of the country's complex healthcare environment calls for practitioners with the highest level of scientific knowledge and expertise to assure the quality and safety of care provided to patients (Schober & Affara, 2009; Zaccagnini & White, 2015). Doctorally prepared nurses have a new focus on their capabilities as they reflect on the importance of responding and adapting to the dynamic health care environment. A great contribution of this doctoral project to me as a practitioner was the formation of a critical mindset. I am now able to identify strengths and limitations of research evidence and take information from different sources into account before reaching a conclusion. Another interesting lesson learnt was the logic and depth of reasoning that is needed when analyzing an issue in the health care sector. As the project progressed, it became important that as the writer, I provide a clear and critical analysis to the reader, and the logic and depth of reasoning developed during the project will help me as a leader in analyzing and solving the current problems facing the health care sector. Advanced practice nurses have the knowledge and competencies required articulate the standards of care in more tangible ways to address professional development needs (Schober & Affara, 2009).

I became a registered nurse in 2006, and I have constantly maintained a desire to have the highest level of knowledge, skills, and competence to provide patient-centered care. The knowledge and the competency have been credited through my advancement of

nursing education through the DNP program. The DNP project gave me an opportunity to make use of my new skills that were developed moving through the doctoral educational classes and develop a program informed by existing evidence and theory.

The current project demonstrates my ability to synthesize and makes use of foundational practice competencies essential for the practice of an advanced nurse (Keating, 2014). I was able to apply evidence from research and use the self-efficacy theory to introduce and implement practice change at the project site labor and delivery/postpartum units. The theory was useful in improving PPH prevention and management knowledge and skills among obstetrics and postpartum nurses. I feel that my future as an advanced nurse has been brightened by the development of critical analysis skills and improved ability to translate research findings into practice to address the current problems facing the health care sector. I have also benefited immensely from improved confidence in leadership roles.

### **As a project developer**

Project developers are expected to assume various roles and responsibilities for effective development and implementation of a project. Examples of roles and responsibilities of a project developer include providing leadership, decision making, planning, and keeping the team members informed (Kerzner, 2013). As the project developer, I had to lead, make decisions, and communicate effectively with the management of the institution to gain an appropriate level of buy-in to have the project implemented. The process involved in developing an acceptable DNP project that consistently used the complex processes involved in developing and managing a project

(Hodges & Videto, 2011). The numerous revisions involved throughout the process of completing this project allowed me to identify and address my weaknesses, and concisely focus on the goals and outcomes to produce an acceptable manuscript.

The DNP project also provided me the opportunity to assess evidence and identify theoretical frameworks that guide the process of project development and implementation. I applied Bandura's self-efficacy and social learning theories to design the project and evaluate its outcomes. A project developer needs to have a framework for his/her project when recruiting all essential stakeholders at various levels of management to have the project move forward (Hodges & Videto, 2011). Implementing the DNP project gave an opportunity to have hands-on experience in breaking down barriers to practice change. I will continue to commit myself to projects aimed at facilitating provision of better quality care and improving patient outcomes.

#### **What does this Project mean for Future Professional Development?**

The DNP project has given me an opportunity to develop competence as a scholar, practitioner, and project developer. The program has opened my eyes to the significance of continuing my professional development and keeping abreast with the latest best practices and implementing them in care settings. From the skills that I gained in developing and implementing this project, I aim to continue taking part in various projects to improve care delivery and safety at the institution, including initiatives related to PPH and other high-risk clinical situations. Postpartum bleeding remains a leading cause of death in the US, and there is a need to develop similar projects in hospital settings to improve maternal health.

## Summary

Maternal mortality due to complications related to PPH present a significant health problem across the globe. It is important for nurses to gain practical skills and knowledge on the prevention and management of PPH. Section four presented the findings of the project in the context of the literature and theoretical framework as well its implications for nursing practice, research, health policy, and professional growth of the DNP candidate. Although there were various strengths of this project, some limitations that related to sample size were identified. A statistical analysis of the findings of the project showed a statistically significant improvement in the nurses' knowledge and management of PPH as demonstrated by the pretest and posttest scores. It is expected that the increase in knowledge and improvements of attitudes towards EBP at the facility will lead to a reduction in morbidity and mortality associated with PPH. In future, longitudinal projects can be carried out to establish the impact of the PPH training program on the knowledge, skills, attitudes, and self-efficacy in the long-run.

## Section 5: Scholarly Product

As in any project, nurses from across the health care system come together to share and disseminate the findings of their research and quality improvement projects. The Q I project of prevention and management of postpartum hemorrhage has been presented to the project site women services. Therefore, to determine the effectiveness of practice, I plan to disseminate the quality improvement project with a poster presentation to stakeholders at the project site. The poster will be displayed in labor and delivery/postpartum units where QI project was conducted. Double click on the following icon to view the poster presentation.

### **Poster Presentation**



Lisa Poster  
Presentation.ppt

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## Appendix A: AWHONN Guidelines

**Oxytocin Doses and Administration**

- Oxytocin should never be administered via IV push

Administration:

— Oxytocin 20 units in 1 liter normal saline (NS) or lactated Ringer's (LR) solution

—Initial bolus rate (500-1000 ml/hour) for 30 minutes followed by a maintenance rate of 125 ml/hour for the next 3.5 hours

- Provide a minimum infusion time of 4 hours after delivery.
- Give oxytocin 10 units intramuscularly (Im) in women without intravenous (IV) access.
- for woman who are at high risk for a postpartum hemorrhage or who have had cesarean births, continuation beyond 4

hours is recommended. Rate and duration should be titrated according to uterine tone and bleeding (AWHONN, 2014).

**Active Management of the Third Stage of Labor (AMTSL)**

- AmTSL consists of administration of uterotonic agents, controlled cord traction, and uterine massage after the delivery of the placenta

AmTSL reduces the risk of postpartum hemorrhage

- Researchers found no difference in amount of blood loss or incidence of retained placenta when oxytocin was given

at the time of the delivery of the anterior shoulder compared to administration after the delivery of the placenta

- In a study on the effectiveness of the individual components of AmTSL, IV oxytocin reduced the risk of postpartum hemorrhage by 70% compared to IM administration, although the route of administration had no greater effect when combined with cord traction and uterine massage (AWHONN, 2014).

## Appendix B: Demographic Form

Participant ID # \_\_\_\_\_

Age \_\_\_\_\_

Gender \_\_\_\_\_

Years of experience as a nurse \_\_\_\_\_

Years of experience as a postpartum nurse \_\_\_\_\_

## Employment Status

 Permanent Temporary

## Contact Information

Phone \_\_\_\_\_

Email \_\_\_\_\_

## Highest Level of Education:

 Associate Degree Nursing (ADN) Bachelors of Science in Nursing (BSN) Masters of Science in Nursing (MSN) Other \_\_\_\_\_

Source: Self-developed for this project

## Appendix C: Pretests/Posttests Multiple Choice Questions

- 1) A postpartum nurse is preparing to care for a woman who has just delivered a healthy newborn infant. In the immediate postpartum period, the nurse plans to take the woman's vital signs:
  - A) Every 30 minutes during the first hour and then every hour for the next two hours.
  - B) Every 15 minutes during the first hour and then every 30 minutes for the next two hours.
  - C) Every hour for the first 2 hours and then every 4 hours
  - D) Every 5 minutes for the first 30 minutes and then every hour for the next 4 hours.
  
- 2) A postpartum nurse is taking the vital signs of a woman who delivered a healthy newborn infant 4 hours ago. The nurse notes that the mother's temperature is 100.2°F. Which of the following actions would be most appropriate?
  - A) Retake the temperature in 15 minutes
  - B) Notify the physician
  - C) Document the findings
  - D) Increase hydration by encouraging oral fluids
  
- 3) The nurse is assessing a client who is 6 hours PP after delivering a full-term healthy infant. The client complains to the nurse of feelings of faintness and dizziness. Which of the following nursing actions would be most appropriate?
  - A) Obtain hemoglobin and hematocrit levels
  - B) Instruct the mother to request help when getting out of bed
  - C) Elevate the mother's legs
  - D) Inform the nursery room nurse to avoid bringing the newborn infant to the mother until the feelings of light-headedness and dizziness have subsided.
  
- 4) A nurse is preparing to perform a fundal assessment on a postpartum client. The initial nursing action in performing this assessment is which of the following?
  - A) Ask the client to turn on her side
  - B) Ask the client to lie flat on her back with the knees and legs flat and straight.
  - C) Ask the mother to urinate and empty her bladder
  - D) Massage the fundus gently before determining the level of the fundus.
  
- 5) The nurse examines a woman one hour after birth. The woman's fundus is boggy, midline, and 1 cm below the umbilicus. Her lochia flow is profuse, with two plum-sized clots. The nurse's initial action would be to:
  - A) Place her on a bedpan to empty her bladder
  - B) Massage her fundus
  - C) Call the physician
  - D) Administer Methergine 0.2 mg IM which has been ordered prn

- 6) When performing a PP assessment on a client, the nurse notes the presence of clots in the lochia. The nurse examines the clots and notes that they are larger than 1 cm. Which of the following nursing actions is most appropriate?
- A) Document the findings
  - B) Notify the physician
  - C) Reassess the client in 2 hours
  - D) Encourage increased intake of fluids.
- 7) When performing a postpartum check, the nurse should:
- A) Assist the woman into a lateral position with upper leg flexed forward to facilitate the examination of her perineum
  - B) Assist the woman into a supine position with her arms above her head and her legs extended for the examination of her abdomen
  - C) Instruct the woman to avoid urinating just before the examination since a full bladder will facilitate fundal palpation
  - D) Wash hands and put on sterile gloves before beginning the check
- 8) A PP nurse is providing instructions to a woman after delivery of a healthy newborn infant. The nurse instructs the mother that she should expect normal bowel elimination to return:
- A) One the day of the delivery
  - B) 3 days PP
  - C) 7 days PP
  - D) within 2 weeks PP
- 9) Select all of the physiological maternal changes that occur during the PP period.
- A) Cervical involution ceases immediately
  - B) Vaginal distention decreases slowly
  - C) Fundus begins to descend into the pelvis after 24 hours
  - D) Cardiac output decreases with resultant tachycardia in the first 24 hours
  - E) Digestive processes slow immediately.
- 10) Which of the following circumstances is most likely to cause uterine atony and lead to PP hemorrhage?
- A) Hypertension
  - B) Cervical and vaginal tears
  - C) Urine retention
  - D) Endometritis
- 11) A nurse is developing a plan of care for a PP woman with a small vulvar hematoma. The nurse includes which specific intervention in the plan during the first 12 hours following the delivery of this client?
- A) Assess vital signs every 4 hours
  - B) Inform health care provider of assessment findings

- C) Measure fundal height every 4 hours
  - D) Prepare an ice pack for application to the area.
- 12) A new mother received epidural anesthesia during labor and had a forceps delivery after pushing 2 hours. At 6 hours PP, her systolic blood pressure has dropped 20 points, her diastolic BP has dropped 10 points, and her pulse is 120 beats per minute. The client is anxious and restless. On further assessment, a vulvar hematoma is verified. After notifying the health care provider, the nurse immediately plans to:
- A) Monitor fundal height
  - B) Apply perineal pressure
  - C) Prepare the client for surgery.
  - D) Reassure the client
- 13) A nurse is monitoring a new mother in the PP period for signs of hemorrhage. Which of the following signs, if noted in the mother, would be an early sign of excessive blood loss?
- A) A temperature of 100.4°F
  - B) An increase in the pulse from 88 to 102 BPM
  - C) An increase in the respiratory rate from 18 to 22 breaths per minute
  - D) A blood pressure change from 130/88 to 124/80 mm Hg
- 14) A nurse is preparing to assess the uterine fundus of a client in the immediate postpartum period. When the nurse locates the fundus, she notes that the uterus feels soft and boggy. Which of the following nursing interventions would be most appropriate initially?
- 1. Massage the fundus until it is firm
  - 2. Elevate the mothers' legs
  - 3. Push on the uterus to assist in expressing clots
  - 4. Encourage the mother to void
- 15) A PP nurse is assessing a mother who delivered a healthy newborn infant by C-section. The nurse is assessing for signs and symptoms of superficial venous thrombosis. Which of the following signs or symptoms would the nurse note if superficial venous thrombosis were present?
- A) Paleness of the calf area
  - B) Enlarged, hardened veins
  - C) Coolness of the calf area
  - D) Palpable dorsalis pedis pulses
- 16) Which of the following findings would be expected when assessing the postpartum client?
- A) Fundus 1 cm above the umbilicus 1 hour postpartum
  - B) Fundus 1 cm above the umbilicus on postpartum day 3

- C) Fundus palpable in the abdomen at 2 weeks postpartum
  - D) Fundus slightly to the right; 2 cm above umbilicus on postpartum day 2
- 17) A PP client is being treated for DVT. The nurse understands that the client's response to treatment will be evaluated by regularly assessing the client for:
- A) Dysuria, ecchymosis, and vertigo
  - B) Epistaxis, hematuria, and dysuria
  - C) Hematuria, ecchymosis, and epistaxis
  - D) Hematuria, ecchymosis, and vertigo
- 18) A nurse performs an assessment on a client who is 4 hours PP. The nurse notes that the client has cool, clammy skin and is restless and excessively thirsty. The nurse prepares immediately to:
- A) Assess for hypovolemia and notify the health care provider
  - B) Begin hourly pad counts and reassure the client
  - C) Begin fundal massage and start oxygen by mask
  - D) Elevate the head of the bed and assess vital signs
- 19) A nurse is assessing a client in the 4<sup>th</sup> stage of labor and notes that the fundus is firm but that bleeding is excessive. The initial nursing action would be which of the following?
- A) Massage the fundus
  - B) Place the mother in the Trendelenburg's position
  - C) Notify the physician
  - D) Record the findings
- 20) Which measure would be least effective in preventing postpartum hemorrhage?
- A) Administer Methergine 0.2 mg every 6 hours for 4 doses as ordered
  - B) Encourage the woman to void every 2 hours
  - C) Massage the fundus every hour for the first 24 hours following birth
  - D) Teach the woman the importance of rest and nutrition to enhance healing

Source: Student Nursing Study Blog (2015)



Appendix D: Questionnaire to Determine Respondents' Perception of PPH Educational Program

Please respond to the following questions using; 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree. There is no right or wrong answer to any of these questions.

1. Adherence to postpartum management guideline recommendations is important in saving women's lives 1 2 3 4
2. Training on postpartum hemorrhage (PPH) is essential 1 2 3 4
3. A nurse should follow obstetric emergency protocols in applying clients' care 1 2 3 4
4. One should use the knowledge gained in training programs on the PPH program while providing the care 1 2 3 4
5. After attending the training on PPH prevention and management, I can apply the new training guidelines in the working environment 1 2 3 4
6. If you answered disagree or strongly disagree, what makes you believe so?
  - a) Colleagues attitudes regarding new methodology
  - b) Resistance of change environment in the department
  - c) Head of department resistance for change
  - d) I have no authority to change
  - e) Lack of management support
  - f) Others (please specify) .....
7. Managing PPH requires team work in the hospital 1 2 3 4
8. Managing PPH requires effective communication in the hospital 1 2 3 4

9. Most of reasons for maternal mortality are preventable when providing proper health care 1 2 3 4

Thank you for taking the time filling the questionnaire, I wish you all the best and good luck in your career.

(Imam, Najjab, Dhaher, Barghouti, Abdo, Shaar, & Hansel, 2012).

## Appendix E: PPH PowerPoint Educational Module

Double click on the following icon to view the PowerPoint Educational Module



PPH Powerpoint  
Educational Module

## Appendix F: Project Site Approval

## Office of Regulatory Research Compliance

Date: June 7, 2017

To: Davene M. White, RN, NNP, MPH  
Department of Pediatrics and Child Health

From: Office of Regulatory Research Compliance

Title: **IRB-17-PED-01:** Prevention and Management of Postpartum Hemorrhage

**Approval Date: May 31, 2017**

Action: Full Board Review- *Exempt: New Student Research*

The above-referenced submission was approved via full board review on May 31, 2017. This study was determined to be exempt based on *45 CFR 46.101(b)(4)* and involves minimal risk.

The Project site IRB Federal Wide Assurance number is **FWA00000891**.

Please refer to the above-mentioned date and protocol number when making inquiries concerning this protocol.

CC: IRB File

Thomas O. Obisesan, M.D., MPH, F.A.A.F.P., AVP of Regulatory Research Compliance  
Marline Brown-Walthall, MPH, Sr. Compliance Administrator  
Lisa Medoh, Student Investigator