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Improving Education on Preeclampsia with Non-Severe Features and Frequency of Assessment Among Nurses in the Maternal-Child Postpartum Unit

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Abstract

Problem: This Quality Improvement (QI) project aims to improve preeclampsia education among nurses and reduce the frequency of preeclampsia assessments among patients(without severe features) (SF) in the Mother-Baby postpartum unit at Hospital A. Nurses often stated that patients are unable to have uninterrupted rest periods with frequent assessments, which research shows is necessary for reducing patient blood pressure.

Context: The QI project is implemented in a 25-bed postpartum unit that cares for women and their newborns in the postpartum period. The unit's nurse educator and nurse manager requested that the visiting University of San Francisco research group focus on simplifying the preeclampsia assessment along with providing refresher education on preeclampsia signs and symptoms.

Interventions: Distribute brief questionnaires to registered nurses on the postpartum unit to determine the most beneficial information nurses need on preeclampsia signs and symptoms and recommendations for frequency of assessment. No intervention was implemented at this time.

Measures: The improvement process began with a microsystem assessment using the 5Ps (see Appendix C) and distributing questionnaires (see Appendix G) that assisted us in assessing the comfort level of nurses. Edible incentives were provided to encourage active participation in the change process.

Results: Our results were a combination of both qualitative and quantitative data. The response rates of the pre-assessment survey gave insight into the nurses' opinions (see Appendix H), and the goal and direction of the QI project that would be most beneficial to the postpartum unit. The pre-assessment survey stated that refresher courses would be beneficial to 69.3% of nurses.

Barriers to the QI included a lack of time for staff to complete surveys, and/or hesitation to complete the survey.

Conclusion: Although the overall comfort level on the topic of preeclampsia was high, having more frequent refresher training courses was highly requested on the pre-assessment survey. Furthermore, after education was provided, quantitative and qualitative data from nurses on the postpartum unit showed an increase in preeclampsia education and satisfaction with assessment frequency among nurses.

***Keywords*:** assessment, compliance, education, frequency, improvement, maternal outcomes, nursing outcomes, postpartum, preeclampsia

Introduction

According to the Preeclampsia Foundation, preeclampsia (PE) rates have reportedly increased by about 25% over the last two decades. Although preventable, it is the leading cause of maternal morbidity and mortality. PE is a persistent high blood pressure (BP) that occurs during pregnancy or in the postpartum period and is typically diagnosed in the 20th week of gestation. Along with persistently high BP, PE is often characterized by the following: high levels of protein in the urine, a newly recognized decrease in blood platelets, decreased function of the kidneys or liver, build-up of fluid in the lungs, and seizures and/or visual disturbances (Preeclampsia Foundation, 2023).

This QI project is necessary to improve the education among postpartum staff, and the frequency of preeclampsia assessment without SF. Although many registered nurses shared a high comfort level pertaining to preeclampsia, refresher education was often requested to stay current on preeclampsia protocols. Delays in diagnosis/management can result in detrimental health outcomes for mothers and their infants, which is why implementation in this area of maternal health is so pertinent. Refresher education provided to staff will be detailed in the discussion section of this paper. Interventions that take place in this QI project are critical because proper identification and education are primary and secondary interventions that can improve maternal-fetal health outcomes.

Problem Description

The maternal-child family unit at Hospital A is a 25-bed unit with reports of barriers related to the assessment frequency of preeclampsia patients without SF. Nurses often reported that frequent patient assessments interrupted the patient's rest, which was one suggestion for improving preeclampsia in the postpartum period. Data analysis in the pre-assessment phase also

showed that there was no standard policy/procedure for nurses to have preeclampsia-specific education to work on the unit. After analyzing the hospital's current preeclampsia protocol provided by leadership, the research team determined that RNs are required to do a thorough assessment of the patient's vital signs every four hours, as well as assess deep tendon reflexes (DTRs), edema, level of consciousness (LOC), headaches (HA), visual disturbances, epigastric pain, and urine output (U/O) every 8 hours (see Appendix M).

Because of the amount of time that it would take to conduct a full audit on patients diagnosed with preeclampsia, leadership was not able to provide current data at Hospital A showing existing rates on this unit. This type of data would greatly support the improvement process and detail the frequent assessment required by the nurses. Nurses are often the first line of defense in recognizing signs and symptoms of preeclampsia and are responsible for educating patients on the manifestations of this hypertensive disorder. According to an article on the effect of nursing intervention regarding preeclampsia, although preeclampsia is often diagnosed in the 20th week of gestation, nurses still play an incredibly important role in teaching patients how to properly identify the warning signs specific to their diagnosis (Abd et al., 2021). Warning signs that patients should be aware of include but are not limited to headache, epigastric pain, swelling in the face and hands, and visual changes.

The quality improvement process began with assessing the postpartum units' comfort level with preeclampsia education and assessment protocols. Although the overall consensus showed that registered nurses were comfortable with the topic of preeclampsia, the improvement process was based on updating nurses on current preeclampsia data and reducing assessment frequency for patients with non-SF. The goal of completing the microsystem assessment is to determine areas for improvement in preeclampsia education for nurses. Along with improving

education, the research team would also like to determine the safest possible reduction in assessment frequency. This effort would improve rest periods for patients and decrease the workload for nurses. The process ends with addressing challenges faced by the nurses regarding education and assessment frequency stated by many in the pre-assessment survey.

PICOT Question

The preeclampsia research team established a population, intervention, comparison, outcome, and time frame (PICOT) to guide our evidence-based research. After conducting a literature review and data analysis on preeclampsia protocols and patient outcomes, the following PICOT question was posed: Among registered nurses (RNs) in the postpartum unit (P), how does providing continuing preeclampsia education and less frequent assessments for nonsevere feature patients (I), compared to less frequent education and more frequent assessments (C), improve knowledge among staff and health outcomes for patients (O) in a timeframe of three months (T)?

Rationale

Although the preeclampsia research team did not use a change theory to implement change within the unit due to time constraints, the most appropriate theory that could be applied to this improvement process is Lewin's change theory. Also referred to as the 3 stage model of change, this change theory involves; Unfreeze, Change, and Refreeze. The first stage in Lewin's theory requires that stakeholders (any individual that this change affects and anyone who is a part of putting changes into place) be made aware of the plan and why changes need to take place. With this change specifically, input from leadership and the registered nurses is incredibly helpful in implementing changes. The second stage in Lewin's theory is Change, where the stakeholders begin taking action and working together to meet a common and previously agreed

upon goal. During the change phase of Lewin's theory, it is important to have open communication with all stakeholders while adjusting to the changes being made. The final step in Lewin's theory is refreezing. In this step, the changes that have been implemented become the "new normal". In other words, the changes that were made to improve the health outcomes in the maternal-child setting became the new standard of practice.

Literature Review

A comprehensive literature review was conducted using the following databases: CINAHL, EBSCO, PubMed, and Scopus. Keywords used for the literature search and data collection included *assessment, compliance, education, improvement, maternal outcomes, postpartum, and preeclampsia.* Search criteria required articles that were English-only and published no earlier than 2013. Based on the research team's proposed PICOT question, 9 peer-reviewed articles were selected and analyzed using the Johns Hopkins evidence evaluation table (see Appendix B).

Nurses heavily rely on evidence-based practice and knowledge obtained through education to promptly care for their patients. An article on an initiative to increase nurse knowledge and decrease preeclampsia-related readmissions highlights the importance of providing regular education sessions for intradisciplinary staff to stay current on topics specific to their profession (Sara & Hunker, 2023). With a diagnosis of preeclampsia specifically, it is crucial to be able to properly identify and manage presenting symptoms to avoid negative maternal-child health outcomes. According to an article on readmission for hypertensive patients, preeclampsia in the postpartum period is the most common cause of readmission in this patient aggregate (Venkatesh et al., 2023). This article also acknowledges that the nurses' degree level does not necessarily equal the level of current knowledge on the topic. Similarly, in a cross-

sectional study on the knowledge and management of pre-eclampsia among healthcare providers, results showed that there was a direct correlation between time spent in practice (not degree level) and level of knowledge regardless of the specialty of the individual participating in the study (Olaoye et al., 2019).

Research conducted on recognizing early warning signs in the postpartum mother shows that nurses play one of the most critical roles in foreshadowing when mothers and their newborns can be at risk of a hypertensive crisis (Fant et al., 2023). There is a significant amount of research on supporting maternity nurses' continuing education on preeclampsia as this is the leading cause of morbidity and mortality in maternal-child health. As many of the research articles included in this literature review will discuss, it is incredibly important for nurses to continue education so that they are properly able to help patients manage their diagnoses and be advocates for themselves. An article on postpartum outcomes and management details the existing methods of caring for hypertensive disorders in pregnancy and greatly details the methods found to be effective in improving maternal-child health outcomes. The results of this quality improvement project found that focusing on the consistency of postpartum follow-up visits greatly improved the multidisciplinary teams' work process and patient health outcomes.

An article on the effect of simulation-based training on maternity nurses’ performance highlights the importance of providing interactive education resources to intradisciplinary staff to improve these outcomes (Abd et al., 2022). The data collected on the unit during the pre-assessment phase of this QI project showed an overwhelming majority of nurses requesting interactive/simulation-based refresher training on preeclampsia protocols. This article is relevant to our study because it highlights simulated learning environments as one that greatly improve

staff interactions and understanding of medically necessary information and interventions specific to maternal-child health outcomes.

Along with the search criteria previously mentioned, data that supports safely decreasing the frequency of assessment of patients without SF was also an important criterion for this QI project. Postpartum nurses frequently stated during the pre-assessment period that patients without SF could be assessed less frequently, and also that it interrupted the patient's rest period. Currently, the preeclampsia protocol at Hospital A states that patients without SF in the postpartum unit are to be assessed as follows: BP, HR, RR, 02, and lung sounds every four hours. DTRs, edema, LOC, HA, disturbances in vision, epigastric pain, and U/O every eight hours. Refer to Appendix N for a list of abbreviations and meanings. The California Maternal Quality Care Collaborative (CMQCC) created a toolkit dedicated to improving healthcare staff's preeclampsia response to improve maternal-fetal outcomes. The toolkit states that the minimum assessment frequency for patients without SF and not on magnesium sulfate can be every four-eight hours. This toolkit played a foundational role in presenting evidence-based research to leadership and will be referred to throughout the QI project.

A retrospective study by Wen et. al (2019) evaluated postpartum readmission rates among high-risk for severe maternal morbidity (SMM) in the postpartum period. Results of this study, which included "all-cause" readmissions during a 60-day time period, showed that readmissions often occurred within 20 days regardless of the postpartum patient's age, and within 10 days for women greater than 35 years of age (Wen et. al 2019).

Specific Project Aim

This study aims to improve maternal-child health education and assessment among the multidisciplinary staff in the postpartum unit at Baby Hospital regarding pre-eclampsia

symptoms. Many current studies on pre-eclampsia show that there is a direct correlation between improving education among multidisciplinary staff and improving maternal-child health outcomes. To establish the intradisciplinary staff's baseline knowledge of pre-eclampsia symptoms without SF, and the frequency of assessment necessary for each postpartum patient, a pre-assessment survey will be distributed to all staff. After baseline knowledge of the topic is assessed, education that utilizes evidence-based practice will be provided to staff as a refresher course. A post-test will be utilized to assess the effectiveness of staff education. The pre-eclampsia research team will provide feedback based on the data collected, and make implementation recommendations based on evidence-based practice.

Methods

Context

The ME-MSN program at the University of San Francisco provided an education that emphasized the Clinical Nurse Leader (CNL) role that will not only assist in delivering quality patient care, but also a means to properly advocate for our patients and their families. As future CNLs, it was pertinent to our team to incorporate the qualities of a CNL into this QI project. The Plan-Do-Study-Act cycle provided a methodical approach for executing, testing, and analyzing the effectiveness of implementations made throughout the change process. The data collection process assisted the team in determining potential gaps within the unit’s policies and work processes. The following assessment tools supported our quality improvement project and assisted the research team in suggesting implementation measures to the maternal-child postpartum unit leadership.

Microsystem Assessment

As an early step in the quality improvement process, we conducted a microsystem assessment to better identify areas of improvement. Using the 5 P's of assessing a microsystem, the PE research team was able to get a more detailed understanding of where the most effective improvements could be implemented. In no specific order, the 5 P's assessment includes Purpose, Patients, Professionals, Process, and Patterns. It is important to include primary stakeholders in the process of microsystem assessment to help enhance understanding of processes within the unit and encourage staff to participate in the change process. This type of assessment also greatly supported our research and helped our team to determine which questions were most important to assist in data collection that would support our project aim most.

As stated throughout, the purpose of this QI project was to reduce the frequency of assessment for preeclampsia patients with non-SF and improve education among the nurses on the postpartum unit. An effort to decrease the nurse workload and improve patient rest periods is a critical requirement in patient recovery. The patient population includes preeclamptic mothers with non-SF on the maternal-child postpartum unit who may need specific education toward their diagnosis. Microsystem professionals include but are not limited to postpartum RNs, charge nurses, and clinical nurse educators. The process involves implementing patient assessment every eight hours as opposed to every four hours. Patterns included but did not limit significant burnout among nurses due to frequent patient assessments, ultimately resulting in less thorough assessments and a decrease in patient safety.

Plan, Do, Study, Act (PDSA) Cycle

To determine the best course of action in implementing evidence-based practice, the research team utilized the Plan-Do-Study-Act (PDSA) Cycle (See Appendix D). Upon learning of opportunities for quality improvement in the postpartum unit at Hospital A, it was determined that primary stakeholders recognized barriers in preeclampsia education among staff as well as the necessary frequency of assessment of patients without SF. Primary stakeholders within this postpartum unit include the nurse managers and the nurse educator who suggested that quality improvement could be made in the area of preeclampsia compliance.

Based on these barriers, the research team created a PICOT question and initiated implementations that would improve preeclampsia compliance, staff morale, and quality of care. The first step in the PDSA cycle is to plan. During this phase, it was important to gather data that would best support the improvement process; locating internal and external preeclampsia resources, collecting pre-assessment surveys from RNs to determine unit knowledge of preeclampsia, and finding data that supports safety decreasing assessment frequency. The "Do" phase of the cycle requires the research team to begin implementation by assessing the microsystem using the 5 P's, providing education to RNs on preeclampsia and frequency of assessment, and collecting post-survey data that detail education effectiveness and any other improvements that can be made. The "Study" phase allows for analysis of data, and to synthesize and present any important findings. Finally, the "Act" phase of the cycle allows the research team to provide recommendations to the primary stakeholders (leadership and nurse educator). It is also important to determine if any changes in protocols are positive changes that improve quality of care and staff morale along with any further adjustments to implementation that should be made.

SWOT Analysis

The PE research team collected pre and post-questionnaire data that supported our research along with any other recommendations or pertinent details from RNs and leadership from October 2023 to November 2023. We then assessed the data and conducted a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis (See Appendix F). By completing a SWOT analysis we were able to properly identify internal and external factors that impacted the unit and interventions that would best support the success of this quality improvement project.

The most notable strengths identified in the unit include support from leadership to implement changes that improve staff morale, a strong commitment to patient safety, and the delivery of high-quality patient care from registered nurses. Weaknesses include a challenging workload for nurses that may impact their willingness to process implementation strategies and a lack of required annual preeclampsia training that assists staff in remaining current with protocols. Opportunities include making changes to staffing protocols based on Title 22 and AWHONN Guidelines for staffing that improve conditions relating to workload. An invaluable opportunity that was mentioned throughout the planning phase of the QI project is an increase in comfortability and compliance with preeclampsia assessment protocols. Another opportunity includes reduced long-term hospital costs and decreased mortality rates often associated with this diagnosis. One threat that was prevalent throughout this quality improvement process was staff hesitation to actively participate in surveys that were the foundation of improving care for patients and work processes for nurses.

Root Cause Analysis (RCA)

Along with the 5 P's microsystem assessment, the Root Cause Analysis (RCA) (See Appendix E) that we conducted helped us to identify which implementations would be most appropriate for the maternal-child postpartum unit. The RCA fishbone diagram is divided into

areas that we decided were most pertinent to focus on to make quality improvement; documentation, monitoring, policies and procedures, and primary stakeholders, all of which lead to improving education compliance and reducing the frequency of assessment.

Cost-Benefit Analysis (CBA)

According to an article on the economic evaluation of prenatal and postpartum care in women with hypertensive disorders, the evaluation of factors that impact financial status in the healthcare setting is a critical aspect in determining whether interventions are beneficial to the organization or if they need to be reassessed (Li et al., 2022). A cost-benefit analysis was conducted to evaluate the pros and cons, in monetary form, of implementation within the postpartum unit (See Appendix K). During the initial pre-assessment data collection phase of this project, nurses stated that they would benefit greatly from having a refresher course on preeclampsia education. Nurses also stated that a reduction in the frequency of assessment would decrease burnout and greatly benefit patients' rest periods which is a significant requirement in patients with preeclampsia. During this quality improvement project, we projected that costs included; educating about 74 staff members at $100/hour, staff educators running audits during a 12-month period (CA average salary- $120,000), and supplies. Benefits included a decrease in nurse turnover due to burnout reported by the nursing staff (projection of $10,098-$88,000), a significant increase in patient satisfaction, and a significant decrease in readmission rates ($33,000 per readmission).

Timeline

A Gantt chart was created and utilized throughout the QI project to help plan the project and track task timelines (See Appendix L). The Gantt chart will show that this project was conducted from September 2023 to December 2023, and include specific start and end dates for

each task. According to an article on the application of project management tools, Gantt charts are necessary project management tools that are useful in portraying the order of important projects within the quality improvement process (Rew et al., 2020).

Intervention

Upon arrival to the unit, leadership provided the QI team with an employee roster of about 74 registered nurses. Shifts included day: 7 am-3:30 pm, evening: 3 pm-11:30 pm, and night: 11 pm-7:30 am. The employee roster played a significant role in ensuring that we surveyed as many nurses from each shift as possible. During the pre- and post-survey assessments, edible incentives were provided to encourage participation in the quality improvement process. Although we did not witness the unit implement the suggested change of patient assessment frequency of once each shift (every eight hours), we did provide pre-eclampsia education and evidence-based practice from CMQCC that supports reducing the assessment frequency. The QI team conducted brief sessions during staff huddles that focused on hospital-specific protocols, and critical signs/symptoms of pre-eclampsia. Because of the limited time to implement this improvement project, educational handouts were given to nurses to supplement pre-eclampsia education.

Due to time constraints and not being able to conduct a full educational session, the QI team remained on the unit during each shift to answer any follow-up questions regarding the material and suggestions for implementing less frequent patient assessments. During education, and throughout our time on the unit, the QI team informed the nursing staff of the pros and cons of implementing less frequent assessments. We also made sure to highlight the importance of utilizing clinical judgment when reducing the frequency of patient assessments. According to an article on clinical judgment in nursing, clinical judgment requires knowledge specific to the

medical field and involves thinking processes that assist nurses in quickly recognizing the meaning of different situations, and the ability to weigh the effectiveness of interventions in those situations (Jessee, 2021).

During the pre-assessment phase of quality improvement, nurses shared their comfort level on preeclampsia education and also provided input on ideas for changes in assessment frequency for patients with non-SF. Over the course of three weeks, the team educated approximately 32 registered nurses during huddles and throughout the shift. Education focused on signs and symptoms of pre-eclampsia, vital sign assessments to include, and recommended assessment frequency. A post-assessment survey was distributed after providing education to each registered nurse and assessed the effectiveness of education which will be discussed in the results portion of this paper.

Study of Intervention

The study phase of the PDSA cycle assists in guiding the study of the effectiveness of the recommended implementations. and took place after preeclampsia education was provided to the nurses. A pre-and post-assessment survey was designed and distributed among the registered nurses on the unit to obtain the necessary information to guide quality improvement and also to provide a baseline for the effectiveness of education. Although the research team was not able to witness the recommended decrease in patient assessment, the post-assessment survey showed that the educational sessions improved nurse comfort levels.

Measures

Quality improvement began by completing a microsystem assessment using the 5 Ps (Purpose, Patterns, Patients, Professionals, and Processes). The research team evaluated the registered nurses' (RN) knowledge of preeclampsia and the frequency of preeclampsia

assessments by utilizing an anonymous pre-assessment questionnaire (see Appendix G). Edible incentives were provided to encourage the registered nurses (RN) to actively participate in pre- and post-assessment surveys. Survey results showed that nurses utilize multiple resources to stay current on preeclampsia protocols. Learning resources include but are not limited to; unit policy updates, staff developer/manager provided education, and E-learning modules. The effectiveness of refresher education and less frequent assessments will be measured by improvement in: education, patient satisfaction with uninterrupted rest periods, and reports of nurse compliance with assessment.

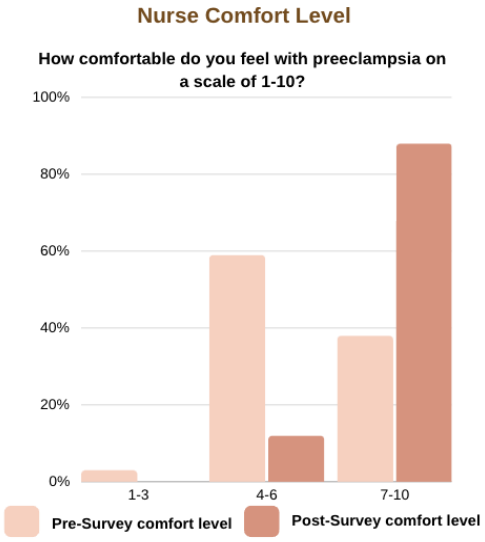
Ethical Considerations

This project meets the guidelines for an Evidence-Based Change in Practice Project and is not a designated research design and, therefore, does not meet the criteria for Institutional Review Board approval.

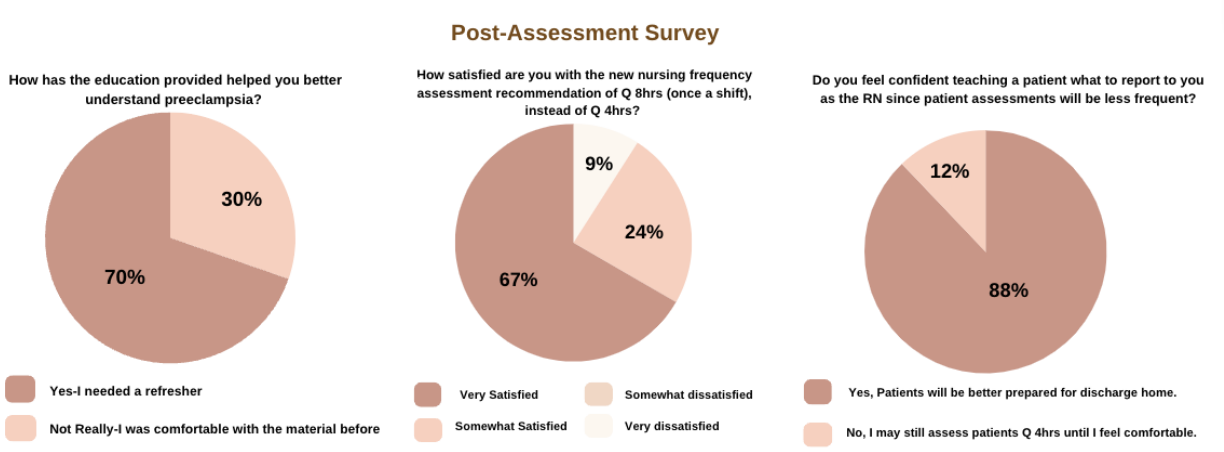
Results

The pre-and post-assessment survey provided qualitative and quantitative results. The response rates on the Maternal-Child unit are as follows: out of 74 registered nurses in the postpartum unit, 31 nurses participated in the Pre-assessment survey and 32 nurses participated in the Post-assessment survey. Before providing education on the unit, nurses were asked to rate their comfort level on preeclampsia education during each assessment to better understand their needs and measure the effectiveness of education post-intervention (1=Not comfortable, 10=Very Comfortable). Post-assessment results showed that 70% (n=23) of nurses found the preeclampsia education helpful, while 30% (n=10) felt comfortable with preeclampsia prior to education and initially stated that a refresher course would not be helpful. Along with the assessment of comfort level post-education, 67% (n=22) of nurses stated that they were very

satisfied with the recommended assessment frequency of every eight hours (once each shift), 24% (n=8) expressed that they were somewhat satisfied, and 9% (n=3) were very dissatisfied. Data analysis showed a direct correlation between decreased satisfaction with the recommendation of change in assessment and concern for a decline in patient safety.



With the recommendation of changing the patient assessment frequency, nurses were often reminded to use their clinical and professional judgment so that patients remain safe while in their care. Throughout the educational session, the research team placed great emphasis on the importance of teaching patients the signs and symptoms that should immediately be reported to ensure quick intervention. Additionally, it was determined that 88% (n=29) of nurses reported a high level of comfort when asked if they would be able to teach their patients the necessary signs and symptoms to report, while 12% (n=4) of nurses felt more comfortable assessing preeclamptic patients every four hours.



Furthermore, and perhaps one of the most useful tools in our research, nurses were asked during the pre-and post-assessment survey to share additional information and any recommendations they felt would improve the current work processes on the unit. Nursing staff often stated that the quality improvement project was useful because it *"got everyone talking about the policy and what changes could be made to improve patient safety and satisfaction".* There were also many suggestions to *"place patients on a prophylactic antihypertensive medication regimen"* and *"explore the possibility of limiting the amount of visitors as toddlers can unintentionally increase the patient's blood pressure"*. Many nurses also expressed the benefits of reducing assessments so that patients would have uninterrupted rest periods which will ultimately improve patient health outcomes.

Discussion

Summary

Although leadership had an idea of where implementation should take place within the postpartum unit, the pre-and post-survey results that were distributed throughout the quality improvement project acted as a guide on how to proceed at each phase of the project. The previously mentioned interventions of providing preeclampsia education and safely reducing the frequency of assessment of patients with non-SF using evidence-based practice were

interventions that the PE QI team and primary stakeholders (nurse manager and nurse educator) agreed would benefit the department most. Due to time constraints, and although the QI team was not present to witness the implementation of the agreed-upon interventions, the education that was provided to the registered nurses served as a necessary refresher, and a reminder of the importance of annual refresher training on areas that improve patient safety.

Limitations

There were limitations that the research team faced during this quality improvement project that interfered with certain phases of project implementation. One limitation that restricted what we were able to accomplish during the improvement process was time constraints. Because this project was conducted over a four-month semester, certain tasks that may have needed more time were completed over one-two weeks. Although we were able to provide education to the nursing staff and received useful feedback, we were not able to implement or see the benefits of our recommendations. Nurses were often hesitant to participate in the improvement process (pre- and post-assessments) due to their increased workload and saw the quality improvement process as extra work that was not made mandatory by leadership. Finally, the lack of evidence-based research on reducing the frequency of assessment for preeclampsia patients made it difficult to determine which direction the project would go. Although we found supporting evidence on CMQCC, it is helpful when delivering recommendations to have multiple sources of research supporting the project.

Lessons Learned

It is important to ensure that RNs working directly with patients are properly trained and stay current on evidence-based data that supports the care they are providing. The quality improvement project implemented on the maternal-child unit allowed us, as nursing

professionals joining the field, to implement a study that improves the quality of care among patients and work processes for nurses. Throughout the improvement process, we were able to practice important characteristics of the CNL that are invaluable to our nursing profession.

Recommendations

The following recommendations are based on staff feedback and findings of the current quality improvement project and will help guide next steps for future projects on preeclampsia in the maternal-child unit. Future recommendations for this site include conducting quarterly audits on preeclampsia patients to have a better understanding of how to work with this aggregate. During the data collection phase of the improvement process, many of the nurses were hesitant to participate due to the increased workload. For this reason, and the staff's request for evidence-based research supporting a decrease in assessment frequency, we recommend increasing the number of nurses that are on the unit, and/or decreasing the patient-to-nurse ratio when caring for preeclamptic patients.

During the quality improvement process, our team took note of recommendations that would help future groups working together to improve the quality and delivery of care. These recommendations include determining a clear goal of what the final project should look like, developing a detailed timeline of tasks that need to be done to ensure timeliness of project completion, and establishing tasks that will be completed by each team member so that there is shared responsibility.

Conclusion

In conclusion, and as stated throughout this quality improvement paper, it is critical to ensure that nurses are properly educated on preeclampsia signs and symptoms as well as the proper treatment for each patient. A diagnosis of preeclampsia remains one of the most

dangerous as patients are not always aware that symptoms could be deadly and often need immediate intervention by medical staff. During the quality improvement process, data collection and analysis showed that although nurses were comfortable with preeclampsia education, a refresher course was helpful. With the recommended reduction in the frequency of assessment, nurses are encouraged to teach their patients how to properly report life-threatening symptoms which also prepares the patient for discharge from the maternal-child unit.

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Appendices

Appendix A: Statement of Determination

Student Project Approval: Statement of Determination

Title of Project

Improving Education on Preeclampsia with Non-Severe Features and Frequency of Assessment Among Nurses in the Maternal-Child Postpartum Unit

Brief Description of Project:

The purpose of this quality improvement project is to enhance preeclampsia education among nurses and also reduce the frequency of assessments for patients with non-severe features. During the initial data collection phase, nurses reported feeling burnt out due to frequent patient assessments. They also mentioned that patients are unable to receive uninterrupted rest periods, which is a crucial criterion for a preeclampsia diagnosis.

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used:
(http://answers.hhs.gov/ohrp/categories/1569)

This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Students may proceed with implementation.

Comments:

Signature of Supervising Faculty _____ (date) 12/6/23

Signature of Student Alyssa Willsher (date) November 20, 2023

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST * STUDENT

NAME: Alyssa J. Willsher, RN **DATE:** November 20, 2023

SUPERVISING FACULTY: Nicole Beamish, DNP, APRN, PHN, CNL

Instructions: Answer YES or NO to each of the following statements:

Project Title: Improving Education on Preeclampsia with Non-Severe Features and Frequency of Assessment Among Nurses in the Maternal-Child Postpartum Unit	**YES**	**NO**
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	Yes	
The specific aim is to improve performance on a specific service or program and **is a part of usual care**. ALL participants will receive standard of care.	Yes	
The project is **NOT** designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does **NOT** follow a protocol that overrides clinical decision-making. The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does **NOT** develop paradigms or untested methods or new untested standards. The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does **NOT** seek to test an intervention that is beyond current science and experience. The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP. The project has **NO** funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	Yes	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., **not** a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	Yes	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and agency oversight committee are comfortable with the following statement in your methods section.	Yes	

ANSWER KEY: If the answer to **ALL** of these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research. IRB review is not required, except at Stanford Hospital. Keep a copy of this checklist in your files. If the answer to ANY of these questions is **NO**, you must submit for IRB approval.

*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.

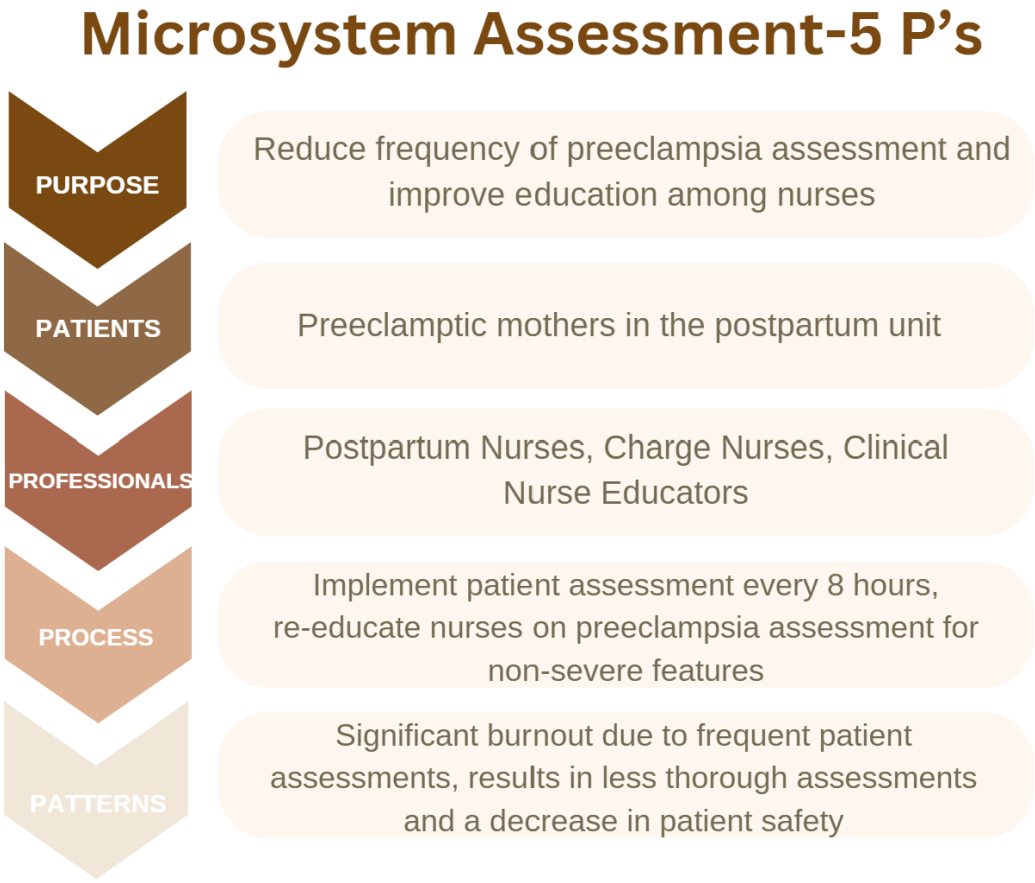
Appendix B: Literature Synthesis Table

Study Author(s)	Study Objective and Design	Sample & Setting	Results	Level of Evidence
Abd, Elshabory, & Shehata, (2022)	The purpose of this study was to evaluate the effectiveness of simulation-based training using a quasi-experimental design.	The sample included 40 maternity nurses	Findings revealed a high statistical difference between pre- and post-intervention.	Level II
Boyd (2023)	The purpose of this study was to determine factors that contribute to increased rates of preeclampsia among maternity patients of color.	The study occurred among nurses in a Labor and Delivery department in the Southeastern United States.	Assessment of nursing practice prior to intervention showed that preeclampsia knowledge ranged from low to moderate. Post-intervention assessment showed that the simulation training was effective in increasing nurses' knowledge and comfort level on preeclampsia treatment.	Level V
Olaoye, Oyerinde, Elebuji, & Ologun (2019)	This cross-sectional study focused on identifying the gaps associated with preeclampsia education among the maternity multidisciplinary team.	The sample consisted of 110 multidisciplinary staff in a hospital in Southwest Nigeria. Participants were each given a 36-item semi-structured questionnaire.	Data was analyzed using the statistical package for social sciences and generated descriptive and inferential statistics. Results showed that there was a correlation between time spent in practice and level of knowledge.	Level II

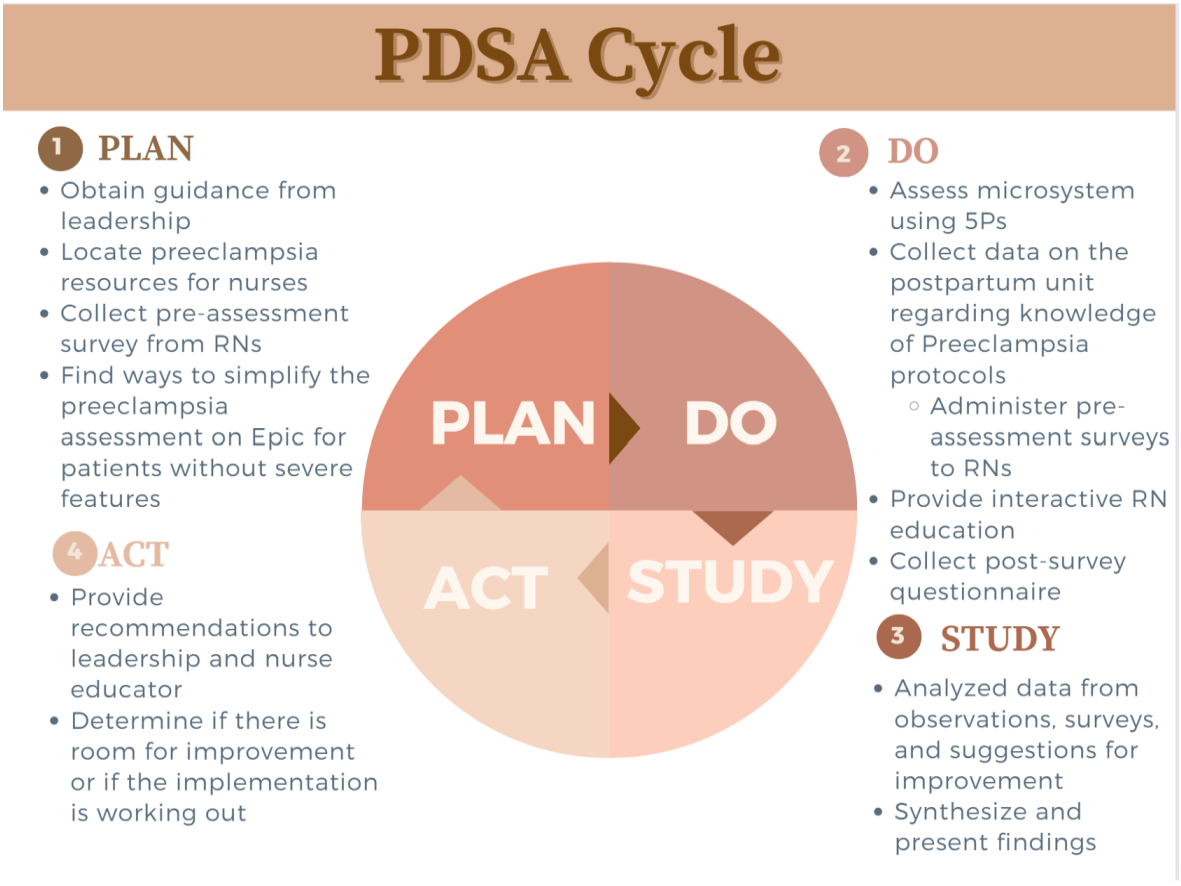
Study Author(s)	Study Objective and Design	Sample & Setting	Results	Level of Evidence
Sara & Hunker, (2023)	The objective of this study was to increase nurses' knowledge of preeclampsia and improve maternal-child health outcomes by reducing readmission rates of patients with this diagnosis.	The sample included 71 nurses working in a postpartum unit at a large tertiary hospital in southeastern Michigan.	During a two-month data collection period, nurse knowledge improved by 10.5% from pre- to post-test period. The postpartum readmission rate was 1.49%.	Level III
Suresh, Duncan, Kaur, Mueller, Tung, Perdigao, Khosla, Dhir, Stewart, Wallace, Ahn, & Rana (2021)	The project aim was to test the accessibility of an organization-wide quality-improvement bundle to improve blood pressure in the postpartum period.	The sample included 926 patients in an inpatient and outpatient setting who delivered from Sept 2018 to Nov 2019.	Results showed that there was a significant increase in patient adherence to follow-up visits (from the pre- to post-intervention period) → 33.5% vs 59.4%. Results also reflected a significant decrease in Systolic and Diastolic BP which greatly decreases a postpartum patient's risk of maternal morbidity.	Level II
Venkatesh, Jelovsek, Hoffman, Beckham, Bitar, Friedman, Boggess, & Stamilo (2023)	The objective of this study was to develop a model for predicting pre-eclampsia postpartum readmission rates across clinical sites.	The sample included a total of 28,201 postpartum patients in a tertiary healthcare setting in the Southern and Northeastern United States.	Results of this study showed that there was an overall readmission rate of 0.9% (0.3% for Southern US, and 1.2% for Northern US). Results also showed that discrimination greatly influences readmission rates	Level III

Study Author(s)	Study Objective and Design	Sample & Setting	Results	Level of Evidence
			among this aggregate of patients.	
Wen, Overton, Sheen, Attenello, Mack, D'Alton, Friedman (2019)	The purpose of this retrospective cohort study was to evaluate postpartum readmissions in at-risk maternity patients.	This sample included "all-cause" readmissions among postpartum patients during a 60-day period.	Many different results were gathered during the 60-day period. One of the most significant was a readmission rate among high-risk postpartum women of 1.7%. Results also showed that readmissions often occurred within 20 days regardless of age and women >35 years of age are often admitted within 10 days.	Level III

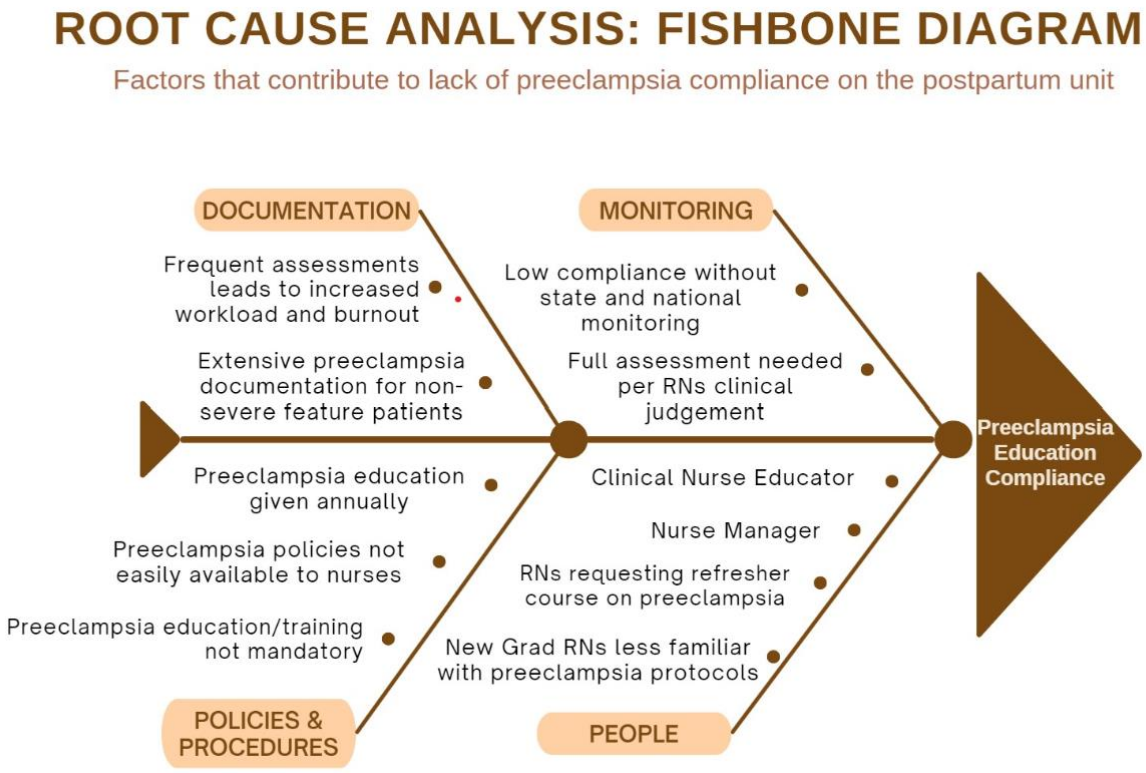
Appendix C: Microsystem Assessment-5Ps



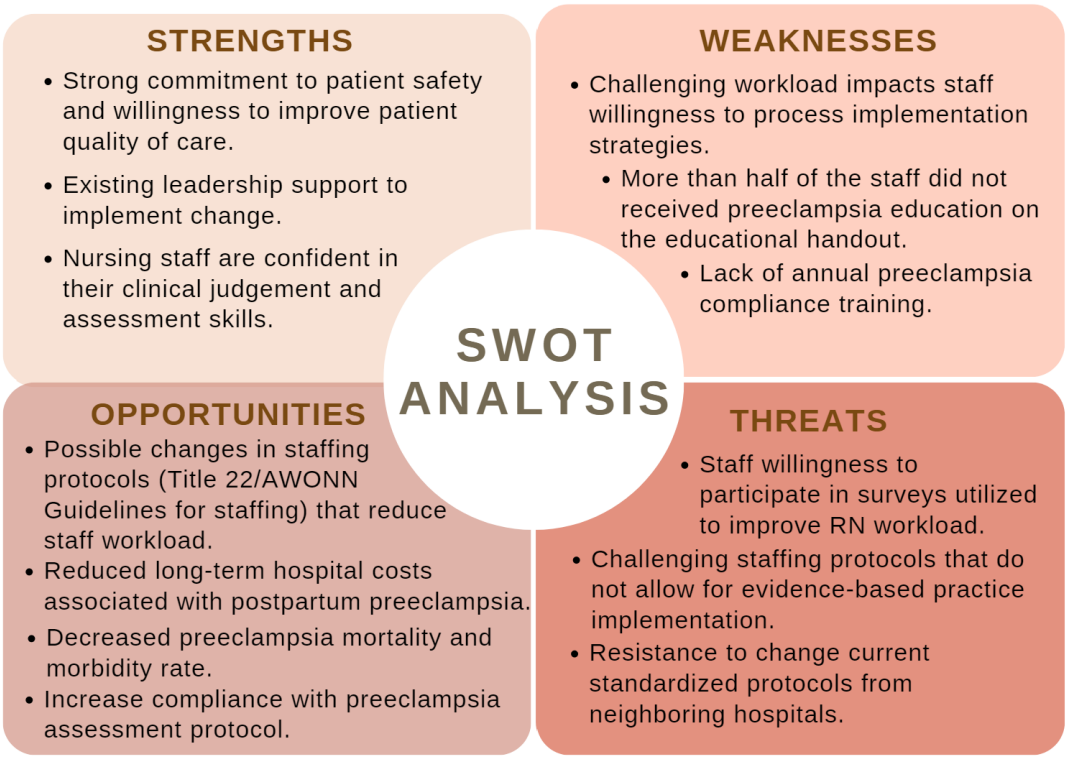
Appendix D: Plan, Do, Study, Act (PDSA) Cycle



Appendix E: Root Cause Analysis (RCA): Fishbone Diagram



Appendix F: Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis



Appendix G: Pre-Assessment Questionnaire

Pre-Eclampsia Pre-Assessment Survey

Any information shared will remain confidential. Your participation is greatly appreciated.

Name:
Date:

1) How long have you been a nurse?
   - ☐ <1 year
   - ☐ 1+ year
   - ☐ 5+ years
   - ☐ 10+ years

2) Have you received any previous training specific to preeclampsia?
   - ☐ Yes
   - ☐ If not, why?

3) What is your comfort level with Preeclampsia?
   - ☐ Not comfortable
   - ☐ Unsure
   - ☐ Comfortable
   - ☐ Very comfortable

4) How often do you encounter patients with preeclampsia?
   - ☐ Very often
   - ☐ Often
   - ☐ Rarely
   - ☐ Never

5) When was the last time you received education on pre-eclampsia?
   - ☐ Weeks ago
   - ☐ Months ago
   - ☐ Years ago
   - ☐ Never

6) Would you find it beneficial to have a training class on preeclampsia?
   If not, why?

   If yes, how often?
   - ☐ Every month
   - ☐ Every 6 months
   - ☐ Every year
   - ☐ Every 2 years

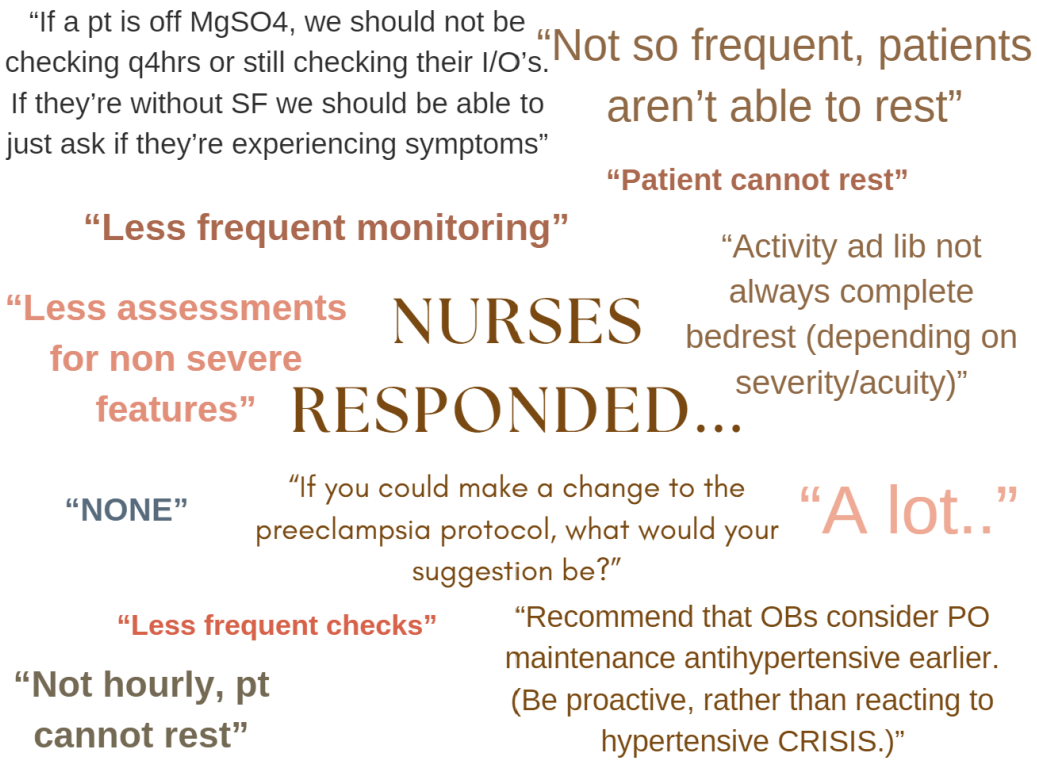
7) What style or learning method would best help you feel comfortable with preeclampsia education?
   - ☐ Online course
   - ☐ Interactive (in-person) class
   - ☐ Simulations
   - ☐ Unit training

8) How are you currently staying informed on pre-eclampsia guidelines?

9) Based on your experience, how frequently do you think Preeclampsia assessments should be done?
   Severe features:
   Non severe features:

10) If you could make a change to the preeclampsia protocol, what would your suggestion be?

Appendix H: Pre-Assessment Comments



Appendix I: Post-Assessment Questionnaire

Preeclampsia Post-Assessment Survey

Your participation is greatly appreciated.

1) After the implemented education, how comfortable do you feel with preeclampsia on a scale of 1-10?
   - ☐ 1-3 Not comfortable
   - ☐ 4-6 Comfortable
   - ☐ 7-10 Very comfortable

2) How has the education provided helped you better understand preeclampsia?
   - ☐ Yes-I needed a refresher
   - ☐ Not Really-I was comfortable with the material before

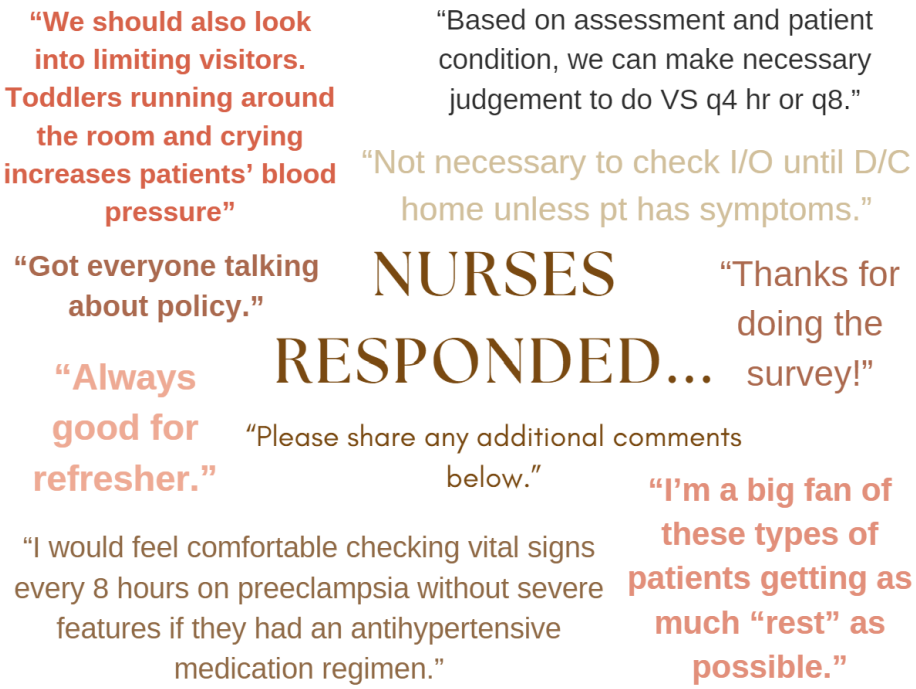
3) How satisfied are you with the new nursing frequency assessment recommendation of Q 8hrs (once a shift), instead of Q 4hrs?
   - ☐ Very dissatisfied
   - ☐ Somewhat dissatisfied
   - ☐ Somewhat Satisfied
   - ☐ Very Satisfied

4) Do you feel confident teaching a patient what to report to you as the RN since patient assessments will be less frequent?
   - ☐ Yes, Patients will be better prepared for discharge home.
   - ☐ No, I may still assess patients Q 4hrs until I feel comfortable.

5) Please share any additional comments below.

Thank you for your time!

Appendix J: Post-Assessment Comments



Appendix K: Cost-Benefit Analysis

Estimated Cost of Preeclampsia Education Refresher Course

74 Nurses*$100/hour

$7,400 per year

Estimated Cost of Badge Reference Card

$220

Total Estimated Cost/Year: $7,620

Compared To:

Decreased nurse turnover (anywhere from **$10,098-$88,000**). Increased patient satisfaction. Decreased readmission rates **($33,000 per readmission**)

Appendix L: Gantt Chart

Preeclampsia Education Quality Improvement

Gantt Chart

TASKS	Start Date	Due Date	SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER			
			Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4	Week 1	Week 2	Week 3	Week 4
Orientation	09/26/23	09/26/23																
Literature Review	09/11/23	09/30/23																
Meeting w/ Ldrshp	09/26/23	09/26/23																
5 P's Assessment	09/26/23	09/30/23																
Questionnaire Development	10/03/23	10/03/23																
Pre-Assessment (Data Collection)	10/04/23	10/12/23																
Data Analysis	10/23/23	10/31/23																
Staff Education Dev.	10/27/23	10/30/23																
Implementing Staff Education	10/30/23	11/10/23																
Post-Assessment (Data Collection)	10/30/23	11/10/23																
Evidence-Based Project Poster Creation	10/01/23	12/01/23																
Project Presentation	12/01/23	12/14/23																

Appendix M: Current Postpartum Unit Policy

E. Postpartum to discharge ongoing assessment:
Preeclampsia without Severe Features
1. Obtain BP, HR, RR, and O_2sat every 4 hours.
2. Assess lung sounds every 4 hours.
3. DTRs, edema, LOC, HA, visual disturbances, epigastric pain, and urine output every 8 hours.

Appendix N: Educational Handout

UNIVERSITY OF SAN FRANCISCO

Improving Maternal Health Outcomes
in the Postpartum Unit

Jazmin Garduno, RN
Monica Heredia, RN
Alyssa Willsher, RN

What is Preeclampsia?
Preeclampsia (Pre-E) is a severe hypertensive disorder that occurs during pregnancy after 20th week. This condition can affect other organs in the body and it is dangerous for mom and fetus.

Clinical Manifestations
- High BP
- Proteinuria
- SOB
- Edema
- Increased DTRs
- Headaches
- Visual disturbances

Why is this important?
- Pre-E occurs in 5-7% of all pregnancies.
- Annually, it is responsible for 70,000 maternal deaths and 500,000 fetal deaths worldwide.
- Early-onset HTN has increased by approx. 143% from 1990 and 2010 in the US.
- Pre-E has risk factors common with cardiovascular disease and sleep-disordered breathing including obesity, essential HTN, and diabetes.

Continued ...
- Postpartum fatigue was related to reduced amounts of sleep and low levels of ferritin and hemoglobin.
- Screening for symptoms of sleep-disordered breathing should be considered in women with early-onset preeclampsia.

Risk Factors
- Chronic HTN
- Multiparity
- Pregnancies ≥35y/o
- Diabetes
- Obesity

Diagnostics/Tests
- Blood pressure: ≥ 140/90 mmHg
- 24-hr urine collection:
  - ≥ 300mg protein
  - ≥ 0.3mg/dL protein/creatinine
  - ≥ 1.1mg/dL serum creatinine
- Dipstick: 2+
- Thrombocytopenia: ≤ 100 x 10
- Weight gain ≥ 3-5 lbs/week

Recommended Nursing Assessment

Assessment/Findings	Postpartum Nursing Assessment Frequency
BP ≥ 140/90 mmHg Pulse Respirations sPo2	Q 4-8 hrs
Temperature	Per unit protocol
Intake and Output (I&Os)	Q 8 hrs
Lung Auscultation	Q 4-8 hrs
Deep tendon reflex Clonus Level of consciousness (LOC) Edema Headache, visual disturbances, epigastric pain	Q 4-8 hrs PRN
Fetal status and uterine activity	Not applicable

Patient Outcomes
- Uninterrupted rest periods necessary for recovery
- Increased patient safety

Nurse Outcomes
- Decreased assessment frequency allows more time for RN to adequately complete patient assessments

Data supports assessing patients q 4-8hr (Once per shift) However, clinical judgement and providing education to patients on what symptoms to look for is critical in ensuring patient safety.

THANK YOU FOR YOUR PARTICIPATION!

References