

The development of assessment instrument for postpartum patients with severe preeclampsia-eclampsia based on need for help and self-care models

Endah Suprihatin ^{1,*} , Sri Hardi Wuryaningsih ² 

¹ Health Polytechnic of the Ministry of Health, Surabaya, Indonesia

*Correspondence: Endah Suprihatin. Address: Pucang Jajar Tengah Street No.56, Kertajaya, Surabaya City, East Java 60282, Indonesia. Email: endah.atin@poltekkesdepkes-sby.ac.id

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ABSTRACT

Introduction: One of the causes of the high mortality rate of patients with severe preeclampsia-eclampsia in the postpartum period is the inaccurate assessment of the patient's need for help and independence in self-care. This study aimed to develop specific assessment instruments for postpartum patients based on Wiedenbach's need for help and Orem's self-care models.

Methods: This study used a research and development (R&D) approach. The samples were 30 midwives and 100 documents of postpartum patients with preeclampsia from Airlangga University Hospital, Surabaya, and 30 midwives from Haji Hospital Surabaya. Data were collected through document tracking and interviews. Data were analyzed with R&D methods.

Results: The results showed that the mean rank value of the new assessment instrument was higher (29.72) than the old assessment instrument (19.93). A significant difference was found between the new assessment instrument and the old assessment instrument (Wilcoxon test value -5.379 with $p < 0.001$). The new instrument had functionality, efficiency, and usability for assessment of the need for help and self-care of postpartum patients with severe preeclampsia and eclampsia.

Conclusions: Postpartum patients with severe preeclampsia-eclampsia should be assessed by the specific assessment instruments based on Wiedenbach's need for help and Orem's self-care models.

Keywords: assessment instruments; eclampsia; need for help; postpartum; self-care; severe preeclampsia

Introduction

Preeclampsia and eclampsia are one of the main causes of maternal and fetal mortality and morbidity in addition to bleeding and infection (triad complications) (Shamsi, Saleem and Nishter, 2013). In 2019, the maternal mortality rate of East Java Province reached 89.81 per 100,000 live births. The most common cause of maternal death in Surabaya is preeclampsia-eclampsia, which is 26.90% (Ministry of Health, 2021).

Preeclampsia is a widespread disorder of endothelial or vascular malfunction resulting in vasospasm after 20 weeks of gestation, resulting in decreased organ perfusion and endothelial activation, leading to hypertension, non-dependent edema, and proteinuria. It is called severe preeclampsia if the systolic blood pressure is ≥ 160 mmHg and diastolic blood pressure ≥ 110 mmHg

accompanied by proteinuria of more than 5g / 24 hours (Peres, Mariana and Cairrão, 2018).

Eclampsia is an advanced condition of severe preeclampsia that is not resolved properly, leading to seizures. About 75% of eclamptic seizures occur before delivery, 50% within the first 48 hours after delivery, and can occur after 6 weeks postpartum. Eclampsia can lead to coma and even death, either before or after childbirth (Bernstein et al., 2017). The rate of caesarean sections in cases of severe preeclampsia is estimated to be high (around 70% or more in preterm pregnancies), because many obstetricians prefer performing caesareans in women with preeclampsia, even with a reassuring fetal status (Ferreira et al., 2016). Postpartum patients with severe preeclampsia-eclampsia are most at risk of infection due to childbirth with caesarean section, at risk of bleeding due to decreased ability of uterine



contractions due to administration of MgSO₄ and at risk of postpartum depression due to infant loss and inability to adapt to hormonal changes (Frawley et al., 2020; Hoedjes et al., 2011; Peres et al., 2018; Stern et al., 2014).

Several studies on the experiences of patients who received emergency treatment for severe preeclampsia indicated that patients felt that their lives were threatened, felt discomfort, tried to reduce discomfort, worried about the failure of treatment measures, felt close to death, felt that they did not get full support, expected friendly service and yearned for better conditions. The sense of loss can cause emotional distress to the mother, and leave a deep sense of grief. It is found that the patient expresses the need for professional support or social support (Frawley et al., 2020). To minimize the impacts, the needs and self-care of postpartum patients with severe preeclampsia and eclampsia should be identified as early as possible (Frawley et al., 2020). Assessment of the need and self-care of postpartum patients with severe preeclampsia and eclampsia is essential for professionals to meet the need and self-care of patients. Thus, an appropriate assessment instrument based on need and self-care of postpartum patients is needed. Based on a preliminary study on obstetric wards in several hospitals in Surabaya, there was no specific assessment instrument for postpartum patients with severe preeclampsia and eclampsia.

Wiedenbach's "need for help" model reveals that nurses are people who can help postpartum clients with preeclampsia-eclampsia overcome problems and improve their welfare through their actions, thoughts, feelings, words, writing, and body movements, while postpartum clients with preeclampsia-eclampsia are recipients of assistance (need for help) from health professionals either in the form of care, advice or education. Three goals put forward by Wiedenbach in helping clients are: (1) preventing maternal emergency, (2) reducing anxiety due to loss, (3) building effective coping in dealing with emergencies and losses by collaborating and coordinating with other health teams so that clients get actioned appropriate treatment procedures. In addition, Orem's "self-care" model sees that every individual has the ability and potential to care for himself and achieve prosperity (Alligood, 2018). In this case, the modification of Wiedenbach's need for help and Orem's self-care models can allegedly be applied to overcome the physical and psychological crisis and emergency problems of postpartum patients due to preeclampsia and eclampsia and help postpartum patients and their families achieve independence in self-care and baby care according to their abilities (Rahayu, 2015).

The development of assessment instruments has been carried out in several previous studies. Based on international joint commission accreditation standards, there is only a general nursing assessment instrument,

not specifically for postpartum patients (Rachmania, Sunaringtyas and Widayati, 2019). The development of maternal assessment instrument has been done in Brazil which is tracing about the quality of life of the mother and her baby, not identifying about emergency care needs as an impact of preeclampsia and eclampsia (Zubaran et al., 2009). Another study was conducted in Turkey aimed to compare the various existing instruments and determine which instrument is the most suitable for assessing the antenatal and postpartum period for Turkish society (Çakşak et al., 2018). Similar studies found the evaluation of changes in postnatal care using the Parents' Postnatal Sense of Security (PPSS) instrument. The study evaluated two models of postnatal care using a questionnaire incorporating the PPSS instrument. The PPSS can be used by mothers and fathers in the postpartum period to identify the sense of security of parents in the postnatal period (Kvist and Persson, 2009). However, those studies have not linked with the assessment instrument in postpartum with preeclampsia-eclampsia.

To overcome the limitation and the weakness of the previous studies, the current study aimed to develop an assessment instrument for postpartum patients with severe preeclampsia-eclampsia based on Wiedenbach's need for help and Orem's self-care models according to research with R&D design. This study is expected to identify the need for help and self-care of such patients by nurses and midwives in the emergency and maintenance period. Thus the risk of morbidity and mortality due to severe preeclampsia and eclampsia can be reduced significantly.

Materials and Methods

Study Design

The study used a research and development (R&D) design, a method used to produce certain products and test the effectiveness of these products (Yoshikawa, 2012). The purpose of using this method was to develop an assessment instrument in postpartum patients with pre-eclampsia based on Wiedenbach's need for help and Orem's self-care models. The research was conducted in two stages, namely the development stage and the trial stage.

At the development stage, the study used a qualitative research design and was carried out in the obstetric ward and the Medical Record Section of Airlangga University Hospital, Surabaya. Data collection was carried out by interviewing and tracing the contents of postpartum patient documents with preeclampsia-eclampsia.

The trial stage used a quasi-experimental, and the respondents were 60 midwives who were in charge for postpartum patients with preeclampsia in the obstetric ward of Airlangga University Hospital, Surabaya, and Haji Hospital, Surabaya.

Respondent

At the development stage, the participants were 30 midwives and 30 postpartum patients with severe preeclampsia-eclampsia, as well as 100 medical records stored in Airlangga University Hospital, Surabaya.

In the trial stage, the respondents were 60 midwives and 120 postpartum patients with preeclampsia in the obstetric ward of Airlangga University Hospital and Haji Hospital. The respondents were selected using purposive sampling technique, which is a sample selection method based on the predetermined criteria: Midwives who have experience caring for postpartum patients at least 1 year, as well as postpartum patients who have preeclampsia-eclampsia and are not admitted to the intensive care unit.

Instrument

The data were collected using some instruments based on the two stages. In the development stage, the instruments used were observation sheets, interview guidelines, and documentation. In the trial stage, the instrument used was a questionnaire to test the effect of the instrument of Assessment of Postpartum Mothers with Severe Preeclampsia and Eclampsia based on the "Need for Help" and "Self-Care" models.

Data Collection

The development stage began with a search for the availability of assessment instruments used by health workers in conducting studies of postpartum patients with preeclampsia-eclampsia. At this stage, in-depth interviews and documentation studies were carried out on the use of the assessment format, which had been used for the past 1 year. In-depth interviews were conducted with 30 midwives to explore their opinion on the instrument for assessing postpartum patients with severe preeclampsia that has been used so far. The media used at this stage was an interview guide that had been prepared based on the "need for help" and "self-care" models. To trace the documentation that used so far, a checklist was used. The results of in-depth interviews showed that the instruments provided by the hospital were general for all obstetric patients, not specific for postpartum patients with preeclampsia-eclampsia, so that often the risk of emergency due to preeclampsia was not detected.

The results of the qualitative analysis in the first stage were used as a basis for developing the new assessment instruments for postpartum patients with preeclampsia based on Wiedenbach's need for help and Orem's self-care models. After the new assessment instruments for the postpartum patients were arranged, a focus group discussion (FGD) was then carried out by involving researchers, patients, midwives, and experts on the preparation of the instruments. The results of the FGD were used to make improvements to the development of the assessment instrument.

At the second stage, it began with the midwife filling out a questionnaire about the old assessment instrument. Then the midwife was introduced to the new assessment instrument. After understanding about how to use the new assessment instrument, the midwife tried to conduct an assessment using the new instrument on two patients. After using the new assessment instrument, the midwife was asked to fill out a questionnaire about it.

Data Analysis

At the development stage, data were analyzed using qualitative method. The analysis consists of three activities that occur simultaneously: data reduction, data presentation, data withdrawal conclusion/verification. In this case, it was carried out to obtain conclusions about the use of assessment instruments that have been used so far. At the trial stage, data were analyzed using the Wilcoxon test with the significance level < 0.001 , because the result of the normality test of the post-test was not normal (Sugiyono, 2019). In this research, the validity test used the validity of the construction (construct validity) by asking for opinions from experts (experts' judgments). Instruments were made according to the aspects to be measured which were then consulted with experts to determine an opinion whether the instrument was feasible or not. In addition, testing the validity of the instrument was carried out using the Product Moment Correlation technique. If the results of $r_{count} > r_{table}$ have a significance level 5% it will be declared valid. In this study, the reliability of the instruments that have been compiled was tested by using the Cronbach's alpha technique. If coefficient reliability (r_{11}) is 0.7, then the instrument is declared reliable (Sugiyono, 2019).

Ethical Consideration

Prior to conducting the research, the research proposal was reviewed and received ethical approval from the Health Research Ethics Commission Team at Airlangga University Hospital No. 136/KEH/2019 and Haji Hospital Surabaya No. 073/34/KOM.ETIK/2019.

Results

The results of the development stage are described in [Table 1](#), [Table 2](#), and [Table 3](#), while the trial stage can be seen in [Table 4](#), [Table 5](#), and [Table 6](#).

The results of the evaluation of the old assessment instruments in the obstetric ward are shown in [Table 1](#). The finding showed that 5 of the 10 essential assessment components based on Wiedenbach's need for help and Orem's self-care models were not found. The old assessment instrument is (1) not specific assessment, (2) does not identify the risk of bleeding as an effect of administration of magnesium sulfate, (3) does not identify the ability to meet basic needs, (4) does not identify self-care abilities, and (5) does not identify parental readiness. Four components were partially

Table I Evaluation of old instrument

Instrument Standards	Information	Category
There is a focus or specific assessment format for postpartum patients with severe preeclampsia/eclampsia	The assessment format is not specific for postpartum patients with severe preeclampsia/eclampsia, still mixed with other cases (antepartum, intrapartum, and gynecology)	Not appropriate
Based on Wiedenbach's need for help model, the assessment of postpartum patients with severe preeclampsia/eclampsia should be sufficient to detect signs of eclampsia impending: <ol style="list-style-type: none"> 1. Headache complaint 2. Complaints of epigastric pain 3. Complaints of vision impairment 4. Complaints of nausea, vomiting 5. Help needed to deal with impending eclampsia in the hospital and after being discharged 	In the assessment format there is already a complaint assessment of dizziness and nausea and vomiting, but it is not specific for signs of impending eclampsia	Partially suitable
Based on Wiedenbach's need for help model, the assessment of postpartum patients with severe preeclampsia/eclampsia should be sufficient to identify fluid balance: <ol style="list-style-type: none"> 1. Intake 2. Output 3. Assistance needed for fluid balance in the hospital and after hospital discharge 	In the assessment format, there is already an assessment of fluid intake and output	Suitable
Based on Wiedenbach's need for help model, the assessment of postpartum patients with preeclampsia/eclampsia should be sufficient to identify signs of magnesium sulfate therapy poisoning: <ol style="list-style-type: none"> 1. Respiratory depression (RR <12 times/minute) 2. Tendon reflexes disappear 3. Declining awareness 4. Help needed to overcome magnesium sulfate intoxication 	In the assessment, there has been an assessment of breathing, awareness, but there is no assessment of tendon reflexes	Partially suitable
Based on Wiedenbach's need for help model, the assessment of postpartum patients with preeclampsia/eclampsia should be sufficient to identify the risk of bleeding as an effect of the administration of magnesium sulfate <ol style="list-style-type: none"> 1. Uterine contractions 2. Height of the uterine fundus 3. Characteristics of vaginal discharge 4. Assistance needed to deal with the risk of bleeding in the hospital and after being discharged 	In the assessment format, there is no assessment of uterine contractions, the height of the uterine fundus, or characteristics of vaginal discharge for postpartum	Not appropriate
Based on Wiedenbach's need for help model, the assessment of postpartum patients with preeclampsia/eclampsia should be sufficient to identify the risk of pulmonary edema as a hypoalbumin effect <ol style="list-style-type: none"> 1. Fluid restriction 2. Lung sounds 3. Respiration rate (RR) 4. Assistance needed to deal with the risk of pulmonary edema in the hospital and after hospital discharge 	In the assessment, there is an assessment of lung sounds and RR, but there is no assessment of fluid restriction	Partially suitable
Based on Wiedenbach's need for help model, the assessment of postpartum patients with preeclampsia/eclampsia should be sufficient to identify the ability to meet basic needs <ol style="list-style-type: none"> 1. Oxygenation 2. Nutrition 3. Elimination 4. Mobilization 5. Rest and sleep 6. Assistance needed to meet basic needs in the hospital and after being discharged 	In the assessment, there is an assessment of nutrition, but there is no assessment of oxygenation, elimination, mobilization, health, and sleep, and the assistance needed	Not appropriate

Table 1 Evaluation of old instrument (continuos)

Instrument Standards	Information	Category
Based on Wiedenbach's need for help model, the assessment of postpartum patients with preeclampsia/eclampsia should be sufficient to identify comfort 1. Pain scale 2. Causes of pain 3. The ability and habit of dealing with pain 4. Assistance needed for comfort in the hospital and after being discharged	In the assessment, there is an assessment of the scale of pain but there is no assessment of the causes of pain, as well as the ability and habits to deal with the pain	Partially suitable
Based on Wiedenbach's need for help and Orem's self-care models, the assessment of postpartum patients with preeclampsia/eclampsia should be sufficient to identify abilities to meet basic care 1. Personal hygiene 2. Perineal care 3. Wound care 4. Knowledge of postpartum danger signs 5. Help is needed about self-care in the hospital and after being discharged	In the study, there was no assessment of personal hygiene, milk production and breastfeeding, and perineal care/wound care	Not appropriate
Based on Wiedenbach's need for help and Orem's self-care models, the assessment of postpartum patients with preeclampsia/eclampsia should be sufficient to identify parental readiness 1. Mental readiness 2. Readiness of knowledge about baby's needs and care 3. Breast Production and Breastfeeding 4. Support system 5. Rocks needed for baby care in the hospital and after hospital discharge	In the assessment format, there is no assessment of parental readiness	Not appropriate

Table 2 First focus group discussion results

Strategic Issues	Causes	FGD results	Researcher Study
Specific assessment instrument for postpartum with severe preeclampsia-eclampsia	1. The unavailability of a special assessment instrument for postpartum patients with severe preeclampsia/eclampsia 2. The instrument of the outpatient assessment is made public for all cases treated in the midwifery ward	Development of specific assessment instruments for postpartum patients with severe preeclampsia/eclampsia	Development of a special assessment instrument is needed to identify the needs, abilities, independence, and assistance needed by postpartum patients with severe preeclampsia -eclampsia.
Self-management support	There are no instruments that show the self-management data of postpartum patients with severe preeclampsia/eclampsia who need support	Development of an instrument to explore the self-management data of postpartum patients with severe preeclampsia/eclampsia who need support	Development of the instrument needs to be done in the obstetric ward to overcome the emergency conditions and improve the ability and independence of postpartum patients with severe preeclampsia/eclampsia
Decision support	No instrument shows the decision support in the form of a written list of things that must be studied about the needs, abilities, and assistance needed by postpartum patients with severe preeclampsia/eclampsia	Development of Instrument which includes: 1. List of patient needs 2. List of patient abilities 3. List of assistance the patient needs	Development of an Instrument is needed to overcome the emergency conditions and improve the ability and independence of postpartum patients with severe preeclampsia/eclampsia
Service system design	No instrument shows the things that need to be studied about the needs, abilities, and assistance needed by postpartum patients with severe preeclampsia/eclampsia	1. Development of Instrument that includes a list of patient needs 2. List of patient abilities 3. List of assistance the patient needs	Development of an Instrument is needed to overcome the emergency conditions and improve the ability and independence of postpartum patients with severe preeclampsia/eclampsia
Clinical information	Clinical information such as signs of eclampsia impending, self-care ability, parental readiness has not been systematically arranged	Systematic development of clinical information 1. Subjective data 2. Objective data	Development of Instrument is carried out to determine the patient's development and arrange further self-management strategies

Table 3 Results of expert discussions

Instrument	Component	Feedback
Specific or focus assessment instrument for postpartum patients with severe preeclampsia-eclampsia	1. Self-management support	Specific data based on the model need for help and self-care
	2. Decision support	Data that examines the management of postpartum patients with severe preeclampsia/eclampsia which includes: <ol style="list-style-type: none"> 1. Symptoms of impending eclampsia 2. Fluid balance 3. Signs of magnesium sulfate poisoning 4. Risk of pulmonary edema 5. Risk of bleeding 6. Self-care ability 7. Comfort 8. Parental readiness 9. Meeting basic needs
	3. Service system design	Development of instruments is needed to improve the alarm warning to detect early and overcome emergencies and improve the ability of postpartum patients with severe preeclampsia/eclampsia in the obstetric ward
	4. Clinical information	An instrument is available that examines data about: <ol style="list-style-type: none"> 1. Symptoms of impending eclampsia 2. Fluid balance 3. Signs of magnesium sulfate poisoning 4. Risk of pulmonary edema 5. Risk of bleeding 6. Self-care ability 7. Comfort 8. Parental readiness 9. Meeting basic needs

Table 4 Normality test results

	Pre	Post
Kolmogorov-Smirnov Z	1.133	1.701
Asymp. Sig. (2-tailed)	0.153	0.006
Information	Normal	Abnormal

Table 5 Statistical test results

Group	N	Mean Rank	Z score	P-value
Old Instrument	100	19.93	-5.379	<0.001
New Instrument	100	29.72		

Table 6 Second FGD results

Strategic Issues	Cause	FGD results	Researcher
Specific assessment instrument or focus for postpartum patients with severe preeclampsia/eclampsia	It cannot be applied directly to postpartum patients with severe preeclampsia/eclampsia	It has been done even though it has not been a supplementary document	The assessment instrument of the postpartum patient with severe preeclampsia/eclampsia based on the "Need For Help" and "Self-Care" Models can already be used in the obstetric ward to get complete information from the patient

compliant, namely (1) detecting signs of impending eclampsia, (2) signs of magnesium sulfate therapy poisoning, (3) the risk of pulmonary edema as a hypoalbumin effect, and (4) comfort. There is only one component which was suitable, namely about fluid balance. Therefore, the old instrument is insufficient to assess the need for help and self-care of postpartum patients with severe preeclampsia/eclampsia.

The results of the FGD in the first stage are shown in [Table 2](#). The finding showed that, based on five aspects of strategic issues, the development of an instrument to assess postpartum patients with severe preeclampsia or eclampsia was needed. The FGD recommendations are the approval of the development of a specific assessment instrument for postpartum patients with severe preeclampsia/eclampsia. Furthermore, a new assessment instrument was developed for postpartum patients with severe-eclamptic preeclampsia based on Wiedenbach's need for help and Orem's self-care models.

The results of discussions with experts on the four elements are shown in [Table 3](#). The finding showed that the development of assessment instruments is needed to improve the alarm warning to detect early and overcome emergencies and improve the ability of postpartum patients with severe preeclampsia/eclampsia in the obstetric ward. Recommendations from an expert discussion on the instrument for the study of postpartum patients with severe preeclampsia/eclampsia were: 1) the development of a specific assessment tool for postpartum patients with severe preeclampsia/eclampsia, and 2) the components of the instrument should include: self-management support, decision support, service system design, and clinical information.

Before further analysis was carried out, the normality of the data was tested with the Kolmogorov Smirnov test because the data are more than 50. The data normality test can be seen at [Table 4](#) and the test result at [Table 5](#). In this study, the results of the pre-test data normality test were normally distributed, while the post-test was not normal. So that the statistical test used is the Wilcoxon Signed Rank Test. The old assessment instrument was rated lower with a mean rank of 19.93, while the new assessment instrument was with a mean rank value of 29.72. The Wilcoxon test results obtained a value of -5.379 with $p < 0.001$. So there is a significant difference between the old assessment instrument and the new postpartum patient assessment instrument.

The results of the second stage FGD are shown in [Table 6](#). The finding shows the assessment instrument can be used in obstetric wards to get the more complete information from the patients. In addition, the experts recommended to improve the instruments by adding data components about the medication that patients should continue at home. This is important because treatment with antihypertensive drugs is recommended for severe postpartum hypertension.

Discussions

The results of this study illustrate that an instrument carried out to assess postpartum patients with severe preeclampsia/eclampsia was inadequate. Some previous studies have described that postpartum patients with preeclampsia are at risk for experiencing emergencies, namely eclampsia, bleeding, and dyspnea (Cairns et al., [2017](#); NICE, [2019](#); Kvist & Persson, [2009](#); Magee et al., [2014](#); Rana et al., [2019](#); Rawlins et al., [2018](#)).

Based on the results of previous research, it illustrates that the need for help and self-care models are effective to be applied to patients with maternal complications, both physical and psychological. This model can be used in patients with preeclampsia, bleeding, preterm labor, and in patients with postpartum depression (Machmudah, [2015](#); Rahayu, [2015](#); Wulandari and Setyowati, [2015](#); Dwi Susanti et al., [2016](#)).

The results of this study illustrate that the assessment instruments that have been used so far are still general and not entirely specific to identifying the special needs of preeclamptic patients. Based on the input from the experts, the development of instruments for postpartum patients with severe preeclampsia/eclampsia using the "Need for Help" concept proposed by Wiedenbach with the goals in helping clients are: 1) to prevent maternal emergencies, 2) reduce anxiety due to loss, and 3) develop effective coping by collaborating and coordinating with other health teams so clients can get appropriate action and handling procedures.

In addition, the self-care theory by Orem, which believes that every individual has the ability and potential to care for themselves and achieve prosperity, was also used to develop the instruments. Changes that occur during the postpartum period cause a decrease in the client's independence to meet their needs. Nurses play a role in helping to increase the independence of clients to meet their self-care needs through a learning process or exercise in the form of self-care, creating an environment that facilitates the achievement of independence.

The statistical test showed that there is a significant difference between the old assessment instrument and the new one, which was considered more effective. Based on the results of data analysis from the results of filling out the questionnaire, almost all respondents gave the opinion that the assessment instrument for postpartum patients with severe preeclampsia-eclampsia based on Wiedenbach's need for help and Orem's self-care models met the criteria of functionality, efficiency, and usability. The effectiveness of using the need for help and self-care models in providing nursing care has been illustrated in the results of previous studies in different cases (Çapik et al., [2015](#); Ferreira et al., [2016](#); Hajira Irshad Ali, [2018](#)).

Conclusions

The assessment instruments in obstetric ward have not been specific for postpartum patients with severe

preeclampsia/eclampsia, while the new instrument has been developed for postpartum patients with severe preeclampsia-eclampsia based on Wiedenbach's need for help and Orem's self-care models through FGD and expert discussion. The new assessment instruments met the criteria of functionality, efficiency, and usability.

For stakeholders, midwives recommend the use of the assessment instrument of the postpartum patients with severe preeclampsia-eclampsia based on Wiedenbach's need for help and Orem's self-care models in the obstetric ward setting.

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