

Levine's Conservation Model and Unpleasant Symptoms Theory in Nursing Care of Pregnant Women with Preeclampsia: A Case Study

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Abstract

Preeclampsia is a multisystem complication that occurs after 20 weeks of pregnancy and may cause maternal and fetal morbidity and mortality. Preeclampsia is the leading cause of maternal death in many countries. The purpose of this case study to show that Levine's conservation model and unpleasant symptoms theory can be applied to pregnant women with preeclampsia. A case study with the application of Levine's Conservation and unpleasant symptoms theory on the nursing process of 5 pregnant women with severe preeclampsia. This study was conducted in November 2015 to April 2016 at the post-partum treatment room at two different hospitals which are Bekasi District Hospital (RSUD Bekasi) and Cipto Mangunkusumo General Hospital Jakarta (RSCM). Data were obtained through assessment, medical records as well as the patients' nursing and observation. Levine's conservation theory allows individuals to adapt in order to maintain their integrity with conservation as the final result. The conclusion are the main focus of conservation is a balance between supply and demand of energy, in order to preserve all aspects of individual wholeness. While the unpleasant symptom theory is applied in reducing the symptoms of discomfort by increasing the understanding of a set of symptoms of discomfort from various contexts and providing useful information as well as teaching about the negative effects of them.

Keywords: Preeclampsia, Levine's conservation model, Unpleasant symptoms theory

INTRODUCTION

Preeclampsia becomes the main cause of maternal mortality in many countries. The number of preeclampsia and eclampsia cases around the world as reported by World Health Organization (WHO) in 2007 is 38.4% of all pregnancies. The number of preeclampsia cases in Indonesia is about 3-15% of all pregnancies, which is 23.6 cases per 1000 live births.

The data of pregnant mothers from Februari until Desember 2015 derived

from Bekasi Regency local hospital (RSUD) show that out of 52 pregnant mothers who undergo hospitalization, 8 of them suffer from gestational hypertension including preeclampsia. 13.2% of them was in RSUPN Cipto Mangunkusumo Jakarta in 2010 (Sumanti, Noormartany, Alamsyah, Rostini, 2013). Based on the medical record data in the emergency room of RSUPN Cipto Mangunkusumo on Januari 2015, there are 217 cases of preeclampsia and 32 cases of eclampsia, while on April 2016 there was 23 cases of

preeclampsia. The data shows the increasing number of eclampsia cases.

The cause of preeclampsia is not yet certainly known. There are many factors that could be the cause of preeclampsia such as particular genetic trait, obesity, nulliparous status, history of preeclampsia, diabetes, hypertension, and lifestyle (Nishimoto et al, 2009). Preeclampsia occurs due to trophoblast disorders in differentiating and invading in early pregnancy, resulting in the failure of the trophoblast cells to destroy the spiral artery muscular layer thus exacerbate placental perfusion and stimulation of systemic inflammatory response (McCarthy & Kenny, 2015).

Preeclampsia can lead to complications such as uncontrolled severe hypertension, eclampsia, pulmonary edema, placental abruption, disseminated intravascular coagulation, and impaired fetal growth (Roberts et al, 2013). Long-term complications in women with preeclampsia will have a 3.7 times increased risk of hypertension; 2.2 times the risk of coronary heart disease and 1.8 times the risk of stroke. In addition, the offspring of mothers who experience preeclampsia will experience poor growth in childhood, at risk of hypertension and at risk of experiencing preeclampsia during pregnancy (McCarthy & Kenny, 2015).

Prevention of preeclampsia can be conducted by promotive and curative preventive efforts. Preventative efforts that can be done is to conduct early treatment of pregnancy in order to identify the mothers who are at risk and perform early detection of the disease. Early treatment of pregnancy includes a thorough examination, including anamnesis, physical examination, and laboratory examination. Promotive efforts can be undertaken by nurses by providing preeclampsia disease education and providing counseling on evidence-based interventions. While the curative effort is done by taking antihypertensive drugs to control blood pressure (Moroz, Simpson, & Rochelson, 2015).

In recent years, there has been no significant decline in the number of cases of preeclampsia, even in developed countries it still becomes a major cause of maternal morbidity and increased perinatal mortality (Clin Guideline, 2010). In this regard, it is necessary to maintain the good condition of the mother and the fetus with a close monitoring, so that the disease does not develop more severe and endanger the lives of the mother and fetus. It is undeniable that nurses have a very strategic role in dealing with pregnant patients with preeclampsia, especially maternity-specialized nurses.

The process of providing nursing care for pregnant women with preeclampsia employs nursing theory that support the development of nursing care. Nursing theory that can be applied to pregnant women with preeclampsia is Levine's conservation and unpleasant symptom theory. The applications of both nursing theories not only help patients overcome these problems from the physical aspect alone, but also overcome the problems from psychological, social, personal and situational aspects so that comprehensive nursing care can be given (Tomey & Alligood, 2010).

Levine's conservation theory allows individuals to adapt to maintain its integrity with conservation as a result. The main focus of conservation is the balance between supply and energy needs in order to preserve all aspects of individual wholeness. (Tomey & Alligood, 2010).

While the unpleasant symptom theory is applied in reducing the symptoms of discomfort by increasing understanding about a set of symptoms of discomfort from various contexts and providing useful information as well as showing the negative effects of symptoms of discomfort (Peterson & Bredow, 2004; Smith & Liehr, 2008). Thus, the aim of nursing care in pregnant women with preeclampsia using Levine's conservation

and unpleasant symptom theories, is that pregnancy can be maintained until mature and preserve the well-being of mother and fetus.

METHOD

This research is case study analysis by examining five cases. This study was conducted in November 2015 to April 2016 at the post-partum treatment room at two different hospitals which are Bekasi District Hospital (RSUD Bekasi) and Cipto Mangunkusumo General Hospital Jakarta (RSCM). The sample of this study was pregnant women with severe preeclampsia. Data were obtained through assessment, medical records as well as the patients' nursing and observation.

RESULT

The cases studied were pregnant women with severe preeclampsia aged ≥ 35 years old in two different hospitals, two cases were taken from Bekasi District Hospital in residency one, and three cases were taken at RSUPN Dr Cipto Mangunkusumo Jakarta. The following Table 1 illustrates five cases of pregnant women with severe preeclampsia.

Table 1. Results of the assessment at five studied cases of pregnant women with severe preeclampsia

No	Assessment	Treated Patients				
		1	2	3	4	5
		Mrs. T	Mrs. E	Mrs. E	Mrs. M	Mrs. R
1	Age	37 y/o	35 y/o	36 y/o	37 y/o	35 y/o
2	Parity	G4P3A0	G5P3A1	G1P0A0	G4P3A0	G3P2A0
3	Gestational age	32 wk.	28-29 wk.	30-31 wk.	36 wk.	35 wk.
4	Blood pressure	150/100 mmHg	160/100 mmHg	150/90 mmHg	150/100 mmHg	170/100 mmHg
5	Protein urine	++	+++	+++	++	+++
6	Headache	√	√	√	√	√
7	Liver/epigastric pain	√	√	-	-	-
8	Family history of preeclampsia	-	-	-	-	-
9	Preeclampsia in previous pregnancies	-	-	-	-	-
10	History of chronic hypertension,	-	-	-	-	-
11	History of diabetes mellitus	-	-	-	-	-
12	History of pre-pregnancy kidney disease	-	-	-	-	-
13	Gemelli	-	√	-	√	-
14	Overweight before becoming pregnant	√	√	√	√	√
15	Maternal hemodynamics	stable	stable	stable	stable	stable
16	Seizures	no	no	no	no	no
17	Laboratory examination as kidney and liver function tests	yes	yes	yes	yes	yes
18	Physical condition: weak	√	√	√	√	√
19	Fetal wellbeing: good	√	√	√	√	√
20	Controlled blood pressure	√	√	√	√	√
21	Seizures	no	no	no	no	no

The assessment of five cases of pregnant women with preeclampsia shows that all cases have the same symptoms which are increased blood pressure at gestational age over 20 weeks, urine protein problem, and headache with or without liver/epigastric pain.

Some risk factors in the studied case are consistent with the theory and some are not. Not all mothers in the studied case have the characteristic of nullipara, age > 40 years old, no family history of

preeclampsia, no preeclampsia in previous pregnancies and no history of chronic hypertension, diabetes mellitus and pre-pregnancy kidney disease. Two of the five cases were twin pregnancies in cases number two and four. All patients examined were over 35 years old. All mothers in the cases are overweight before becoming pregnant.

In the cases studied there were no complications due to stable maternal hemodynamics, no seizures, controlled

blood pressure, and fetal well-being. The results of measurements using HARS find that the five cases also experienced anxiety with different levels.

Laboratory examination conducted in all cases is examination of urine protein, platelets, serum uric acid concentration, as well as kidney and liver function tests, both at RSUPN Cipto Mangunkusumo Jakarta and Cibitung District Hospital. Laboratory tests conducted at RSUPN Cipto Mangunkusumo are more complete and carried out repeatedly and continuously until the normal results are obtained. In contrast, laboratory tests conducted in RS Cibitung firstly is limited on urine protein examination, a complete examination will be conducted only if it is important.

DISCUSSION

The assessment of five cases of pregnant women with preeclampsia shows that all cases have the same symptoms which are increased blood pressure at gestational age over 20 weeks, urine protein problem, and headache with or without liver/epigastric pain.

This result of five cases fits to the theories on the definition and signs of preeclampsia, which is stated by some experts who suggest that preeclampsia is an increase in blood pressure during

pregnancy with proteinuria, along with one or more accompanying symptoms that appear after 20 weeks of gestation (Magee et al, 2015; McCarthy & Kenny, 2015).

It used to be a diagnosis of preeclampsia by using three signs or triads of preeclampsia, but now it is no longer valid. In 2008, American College of Obstetricians and Gynecologists (ACOG) stated that no complete symptoms is needed, just one or more symptoms, especially hypertension, because hypertension is a very important symptom of preeclampsia (Lowdermilk, Perry & Cashion, 2013).

Symptoms of hypertension seems to be an early sign that arise in the process of the occurrence of preeclampsia. Edema is no longer used as a diagnostic criterion because it is also widely found in normal pregnancies. While proteinuria is an objective marker that shows extensive leakage, which is the characteristic of preeclampsia (Cunningham, 2010).

Headache or visual damage can be a symptom of preeclampsia. Epigastric pain or upper right quadrant often accompanies hepatocellular necrosis and ischemia. This particular pain is usually accompanied by elevated serum levels of liver transaminase. Thrombocytopenia is also a sign of worsening preeclampsia (Cunningham, 2010). This may be due to

the aggregation and activation of platelet and micro angiopathic hemolysis caused by severe vasospasm. The severity difference of preeclampsia can be misleading because what may appear to be a mild disease can develop rapidly into severe disease.

Risk factors for preeclampsia include nulliparity, family history of preeclampsia, obesity, multiple pregnancy, age > 40 years, preeclampsia in previous pregnancy, and medical-genetic conditions: chronic hypertension, type I diabetes mellitus, kidney disease (McCarthy & Kenny, 2015; Sibai, 2007 Lowdermilk, Perry & Cashion, 2013; Nishimoto et al, 2009).

Some risk factors in the studied case are consistent with the theory and some are not. Not all mothers in the studied case have the characteristic of nullipara, age > 40 years old, no family history of preeclampsia, no preeclampsia in previous pregnancies and no history of chronic hypertension, diabetes mellitus and pre-pregnancy kidney disease. Two of the five cases were twin pregnancies in cases number two and four.

All patients examined were over 35 years old. This is in accordance with the results of research conducted by Martini & Paramita (2012), they state that there is a relationship between age and the incidence of preeclampsia, pregnant women aged <20 years or > 35 years have 11.5 times

higher risk for suffering for preeclampsia compared mothers aged 20-35 years. This is also consistent with research conducted by Anggraini, Tamela, & Fitriyeni (2014) which states that pregnant women <20 years and >35 years are at 4.8 times higher risk for preeclampsia. As one gets older, the more vulnerable a person is to experience increased blood pressure.

All mothers in the cases are overweight before becoming pregnant. It has been reported that obesity that occurs before pregnancy (BMI > 30) puts someone at 6.5 times higher risk for developing gestational diabetes, 7.9 times higher risk of hypertension and 3.7 times higher risk of preeclampsia during pregnancy-compared to women of normal weight (Doherty, Magann, Franciss, Morrison & Newnham, 2006). Obesity is caused by many factors such as genetic factors, metabolic disorders and excessive food consumption. The more obese a person, the more the amount of blood contained in the body which means the heavier the blood pumping function, so it can contribute to the occurrence of preeclampsia. At age > 35 years, there is a degenerative process that results in structural and functional changes occurring in the peripheral blood vessels responsible for changes in blood pressure, making it more susceptible to

preeclampsia (El-Gilany & Hammad, 2012).

Preeclampsia can lead to complications in the mother and fetus. According to Magee et al, in 2015, preeclampsia can be life-threatening due to vascular dysfunction and systemic inflammation involving the brain, liver and kidneys, termed severe conditions and complications. The Canadian Guidelines in 2014 determined that the severe complications of preeclampsia were guidelines for termination of pregnancy. Such severe complications include eclampsia, posterior reversible leucoencephalopathy syndrome, retinal deterioration, Glasgow Coma Scale <13, stroke, Transient Ischemic Attack / TIA, uncontrolled heavy hypertension (within 12 hours after taking three antihypertensive drugs), oxygen saturation <90% , myocardial ischemia or infarction, platelet count <50x10 / L, acute renal failure, liver dysfunction, liver enlargement or rupture, stillbirth, abruptio (Dasgupta et al, 2014). In the cases studied there were no complications due to stable maternal hemodynamics, no seizures, controlled blood pressure, and fetal well-being.

Executions include screening for signs of hypertension using blood and urine pressure checks. Performing

laboratory tests for urine protein, platelets, serum uric acid concentration, and liver function tests. Provision of prophylactic steroids if gestational age is less than 34 weeks. Performing an ultrasound examination to monitor the estimated weight of the fetus. Performing regular cardiotocographic (CTG) checks (Mccarthy & Kenny, 2015). These are consistent with the execution performed on the five cases, which are blood pressure monitoring as an effort to control blood pressure, providing prophylactic steroids i.e. dexamethasone for fetal lung maturation, and examining using ultrasound and CTG to monitor fetal well-being.

Antihypertensive therapy is given to reduce blood pressure. Antihypertensive drug therapy aims to reduce maternal morbidity and mortality, reduce prematurity, and keep systolic blood pressure less than 160 mmHg and diastolic blood pressure less than 110 mmHg. Alternative treatments given are fast-acting antihypertensive drugs, such as nifedipine capsule, parenteral hydralazine and labetalol. Provision of hypertension therapy category preeclampsia fits to the calculation of Mean Arterial Pressure (MAP) (WHO, 2011).

In all cases, antihypertensive drugs were given to control hypertension,

although antihypertensive drugs are not proven to prevent preeclampsia. There are various types of anti-hypertensive drugs given, such as oral adalate, methyldopa, dopamet and nifedipine. Nifedipine is a calcium blocker that can be used in 5-10mg oral dose, the dosage can be repeated every 20-30 minutes or as needed until the MAP target is reached. The drug should not be placed under the submucosa of the tongue (sub lingual) because the best absorption is through the digestive tract of food (Easterling, 2014).

Administration of magnesium sulphate (MgSO₄) (4gr intravenously (IV) then 1g/h) may prevent eclampsia (Duley et al, 2010). Magnesium sulfate is indicated as the first anticonvulsant. Monitoring can be conducted every four hours to observe the side effects (muscle paralysis, absent reflexes, respiratory depression and heart arrhythmia). The antidote is 10 mg of 10% calcium gluconate administered slowly through the intravenous. 97% of magnesium sulfate is excreted through the urine, so oliguria (<80 ml/h) can cause poisoning (Mccarthy & Kenny, 2015).

In the managed case, all pregnant women with preeclampsia are given MgSO₄ 4 gr and 1gr/hour maintenance was administered for 1x24 hours. When administering MgSO₄, monitoring signs of intoxication is conducted by examining the

patella, respiratory depression symptoms (respiration <16x/m), and monitoring the amount of urine production. Additionally, preparing 10% calcium gluconate in 10cc as an antidote if signs and symptoms of intoxication appear.

Exercise and physical activity have been widely studied and believed to be able to minimize the effects of preeclampsia. Research conducted by Kasawara et al (2012) says that the physical activities in the relaxation group can protect a person from preeclampsia. In a study conducted by Seon Ae Yeo in 2010, it was found that the person's heart rate in the stretching group was significantly lower than those who are in the control group. Pregnant women who never perform physical activity are at risk of increased blood pressure. Physical activity in pregnant women is one way to prevent the occurrence of increased blood pressure which is one of the symptoms of preeclampsia (Chobanian, 2004). One of the physical movements performed by the treated patient, pregnant women with preeclampsia, is a progressive muscle relaxation technique.

A progressive relaxation technique is a technique that focuses on a muscle activity, by identifying the tense muscles and then reducing the tension by performing relaxation techniques to get relaxed feelings (Murphy, 1996).

Relaxation describes the ability to control lifestyle factors such as sleep, quality of life and social factors such as stress, anger, sadness and so on. Relaxation is also known to decrease stress levels during pregnancy (Tragea, Chrousos, Alexopoulos, & Darviri, 2014).

While Townsend (1996) describes the advantages of this technique is to reduce muscle tension, anxiety, insomnia, depression, fatigue, irritability, muscle spasms, neck-back pain, high blood pressure, mild phobia, and mild stuttering. Progressive relaxation techniques help the individuals to reduce stress and become relax.

Pregnancy can be maintained until the "at term" age after the observation and stabilization period with no maternal and neonatal complications. But if severe complications occur in the mother and fetus, then the pregnancy should be terminated. In the treated case, the pregnancies in four cases were preserved. However in the case four, pregnancy termination has to be performed after two day medication to mature the fetal lung, due to uncontrolled blood pressure and worsening PEB. After the termination, the mother and fetus are rescued, the infant is admitted directly into the "combined-treatment" room after one day of

hospitalization in the nursery (perina room).

Nursing problems that arise in all cases are tissue perfusion disorders, high risk of fetal injuries and anxiety. The results of measurements using HARS find that the five cases also experienced anxiety with different levels. Anxiety can worsen the incidence of preeclampsia. Some studies suggest that anxiety correlates with preeclampsia in pregnant women (Kurki et al 2000). Research conducted by Isworo, Hakimi, & TA (2012), also find that the risk of preeclampsia in pregnant women will increase 7.84 times higher in mothers who suffer from anxiety compared to those who do not. In addition, there are four nursing problems that arise not in all cases such as electrolyte balance disorders, high risk of infection, and activity and pain intolerance. This is related to the different circumstances of each patient which also bring up different problems.

All patients receive nearly the same education in the nursing action. They receive the explanation about preeclampsia causes, impact and treatment. This is necessary because although the cases cover both the first-timers (primi) and those who have been pregnant before (multi), they both experience preeclampsia in their pregnancy for the first time. At the time of discharge planning, all patients are

also given an explanation about the risk of developing preeclampsia again in their subsequent pregnancies. The "multi" mothers are more preferred to prevent pregnancy by non-hormonal family planning methods, while the "primi" mothers who want to get pregnant again are advised to conduct routine pregnancy checks.

The interventions and implementations performed in each case are adjusted to the problems that arise, according to the management of patients with preeclampsia while employing the Levine's Conservation and Unpleasant Symptoms nursing theory. All actions taken are to achieve energy conservation such as meeting the need for nutrition, oxygenation, activity and rest, as well as preventing fatigue due to pain and discomfort (dizziness). All the actions taken to prevent the patients' fatigue need to be done at one time, in order not to disrupt the patients' rest. In addition, the room should be modified to keep the calmness and the patient visiting hours should be restricted. All actions are also taken to fulfill the conservation of structural integrity such as improving physical conditions, improving maternal and fetal welfare, controlling blood pressure, and preventing seizures. Actions are also undertaken to meet the conservation of personal integrity such as

overcoming anxiety, improving mother's knowledge of her illness and maintaining patient privacy. There are also actions to fulfill the conservation of social integrity such as how to keep communication and socialization undisturbed. The final results of the evaluation are the improvement of nursing care quality and patient condition, stable hemodynamic, no seizure, controlled blood pressure, healthy fetal condition, decreased patient anxiety, and increased patient independence.

The integration of Levine Conservation and unpleasant symptoms theory works out and is mutually supportive to meet the needs of pregnant women with preeclampsia. Preeclampsia in pregnant women will have an impact toward the mother and fetus which makes the mothers experience symptoms of discomfort such as dizziness and anxiety. As for pain, not all patients experience it because the pain threshold on each individual is different from one another. therefore the mothers need nurse's help to improve their condition and prevent complications in mothers and their fetus (Smith & liehr, 2008).

The advantage of the unpleasant symptom theory is that it is suitable to be applied on prenatal clients because it focuses on the symptoms felt by the mother during pregnancy as a result of physiological and psychological responses

when adjusting to the pregnancy. While the lack of this theory if applied to prenatal cases is that the analysis is more emphasized on the subjective feelings of the mother, although the objective signs can also be seen by observing and performing physical examination. The research becomes not comprehensive where the spiritual, sexual and cultural aspects are not specifically studied.

CONCLUSION

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REFERENCES

Alligood, M. R. (2010). *Nursing Theory : Utilization & Application*. (4th Ed). Maryland Heights, Missouri : Mosby Elsevier.

Anggraini, D. G., Tamela, P., & Fitrayeni. (2014). Faktor Risiko Kejadian Preeklampsia Pada Ibu Hamil Di RSUP DR.M. Djamil Padang, *Jurnal Kesehatan Masyarakat Andalas*, 38–44.

Badan Litbangkes. Riset Kesehatan Dasar (Riskesdas) 2010. Badan penelitian dan Pengembangan Kesehatan (Balitbangkes) Kementerian Kesehatan republik Indonesia (Kemenkes RI), Jakarta, 2010.

Bujold E, Roberge S, Lacasse Y, et al. 2010. prevention of preeclampsia and intrauterin growth restriction with aspirin started in earlt pregnancy : meta-analysis. *Obstet Gynecol* 2010 Aug; 116 (2pt 1) : 402-14.

Bhasavanhappa, B T. (2007). *Nursing Theories*. New Delhi : JBMP.

Chobanian AV. (2004). *Prevention, Detection, Evaluation and Treatment of High Blood Pressure*. 10 Mei 2014.

- <http://www.nhlbi.gov/resources/docs/cht-book.htm>.
- Cobb, S. E (2007). Structural equation model exercise in women utilizing the theory of unpleasant symptoms and social variables. proquest dissertation.
- Dasgupta K, Quinn RR, Zarnke KB, et al. The 2014 Canadian Hypertension Education Program Recommendations for blood pressure measurement, diagnosis, assesment of risk, prevention, and treatment of hypertension. *Can J Cardiol* 2014 May; 30 (5):485-501.
- Doherty, D. A., Magann, E. F., Francis, J., Morrison, J. C., & Newnham, J. P. (2006). Pre-pregnancy body mass index and pregnancy outcomes. *International Journal of Gynaecology and Obstetrics*, 95 (3), 242–247. <http://dx.doi.org/10.1016/j.ijgo.2006.06.021>
- Dssursuldwh, O., Fduh, S., Revhuydwlrq, Z., Rxwfrphv, S., Pruelglw, V. P., & Pru, D. Q. G. (2013). Hypertension in Pregnancy, 122(5), 1122–1131.
- Duley L, Gulmezoglu AM, Henderson_Smart DJ, et al. Magnesium sulfate and other anticonvulsants for women with pre-eclampsia. *Cochrane Database Syst Rev* 2010; (11) : CD000025.
- Evidence, N. H. S., & Practice, C. (2015). Hypertension in pregnancy. *Lancet*, 2(7933), 487–489. doi:S0140-6736(75)90552-8 [pii]
- Easterling, T. R. (2014). Pharmacological management of hypertension in pregnancy. *Seminars in Perinatology*, 38(8), 487–495. doi:10.1053/j.semperi.2014.08.016
- El-Gilany AH, & Hammad S. (2012). Obstetric outcomes of teenagers and older mothers: experience from Saudi Arabia. *International Journal of Collaborative Research on Internal Medicine & Public Health*. 4(6): 903.
- Gift, A. (2004). Unpleasant symptoms. In T. S. Bredow (Ed), *Middle range theories : application to nursing research* (pp. 78-94). Philadelphia : Lippincott Williams & Wilkins.
- Hofmeyr GJ, Lawrie TA, Atallah AN, et al. (Calcium supplementation during pregnancy for prefenting hypertensive disorder and related problems. *Cochrane Database Syst Rev* 2014; 6 : CD001059.
- Hsiao, Chao-Pin. (2008). stress, symptoms, symptoms dstress and symptom self management in localized prostate cancer. disertation of the university of arizona.
- Isworo, A., Hakimi, M., & TA, W. (2012). Hubungan antara Kecemasan dengan Kejadian Preeklampsia Di Kabupaten Banyumas Jawa Tengah. *Berita Kedokteran Masyarakat*, 28(1), 9–19.
- Kasawara, K. T., Nascimento, S. L. Do, Costa, M. L., Surita, F. G., & E Silva, J. L. P. (2012). Exercise and physical activity in the prevention of pre-eclampsia: Systematic review. *Acta Obstetricia et Gynecologica Scandinavica*, 91(11), 1147–1157. doi:10.1111/j.1600-0412.2012.01483.x
- Keman. K, Prasetyorini. N, Langgar. M. J. (2009, Juli). Perbandingan Ekspresi p53, Bcl-2, dan indeks apoptosis trofoblas pada preeklamsia / eklamsia dan kehamilan normal. *Majalah Obstetri Ginekologi Indonesia*, 151-159.
- Kementerian Kesehatan Republik Indonesia. (2012). Pusat Data dan Informasi Profil kesehatan Indonesia. Jakarta : Kementerian Kesehatan Republik Indonesia.

- Kurki T et. al. Depression and Anxiety in Early Pregnancy and Risk for Preeclampsia.2000. Available from: <http://www.ncbi.nlm.nih.gov/pubmed>. Diakses pada tanggal 6 Juni 2016.
- Lenz, E R & Pugh, L C. (2008). Theory of unpleasant symptoms. dalam Smith, M J & Liehr, P R. (Ed) Middle Range Theory for Nursing (pp 159-182). 2nd Ed. New York : Springer Publishing Company.
- Lenz, E.R., Pugh, L.C., Milligan, R. A., Gift, A., & Suppe. F. (1997). The middle range teori of unpleasant symptoms : an update. *ANS Adv Nurs Sci*, 19(3), 14-27.
- Lenz, E. R., Suppe, F., Gift, A. G., Pugh, L. C., & Milligan, R. A. (1995). Collaborative development of middle - range nursing theories : toward a theory of unpleasant symptoms. *ANS Adv Nurs Sci*, 17(3), 1-13.
- Liehr, patricia. (2005). Looking at symptoms with a middle - range theory lens. *Proceedings. 3.5* : 152-157.
- Lowdermilk, Perry & Cashion. (2013). *Keperawatan maternitas*. Singapore : Elsevier mosby.
- Magee LA, Pels A, Helewa M, et al., (2014). On behalf of the Canadian Hypertensive Disorders of Pregnancy (HDP) Working Group. Diagnosis, evaluation and management of the hypertensive disorders of pregnancy. *Pregnancy Hypertens*;4:105-45.
- Magee, L. A., Pels, A., Student, M., Bujold, E., Anne-marie, C., Douglas, M. J., ... Sebbag, I. (2015). *Best Practice & Research Clinical Obstetrics and Gynaecology The hypertensive disorders of pregnancy* (29.3) Andr e, 29. doi:10.1016/j.bpobgyn.2015.04.001
- Mccarthy, F., & Kenny, L. C. (2015). Hypertension in pregnancy. *Obstetrics, Gynaecology & Reproductive Medicine*, 25(8), 229–235. doi:10.1016/j.ogrm.2015.05.004
- Moroz, L. A., Simpson, L. L., & Rochelson, B. (2015). Management of severe hypertension in pregnancy. *Semin Perinatol*, 1–7. doi:10.1053/j.semperi.2015.11.017
- Myers, J S (2009). A Comparison of the Theory of Unpleasant Symptoms and the Conceptual Model of Chemotherapy-Related Changes in Cognitive Function. *Oncology Nursing Forum*. Vol. 36, No. 1. E1-E10.
- National Health Standard. National Institute for Clinical Excellence. (2010). Hypertension in pregnancy: the management of hypertensive disorders during pregnancy. *Clin Guideline*. 29 : 163–79.
- Nishimoto, F., Sakata, M., Minekawa, R., Okamoto, Y., Miyake, A., Isobe, A., et al. (2009). Metal transcription factor-I is involved in hypoxia-dependent regulation of placenta growth factor in trophoblast-derived cells. *Endocrinology*. 150 : 1801-1808.
- Paramita, T. F & Martini S. (2012). Hubungan antara gaya hidup selama masa kehamilan dan kejadian preeklampsia. *The Indonesian Journal of Public Health*. Vol 8. No 3 Maret 2012. 122-125.
- Parker, M. E. (2005). *Nursing theories and nursing practice*. Philadelphia : F. A. Davis Company.
- Persatuan Obstetri dan Ginekologi Indonesia. (2010). *Panduan*

- Penatalaksanaan Hipertensi Dalam Kehamilan. Jakarta : HKFM POGI.
- Reeder, S.J., Martin. L.L., & Griffin, D.K. (2012). *Keperawatan Maternitas : kesehatan perempuan, bayi dan keluarga*. Alih bahasa : Yati A., Imami N.R., Sri D. Jakarta : Penerbit Buku Kedokteran EGC.
- Roberts et al. (2013). Hypertension in pregnancy. *American College of Obstetricians and Gynecologists. Obstet Gynecol*; 122; 1122-31.
- SeonAe Yeo. (2010). Prenatal Stretching exercise and autnomic responses : preliminary data and a model for reducing preeklampsia. *Journal of Nursing Scholarship*. 42 :, 113-121.
- Sibai, Baha M. (2010). Induction Of LabourImproves Maternal Outcome ComparedWith Expectant Monitoring In WomenWith Gestational Hypertension Or MildPre-Eclampsia. *Evidence Based Medicine*, Vol. 15 (1): 11-12.
- Society of Obstetricians and Gynaecologist of Canada. (2008). Diagnosis evaluation and management of the hipertensive disosders of pregnancy. *Journal of Obstetric Gynaecologiy canada*. 30 (3) : s1- s6.
- Sumanti. N., Noormartany., Alamsyah. M., & Rostini. T. (2013). Kadar asam urat serum sebagai biomarker preeklamsia. *MKB*. 45 (2) : 98-104.
- Tomey, A. M, & Alligood, M. R. (2010). *Nursing Theory and their Work*. (7th Ed). Maryland Heights, Missouri : Mosby Elsevier.
- Tragea, C., Chrousos, G. P., Alexopoulos, E. C., & Darviri, C. (2014). A randomized controlled trial of the effects of a stress management programme during pregnancy. *Complementary Therapies in Medicine*. doi:10.1016/j.ctim.2014.01.006
- World Health Organization. (2014). *Maternal and Reproductive Health*. WHO press : Genewa.
- World Health Organization. (2011). *WHO recommendations for prevention and treatment of pre-eclampsia and eclampsia*. WHO press : Genewa.
- WHO Study Group. (2007). *The hypertensive disorders of pregnancy*. WHO technical report series no 758. Geneva: World Health Organisation.