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Staff Education Plan for Treatment of Obstetrical Hypertension in the Emergency Department

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Walden University

College of Nursing

This is to certify that the doctoral study by

Ashley D'Elia

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Walden University
2022

Abstract

Staff Education Plan for Treatment of Obstetrical Hypertension in the Emergency

Department

by

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MSN, Thomas Edison State University, 2011

BSN, Thomas Edison State University, 2008

ADN, West Virginia University, 2001

Study Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

Walden University

August 2022

Abstract

The United States has the highest childbearing morbidity and mortality rate of any industrialized nation, and the rate has steadily increased over the last three decades. It is estimated that at least half of all maternal deaths are preventable. Hypertensive disorders that present during pregnancy, regardless of etiology, are associated with this increased maternal morbidity and mortality. Obstetrical hypertension, when recognized in settings like the emergency department, readily responds to medical intervention. While guidelines for recognition and treatment of severe and high range blood pressure readings have been defined, hospital emergency departments do not consistently have a related education program for nursing staff. The purpose of this scholarly project was to provide education for emergency department nurses to improve their knowledge and self-efficacy in the recognition of and the risk for elevated blood pressure in pregnant women.

Knowles' theory of adult learning guided this project. The ADDIE model provided the design model for development of the education module. The developed AIM Severe Hypertension in Pregnancy Maternal Safety Bundle was presented via PowerPoint presentation in the project site's education system. Eighty-one registered nurses from the adult and pediatric emergency departments participated in the pretest, education module, and posttest. Knowledge gain measured by the pretest and posttest indicated a knowledge increase of 35.3% among participants. This project has potential implications for positive social change because it could lead to improved nursing assessment and early treatment that may prevent morbidity and mortality in pregnancy.

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Dedication

I set out on this journey to show my children that anything is possible with hard work and dedication. Throughout the course of this journey, I have watched my oldest son overcome obstacles and truths that a child his age should never have to face. I am so thankful for his existence and persistence in life. I dedicate this journey and its completion and success to Garrett, as you are my “why.” You inspire me every day to continue my personal, professional, and academic paths, and I am so incredibly grateful that I have the opportunity to call you, my son.

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This project has been rooted in evidence-based practice and literature and I would like to acknowledge all the professionals in the discipline in Obstetrics who have recognized the disparities that exist, and their perseverance to developing processes and guidelines to fight this battle. In addition, I would like to thank Dr. Deborah Lewis, as she has been a consistent and motivating mentor during this seemingly endless journey. I would also like to extend thanks to both Christopher Norris, MD and Sadaf Lodhi, MD for their expertise and collaboration during this project.

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Section 1: Nature of the Project

Introduction

The United States has the highest morbidity and mortality rate in childbearing of any industrialized nation (Troiano & Witcher, 2018). This incidence of morbidity and mortality has steadily increased over the last three decades, with an estimation that at least half of all maternal deaths are preventable (Troiano & Witcher, 2018).

Collaboratives on both the national and state levels have taken note of this disparity and have developed task forces and initiatives to combat the morbidity and mortality through the implementation of evidence-based practices. In the obstetrical community, preventable contributing factors have been recognized and determined. There has been a push to complete a systematic, multidisciplinary review of cases internally to identify areas of concern, determine process or practice issues, and implement measures and programs to decrease this maternal morbidity and mortality rate (Troiano & Witcher, 2018).

Hypertensive disorders in pregnancy should be addressed upon presentation of the patient in all services of healthcare, including the emergency department. However, because of the lack of resources, knowledge deficit, and overcrowding, it is possible for obstetrical hypertension to be overlooked or left unaddressed when patients present for care in the emergency department. Hypertension is often attributed to the stress of the environment of the emergency department, physical pain the patient is reporting, and/or the physical state of the unit itself and is often ignored by the provider (Karolinksa

Institutet, 2019). Physiological changes of pregnancy, specifically the manifestation of and consequences of hypertension disorders in obstetrical patients are recommended to be treated differently, promptly, and aggressively when compared to nonobstetrical patients (New York State Department of Health, 2013). Through this DNP project, I sought to address the gap in nursing practice in the emergency department regarding recognizing and referring patients appropriately for treatment. I conducted this study in a large community hospital in the North Eastern United States, that serves an indigent population with a high risk of hypertensive disorders of pregnancy in the obstetrical population. The results of this project and potential implications for positive social change through access to care in the community with patients receiving evidence-based care based on the Safe Motherhood Initiative Maternal Safety Bundle for Hypertensive Disorders in Pregnancy (New York State Department of Health, 2013).

Problem Statement

Hypertensive disorders during pregnancy, regardless of etiology, have been associated with severe maternal morbidity and mortality and readily respond to early recognition and medical intervention (Hitti et al., 2018). Morbidity and mortality directly linked to hypertensive disorders of pregnancy include stroke; eclampsia; hemolysis; elevated liver enzymes, low platelet count syndrome; renal failure and disseminated intravascular coagulation, which are among the leading causative factors of maternal death in the United States (Kilpatrick et al., 2016). Perinatal safety collaboratives across the nation have developed stringent clinical practice guidelines and protocols that should

be instituted and followed to decrease this highly preventable and treatable contributor to severe maternal morbidity and mortality in the United States. Guidelines for recognition of severe and high range blood pressure readings should be defined, and a step-by-step algorithm for treatment of these measures should be employed for intradisciplinary, collaborative, and timely treatment.

The New York State Department of Health (2013) conducted a maternal mortality review and found that between 2006 and 2008, there were 70 maternal deaths in the state, and the presence of a hypertensive disorder contributed to the cause of death in 20% of documented cases, higher than any other causative factor. According to the Safe Motherhood Initiative Maternal Safety Bundle for Hypertensive Disorders in Pregnancy, there is a consensus that acute management of hypertensive disorders of pregnancy should be instituted within 15 minutes of presentation of the patient with hypertension (New York State Department of Health, 2013). Because of the time sensitive nature of this management recommendation, emergency department nurses must have the knowledge base to understand and recognize the significance and urgency of hypertensive disorders of pregnancy.

Purpose Statement

Professional organizations and regulatory bodies in the United States have advocated for public reporting of the contributing disparities of maternal and neonatal morbidity and mortality in the form of a report card (Kilpatrick et al., 2016). National and state level quality initiatives are in place to decrease and combat the unnecessarily high

levels of disparity. The 2020 Healthy People topics and objectives identified maternal, infant and child health as a priority (Healthy People, 2020). The goals of the initiative are clear and include improvement of the health and well-being of women, infants, children, and families through prevention to determine the health of the next generation and predict future health challenges for families, communities, and health care systems (Healthy People, 2020). Prevention is key, as the risks of maternal and infant morbidity and mortality are directly proportional to pregnancy related complications and can be reduced by increasing access to quality care in the preconception, prenatal, interconception, and postpartum time frames (Johnson, et. al., 2006).

Obstetrical patients present for care in a multitude of areas. Patients who present to emergency departments with complaints that could be indicative of severe hypertensive dysfunction may not be recognized as significant by professionals outside the obstetrical practice community. The gap in practice is that this emergency department does not have staff education or a standardized assessment system for patients at risk for obstetrical hypertension. The purpose of this project was to develop and institute a staff education plan for recognition and treatment of maternal hypertension in the emergency department that will effectively lead to recognition and timely treatment in accordance with current evidence-based practice guidelines for obstetrics as outlined in the bundle presented by Safe Motherhood Initiative (Simpson et. al, 2018). This requires the timely recognition, reporting, and initiation of treatment of hypertension in the obstetrical patient. The practice-focused question for this project was: Does the education of staff in

the emergency department lead to increased knowledge of the Safe Motherhood Initiative that outlines the recognition and treatment of patients presenting with obstetrical hypertension?

Nature of the Doctoral Project

In this project, I followed the Walden University guidelines for staff education. The setting for the development and implementation of the doctoral project was in the Northeastern United States in a facility that serves an indigent population with multiple high-risk comorbidities. Obstetrical patients often present through the emergency department with complaints both related to pregnancy and for other illnesses. There is a need to extend clinical practice guidelines to the professionals working in emergency services to recognize presentation of severe maternal hypertension and institute the nationally recognized standard of treatment. I led the multidisciplinary team involved in the development and institution of this project and consisted of nursing and physician leadership from the obstetrical and emergency medicine service lines. The assessment protocol, which is routine in obstetrical inpatient units, was introduced into the emergency department to help staff members better identify and treat obstetrical patients presenting with hypertensive disorders of pregnancy. A staff education plan was developed through the use and review of national perinatal quality standards presented through the Safe Motherhood Initiative's Maternal Safety Bundle for guidelines for early recognition and treatment of obstetrical hypertension among a multidisciplinary team.

The project is supported by the hospital leadership as part of their commitment to practice improvement to address the issue of maternal morbidity and mortality.

The clinical staff education plan was developed beginning with recognition of the patient presentation with obstetrical hypertensive disorders and appropriate triage by emergency department nurses. This plan would mimic the practice guidelines set by the Safe Motherhood Initiative and in place throughout the inpatient and outpatient obstetrical care areas, with additional development of recognition during emergency department triage. The initial step of the process will be to make necessary changes to the electronic medical record and included adding a question to the triage evaluation stating, “Are you currently pregnant or have you delivered a baby within the last eight weeks.” Postpartum hypertensive disorders are often unrecognized as such and can manifest immediately after delivery through an estimated 6 months postdelivery, with a significant percentage of disease appearing within the first 8 weeks (Al-Safi, et al., 2011). This question would be auto populated to the triage questionnaire based on two qualifying fields: identification with the female gender and reported age of 14 to 60 years. This step of the project would be put into place prior to delivery of the educational program and would be included as part of the module for learning.

The next step was the development of an education module surrounding the clinical practice guideline for all nursing and provider staff in both the pediatric and adult emergency departments. This presentation was delivered to the staff via a PowerPoint presentation (Appendix A) uploaded to their electronic learning system Healthstream.

The learning module includes a five-question pretest and posttest (Appendix B) developed specifically for this project to validate any increase in knowledge base at the end of the module. The test for both the pretest and posttest exercises used the same questions, which were developed from the learning objectives. Satisfactory completion of the online learning module and a score of 100% on the posttest evaluation was the standard to identify the stakeholders as competently educated and capable of identifying and treating patients according to the protocol.

The educational PowerPoint was delivered through Healthstream and included the definition of severe hypertensive and hypertensive emergency, as defined by the Alliance for Innovation on Maternal Health (AIM) Severe Hypertension in Pregnancy Maternal Safety Bundle (Burgansky, et. al., 2016). In addition, the slides covered the diagnostic criteria, recommendations for when to treat, treatment agents to utilize, monitoring of the patient, complications and escalation process, further evaluation, changes in patient status, and postpartum surveillance. There was a slide included to the dedication of triage questionnaire and a chart identifying the types of hypertension and their defining characteristics. Specific guidelines for when to treat obstetrical hypertension were included, along with algorithms for first line therapies by drug, provided by the AIM bundle. In addition, several checklists, including the hypertensive emergency checklist, the postpartum preeclampsia checklist, and the eclampsia checklist were included. Additionally, resources for downloading applications provided by both the American

College of Obstetricians and Gynecologists (ACOG) and AIM were provided (Burgansky et al., 2016).

The education module included pharmacological dosing algorithms designed by the AIM Safe Motherhood Severe Hypertension Bundle (Burgansky et al., 2016).

Additionally, these algorithms were posted in all provider order entry areas, triage, and trauma bays. A visual aid for nursing recognition and triage (Appendix C) was posted in all entry points of assessment of the patient.

Significance

In the United States, the primary cause of maternal death is hemorrhagic stroke caused by untreated severe hypertension in both the antepartum and postpartum periods (Lynne et al., 2018). The AIM Severe Hypertension in Pregnancy Maternal Safety Bundle outlines stringent guidelines for timely treatment of severe hypertension in less than 60 minutes to reduce maternal stroke and severe maternal morbidity and mortality (Lynne et al., 2018). Both ACOG and the Association of Women's Health, Obstetrics, and Neonatal Nurses (AWHONN) have endorsed this safety bundle (Kilpatrick et al., 2016). Patients who are pregnant or postpartum present to the emergency department for evaluation of both pregnancy and non-pregnancy-related complaints, and providers in the emergency department must be prepared to recognize and treat hypertensive disorders according to the guidelines set by the AIM Severe Hypertension in Pregnancy Maternal Safety Bundle (New York State Department of Health, 2013). Referral and collaboration between emergency department and obstetric providers is necessary to manage the

disorder throughout the remainder of the pregnancy or postpartum period to ensure that patients are provided with the most appropriate evidence-based care (Lynne et al., 2018).

Summary

In summary, the prevalence of maternal hypertensive disorders is of concern and there is a clear treatment algorithm to ensure timely recognition and treatment to decrease maternal morbidity and mortality. Because of the multiple locations where patients may present for treatment, there is a need to expand the knowledge beyond primary obstetrical care locations and institute the protocol and treatment plans into other patient care areas, such as the emergency department. Institution of a staff education plan for the recognition and treatment of hypertensive disorders prevalent in the childbearing population in the emergency department will expand the probability that these patients are recognized and treated appropriately.

Through this project, education was provided to ensure that staff in the emergency department are competent to recognize and institute evidence-based practice guidelines to treat obstetrical hypertensive disorders in the emergency department according to the AIM Severe Hypertension in Pregnancy Maternal Safety Bundle (Burgansky et al., 2016).

In Section 2, I present discussion of the concepts, models, and theories that the education plan is developed around, as well as relevance to nursing practice and the role of the DNP student. Illustration of the local background and context relative to the project and the role of the team involved will be shown as it relates to the project.

Section 2: Background and Context

Introduction

As discussed in Section 1, there is a documented disparity in the recognition and treatment of obstetrical hypertensive disorders, with recognized direct correlation to maternal morbidity and mortality. Because of the probability of a patient to present in multiple manners to access healthcare, the practice-focused question that needed to be addressed is: Does the education of staff in the emergency department lead to increased recognition and treatment of patients presenting with obstetrical hypertension? This practice-focused question is relevant to emergency department nursing practice because during patient triage, prompt recognition of hypertensive disorders of pregnancy as defined by the AIM Severe Hypertension in Pregnancy Maternal Safety Bundle is necessary to appropriately provide care for this specialized population (Burgansky et al., 2016).

I examined several potential learning design models to identify the approach that would best suit the intended audience during this project. The analysis, design, development, implementation, and evaluation (ADDIE) model was selected for this project because it is dynamic and flexible for a fully integrated delivery of education to staff across a department, despite their discipline, credentials, or hours of work (Constancio et al., 2018).

The project was completed in the Northeast region of the United States to address the disparity outlined by the New York State Department of Health's (2013) publication

on hypertensive disorders of pregnancy. Statistical data from this publication indicate a need for a significant contribution to maternal mortality based upon the presence of hypertensive disorders during pregnancy and the postpartum period and call for the necessary institution of the AIM Severe Hypertension in Pregnancy Safety Bundle (New York State Department of Health, 2013).

During this project, I collaborated with key stakeholders in the facility from emergency department, obstetrical, and nursing leadership to gain support for the initiative. Development of the staff education plan and delivery of the presentation, with pre- and postmodule evaluations, was completed to measure the success of the project in terms of increased knowledge to recognize and provide timely treatment to patients presenting to the emergency department with hypertensive disorders of pregnancy.

Concepts, Models, and Theories

American educator Malcolm Shepherd Knowles developed a theory of adult learning and described *andragogy* as the art and science of adult learning (Kearsley, 2010). Through his theory, Knowles (1984) introduced five assumptions about the adult learner, including (a) self-concept, (b) adult learner experience, (c) readiness to learn, (d) orientation to learning, and (e) motivation to learn. Through these principles, Knowles (1984) described self-concept as the evolution of one to move from a state of dependence to self-directed. Knowles (1984) described the adult learner experience as a cumulative reservoir of experience that serves as a resource for continuation of knowledge and the social role of an individual has significance in their readiness to learn. Knowles (1984)

also believed that as an individual matures, their focus for learning shifts from subject centeredness to problem solving, with a shift to internal motivation to learn. Knowles' theory of adult learning is applicable to this project as the audience is comprised of adult learners and the development of materials should be based on Knowles' key principles.

The development of this staff education model was based on the ADDIE model. During the first three stages of the ADDIE model (analysis, design, and development) the education need will be completed. Patients often present to the emergency department seeking treatment during and after pregnancy for a wide variety of complaints, and professionals working in these areas are unfamiliar with the significance and treatment modality for obstetrical hypertensive disorders. The intended learners for the staff education plan were discussed and nurses completing obstetrical triage, as well as emergency department providers treating these patients, were identified.

When using the ADDIE model, the development of the staff education plan cycles through five stages: analysis, design, development, implementation, and evaluation (Hidayanto et al., 2017). During the analysis phase, the problem is clarified, the goals and objectives of instruction are established, and the defined learning environment is identified (Misesani et al., 2020). The design phase explores and defines learning objectives, assessment instruments, learning exercises, subject matter experts, and lesson planning (Misesaniet al., 2020). In development, the actual learning plan is assembled and tested, with review and revision as needed (Hidayanto et al., 2017). The implementation phase involves the execution of the training materials, including the

pretest, the PowerPoint learning module, and the posttest, (Misesani et al., 2020). After completion of the staff education project, evaluation is instrumental and should be approached through both formative and summative mechanisms (Hidayanto et al., 2017). Formative evaluation is present throughout the entire process and each stage of the ADDIE process and should be included in summaries to reflect on lessons learned and measurable outcomes (Misesani et al., 2020). Summative evaluation is obtained through the comparative analysis of the pre- and posttest scores (Misesani et al., 2020).

A pretest (Appendix B) to examine baseline knowledge and learning needs was disseminated to all intended learners; a posttest (Appendix B) was completed after the learning modules were delivered to determine and validate competency of the materials. The learning materials were delivered via a PowerPoint presentation and visual aids through the organization's online learning system, allowing staff to learn at their own pace and providing the opportunity for a reference and review at any time.

After the completion of the pretest and the online PowerPoint learning modules (Appendix A), the posttest was administered. Comparative analysis of the scores from the pretest and the posttest was completed to substantiate the effectiveness of the staff education model.

Relevance to Nursing Practice

Nursing practice is directly impacted in this project because there is a defined need for a clinical practice guideline for the front-line emergency department staff to recognize and report severe range blood pressures in a timely fashion to a provider for

treatment. There should be a robust staff education plan in place on the recommendations of a clinical practice guideline to be implemented successfully and accurately.

Professional organizations, such as the ACOG, AWHONN, and the American Academy of Pediatrics, have declared the profession of nursing as a key role to combating the maternal morbidity and mortality rates in the United States (Troiano & Witcher, 2018).

Nurses were directly impacted in this project because of the defined need for a staff education plan to support the clinical practice guideline for the front-line staff to recognize and report severe range blood pressures in a defined time frame to providers for prescriptive treatment. Substantiation of the relevance of this project in the profession of nursing can be validated and spoken to by utilizing thorough analysis of the results from the pretest and the posttest to reflect a newly acquired knowledge base.

To obtain data and resources needed to complete this doctoral project, I conducted a systematic literature review of current evidence-based practice and available staff education plans for modeling. There has been, and will continue to be, ongoing review of literature and discussion with stakeholders focused on the progression, development, and implementation of the education plan in this setting.

Multiple sources of expertise were used to substantiate the development of this staff education project, with evidence based on national practice guidelines and current recommendations from the stakeholders in the United States. Of most influence were the models of treatment suggested by the Safe Motherhood Initiative in New York state. Review of the standardized obstetric care bundles is paramount and provides evidence-

based practice guidelines to develop staff education. According to the literature review, hospital protocols are currently inadequate and lack protocols for diagnosis, treatment, management, consultation, and referral (Burgansky et al., 2016). Both ACOG District II and the New York State Department of Health recommend the institution of the Safe Motherhood Initiative bundle for the management of obstetrical hypertensive disorders (Burgansky et al., 2016). The treatment algorithm used in this project was developed by ACOG District II in New York titled *Severe Hypertension in Pregnancy Bundle* as a part of the Safe Motherhood Initiative safety and quality program (Simpson et al., 2018).

Role of the DNP Student

During this project, my role as the DNP student included leader, developer, consultant, and mentor. Presentation of the problem to be addressed, the significance of the problem, and the plan for development and institution of the staff education plan was the key focus of the role of the DNP student.

This project is significant to me on both a personal and professional level, as I have worked in the field for over twenty years and have been involved in the care of women who have had severe consequences related to unrecognized or untreated hypertensive disorders of pregnancy. I did not supervise any nurses that are being educated through this staff education module. After review, I have determined that I do not have any identified biases related to the project or the staff participating in the educational program.

In 2013, the state of New York published an executive summary recognizing the disparity of hypertensive disorders of pregnancy and provided alarming statistics related to the direct morbidity and mortality of women with these conditions (New York State Department of Health, 2013). Building upon the current recommendations by ACOG District II and the New York State Department of Health for treatment of obstetrical hypertensive disorders through the bundles published by the Safe Motherhood Initiative, I took this concept through the continuum of care, reaching patients presenting through the emergency department. Because of my unique expertise and clinical background in both high risk obstetrical and emergency department nursing, I am well qualified to develop and lead this initiative. Education of staff in this area helped to further capture and identify patients who should be managed according to these protocols.

Role of the Project Team

During the project, I collaborated with significant stakeholders in the organization to successfully implement this staff education plan. Preliminary planning meetings with leaders from the emergency department, clinical providers and nursing staff, the director of nursing education, and the chief nursing officer provided opportunities to discuss planning and implementation, as well as support buy in for the project. Throughout the course of the project, the stakeholders were kept up to date on all activities and progress of the staff education plan and presented with findings and outcomes on a regular basis.

Summary

The staff education plan for recognition and treatment of hypertensive disorders in the emergency department is significant to nursing practice, and the findings from the literature review for the project support the need for this extension of the bundles in place in the obstetrical care areas. Furthermore, the project provides evidence for the need to capture patients throughout both their antenatal and post-partum periods.

Recognition that obstetrical emergencies is essentially dependent upon collaboration across multiple specialties of care is the basis for the project, and ACOG District II has operated under the understanding that effective protocols can only be developed and implemented with input and adoption from all parties involved in the care of the patient, both directly and indirectly (Burgansky et al., 2016).

Section 3 contains detailed information regarding the practice-focused question and provide the sources of evidence that substantiate the relevance of this project to nursing practice. The section provides information on any validated and published outcomes or research that has already been published. The actual procedure for the project with information about participant selection and protections is discussed. Finally, explanation of the analysis and synthesis of the project upon completion is defined in section three.

Section 3: Collection and Analysis of Evidence

Introduction

As discussed in Section 1, hypertensive disorders present during pregnancy, regardless of etiology, are associated with severe maternal morbidity and mortality, which is associated with complications that are the leading causative factors of death among child-bearing women (Kilpatrick et al., 2016). The push to institute evidence-based clinical practice guidelines is palpable, and expansion of these guidelines beyond primary care areas for obstetrical care is needed to institute social change through reduction of maternal morbidity and mortality. The Safe Motherhood Initiative Maternal Safety Bundle for Hypertensive Disorders in Pregnancy displays the need for acute and timely recognition and management of hypertensive disorders of pregnancy (New York State Department of Health, 2013). The emergency department setting is an area of need for education centered around the recognition and timely treatment of hypertensive disorders of pregnancy and will yield an expansion of nursing knowledge for a population in need.

Practice-Focused Question

The practice focused question for this is project was: Does formal education of staff in the emergency department lead to increased recognition and treatment of patients presenting with obstetrical hypertension? To understand the presentation of hypertensive disorders of pregnancy and develop a staff education plan for recognition and treatment, initial steps of the project were to define the parameters of concern. Defining clear

parameters for recognition and reporting of severe range blood pressure readings, along with definition of time constraints for reporting is essential in achieving timely treatment according to evidence-based practices. After these parameters are defined, development of a treatment algorithm to guide pharmacological management and treatment of the severe range blood pressures is essential. Guidance for monitoring, follow up, and discharge completed the staff education plan. The gap of nursing practice would be diminished with a clear education plan for reporting, leading to effective and timely management of maternal hypertensive disorders, thus decreasing the direct relationship and causation of morbidity and mortality in the United States.

Sources of Evidence

Collection and analysis of evidence must be substantial, evidence-based, and proven to provide results that lead to positive change. There are multiple publications with measurable results calling for the recognition and treatment of hypertensive disorders among obstetrical patients. Experts on the local, state, and national levels have all bought in and backed the maternal safety bundles published by the Safe Motherhood Initiative. This evidence was summarized and discussed with the key stakeholders of the project, including emergency department, obstetric, and nursing leadership to gain support and permissions to complete the project.

Evidence-based literature and research is available through a multitude of platforms and publications by various state-level perinatal quality collaborative groups, with endorsement from professional organizations such as ACOG, AWHONN, and the

Emergency Nurses Association. In response to the inadequate and varying hospital protocols reviewed, ACOG responded with the development of the Severe Hypertension in Pregnancy Maternal Safety Bundle with a goal to implement consistent protocols for diagnosis, management, consultation, and treatment (Burgansky et al., 2016). AWHONN has endorsed the safety bundle in the profession of nursing. Guidance was provided by the AIM Severe Hypertension in Pregnancy Maternal Safety Bundle (Burgansky et al., 2016). This bundle suggests stringent and systematic management of hypertensive disorders in the obstetrical patient and offers clear and concise parameters for recognition and treatment.

In November 2020, ENA and AWONN partnered together and published a consensus statement on the emergency care of patients during pregnancy and the postpartum period. In this statement, organizations recognized the commonality of an obstetrical patient presenting to the emergency department and the need for accurate risk assessment followed by coordination with experts in the obstetrical community (Baird, et. al., 2020). National recognition of contributing disparities to maternal morbidity and mortality is current and respectively published. Multiple literature reviews, research projects, and published statistical reviews and trials are available for reference when analyzing the contribution of maternal hypertensive disorders to the severe morbidity and mortality rate in the United States. These publications come from validated research completed by established bodies of expertise such as AWHONN, AIM, and ACOG.

The pretest and posttest (Appendix B) was developed for this project to demonstrate the knowledge deficit that was assumed based on the literature reviewed. The practice-focused question was: Does formal education of staff in the emergency department lead to increased recognition and treatment of patients presenting with obstetrical hypertension? This question was answered through comparative analysis of pretest and posttest scores, using a t-test of statistical significance.

Participants

Participants in this education plan included all registered nurses and providers in both the adult and pediatric emergency departments who render care to any potential patient that presents who could fall under the guidelines developed through the SMI severe hypertension bundle in pregnancy. The participants in the project were encouraged by their leadership team to complete the education model; participants consisted of approximately 100 individuals. Each learner was provided with an instructional document via email from their leader on completion of the pretest, PowerPoint learning module (Appendix A) in Healthstream, and posttest with clear expectations on time frame for completion. The course, along with the pretest and posttest, were loaded in each learner's profile in the Healthstream learning platform and a report was used to ascertain completion rates. For any outliers of completion, leadership spoke with them to encourage completion of the education.

Procedures

The delivery of education as described took place on the Healthstream electronic learning portal and included the initial task of completing the pretest. After the completion of this pretest, the learner then completed the PowerPoint presentation through the learning module. Finally, the posttest was taken to demonstrate competency of the learning objectives outlined in the presentation. The pretest was completed immediately prior to beginning the learning module. The posttest was available to the learner only after completion of both the pretest and the content for learning through the PowerPoint presentation. The Healthstream system allows for a self-paced learning timeline and learners were given 2 weeks to complete the program in its entirety.

Protections

The learners involved in this educational module were protected ethically regarding the scope of their license and competencies outlined by the organization. There were no breeches of practice or scope identified in the development of this education module. There were no patients being used in any capacity for this project. For the protections required by institution of this project, I submitted to the Walden University Institutional Review Board (IRB) for review and approval. Approval to conduct the project was granted from the Walden IRB and the approval number was 03-25-22-1003235. Identifying information of the participants was not published or discussed, and no individual results from the pretest or posttest will be disclosed. In this project, I followed guidelines for the Walden University IRB, and data collection did not reveal

any personal information of the participants. The participants were identified by a unique code on the pretest and posttest and were not individually identified in any capacity.

Analysis and Synthesis

To analyze and synthesize the potential success of this project, development of a pre and posttest was profound. Baseline assessment of the knowledge base of the intended learners gave the project the grounds for implementation and help guide the focus of the staff education plan. Ease of development of the plan was embedded in the robust and profound amount of literature available to support the need for the expansion of this safety bundle into the care of patients presenting in the Emergency Department.

Implementation of the staff education plan via the organization's learning platform allowed for ease of the user to complete at their own pace and refer to the educational materials when needed. Utilization of a pretest to determine baseline knowledge level set the grounds for the evaluation of success through the posttest. After delivery of the power point module through the electronic learning platform, competency was evaluated and determined through evaluation of the pretest and posttest scores.

The ADDIE model for the development of a staff education was used to guide the development of a staff education plan. This type of approach is preferable because it allows for the learner to answer the questions they may have through their own reflection after completing a self-paced module (Constancio et al., 2018). The set of methods that are used with the ADDIE model address the concepts of planning, organizing, creating and implementation of all education materials to be delivered. When developing the plan

for the education, conversations with leaders on the provider and nursing level were entertained to elicit views and perspectives centered around learning needs and operationalization of the education plan in the organization. Literature as cited in the sources of evidence was utilized to approach the necessity of the topic and to receive support and buy in.

When reviewing the project for effectiveness, scores from the pretest and posttest was utilized to evaluate the validity of the education plan. Modeling of the Brigham and Women's Hospital Center for Nursing Excellence Pre and Post Test Guidelines was utilized to systematically evaluate knowledge level comparatively before and after the provided education module. According to this model, the pretest and posttest should be designed with direct correlation to the intended learning objectives that are established in the learning module (Brigham and Women's Hospital, n.d.). Development of the pretest and posttest identified the objectives that the learner must know and contained the content delivered in the education module. By administering the pretest prior to completion of the learning module and a posttest after completion, results of the two tests yielded information as to the effectiveness of the module in terms of learning achieved from its delivery. Individual scores from the Pretest and Posttest were compared for percentage in change of overall score. A cumulative comparison of aggregate scores was calculated to evaluate the overall outcome of the effectiveness of the Power Point education module.

Summary

Section three has provided a literature review on the methodologies used to develop the staff education plan from both the evidence-based practice guidelines for the identified problem and the proven model of implementation. The need for this extension of the bundle beyond the obstetrical care areas is evident and both patients and providers of care will benefit from the materials presented. The increase in emergency department nursing and provider knowledge will impact patient outcomes and lead to a progressive social change in the morbidity and mortality of hypertensive disorders of pregnancy in the population being served by this institution.

Section 4: Findings and Recommendations

Introduction

The intent of this DNP project was to address the anticipated lack of knowledge of the Safe Motherhood Initiative's clinical practice guideline for treatment of obstetrical hypertension among healthcare providers working in both the adult and pediatric emergency departments in a large urban hospital in the Northeastern area of the United States. This lack of knowledge was identified through a pretest that encompassed five questions to assess the level of competence that healthcare providers possessed on the topic. After completion of the pretest, the online education model was completed through a PowerPoint presentation, and finally, an identical posttest was completed to perform comparative analysis of scores before and after the delivery of education. In discussion with leaders in the facility prior to the start of the project, I identified that patients presenting to the hospital's emergency department were from an indigent population with a high incidence of risk for hypertensive disorders of pregnancy in the obstetrical population.

The gap in practice identified during the planning of this project was that the emergency department had not delivered staff education and did not employ a standardized assessment system for patients at risk for obstetrical hypertension. The purpose of this project was to develop and institute a staff education plan for recognition and treatment of maternal hypertension in the emergency department that would effectively lead to recognition and timely treatment in accordance with current evidence-

based practice guidelines for obstetrics as outlined in the bundle presented by Safe Motherhood Initiative (Simpson et al., 2018). The bundle used for this staff education plan requires that healthcare providers identify, report, and initiate treatment of hypertension in obstetrical patients on a prescribed algorithm in a timely manner.

The practice-focused question for this project was: Does formal education of staff in the emergency department lead to increased recognition and treatment of patients presenting with obstetrical hypertension? By addressing the practice-focused question for this project, the purpose was to close or decrease the gap of nursing practice with a clear education plan for reporting hypertensive blood pressures as defined by the clinical practice guideline, leading to effective and timely management of maternal hypertensive disorders in the emergency department. Doing so can help decrease the direct relationship and causation of morbidity and mortality among child-bearing people in the United States.

Sources of evidence for this project were readily available and were rooted in the published evidence of multiple professional organizations calling for the advancement of care provided to the child-bearing population through implementation of the Safe Motherhood Initiative Maternal Safety Bundles, specifically the clinical practice guidelines for treatment of obstetrical hypertension. Data obtained for the foundation of this doctoral project were collected through a systematic literature review of current evidence-based practices and available staff education plans for modeling. Throughout the project there was ongoing review of literature and discussion with stakeholders

focused on the progression, development, and implementation of the education plan in the study site setting. Multiple sources of expertise were used to substantiate the development of the staff education project, with evidence being based on national practice guidelines and current recommendations from U.S. stakeholders. Of most influence were the models of treatment suggested by the Safe Motherhood Initiative in New York state. Review of the standardized obstetric care bundles provided evidence-based practice guidelines in the development of the staff education plan.

According to the literature review, hospital protocols are currently inadequate and lack protocols for diagnosis, treatment, management, consultation, and referral (Burgansky et al., 2016). Both ACOG District II and the New York State Department of Health endorse the institution of the Safe Motherhood Initiative bundle for the management of obstetrical hypertensive disorders (Burgansky et al., 2016). The treatment algorithm used in this project was developed by ACOG District II in New York titled *Severe Hypertension in Pregnancy Bundle* as a part of the Safe Motherhood Initiative safety and quality program (Simpson et al., 2018).

The evaluation strategy used to evaluate the staff education project was based on the Brigham and Women's Hospital Center for Nursing Excellence Pre and Post Test Guidelines. The guidelines were used to systematically evaluate the knowledge level of healthcare providers in the emergency department comparatively before and after the provided education module. Following the evaluation guidelines, a pretest and posttest (Appendix B) were designed with direct correlation to the intended learning objectives

established in the learning module (Brigham and Women's Hospital, n.d.). Development of the pretest and posttest identified the objectives and contained content delivered in the education module. By administering the pretest prior to completion of the learning module and a posttest after completion, results of the two tests yielded information as to the effectiveness of the module in terms of learning achieved from its delivery. Individual scores from the pretest and posttest were compared for percentage in change of overall score. A cumulative comparison of aggregate scores was calculated to evaluate the overall outcome of the effectiveness of the PowerPoint education module (Appendix A).

Findings and Implications

The purpose of this DNP project was to compare baseline knowledge of providers in the adult and pediatric emergency departments about the AIM Severe Hypertension in Pregnancy Maternal Safety Bundle through the online administration of a pretest in comparison to an identical posttest after delivery of a staff education module. Delivery of the pretest, learning module, and posttest occurred in the Healthstream online learning system.

Participants were assigned the module based on their status of working in the role of registered nurse in the adult and pediatric emergency departments. Participants were given 2 weeks to complete the assignment. A total of 107 individuals were assigned the education to complete; 81 people completed the module in the assigned time frame, for a completion rate of 75.7%. Outliers were determined to be employees who were on medical leave of absence, vacation, and per diem status employees.

Upon assessment of the comparative pretest and posttest scores, the percentage of increase in correct questions was evaluated. During the pretest, the 81 participants were able to answer an average of 61.73% of the questions correctly. After completing the staff education plan, the percentage of questions answered correctly increased to 97.03%, for a positive change of 57.18%. The increase in scores from the pretest to the posttest demonstrate proof of learning achieved by completing the learning module presented via PowerPoint presentation in the education system.

There were no unanticipated limitations or outcomes of this project. The absence of employees completing the education module was expected to occur, as it was disclosed there would be employees who would not be able to complete the education in the prescribed timeframe due to leaves of absence, vacations, and employment status. I expected that scores would increase after delivery of education that covered the objectives evaluated through the pretest and posttest questions.

The increase in knowledge of the AIM Severe Hypertension in Pregnancy Maternal Safety Bundle after this staff education plan was the intended outcome of the project and will lead to positive changes for individuals, including providers and patients from the community. Providers now possess the knowledge to adequately identify and refer obstetrical patients for treatment who fall into the severe blood pressure ranges identified by the AIM Severe Hypertension in Pregnancy Maternal Safety Bundle (Burgansky et al., 2016). Obstetrical patients in the community presenting to the emergency department for evaluation will be treated according to evidence-based practice

guidelines recommended by the multiple professional organizations and stakeholders for safe care during the prenatal and postnatal periods. For the healthcare organization, intended increase in positive outcomes, and decrease in maternal morbidity and mortality will be reflective of increased provider knowledge allowing provision of adequate care.

This DNP Project has paved the pathway for positive social change, assisting the organization in aligning with the AIM Severe Hypertension in Pregnancy Maternal Safety Bundle. The push to institute evidence based clinical practice guidelines and expansion of these guidelines beyond the primary care areas for obstetrical care was identified during the planning of this project to institute social change through reduction of maternal morbidity and mortality. Positive social change will be evident through access to care in the community with patients receiving evidence-based care based upon the Safe Motherhood Initiative Maternal Safety Bundle for Hypertensive Disorders in Pregnancy (New York State Department of Health, 2013).

Recommendations

To continue the initiative, education will be ongoing of any new team members in the adult and pediatric emergency departments. In addition, the staff education module will be modified by education leaders in the facility on a yearly basis in conjunction with the evidence-based practice guidelines and will be assigned as a yearly competency for all providers in the emergency department. A joint venture between the inpatient obstetric department and the emergency department is under development that will include obstetrical hypertension drills led by the Obstetrical Quality Officer on a monthly basis.

Contribution of the Doctoral Project Team

Throughout the work of this doctoral project, many participants were instrumental and influential in achieving success. The multidisciplinary team involved in the development and institution of this project led by the DNP student consisted of nursing and physician leadership from the Obstetrical and Emergency Medicine Service lines. The Chief Nursing Officer, Obstetrical Physician Chairman, Emergency Physician Chairman, and Director of Nursing Education were avid supporters of the project and readily agreed with the need to institute the staff education plan.

Support was gained through multiple team meetings with all question being answered in relation to the clinical practice guidelines and development and delivery of the educational plan. Results were presented to the team and further progression recommendations were delivered with considerable buy in from the stakeholders.

Strengths and Limitations of the Project

The strengths and limitations of this project were as anticipated during the planning stages. There was an expected outcome of positive knowledge ascertain through delivery of the education module through comparative analysis of the pretest and posttest scores. As expected, the limitations of the project are the lack of reaching 100% of assigned learners in the prescribed timeframe.

Section 5: Dissemination Plan

The dissemination plan for this project was relatively simple and included uploading the pretest, education plan, and posttest into the Healthstream learning system and then assigning to all learners. The 2-week time frame for completion was agreed upon by the project team. Results were then extracted through an automated process in the learning system itself with analysis of comparative test scores reviewed and organized by the DNP student. The basis of this project was to reach providers outside the primary obstetrical areas of nursing in the adult and pediatric emergency departments. This module could be further adapted to be instituted in other outpatient and inpatient areas where this patient population is treated.

Analysis of Self

This project was meaningful to me as a registered nurse who has long-term practice experience in both obstetrics and the emergency department. The morbidity and mortality of pregnant women in the United States is alarming, and the clinical practice guideline and evidence provided by professionals in this area of medicine provide proof of the need for institution. Throughout the process of this DNP project, I felt empowered in my ability to play a role in decreasing the statistics related to maternal morbidity and mortality. I believe this project will serve as a precedent to continue the progression of the SMI initiatives and I am hopeful that others will follow in the pathway to expand practice guidelines through staff education and policy change to address maternal morbidity and mortality in all areas of patient care. Completion of this project has been

rewarding, and I am proud that I have been able to deliver education to staff that will promote professional growth and provide positive social change in the community.

Summary

Maternal morbidity and mortality in the United States is the highest among of any industrialized nation; the rate has steadily increased over the last three decades. It is estimated that at least half of all maternal deaths are preventable. Hypertensive disorders present during pregnancy, regardless of etiology, are associated with the severe maternal morbidity and mortality and readily respond to early recognition and medical intervention (Troiano & Witcher, 2018). Collaboratives on both the national and state levels have taken note of this disparity and have developed taskforces and initiatives to combat the morbidity and mortality through the implementation of evidence-based practices. In the obstetrical community, recognition of the preventable contributing factors has been recognized and determined. The push to complete a systematic, multidisciplinary review of cases internally to identify areas of concern, determine process or practice issues, and implement measures and programs to decrease this maternal morbidity and mortality rate was the driver for this project and allowed for development of the staff education plan.

As expected, increase in provider knowledge based on the intended learning outcomes and objectives was achieved and further implementation of this clinical practice guideline through staff education modules is recommended to decrease the gap in nursing knowledge on the subject, inherently providing positive social change and decreasing maternal morbidity and mortality rates.

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Appendix A: Power Point Presentation

Treatment of Obstetrical Hypertension – Institution of a Clinical Practice Guideline for Recognition and Treatment in the Emergency Department

Treatment of Obstetrical Hypertension – Clinical Practice Guideline for Recognition and Treatment in the Emergency Department

1

Objectives

- ▶ Define severe range Blood Pressures in the Obstetrical Patient
- ▶ Differentiate the classifications of hypertension that present during pregnancy and the post-partum period
- ▶ Define the treatment algorithms for Obstetrical Hypertension, including medications, dosage, and frequency
- ▶ Define process for ESI assignment to Obstetrical patients presenting to the Emergency Department in terms of blood pressure readings

2

Every Unit, Every Time

<p>RISK ASSESSMENT & PREVENTION</p> <ul style="list-style-type: none"> ▶ Diagnostic Criteria ▶ When to Treat ▶ Agents to Use ▶ Monitoring 	<p>READINESS & RESPONSE</p> <ul style="list-style-type: none"> ▶ Complications & Escalation Process ▶ Further Evaluation ▶ Change of Status ▶ Postpartum Surveillance
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3

TYPES OF HYPERTENSION	
Chronic Hypertension	<ul style="list-style-type: none"> • SBP \geq 140 or DBP \geq 90 • Pre-pregnancy or \geq 20 weeks
Gestational Hypertension	<ul style="list-style-type: none"> • SBP \geq 140 or DBP \geq 90 • $>$ 20 weeks • Absence of proteinuria or systemic signs/symptoms
Preeclampsia – Eclampsia	<ul style="list-style-type: none"> • SBP \geq 140 or DBP \geq 90 • Proteinuria with or without signs/symptoms • Presentation of signs/symptoms/lab abnormalities but no proteinuria *Proteinuria not required for diagnosis eclampsia seizure in setting of preeclampsia
Chronic Hypertension & Superimposed Preeclampsia	<ul style="list-style-type: none"> • SBP \geq 140 or DBP \geq 90 • Proteinuria with or without signs/symptoms

4

DEFINITIONS

- ▶ **SEVERE HYPERTENSION**
 - Systolic blood pressure ≥ 160 mm Hg or
 - Diastolic blood pressure ≥ 110 mm Hg
- ▶ **HYPERTENSIVE EMERGENCY**
 - Persistent, severe hypertension that can occur antepartum, intrapartum, or postpartum
 - Defined as:
 - Two severe BP values ($\geq 160/110$) taken 15-60 minutes apart
 - Severe values do not need to be consecutive

5

Triage Questionnaire

- Are you pregnant or have you had a baby in the last 8 weeks?
- Symptoms to look out for
 - HA, Visual complaints, Altered Mental Status, CVA, Seizure
 - Abdominal pain- especially RUQ, epigastric pain
 - Persistent nausea, vomiting
 - SOB, pulmonary edema
 - SBP ≥ 160 or DBP ≥ 105
- Immediate OB consult if SBP ≥ 160 or DBP ≥ 105
- OB consult within 60 minutes if SBP 140-159 or DBP 90-105

6

WHEN TO TREAT

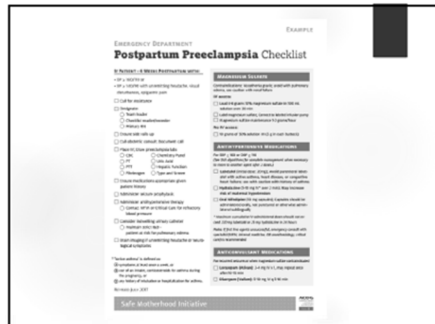
- **SEVERE HYPERTENSION**
 - SBP ≥ 160 or DBP ≥ 110
 - Repeat BP every 5 min for 15 min
 - Notify physician after one severe BP value is obtained
- **HYPERTENSIVE EMERGENCY**
 - Persistent, severe hypertension that can occur antepartum, intrapartum, or postpartum
 - Two severe BP values ($\geq 160/110$) taken 15-60 minutes apart. Severe values do not need to be consecutive
 - If severe BP elevations persist for 15 min or more, begin treatment ASAP. **Preferably within 60 min of the second elevated value.**
 - If two severe BPs are obtained within 15 min, treatment may be initiated if clinically indicated

7

First Line Therapies

- ▶ IV Labetalol
- ▶ IV Hydralazine
- ▶ Oral Nifedipine
- ▶ **Magnesium sulfate not recommended as antihypertensive agent**
 - ▶ Should be used for seizure prophylaxis and controlling seizures in eclampsia
- ▶ IV bolus of 4-6 grams in 100 ml over 20 minutes, followed by IV infusion of 1-2 grams per hour. **Continue for 24 hours postpartum**
- ▶ If no IV access, 10 grams of 50% solution IM (5 g in each buttock)
- ▶ Contraindications: pulmonary edema, renal failure, myasthenia gravis
- ▶ **Anticonvulsants** (for recurrent seizures or when magnesium is C/I):
 - ▶ **Lorazepam:** 2-4 mg IV x 1, may repeat x 1 after 10-15 min
 - ▶ **Diazepam:** 5-10 mg IV every 5-10 min to max dose 30 mg
 - ▶ **Phenytoin:** 15-20 mg/kg IV x 1, may repeat 10 mg/kg IV after 20 min if no response. Avoid with hypotension, may cause cardiac arrhythmias.
 - ▶ **Keppra:** 500 mg IV or orally, may repeat in 12 hours. Dose adjustment needed if renal impairment.

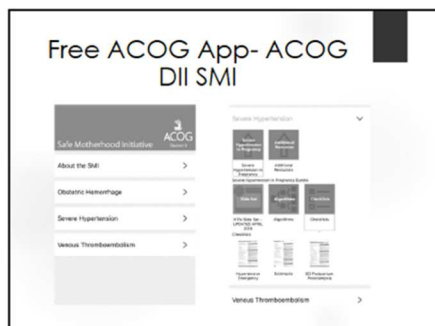
8



13



14



15

Appendix B: Pretest/Posttest

1. Which of the following patients should be triaged at an ESI level 2 and referred for provider evaluation within 15 minutes of presentation to the Emergency Department?
 - a. A patient who is 20 weeks pregnant and presents to triage with complaints of a foul-smelling vaginal odor. BP 132/78, HR 77, R 16, T 98.4.
 - b. A patient who delivered a live full-term baby 3 weeks ago and presents to triage with complaints of a mild headache. Initial BP 168/108, HR 80, R 18, T 98.2. Repeat vital signs 5 minutes later: BP 177/112, HR 77, R 16, T 98.2.
 - c. A patient who is 2 weeks post-partum and breastfeeding. Presents to triage with complaints of painful right breast with redness and edema. BP 120/66, HR 80, R 15, T 100.4.
 - d. A patient who presents to triage stating that she believes that she is pregnant and has had vomiting for 3 days without relief. BP 102/62, HR 60, R 18, T 98.9.
2. True or False: (circle one). A patient who is chronically hypertensive cannot have an additional diagnosis of preeclampsia during pregnancy.
3. Which medications are the first line agents for treatment of Severe Obstetrical Hypertension? Select all that apply.
 - a. Intravenous Labetalol

- b. Intravenous Cardizem
 - c. Intravenous Hydralazine
 - d. Oral Nifedipine
4. True or False: (circle one). Intravenous administration of Magnesium Sulfate is recommended as an Obstetrical Antihypertensive agent.
5. Which of the following blood pressure readings should immediately be recognized as reason for treatment of a pregnant or postpartum patient with medication?
- a. 158/90
 - b. 166/109
 - c. 129/78
 - d. 148/88

Appendix C: Triage Sign

