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Educating Preeclampsia Management Using Case Studies of Disease Progression

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Nurse Educator Scholarly Project (NESP): Final Manuscript

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University of Portland

Educating Preeclampsia Management Using Case Studies of Disease Progression

Preeclampsia is a multisystem hypertensive disease that is unique to pregnancy which can compromise the health of both the mother and the fetus (Phillips & Boyd, 2016). Preeclampsia and eclampsia are responsible for more than 50,000 maternal deaths annually worldwide (Ghulmiyyah & Sibai, 2012). Early diagnosis and disease management is critical for optimizing outcomes (Phillips & Boyd, 2016). Nurses can impact care and outcomes based on vigilance, recognition of warning signs, and patient education regarding the importance of postpartum follow-up care. Preeclampsia can initially manifest or continue during the postpartum period, which can lead to chronic hypertension, complicate future pregnancies, and cause long term multi-organ damage (Phillips & Boyd, 2016). Thus, the focus of this scholarly project is to educate undergraduate nursing students to identify disease progression of an acute crisis when caring for women with preeclampsia during the intrapartum period.

Background

Preeclampsia is the development of hypertension after 20 weeks gestation (Phillips & Boyd, 2016). Two blood pressure assessments exceeding 140 mm Hg systolic and/or over 90 mm Hg diastolic four hours apart in addition to proteinuria greater than 300 mg in 24 hours are required to confirm the diagnosis of preeclampsia (Phillips & Boyd, 2016). Often preeclampsia is asymptomatic, but as the disease progresses women may experience severe features including: headaches, visual changes, abdominal pain, and excessive swelling in the hands, feet, and face (US Department of Health and Human Services [US DHHS], 2014). A diagnosis of preeclampsia between 20 to 34 weeks gestation is associated with an increased risk of developing severe complications from elevated blood pressures for the remainder of the pregnancy, such as

eclampsia, which is the progression of preeclampsia into a tonic-clonic seizure (Phillips & Boyd, 2016).

In the United States, preeclampsia affects 5% to 8% of all pregnancies (Phillips & Boyd, 2016). It is estimated that preeclampsia accounts for 40% to 60% of maternal deaths and is the second leading cause of neonatal deaths among developing countries (US DHHS, 2013). Risk factors associated with preeclampsia include, but are not limited to chronic hypertension, first pregnancies, obesity, women younger than 20 years or older than 35 years of age, African Americans, multifetal pregnancies, and a family history of preeclampsia (US DHHS, 2013). Studies have shown that prior to a preeclampsia diagnosis there are developmental changes in the placenta and uterus indicating the duration of the condition may be longer than previously anticipated (Phillips & Boyd, 2016; Snyder, 2014; US DHHS, 2013).

Preeclampsia is a progressive disease that can have serious effects on multiple organs such as the liver, kidneys, brain, and lungs (Snyder, 2014). Preeclampsia can develop complications such as eclampsia, pulmonary edema, HELLP (hemolysis, elevated liver enzymes, low platelets) syndrome, renal failure, liver infarction, and postpartum hemorrhage (Snyder, 2014; US DHHS, 2014). Fetal complications related to hypertension are intrauterine growth restriction, prematurity, placental abruption, and death (Phillips & Boyd, 2016). Timely detection of preeclampsia, the progression of the disease process, gestational age, and education are important aspects to managing the condition (Snyder, 2014).

Care Coordination

Care coordination is imperative for assuring maternal and fetal safety during the antepartum period and is modified throughout pregnancy based on the individual's disease progression and the personal history. The management of preeclampsia is dependent on onset,

severity, gestation, and benefit of continuing the pregnancy or expediting delivery (Snydal, 2014). Education for nursing staff and the patient can improve assessment and recognition of signs and symptoms of disease progression preventing severe complications (Phillips & Boyd, 2016).

Care coordination of a patient with preeclampsia will continue during the postpartum period. Current studies revealed that proteinuria and hypertension can remain for months to years after birth (Phillips & Boyd, 2016). Postpartum care coordination for patients with preeclampsia include counseling for future pregnancies, psychosocial support, service integration, nutrition counseling, and assessment of residual symptoms (Phillips & Boyd, 2016). Care coordination is prominently provided during the immediate postpartum phase; however, there is a lack of continuation in care as women age (Phillips & Boyd, 2016). The gap in care coordination for women past childbearing age related to complications they experienced during pregnancy can be detrimental to the patient's health. Women that had a diagnosis of preeclampsia during pregnancy are at increased risk for cardiovascular complications, stroke, renal insufficiencies, metabolic disorders, diabetes, and chronic endothelial dysfunction and inflammation (Phillips & Boyd, 2016).

Implications for Nursing Education

The importance of an early introduction of preeclampsia in nursing programs is to recognize and assess disease progression, reduce complications, and educate the patient about when to seek medical attention during the antepartum and postpartum period. Nursing students need to learn critical assessment skills since preeclampsia can progress rapidly, cause long term multi-organ damage, and develop into chronic hypertension (Phillips & Boyd, 2016).

Antepartum and postpartum visits create opportunities for patient education related to the disease

process and need for regular blood pressure monitoring. Education for chronic risk management includes recognizing that preeclampsia can linger for an extended period of time and can also complicate future pregnancies (Phillips & Boyd, 2016).

Literature Review

Implementing a variety of instructional methods, materials, and activities improves learning retention and outcomes (Fitzgerald & Keyes, 2014). Multiple teaching strategies based on experiential and cooperative learning theories were utilized as a framework to guide the teaching strategies for this project. Both theories focus on learner-centered strategies to encourage engagement in class activities and information retention.

Experiential Learning and Teaching Strategies

Kolb introduced the experiential learning theory as a way to apply knowledge and meaning to real-life experiences (Kitchie, 2014). The four modes of learning that correspond with the experiential learning cycle are experiencing, reflecting, thinking, and acting (Kolb & Kolb, 2011). Kolb categorized the learning modes into learning styles which include diverger, assimilator, converger, and accommodator (Kolb & Kolb, 2011). Each of the four learning styles corresponds to a combination of learning modes that best meets the student's educational needs. Divergers focus on the concrete experience and reflective observation through the gathering of broad information and generating ideas (Kitchie, 2014; Kolb & Kolb, 2011). The assimilators prefer reflection observation and abstract conceptualization, which is achieved by concise logical ideas and inductive reasoning (Kitchie 2014; Kolb & Kolb, 2011). The convergers favor active experimentation and abstract conceptualization by means of practical application of factual information and finding solutions through problem solving (Kitchie, 2014; Kolb & Kolb, 2011). Finally, accommodators focus on concrete experience and active experimentation by relying on

intuition and risk taking to explore all the possibilities during challenging experiences (Kitchie, 2014; Kolb & Kolb, 2011). Approximately one fourth of all students will fall into each style; the instructor must be creative in applying a variety of teaching strategies to enhance knowledge retention (Kitchie, 2014).

Assimilators and convergers learn best through lecture and demonstration (Kitchie, 2014; Kolb & Kolb, 2011). Divergers prefer group discussions and accommodators favor simulation or role playing to enhance learning (Kitchie, 2014; Kolb & Kolb, 2011). The class combined the experiential theory's recommended process of lecture and demonstration, which provided a foundation for applying concepts while improving learning and retention (Kitchie, 2014). To incorporate divergers and accommodators learning styles, a small group low fidelity simulation and a whole group discussions was used.

Cooperative Learning and Teaching Strategies

The cooperative learning theory is active learning that incorporates face-to-face interactions, accountability from groups and individuals, interpersonal skills, positive interdependence, and group processing (Hanson & Carpenter, 2011; Yi & LuXi, 2012). Students learn prioritization, time management, communication, diversity, and accountability while working as a team (Yi & LuXi, 2012). Studies have shown that cooperative learning has a significant positive effect on developing critical thinking skills since it is socially and intellectually stimulating (Hanson & Carpenter, 2011). This is important because it motivates students to take active roles in their learning, which can facilitate an understanding of topics such as the complexity of caring for a person with a chronic illness (Hanson & Carpenter, 2011).

Cooperative learning can be achieved through the integration of case studies and reflection into teaching and learning activities. Providing a foundation of knowledge and

understanding for students prior to application in practice is embedded in the roots of cooperative learning theory (Fitzgerald & Keyes, 2014). The progressive case study allowed students to work in small groups that involve teamwork to identify patient needs, physiological changes, and nursing actions. The case study supported cooperative learning by engaging students in problem solving, observation, participation, and reflection (Yi & LuXi, 2012). The class convened for a debriefing discussion of the case studies followed by an individual self-reflection. Cooperative learning supports immediate debriefing and feedback for students to solidify knowledge transfer and allow for the instructor to make modifications for future lesson plans (Fitzgerald & Keyes, 2014).

Learner Assessment and Evaluation

The assessment methods were used to evaluate both the cognitive and affective domains of the learning outcomes. A pre-session quiz assisted the instructor to identify the student's current level of knowledge surrounding a topic and guide the development of lesson plans (Boyas, Bryan, & Lee, 2012; Mager, 2013). A post-session quiz evaluated student learning and progress after course instruction (Boyas et al., 2012; Mager, 2013). Pre- and post-session quizzes are successful for evaluating student learning, the results can then be analyzed and used to improve the design for the curriculum, course, and teaching strategies (Boyas et al., 2012). The affective domain was assessed through a one-minute reflection paper, which allowed for students to make connections between the information presented and explore deep insights into knowledge gained during class (Anderson & Burns, 2013; Phillips, 2015). Reflections provide feedback for instructors, permit students to openly express feelings, and identify emerging themes that can be addressed in the subsequent classes (Ashakiran & Deepthi, 2013). Reflective

writing can foster unresolved conflicts, which is an opportunity for the instructor to guide learning and facilitate problem solving (Phillips, 2015).

Educational Resources

Effectively utilizing resources, developing an organized curriculum design, and preparing teaching activities facilitate a positive learning environment (Sullivan, 2015). The internal resources include planning time for consultations with faculty advisor and faculty preceptor, PowerPoint presentation with video clips, printing for the case study project, and printing costs for the pre- and post-session quizzes. Additional internal resources are classroom space for two hours, a computer with a projector, whiteboard with markers, and access to the course's online web page. External resources included the course textbook, access to videos, and the National League of Nursing nurse educator core competencies (Fisher, 2015) to guide the development and implementation of the curriculum to senior level nursing students to ensure effective learning.

Methods

Learning Outcomes

The four learning outcomes assessed both the cognitive and affective learning domains (Appendix A). The cognitive learning outcomes included the students will be able to (1) categorize hypertensive disorders of pregnancy based on definitions and (2) identify four symptoms of preeclampsia progression. Within the affective domain, the students would (3) report confidence in their ability to care for a patient with a chronic illness in acute crisis and (4) reflect on their feelings of caring for a patient with preeclampsia.

Teaching Strategies and Learning Activities

Prior to the teaching session the students completed a pre-session quiz and were encouraged to read the corresponding course textbook chapter. Class learning activities included a lecture with PowerPoint to introduce preeclampsia and compare hypertensive disorders, several video clip presentations demonstrating progressive signs and symptoms of preeclampsia, and a small group progressive case study (Appendix B). The students had visual recall and hands on practice to be able to recognize an acute crisis of a chronic condition during the case study. The case study depicted a realistic patient situation, which provided students the opportunity to develop problem solving skills, explore complex disease processes, and apply new knowledge. The students participated in a group debriefing discussion following each case study to support knowledge transfer. The group discussions were learner and subject centered to compliment both the affective and cognitive domains (Fitzgerald & Keyes, 2014).

Learning Evaluation

Student learning was evaluated by a pre- and post-session quiz and a one minute reflection paper. The pre-session quiz determined the students' current level of knowledge regarding preeclampsia prior to and following the teaching session. The post-session quiz assessed if the cognitive learning outcomes had been met (Appendix C). The one minute reflection paper addressed the affective learning outcomes by allowing students to report feelings on caring for a patient with a chronic illness during an acute crisis (Appendix D).

Evaluation of Teaching Effectiveness

The evaluation tool utilized to assess teaching effectiveness was adapted from the student ratings of instruction instrument by Individual Development and Educational Assessment ([IDEA], 2016). IDEA (2016) has robust research supporting the validity and reliability of the

evaluation tool for measuring student perception of teaching effectiveness (Ellis, 2015). The combined techniques from the IDEA framework and the nursing program instructor evaluation tool were used to produce a Likert-scale instrument to specifically measure effectiveness of the instructor (Appendix E).

Results

The sample consisted of 22 senior level students enrolled in the maternal-child course. Data collection and evaluation was based on the four learning outcomes. The four learning outcomes included the students ability to (1) categorize hypertensive disorders of pregnancy based on definitions; (2) identify four symptoms of preeclampsia progression; (3) report confidence in their ability to care for a patient with a chronic illness in acute crisis; and (4) reflect on their feelings of caring for a patient with preeclampsia. Overall, the results revealed enhanced student knowledge regarding the diagnosis of preeclampsia, disease progression, and the role of the nurse. The results also reflected an increase in confidence in caring for a patient with preeclampsia and the importance of understanding the disease process.

Evaluation of Learning Outcomes

Evaluation of the cognitive learning outcomes and confidence levels were assessed by the pre- and post-session quiz. The affective learning outcome of students reporting feelings toward caring for a patient with preeclampsia was assessed through a one minute reflection paper.

Pre- and post-session quiz. The overall pre- and post-session scores improved significantly by 32.7 percent ($p < 0.001$). The first learning outcome assessed the students' ability to categorize the hypertensive disorders in pregnancy by matching the definition to the corresponding disorder (Appendix C). The first learning outcome score demonstrated a slight increase of 2.3 percent ($p = 0.72$) between the pre- and post-session quizzes (Appendix F).

Evaluation of the second learning outcome measured the students' ability to identify four symptoms of preeclampsia disease progression. The question was written in a short answer list format (Appendix C). The results established a significant improvement ($p < .001$) between the pre- and post-session quizzes by 53 percent increase in correct responses (Appendix F).

The third learning outcome was evaluated by ranking confidence levels of caring for a patient diagnosed with preeclampsia on a scale of one to ten, one being not confident and ten being very confident (Appendix C). The students' ($n=21$) reported confidence significantly increased by 40 percent ($p < 0.001$) after the teaching session (Appendix F). The third learning outcome omitted the data of one student because the student did not complete the information on the confidence section of the quiz.

In addition to ranking individual confidence levels, the students were asked an open-ended question about what would increase confidence levels. The most dominant responses from the pre-session quiz included a desire for more education (100%) and more experience (19%). The post-session free text responses revealed fewer requests for more education (14.3%) and increased requests for more experience (81%) (Appendix G). Post-session responses included two additional requests for more information (4.8%) and simulation or clinical experience (9.5%).

One-minute reflection paper. The fourth learning outcome was assessed through a one minute reflection paper presented after the teaching session to identify the students' feelings toward caring for a patient with preeclampsia as a chronic illness during an acute crisis (Appendix D). Following thematic analysis, the dominant emerging themes included the importance of understanding the disease process (45.5%), being more comfortable caring for a patient with preeclampsia (40.9%), and increasing diligence when caring for a patient with a

complicated disease process (27.3%). Additional themes which occurred less frequently included desiring more education (18.2%), feeling scared (18.2%), understanding the importance of teamwork (13.6%), and feeling stressed, emotional, or nervous (18.2%) (Appendix G).

Evaluation of Teaching Effectiveness

The students (n=22) were asked to complete a five question evaluation of the instructor's teaching effectiveness (Appendix E). The questions were ranked in a Likert-type scale (1= strongly disagree and 5= strongly agree) and calculated by mean responses and standard deviation. Overall, the results indicated the students either agreed or strongly agreed (with the exception of one question) that the instructor (1) explained the content clearly (mean 4.64, SD 0.49); (2) offered engaging class activities (mean 4.77, SD 0.43); (3) provided feedback that helped learning (mean 4.5, SD 0.67); (4) maintained effective communication (4.73, SD 0.46); and (5) provided a valuable learning experience (mean 4.91, SD 0.29) (Appendix H).

Discussion

This teaching session has established key insights into the educational approach for introducing the topic of preeclampsia as a chronic illness with acute crises. Implementing a pre- and post-session quiz, a one minute reflection paper, and a teaching effectiveness evaluation tool allowed for anonymous data collection to determine whether the learning outcomes were met. The instructor intentionally omitted stating the quiz was going to be administered before and after the session as to not impact the results of students memorizing the questions and searching for the answers during the class. Overall, the pre- and post-session quiz scores improved. However, the first cognitive learning outcome for student ability to categorize hypertensive disorders in pregnancy improved, but did not demonstrate significance. This suggests that students may have required additional information and time spent on definitions and

classification of pregnancy related hypertensive disorders. Other factors that could have impacted these results are that 78 percent of the students correctly answered the question on the pre-session quiz meaning the students may have been familiar with the information, the later time of day into the evening, and students' not thoroughly reading the question since the quiz was previously administered.

The second cognitive learning outcome of the students' ability to list four symptoms of preeclampsia disease progression improved significantly. The use of multiple instructional methods for teaching symptom progression may have contributed to the increase in scores between quizzes. Similarly, Vondracek (2009) found that incorporating various teaching strategies into each lesson can enhance cognitive learning among students while providing equal opportunities for success.

The affective learning outcomes were related to confidence levels and feelings toward caring for patient with preeclampsia. Confidence levels in caring for a patient with preeclampsia significantly increased by the end of the course. Students reported in the pre-session quiz that more education would improve confidence, while the post-session quiz revealed the majority of students' desired clinical experience. This could indicate that 81 percent of the class preferred visual and clinical stimuli to enhance learning after foundational knowledge. The post-session one minute reflection paper results suggested that exposure and education for disease processes can assist students in their ability to care for patients with chronic illnesses.

The results for teaching effectiveness revealed that the students responded favorably to the diverse teaching strategies incorporated through experiential and cooperative learning theories. Students attentively listened during the lecture requesting the PowerPoint to be posted prior to class for notetaking and actively participated during the demonstration of symptom

assessment and the progressive case studies. The two students that felt neutral about the instructor's ability to provide feedback could be related to the students sitting in the back of the classroom, the students exhibiting a higher personal need for feedback, or that the class size may have prohibited the instructor's ability to acknowledge each individual on the learning process and skills demonstration. According to Lee, Dapremont, and Sasser (2011), larger class sizes negatively impact student satisfaction and perception of the course, but does not affect test performance. This is consistent with the pre- and post-session scores improving and two students feeling neutral towards individualized instructor feedback. The research is inconsistent in defining large class sizes within nursing programs, ranging from 20 to 60 students per session; more information is needed to determine the optimal class size for student learning and satisfaction.

Limitations

Class size and time constraints were the greatest limitations of this project. The class size consisted of 22 students, which made it difficult for the instructor to observe demonstrations of symptom assessment or visit each small group during the case studies. The instructor could have given individual feedback to each student with a smaller class size. Another limitation was time. The project was modified to be an optional after class session to adjust for the suggested time constraint of one hour. However, the topic of preeclampsia within the course curriculum must be condensed to less than 30 minutes to be able to cover all required material relating to complications of pregnancy.

Lessons Learned

During the final development of the scholarly project, instructional methods were adapted to incorporate a more diverse learning environment. These adaptations included

mapping patient scenarios on the white board to demonstrate various pathophysiological responses to preeclampsia and allowing students to practice skills demonstrated in the video clips. Students were able to demonstrate assessment of clonus and deep tendon reflexes. The practicing of skills could have been added to the learning outcomes within the psychomotor domain to create a more versatile teaching plan.

Recommendations and Conclusions

Educating students on preeclampsia as a chronic illness with acute crises is essential for increasing awareness and confidence in caring for patients by narrowing the academic practice gap. Although this project was set in a classroom, the skills demonstration could be applied to simulation and clinical post conference discussions. It is recommended that preeclampsia be taught as a progressive disease with diverse outcomes through various instructional methods. Teaching strategies should accommodate the diverse learner to achieve and maintain student engagement. Further research is needed to evaluate teaching strategies to enhance student learning and retention in relation to content topics. Additionally, it is recommended that faculty adjust for time constraints through the use of online voiceover PowerPoints and reading preparation prior to class. Faculty should focus class time on demonstrating skills and practicing case studies as a group to provide sufficient opportunities for cognitive rehearsal and faculty feedback. Finally, faculty should develop an online open forum discussion for questions and clarification if unable to adequately address content during the lesson.

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Appendix A
Teaching Plan

Project Outcomes (knowledge domain level)	Learning Theories to support project focus	Content Outline with key concepts	Teaching strategies & Learning activities for key concepts)	Simulation & Debriefing Plans	Session Resources for anticipated class enrollment	Method of Learner Assessment & Evaluation
<p>Cognitive Domain:</p> <p>Students will be able to categorize hypertensive disorders of pregnancy based on definitions by the end of the lecture</p> <p>At the end of the case study discussion, the students will be able to identify four symptoms of preeclampsia progression</p> <p>Affective Domain:</p>	<p>Experiential Learning Theory:</p> <p>Focuses on the process of creating knowledge from experience by tailoring education to meet the needs of various learning styles (Kolb & Kolb, 2011). The students will apply knowledge from lecture and clinicals to a progressive case study while working in small groups.</p>	<ul style="list-style-type: none"> • Review pathophysiology of hypertension and long term complications • Introduce definitions of preeclampsia and hypertensive disorders in pregnancy • Explain and demonstrate severe features and symptoms of disease progression • Describe care of preeclampsia in pregnancy and postpartum • Practice caring for a patient 	<p>Prior to class: (30 minutes)</p> <ul style="list-style-type: none"> • Students will read course textbook chapter <p>In Class: (120 minutes)</p> <ul style="list-style-type: none"> • Students will take the pre-session quiz prior to class (10 minutes) • PowerPoint lecture to introduce preeclampsia by reviewing and making connections with hypertensive 	<p>A low fidelity simulation will occur as a progressive case study in the classroom. The case study will have three components that begin with a patient arriving for an induction of labor for preeclampsia and progress to eclampsia. The students will focus on symptom recognition and communication of patient status to providers.</p>	<p>Classroom: space, one hour of class time, computer, projector, and whiteboard with markers</p> <p>Supplies: printing of pre- and post-session quizzes, printing of case study</p> <p>Internet: Moodle and YouTube access</p> <p>Human: faculty advisor</p>	<p>Pre- and Post-Session Quiz: These exams will be administered at the beginning and at the end of the class.</p> <p>A pre-session quiz can determine the students' current level of knowledge surrounding a topic, while the post-session quiz evaluates the students learning over a course (Boyas, Bryan, & Lee, 2012).</p>

<p>Students will report confidence in their ability to care for a patient with a chronic illness during an acute crisis after completing the case study and debrief.</p> <p>By the end of the class, the students will reflect on their feelings of caring for a patient with preeclampsia as a chronic illness with acute crisis in a one minute written paper.</p>	<p>Cooperative Learning Theory: Incorporates active learning by participating in group work and thinking about individual actions (Yi & LuXi, 2012). The students will participate in a case study with debrief and an individual one-minute reflection to practice teamwork and examine personal feelings.</p>	<p>with preeclampsia in a case study</p> <ul style="list-style-type: none"> • Debrief as a group after each case study • Have students take a pre- and post-session quiz of knowledge • Individual reflection during a one-minute paper 	<p>disorders (50 minutes)</p> <ul style="list-style-type: none"> • Lecture will include short video clips of signs and symptoms • Small group progressive case study activity with class discussion and debrief (45 minutes) • One-minute reflection paper (5 minutes) • Post-session quiz (10 minutes) 	<p>A debrief will follow the case study to allow for group discussion.</p> <p>A one-minute reflection will be completed by each individual. Reflections allow for students to feel safe to openly write about their thoughts and feelings (Anderson & Burns, 2013).</p>	<p>and faculty preceptor</p> <p>External: course textbook, literature review of teaching session, and National League of Nursing core competencies</p> <p>Anticipated Enrollment: 15-20 students enrolled in the NRS 422, spring semester 2017</p>	<p>One-Minute Reflection: Will be conducted at the end of the class.</p> <p>One-minute reflections allow for students to make connections between the information presented and explore deep insights into knowledge gained (Anderson & Burns, 2013).</p>
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Appendix B
Progressive Case Studies

Case Study 1

Emma is a 17 year old African American female at 38w3d gestation. She is a G1P0 that arrived to the hospital for an induction of labor for preeclampsia. During your admission assessment you notice 1+ swelling on feet and lower legs bilaterally. DTR's +2. Emma reports having a mild headache for the past three days that has not been relieved by Tylenol.

Vital signs: Temp- 36.9 C, RR- 18, HR- 84, BP- 154/96

Patient History: depression, anxiety, BMI 45, and mild asthma.

Current Medications: prenatal vitamin when she remembers and Zoloft

Family History: Mother- chronic hypertension and preeclampsia during pregnancy
Father- arthritis and chronic back pain

Labs upon Admission

Cervical Exam

HGB	12.8 gm/dl
HCT	34%
PLT	150 mm ³
P/C ratio	0.35 g ↑
ALT	62 U/L
AST	54 U/L
Dilation	0
Effacement	20%
Position	Posterior
Consistency	Hard
Station	-3
Bag of Water	Intact

Plan of Care: Per provider orders- Give 25 mg Buccal Misoprostol q 4hr as needed for cervical ripening.

- What are Emma's risk factors for developing preeclampsia?
- What does Emma's lab values and assessment information provide the RN of current status?
- What will the nurse continue to monitor?

Case Study 2

Emma has now received 2 doses of Misoprostol. Emma reports a severe headache with spots in her vision. Assessment reveals 2+ bilateral edema of hands, feet, and lower legs. DTR's +3.

Vital signs: Temp- 37.1 C, RR- 16, HR- 82, BP- 168/104

Lab Values		Cervical Exam
HGB	12.6 gm/dl	
HCT	33%	
PLT	149 mm ³	
P/C ratio	0.52 g ↑	
ALT	62 U/L	
AST	53 U/L	
Dilation		2
Effacement		60%
Position		Mid
Consistency		Soft
Station		-2
Bag of Water		Intact

Plan of Care: Place a Foley bulb for cervical dilation. Give labetalol 20 mg IV immediately to stabilize blood pressure repeat every 10 minutes as needed to maintain BP below 160/110. Begin magnesium Sulfate IV 4 gram/hr bolus with a 1 gram/hr maintenance immediately.

- What has changed in Emma's assessment that indicates the development of severe features?
- What is the purpose of giving both labetalol and magnesium for preeclampsia management?
- What symptoms will the nurse watch for during magnesium infusions?

Case Study 3

Emma successfully delivers a healthy baby boy 10 hours after starting the magnesium sulfate, which is still infusing at 1 gram/hr. During the nurse's 1 hour postpartum assessment you observe no change in edema, DTR's are +3. Emma reports severe headache on her forehead, spots in vision, and new onset of pain on her right side.

Vital Signs: Temp- 37.1 C, RR- 20, HR- 84, BP- 176/110

After the nurse takes Emma's blood pressure the patient eyes become wide. Her face begins to twitch; suddenly Emma's entire body becomes stiff and convulses.

- Prioritize and list the actions the nurse should take?
- What information during the nurse's assessment demonstrates the magnesium was at an ineffective dose?
- After the seizure what additional information would the nurse want to gather?
(Hint: labs, disorders, education)

Appendix C
Pre- and Post-Session Quiz

Pre-Session	Post-Session																																																																																																
<p>1) Match the diagnosis to the correct definition (may only use a term once):</p> <ul style="list-style-type: none"> • Preeclampsia _____ • Pregnancy induced hypertension _____ • Superimposed preeclampsia _____ • Chronic hypertension _____ <p>A) The development of proteinuria and severe features in preexisting hypertension B) High blood pressure condition prior to pregnancy C) Persistent high blood pressure that develops during pregnancy or postpartum, often in occurrence with proteinuria D) New onset of high blood pressures during pregnancy</p> <p>2) Your patient on magnesium sulfate IV at 2 grams/hr has routine labs taken, the magnesium results read 10 mEq/L, your response is to?</p> <p>A) Do nothing, the patient is in the therapeutic range B) Give calcium gluconate immediately C) Increase the magnesium infusion rate D) Decrease the magnesium infusion rate</p> <p>3) List four symptoms of preeclampsia disease progression</p> <p>1) _____</p> <p>2) _____</p> <p>3) _____</p> <p>4) _____</p> <p>4) The goal of managing preeclampsia during labor is ultimately to prevent what from occurring?</p> <p>_____</p> <p>5) On a scale of 1 to 10 how CONFIDENT are you in your ability to care for and recognize disease progression in a patient with preeclampsia?</p> <table style="width: 100%; text-align: center; border: none;"> <tr> <td colspan="4">Not</td> <td colspan="6"></td> <td colspan="4">Very</td> </tr> <tr> <td colspan="4">Confident</td> <td colspan="6"></td> <td colspan="4">Confident</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td> </tr> </table> <p>What would make you more confident?</p> <p>_____</p>	Not										Very				Confident										Confident				1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	<p>1) Match the diagnosis to the correct definition (may only use a term once):</p> <ul style="list-style-type: none"> • Preeclampsia _____ • Pregnancy induced hypertension _____ • Superimposed preeclampsia _____ • Chronic hypertension _____ <p>A) The development of proteinuria and severe features in preexisting hypertension B) High blood pressure condition prior to pregnancy C) Persistent high blood pressure that develops during pregnancy or postpartum, often in occurrence with proteinuria D) New onset of high blood pressures during pregnancy</p> <p>2) Your patient on magnesium sulfate IV at 2 grams/hr has routine labs taken, the magnesium results read 10 mEq/L, your response is to?</p> <p>A) Do nothing, the patient is in the therapeutic range B) Give calcium gluconate immediately C) Increase the magnesium infusion rate D) Decrease the magnesium infusion rate</p> <p>3) List four symptoms of preeclampsia disease progression</p> <p>1) _____</p> <p>2) _____</p> <p>3) _____</p> <p>4) _____</p> <p>4) The goal of managing preeclampsia during labor is ultimately to prevent what from occurring?</p> <p>_____</p> <p>5) On a scale of 1 to 10 how CONFIDENT are you in your ability to care for and recognize disease progression in a patient with preeclampsia?</p> <table style="width: 100%; text-align: center; border: none;"> <tr> <td colspan="4">Not</td> <td colspan="6"></td> <td colspan="4">Very</td> </tr> <tr> <td colspan="4">Confident</td> <td colspan="6"></td> <td colspan="4">Confident</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td> </tr> </table> <p>What would make you more confident?</p> <p>_____</p>	Not										Very				Confident										Confident				1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
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Appendix D
One Minute Reflection

- 1) Reflect and describe your feelings of caring for a patient with preeclampsia as a chronic illness with acute crisis.

Appendix E
Evaluation of Teaching Effectiveness

Please circle the number that best represents how you feel about each statement below:

	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree
The instructor explained new content clearly.	1	2	3	4	5
The class activities encouraged learning.	1	2	3	4	5
The instructor provided feedback that helped me learn.	1	2	3	4	5
The instructor maintained effective communication.	1	2	3	4	5
Overall, the instructor provided a valuable learning experience.	1	2	3	4	5

Appendix F
Quantitative Data: Pre- and Post-Session Quiz

Table 1.

Quantitative Data: Pre- and Post-Session Quiz

Learning Outcomes	Correct Response (%)	Mean (SD)	<i>t</i>	df	<i>p</i>
Overall Survey Results			-7.75	21	<0.001
Pre-Session	43	4.32 (1.81)			
Post-Session	76	7.59 (1.92)			
1. Categorize Pregnancy Hypertensive Disorders			-0.36	21	=0.72
Pre-Session	78.4	3.14 (1.08)			
Post-Session	80.7	3.23 (1.07)			
2. List Symptoms of Disease Progression			-8.3	21	<0.001
Pre-Session	17	0.68 (0.84)			
Post-Session	70.5	2.82 (1.1)			
3. Level of Confidence			-10.58	20	<0.001
Pre-Session	26.7	2.27 (1.91)			
Post-Session	66.7	6.67 (1.06)			

Appendix G
Qualitative Responses for Confidence and Feelings towards Preeclampsia

Table 2.

Qualitative Responses: Pre-and Post-Session Quiz and One Minute Reflection Paper

Learning Outcome 3: What would make you more confident *		
	Pre- Session	Post-Session
Additional Education	100%	14.3%
More Experience	19%	81%
More Information and Studying	0%	4.8%
Simulation and Clinical Experience	0%	9.5%
Learning Outcome 4: Feelings towards Caring for a Patient with Preeclampsia*		
		Post-Session
Importance of Understanding		45.5%
More Comfortable		40.9%
Increase Diligence		27.3%
Desire More Education		18.2%
Stressed, Emotional, Nervous		18.2%
Scared		18.2%
Importance of Teamwork		13.6%

* Based on multiple responses for the question

Appendix H
Evaluation of Teaching Effectiveness

Table 3.

Evaluation of Teaching Effectiveness

	The instructor explained new content clearly	The class activities encouraged learning	The instructor provided feedback that helped me learn	The instructor maintained effective communication	Overall, the instructor provided a valuable learning experience
Mean (SD)	4.64 (0.49)	4.77 (0.43)	4.5 (0.67)	4.73 (0.46)	4.91 (0.29)