



1. The Effect of Health Education on Diet Compliance Among Patients with Diabetes Mellitus in the Sukaraja Public Health Center's Work Area in Sukabumi Regency
2. The Effects of Husband Support, Motivation, and Self-Efficacy on the Examination of Visual Inspection of Acetic Acid (IVA) in Karawang Village, Karawang Health Center, and Sukabumi Regency in Women of Childbearing Age (PUS)
3. The Experience of Nursing Care Patient with ECG Letal in Intensive Care Unit Sekarwangi Hospital
4. The Effectiveness of Consumption of Red Guava Juice Against Increasing Hemoglobin Levels in Pregnant Women
5. Influence of Hypnotherapy to Reduce the Anxiety of School-Age Children in the Preoperative Phase in the Guntur Room of Level II Dustira Cimahi Hospital
6. Academic Stress Affects Smartphone Addiction in Nursing Student
7. The Effectiveness Of The Protective Barrier Of The Skin Against Medical Adhesive Related Skin Injury (Marsi) In Children Treated In Pediatric Intensive Care Units : Systematic Review
8. Stress Level of Nursing Students During Online Learning During the Covid-19 Pandemic
9. The Relationship of Self Care with Disabilities in People with Leprosy in the South Jakarta
10. Effect of Stress Ball on Stress and Anxiety in Hemodialysis Patients
11. What is the Level of Pain in Patients Who Are Inserted Urinary Catheters Using Pure Jelly?
12. Self-Control Technique to Improve Self-Esteem Among Victims of Bullying
13. The Expectations of Baby Moms and Toddlers in An Integrated Health Care (Posyandu) in Penggilingan Village East Jakarta
14. The Effect of Breastfeeding Technique Education on the Breastfeeding Efficacy of Public Mothers at the GSIA Nabire Clinic, Papua
15. Differences in Knowledge of Preconceptional Mothers about Breast Examination (Breacking) as Pre-and-Post Explanation Breast Cancer Prevention
16. The Effectiveness of Biscuit Consumption of Pregnant Women on Increasing The Circumference of The Upper Arm In Pregnant Women with Chronic Energy Deficiency (CED) In The Karawang Kulon Health Center Area
17. Effectiveness of MGSO4 Administration Against Prevention of Eclampsia in Severe Pre-Eclampsia in RSIA Resti Mulya in 2022
18. Differences in the Effectiveness of Giving Dark Chocolate and Ginger to Reducing Menstrual Pain Intensity in SMAN 1 Cikande Students in 2022
19. The Effect of Baby Massage in Healing Cough of The Common Cold in Infants at Zhafira Zarifa Clinic
20. Relationship of Mothers' Characteristic, Attitude, and Self Efficacy Toward Exclusive Breastfeeding Practice in Work Area of Tigaraksa Public Health Centre
21. Technology-Based Interventions in Schizophrenia Patients : A Narrative Review
22. The Effectiveness of Venopheric Infusation on Ferritine Levels in Pregnant Women with Iron Deficiency Anemia in RSPAD Gatot Soebroto
23. Effectiveness Of Beetroot And Spinach Against The Increase In Hemoglobin Levels Of Pregnant Women In The Primary Clinic Kasih Bunda, 2022
24. The Effect of Audiovisual-Based Education Media on Self Management in Type 2 Diabetes Mellitus Patients in the Work Area of UPT Puskesmas Ledeng
25. The Effect of Progressive Muscle Relaxation on Anxiety in Covid-19 Patients in Bandung
26. The Effectiveness of the Combination of Spiritual Emotional Freedom Technique and Slow Deep Breathing in Lowering Blood Pressure Reduction in Hypertensive Patients at UPT Puskesmas Pasundan, Bandung City
27. MUSKAR-T for Improving Mental Health and Cancer-Related Symptoms in Women Diagnosed with Breast Cancer Undergoing Chemotherapy: A Queasy Experimental Design
28. Overview of Emotional Stability in Class Adolescents Based on Nursing Perspectives
29. NICU Room Baby Care at the Sekarwangi Regional General Hospital: Mothers' Satisfaction with Baby Care and Social Support for Mothers with Premature Infants
30. Effectiveness of Consumption of Brown Rice and Potatoes in Reducing Blood Sugar in the Elderly with Type 2 Diabetes Mellitus at Pondok Ranji Health Center

JURNAL KEPERAWATAN KOMPREHENSIF	VOL. 8	Special Edition	Page 1-222	Bandung June 2022	ISSN 2354-8428  e-ISSN 2598-8727
------------------------------------	--------	--------------------	---------------	-------------------------	--

## Research Article

# Effectiveness of MgSO<sub>4</sub> Administration Against Prevention of Eclampsia in Severe Pre-Eclampsia in RSIA Resti Mulya in 2022

Ulviana<sup>1\*</sup> | Novita<sup>2</sup>

<sup>1,2</sup>Sekolah Tinggi Ilmu Kesehatan Abdi Nusantara, Jakarta - Indonesia

### \*contact

ulviana1908@gmail.com

Received : 24/05/2022

Revised : 17/06/2022

Accepted : 27/06/2022

Online : 30/06/2022

Published : 30/06/2022

### Abstract

**Aims:** To determine the Effectiveness of Mgso<sub>4</sub> Administration against Eclampsia Prevention in severe pre-eclampsia in RSIA Resti Mulya in 2022.

**Methods:** This study used the Quasy Experimental quantitative method, with a retrospective approach. The relationship between the two variables in this study was tested using the dependent paired t-test data analysis technique. The population of this study was all mothers who were severely eclampsia and received MgSo<sub>4</sub> therapy as many as 43 respondents, using a total sampling of which all populations were made respondents.

**Results:** Frequency distribution of characteristics of respondents aged 30.8 years with a gestational age of 37.6 weeks with an obese Body Mass Index (30-39.5) of 39.5%, having a history of peer disease of 81.4%, and the number of multipara childbirth as much as 69.8%. Differences in the prevention of eclampsia (blood pressure and urine protein) in severe pre-eclampsia before and after administration of MgSo<sub>4</sub>, namely Sistol values of 163.8 vs 121.4. Diastole pressure value of 105.5 vs 80.4. urine protein 1.52. There is the effectiveness of mgso<sub>4</sub> administration against the Prevention of eclampsia in severe pre-eclampsia at RSIA Resti Mulya in 2022 with a p-value value: 0.000.

**Conclusion:** The results of this study are that the administration of MgSo<sub>4</sub> effectively prevents eclampsia in severe pre-eclampsia at RSIA Resti Mulya in 2022. Thus, it is expected to refer to the importance of giving MgSo<sub>4</sub> to mothers with pre-eclampsia.

### Keywords :

Severe pre-eclampsia, Eclampsia Prevention, MgSo<sub>4</sub>

## INTRODUCTION

The Maternal Mortality Rate (MMR) is still a problem faced throughout the world. Based on data from the World Health Organization (WHO), in 2017, around 800 women died daily from pregnancy and childbirth. 99% of these deaths occurred in developing countries. Furthermore, pregnancy hypertension accounts for 10% of the

causes of MMR and is the most significant cause of maternal and perinatal morbidity and mortality rates worldwide (1).

These include pre-eclampsia, eclampsia, gestational hypertension, and chronic hypertension. The incidence of pre-eclampsia itself has continued to increase over the past two decades by 25%. There are 50,000-60,000 deaths yearly from pre-

eclampsia worldwide (2). In Indonesia, MMR is also a health problem that reflects the quality of health services during pregnancy and puerperium, which is still not optimal. According to Sufas (2015), there are 305 cases of death per 100,000 live births out of 102 per 100,000 pregnancies. Every year about 50,000 mothers die from pre-eclampsia (3).

Pre-eclampsia becomes one of the most severe obstetrics complications and affects 5-8% of pregnant women. It is also one of the leading causes of maternal and perinatal morbidity and mortality, along with bleeding and infectious diseases (4). Pre-eclampsia is a state of arterial hypertension with proteinuria identified after the 20th week of gestational age. In addition, some organ dysfunction can follow it with symptoms in the form of headaches, visual turbidity, abdominal pain, pulmonary edema, brain disorders in the form of headaches, seizures, and scotoma, or changes in laboratory test results such as thrombocytopenia, increased liver enzymes, and hyper-creatinin (5).

Health experts are aware that pre-eclampsia is a systemic disorder. The flow of blood towards each mother's organ is reduced due to vasoconstriction and the formation of micro thrombus and ends in multiorgan conditions. At the same time, fetal complications and growth retardation are secondary due to placental hypoperfusion (6). The current management of pre-eclampsia is based on the diagnosis of the disease, assessment of the severity of the illness, antihypertensive, intrapartum treatment, including seizure prevention, control of blood pressure, and proper management of intravenous fluids. The current review is directed to reverse or restrain the pathological process of the disease pre-eclampsia or carry out Prevention in patients with a high risk (1).

In addition to the high risk to the fetus, pre-eclampsia disease can also affect the mother. Mothers can experience organ dysfunctions such as kidney, liver, central

nervous system damage, stroke, cardiomyopathy, pulmonary edema, respiratory distress syndrome, and even death (4).

The course of pre-eclampsia can be asymptomatic and signs at first but can worsen rapidly and enter into a state of eclampsia seizures (7). Prevention so that pre-eclampsia does not fall into a convulsive condition and becomes eclampsia is essential to do. Blood pressure control with antihypertensives is important, but seizure prophylaxis such as mgSO<sub>4</sub> administration is known to reduce the incidence of eclampsia in severe pre-eclampsia patients (8)

Magnesium is one of the minerals that play an essential role in the health and metabolic system of the body. This mineral works in about 300 enzyme functions in the process of chemical reactions of the body in various forms. The method of protein synthesis, nerve and muscle function, control of blood glucose levels, and blood pressure control are some of the body's metabolic processes that are closely related to magnesium (9). The health risks that arise can become more severe if the state of pre-eclampsia falls into the condition of eclampsia seizures. This situation must be prevented, one of which is by administering mgSO<sub>4</sub> anticonvulsants. Implementing MgSO<sub>4</sub> as a therapy for preventing eclampsia seizures has now become the standard for management services for pre-eclampsia patients in various hospitals. This prophylactic therapy should be administered immediately after the patient is diagnosed with severe pre-eclampsia (10).

Research conducted (9) on magnesium administration (MgSo<sub>4</sub>) in pre-eclampsia/eclampsia pregnancy with the result that there is a relationship between magnesium administration and the incidence of pre-eclampsia ( $p = 0.002$ ). This study can be concluded that magnesium levels are related to the incidence of pre-eclampsia, so it is expected that health workers will be able to carry out early

detection of pre-eclampsia events, one of which is by providing magnesium therapy. (11) research on the effect of using Mgso4 as a seizure prevention therapy in pre-eclampsia with the result that Magnesium sulfate as an anticonvulsant due to minimal side effects and safety that has been tested and affects pre-eclampsia patients in the form of a decrease in cases of eclampsia seizures, a reduction in the use of antihypertensives, a drop in systolic blood pressure and as a neuroprotector agent in the fetus. Research conducted by (12) on the role of Magnesium Sulfate in the management of pre-eclampsia with the results of the analysis showed that magnesium sulfate has a role in the direction of pre-eclampsia with one of its mechanisms of action is to cause vasodilation through relaxation of smooth muscles, including peripheral blood vessels and uterus and as an anticonvulsant. Before administration of MgSO<sub>4</sub>, an antidote must be available, namely calcium gluconate.

RSIA Resti Mulya is a Hospital Mother and Child domiciled in East Jakarta and serves patients with pregnancy, childbirth, puerperium, and others. From the data, Medical Records obtained data on pregnant women for 1 period 3 months July, August, and September 2021, as many as 250 patients. Pregnant women with severe pre-eclampsia were 43 patients (17.2%). All pregnant women patients with severe pre-eclampsia were given MgSo<sub>4</sub> (100% administered), but those with an immediate effectivity of 85.0%, slow effectiveness of 10.0%, and ineffectiveness of 5.0%. Based on this, researchers are interested in seeing the significance of MgSo<sub>4</sub> administration in preventing eclampsia in severe pre-eclampsia at RSIA Resti Mulya.

## METHODS

This research uses the Quasy Experimental quantitative method with a retrospective approach. The data collection was carried out in July, August, and September 2021 using secondary data from medical records

of patients with severe pre-eclampsia who were given MgSo<sub>4</sub> therapy. Variable data were collected simultaneously, namely the patient variable for mgSo<sub>4</sub> treatment. The research was conducted in November 2021 atRSIA Resti Mulya. The population in this study was all mothers who were severely pre-eclampsia and who received MgSo<sub>4</sub> therapy at RSIA Resti Mulya, Jakarta, for 1 period 3 months of July, August, and September 2021, as many as 43 patients. The sample in this study used total sampling. Namely, all populations were sampled in the survey, namely 43 respondents. Of the 43 respondents, they will be divided into 2 control and intervention groups, namely 21 controls and 22 interventions. Univariate data analysis was used to determine the frequency distribution and percentage of independent variables, namely maternal characteristics, and differences in eclampsia prevention in severe pre-eclampsia patients before and after mgSo<sub>4</sub> administration. In addition, bivariate analysis using the Paired Sample t-test was used to test the mean difference between the two groups of dependent data. The two variable t-tests compare whether the two variables are the same or different. The t-obtained will be compared with the proposed t-value.

## RESULTS

### 1. Characteristics of Respondents

**Table 1.**  
**Distribution of maternal characteristics by maternal age and gestational age**

No	Variable	Min-Max	n	Mean	SD
1	Mother's age	21,0-40,0	43	30,8	5,48
	Gestational Age	31,0-40,0			

Table 1 shows that the average age of the respondents was 30.8 years, with a gestational age of 37.6 weeks.

**Table 2.**  
**Distribution of maternal characteristics based on BMI, medical history, and the number of births.**

No	Variable	n	%
<b>1</b>	<b>BMI</b>		
	Thin (<18,5)	0	0,0
	Ideal (18,5-24,9)	3	7,0
	Overweight (25-29,5)	17	39,5
	Fat (30-39,5)	23	53,5
<b>2</b>	Very Fat (>39,5)	0	0,0
	<b>History of Disease</b>		
	None	8	18,6
<b>3</b>	have	35	81,4
	<b>Number of labor</b>		
	Primipara	13	30,2
	Multipara	30	69,8

Based on table 2 above, it can be seen that respondents with a fat BMI (30-39.5) were 39.5%, had a history of disease as much as 81.4%, and the number of multiparous deliveries was 69.8%.

The results of research conducted by (13) stated that pregnant women without hypertension who are at risk of developing pre-eclampsia are women aged > 35 years. The age group > 35 years had a significant relationship with the incidence of pre-eclampsia. Research conducted by (14) states that mothers with parity >3 are at

risk of developing pre-eclampsia compared to mothers with a parity 1-3.

In multi-parity, the endometrial environment around the implantation site is less than perfect and not ready to accept the products of conception, so the provision of nutrition and oxygenation to the effects of birth is less than perfect and results in the growth of the consequences of conception being disturbed so that it can increase the risk of pre-eclampsia. Pre-eclampsia in chronic hypertension is pre-eclampsia that occurs in pregnant women who have suffered from hypertension before pregnancy.

In addition, diabetes, kidney disease, and obesity can also cause pre-eclampsia. The cause of weight gain in edema caused by excessive water accumulation in the interstitial space is unknown, possibly due to water and salt retention (14). (7) Obesity is a risk factor for pre-eclampsia. The risk of pre-eclampsia increases markedly with an increase in BMI before pregnancy. The degree of obesity is related to the severity of pre-eclampsia. Women with the lowest BMI were relatively protected against pre-eclampsia, whereas women with the highest BMI had an increased risk of severe pre-eclampsia (blood pressure 160/110 mmHg; proteinuria 5 g/24 hours).

## Univariate Analysis

**Table 3.**  
**Frequency distribution of differences in preventing eclampsia (blood pressure and urine protein) in severe pre-eclampsia before and after administration of MgSo4 in patients at RSIA Resti Mulya in 2022.**

Preventing eclampsia	N	Min-Max	Mean	SD	Mean
Sistole	Before	140,0-197,0	163,8	0,21	42,4
	After	100,0-140,0	121,4	1,77	
Diastole	Before	90,0-168,0	105,5	3,06	25,1
	After	70,0-100,0	80,4	1,95	
Protein Urine	Before	+1 - +3	1,7	1,27	1,52
	After	0 - +2	0,18	0,100	



Based on table 3 above shows the difference in the prevention of eclampsia (blood pressure and urine protein) in severe pre-eclampsia before and after administration of MgSo<sub>4</sub> to patients at RSIA Resti Mulya in 2022, namely the Sistol value before being given MgSo<sub>4</sub> with a mean of 163.8 and decreased after being given MgSo<sub>4</sub> to 121.4. In addition, the diastolic pressure value before 105.5 fell to 80.4. Meanwhile, urine protein decreased before and after MgSo<sub>4</sub> was delivered by 1.52.

The study is in line with research conducted by (11) on the effect of using Mgso<sub>4</sub> as a seizure prevention therapy in pre-eclampsia, with the results that the anticonvulsant mechanism of MgSo<sub>4</sub> in the form of a decrease in peripheral resistance occurs with the inactivation of myosin kinase chain so that arterial relaxation occurs and leads to a reduction in blood pressure. Using MgSO<sub>4</sub> as seizure prophylaxis in pre-eclampsia has affected various studies significantly. The effect of the use of MgSO<sub>4</sub> in pre-eclampsia patients is a decrease in cases of eclamptic seizures, a reduction in the use of antihypertensives, a drop in systolic blood pressure, and a neuroprotector agent in the fetus.

Research conducted by (15) on the role of magnesium sulfate in the management of pre-eclampsia with the results of the analysis showing that magnesium sulfate has a role in the direction of pre-eclampsia with one of its mechanisms of action being to cause vasodilation through relaxation of smooth muscles, including peripheral and uterine blood vessels and as an anticonvulsant. Before administering MgSO<sub>4</sub>, the antidote must be available, namely calcium gluconate and protein-lowering in the urine.

Magnesium sulfate, when administered by the parenteral route, is used to prevent and control seizures in severe pre-eclampsia or eclampsia without CNS depression adversely affecting the mother, fetus, or neonate and in convulsions associated with hypomagnesemia. In addition, magnesium Sulfate in off-label use can be used to control hypertension, encephalopathy, and seizures in children with acute nephritis; prevent premature labour; treat life-threatening ventricular arrhythmias; Prevention and treatment of magnesium deficiency. While oral use of MgSO<sub>4</sub> can act as a laxative. Possible mechanisms include increased cerebral vasodilation, production of prostacyclin, which can reduce vasospasm secondary to endothelial dysfunction, reduction of endothelial injury from free radicals, and Prevention of calcium entry into the body. In addition, ischemic cells, direct anticonvulsant effect through N-methyl-D-aspartate glutamate receptor antagonism, inhibition of platelet aggregation, decreased release of acetylcholine at motor nerve endings, and reduced placental TNF alpha secretion (7).

The results showed differences in preventing eclampsia (blood pressure and urine protein) in severe pre-eclampsia before and after administration of MgSo<sub>4</sub> to patients at RSIA Resti Mulya. And the level of knowledge in the administration of MgSo<sub>4</sub>. In addition to the side effects of the drug feeling hot, other side effects harm the patient if given without proper control. In addition, pay attention to the availability of MgSo<sub>4</sub> and Calcium Gluconate so that if the drug is needed, it is always available in the practice room, and treatment is not delayed.

## Bivariate Analysis

**Table 4.**  
**The effectiveness of MgSo4 administration on the prevention of eclampsia in severe pre-eclampsia at RSIA Resti Mulya in 2022**

Prevention of eclampsia	N	Mean	SD	t	Pvalue
Siastol Pre-post	43	42,39535	23,26364	11,950	0,000
Diastol Pre-post		25,16279	15,92980	10,358	0,000
Protein Urine Pre-post		1,55814	,73363	13,927	0,000

Table 4 shows the effectiveness of giving MgSo4 for the Prevention of eclampsia in severe pre-eclampsia at RSIA Resti Mulya in 2022, namely based on differences in systolic and diastolic. Urine protein values before and after MgSo4 were given with p-value: 0.000 which means that MgSo4 administration effectively prevents eclampsia in severe pre-eclampsia at RSIA Resti Mulya in 2022.

Research conducted by (9) concerning the Relationship of Magnesium (MgSo4) in Pre-Eclampsia/Eclampsia Pregnancy to Asphyxia Incidence in Newborns at the Samarinda Islamic Hospital the results that there is a relationship between magnesium administration and the incidence of pre-eclampsia (  $p=0.002$ ). It can be concluded that magnesium levels are associated with the incidence of pre-eclampsia, so it is hoped that health workers can carry out early detection of the incidence of pre-eclampsia, one of which is by providing magnesium therapy. Research conducted by (16) on the clinical and laboratory effects of continuous and periodic administration of MgSo4 in preeclampsia-eclampsia patients with research results stating that intravenous magnesium sulfate is better for preventing seizures or repeated seizures.

The mechanism by which MgSO<sub>4</sub> is effective in preventing eclamptic seizures is multifactorial. MgSO<sub>4</sub> is a calcium antagonist and can inhibit smooth vascular

muscle contraction. MgSO<sub>4</sub> is also a potent vasodilator, but its effect on cerebral circulation is much less effective than on systemic blood vessels. In addition, sensitivity to MgSO<sub>4</sub> decreases in cerebral arteries since late pregnancy, indicating that MgSO<sub>4</sub> does not act as a vasodilator in the cerebral circulation. On the other hand, MgSO<sub>4</sub> has been shown to protect the blood-brain barrier through its calcium antagonistic effect on the cerebral endothelium. So that MgSO<sub>4</sub> can prevent recurrent seizures. Magnesium Sulfate is also an NMDA receptor antagonist and thus will act as an anticonvulsant if at high enough concentrations in the brain (17).

Magnesium is administered intravenously as a maintenance dose of 4 g over 15 to 30 minutes, followed by a maintenance dose of 1 g/hour. Angiogenic factors influence another mechanism of magnesium sulfate in the Prevention of seizures. Magnesium can partially reduce the risk of seizures in patients with pre-eclampsia by altering pro- and anti-angiogenic serum levels. Possible mechanisms for this action of magnesium include binding of sFlt1 and zinc receptors resulting in the release of VEGF, binding of calcium channels resulting in decreased sFlt1 secretion, induction of vasodilation and reduced placental ischemia resulting in decreased sFlt1 secretion, changes resulting from the process of decreased sFlt1 synthesis and sFlt1 binding resulting in direct reduction of endothelial damage.

Magnesium reduces the risk of seizures by altering the pro and levels of anti-angiogenic factors (18).

The results showed that the administration of MgSO<sub>4</sub> effectively prevented eclampsia in severe pre-eclampsia at RSIA Resti Mulya. The researchers assumed that the MgSO<sub>4</sub> given by doctors/medical nurses and midwives was following the existing SOPs. The provision of MgSO<sub>4</sub> is expected to improve healing and services at RSIA. MgSO<sub>4</sub> mechanism is effective in preventing eclamptic seizures. It is hoped that RSIA Resti Mulya will always increase the knowledge of medical personnel and make references about the importance of giving MgSo<sub>4</sub> to mothers with eclampsia and provide tighter supervision so that the Prevention of eclampsia in severe pre-eclampsia can run well. Eclampsia. In addition, pay attention to the availability of MgSo<sub>4</sub> and Calcium Gluconate so that if the drug is needed, it is always available so that treatment is not delayed.

## CONCLUSION

The frequency distribution of respondent characteristics shows that the average respondent is 30.8 years old with 37.6 weeks of gestation, with a fat BMI (30-39.5) as much as 39.5%, and has a history of as much as 81.4% and a total of 81.4%. Multiparous delivery as much as 69.8%. Differences in the prevention of eclampsia (blood pressure and urine protein) in severe pre-eclampsia before and after administration of MgSo<sub>4</sub> to patients at RSIA Resti Mulya in 2022, namely, the Systolic value before being given MgSo<sub>4</sub> with a mean of 163.8 and decreased after being given MgSo<sub>4</sub> to 121.4. The diastolic pressure value before 105.5 fell to 80.4. While in urine, protein decreased before and after MgSo<sub>4</sub> was delivered by 1.52.

There is the effectiveness of giving MgSo<sub>4</sub> to the Prevention of eclampsia in severe pre-eclampsia at RSIA Resti Mulya in 2022, namely based on the difference in systolic, diastolic, and urine protein values before

and after being given MgSo<sub>4</sub> with a p-value of 0.000 which means that the administration of MgSo<sub>4</sub> is effective in preventing eclampsia in pre-eclampsia. Severe eclampsia at RSIA Resti Mulya in 2022.

## REFERENCES

1. WHO. Maternal mortality. 2019.
2. WHO. WHO recommendations for Prevention and treatment of pre-eclampsia and eclampsia. Organization WH, editor. Geneva; 2011. 38 p.
3. Depkes RI. Reference Book: Basic Emergency Neonatal Obstetric Services. Indonesia DKR, editor. Jakarta: Departemen Kesehatan Republik Indonesia; 2007.
4. Than NG, Romero R, Tarca AL, Kekesi KA, Xu Y, Xu Z, et al. Integrated systems biology approach identifies novel maternal and placental pathways of preeclampsia. *Front Immunol.* 2018;9:1661.
5. Oliveira LG De, Diniz ALD, Prado CA de C, Cunha Filho EV Da, Souza FLP De, Korkes HA, et al. Pre-eclampsia: Universal Screening or Universal Prevention for Low and Middle-Income Settings? *Rev Bras Ginecol e Obs.* 2021;43:61–5.
6. El-Sayed AAF. Preeclampsia: A review of the pathogenesis and possible management strategies based on its pathophysiological derangements. *Taiwan J Obstet Gynecol.* 2017;56(5):593–8.
7. Noroyono W, Irwinda R, Frisdiantiny E, Karkata MK, Mose JC, Chalid MT, et al. National Guidelines for Medical Services for Diagnosis and Management of Pre-Eclampsia. 2016;
8. Langston-Cox AG, Marshall SA, Palmer KR, Wallace EM. Prolong: a double-blind randomised placebo-controlled trial of broccoli sprout



- extract in women with early onset preeclampsia. A clinical trial protocol. *BMJ Open*. 2019;9(10):e027493.
9. Saidah S, Yusup N. Relationship of administration of magnesium (MgSO<sub>4</sub>) in pre-eclampsia/eclampsia pregnancy to the incidence of asphyxia in BBL in Samarinda Islamic Hospital. *J Kebidanan Mutiara Mahakam*. 2016;4(2):11–20.
  10. Haryanti D, Nurdiani L. RELATIONSHIP OF AGE AND PREECLAMATION WITH THE EVENT OF LOW BIRTH WEIGHT IN RADEN MATTAHER HOSPITAL JAMBI. *MIDWIFERY Heal J*. 2021;6(1):1–6.
  11. Amalia FF. THE EFFECT OF USING MGSO<sub>4</sub> AS SEQUEL PREVENTION THERAPY ON PREECLAMPSIA. *J Ilmu Kedokt dan Kesehat*. 2020;7(1).
  12. Veftisia V, Afriyani LD. Levels of Anxiety, Stress, and Depression in Second and Third Trimester Pregnant Women at PMB Alam, Salatiga City. *Indones J Midwifery*. 2021;4(1):62–7.
  13. Situmorang TH, Damantalm Y, Januarista A, Sukri S. Factors related to the incidence of preeclampsia in pregnant women at the MCH Polyclinic, Anutapura Hospital, Palu. *Heal Tadulako J (Jurnal Kesehat Tadulako)*. 2016;2(1):34–44.
  14. Novianti H. Effect of Age and Parity on the Incidence of Pre-Eclampsia in Sidoarjo Hospital. *J Heal Sci*. 2016;9(1).
  15. Andriani R, Apriani S. Effect of Gentle Birth Method on Pain Level and Duration of First Stage of Labor in Primiparous Mothers. *JOMIS (Journal Midwifery Sci)*. 2021;5(1):28–35.
  16. Lisnawati Y, Sakti J, Irwinda R, Agustin K, Nurfauziah N. A Significant Increase in Maternal Blood Uric Acid Levels Accompanies the Severity of Hypertensive Disorders in Pregnancy. *Indones J Obstet Gynecol*. 2021;144–8.
  17. Cipolla MJ, Kraig RP. Seizures in women with preeclampsia: mechanisms and management. *Fetal Matern Med Rev*. 2011;22(2):91–108.
  18. Tanz LJ, Stuart JJ, Missmer SA, Rimm EB, Sumner JA, Vadnais MA, et al. Cardiovascular biomarkers in the years following pregnancies complicated by hypertensive disorders or delivered preterm. *Pregnancy Hypertens*. 2018;13:14–21.