

## DESCRIPTION OF PREGNANT WOMEN WITH PREECLAMPSIA AT PROF. DR. I. G. N. G. NGOERAH HOSPITAL IN 2022

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### ABSTRACT

Preeclampsia is a specific disorder of pregnancy involving endothelial dysfunction and vasospasm, typically occurring after 20 weeks of gestation and potentially manifesting 4-6 weeks postpartum. Clinically, it is characterized by new-onset hypertension and proteinuria. This study aimed to describe pregnant women with preeclampsia at Prof. Dr. I. G. N. G Ngoerah General Hospital in 2022. The research, conducted in 2023, employed a descriptive approach using secondary data from medical records of 141 preeclampsia patients, sampled through total sampling based on inclusion and exclusion criteria. Data analysis utilized univariate methods with frequency distribution tables. The research findings indicate that the majority of pregnant women with preeclampsia at Prof. Dr. I. G. N. G Ngoerah General Hospital in 2022 were characterized by the following: maternal age between 26-30 years (33.3%), education level up to high school (48.9%), occupation as a homemaker (61%), nulliparity (31.9%), receiving antenatal care (96.5%), interpregnancy interval < 2 years (27.7%), experiencing overweight (44%), absence of chronic diseases (83.7%), and no use of hormonal contraception (69.5%). Preeclampsia incidents predominantly occurred in healthy reproductive-age individuals. Therefore, it is hoped that healthcare professionals can detect and address the condition early, implement preventive measures, and provide timely treatment.

**Keywords:** Preeclampsia., endothelial dysfunction., vasospasm

### INTRODUCTION

World Health Organization (WHO) estimates that every day, approximately 585,000 women die due to pregnancy-related causes, childbirth, and abortions, with 99% of these deaths occurring in developing countries. Preeclampsia is one of the three leading causes of maternal morbidity and mortality worldwide. The prevalence of preeclampsia varies across countries; in Africa, the prevalence is 2.32%, resulting in a mortality rate of 1.39%. In Latin America, the prevalence is 6.00%, with a mortality rate of 0.05%. In Asia, there are recorded incidents of 3.13% for preeclampsia, causing a mortality rate of 0.68%.<sup>1</sup> As one of the developing countries, Indonesia's Maternal Mortality Rate (MMR), which is a key indicator for assessing the quality and status of women's health, remains relatively high compared to other ASEAN countries. In 2020, Indonesia reported a Maternal Mortality Rate of 189 per 100,000 live births.<sup>2</sup> This figure is still quite far from the SDGs target of 70 maternal deaths per 100,000 live births. The high Maternal Mortality Rate (MMR) is a health problem posing a challenge for Indonesia to enhance the quality of healthcare services, especially during pregnancy.<sup>3</sup> In 2021, there were 1,107 cases of maternal deaths related to hypertension in Indonesia. In Bali Province during the same year, the number of maternal deaths due to preeclampsia was 4 cases.<sup>4</sup>

Preeclampsia is a specific disorder of pregnancy involving endothelial dysfunction and vasospasm, typically occurring after 20 weeks and potentially manifesting 4-6 weeks postpartum. Clinically, it is characterized by new-onset hypertension and proteinuria, with or without severe features. Preeclampsia is a hypertensive condition occurring after 20 weeks of pregnancy, where blood pressure is  $\geq 140/90$  mmHg accompanied by proteinuria  $\geq 300$  mg/24 hours, and in some cases, it may occur without proteinuria.<sup>5</sup> The criteria for preeclampsia include mild preeclampsia and severe preeclampsia.<sup>6</sup> The exact cause of preeclampsia is not yet known, but there are several theories proposed regarding the occurrence of hypertension during pregnancy. These include the theory of placental abnormalities, inflammation theory, free radical theory, endothelial dysfunction theory, cardiovascular adaptation theory, nutritional deficiency theory, immunological adaptation theory, and genetic theory.<sup>7-8</sup>

Primary prevention is the best approach, but it can only be implemented when the cause is clearly known. Healthcare professionals are expected to identify the risk factors for preeclampsia and control them, thus enabling the implementation of primary prevention.<sup>4</sup> Risk factors for the occurrence of preeclampsia include maternal characteristics (age, education level, employment status), pregnancy history (parity, history of antenatal care, interpregnancy

interval, obesity, history of chronic diseases, and history of hormonal contraceptive use).<sup>9-15</sup>

The goal of managing preeclampsia is to prevent its progression to eclampsia and to assist/protect the fetus to ensure optimal delivery conditions. The management of pregnant women with preeclampsia involves referring them to a hospital. The general management of preeclampsia includes measures such as bed rest, blood pressure monitoring, administration of magnesium sulfate, and intravenous infusion of lactated Ringer's solution at a rate of 60-125cc/hour (if the patient presents with severe preeclampsia). The first-line choice for antihypertensive treatment includes oral short-acting nifedipine, parenteral labetalol, and hidralazine. Diuretic medication may also be administered in the case of pulmonary edema or kidney failure.<sup>4</sup>

**MATERIAL AND METHOD**

This research design is descriptive with univariate analysis. The sampling method employed in this study is total sampling, where the entire population that meets the inclusion and exclusion criteria is included as the sample. The samples used in this study are secondary data from the medical records of preeclampsia patients at Prof. Dr. I. G. N. G Ngoerah Teaching Hospital in 2022. Inclusion criteria: Pregnant women who experienced preeclampsia at Prof. Dr. I. G. N. G Ngoerah Teaching Hospital within the timeframe of January 1 to December 31, 2022, with complete medical records data corresponding to the variables under investigation. Exclusion criteria: Incomplete medical record data. This research has obtained ethical clearance from the Research Ethics Commission of the Faculty of Medicine, Udayana University, with the ethical clearance details as follows: No. 247/UN14.2.2.VII.14/LT/2023.

**RESULTS**

**Table 1.** Distribution Based on Age Frequency

Age	Number (n)	Percentage (%)
<20 years	4	2.8
21-25 years	20	14.2
26-30 years	47	33.3
31-35 years	32	22.7
36-40 years	29	20.6
>41 years	9	6.4
Total	141	100

**Table 2.** Distribution Based on Education Level

Level of education	Number(n)	Percentage (%)
No school	5	3.5
SD	20	14.2
SMP	21	14.9
SMA	69	48.9
Diploma	8	5.7
Sarjana	18	12.8
Total	141	100

**Table 3.** Distribution Based on Employment Status

Employment	Number (n)	Percentage (%)
Housewife	86	61
Pegawai Swasta	29	20.6
PNS	3	2.1
ASN	4	2.8
Self-employed	16	11.3
Farmer	2	1.4
Teacher	1	0.7
Total	141	100

**Table 4.** Distribution Based on Parity

Parity	Number (n)	Percentage (%)
P0	45	31.9
P1	40	28.4
P2	36	25.5
P3	12	8.5
P4	7	5
P5	1	0.7
Total	141	100

**Table 5.** Distribution Based on History of Antenatal Care

History of ANC	Number(n)	Percentage (%)
Ever	136	96.5
Never	5	3.5
Total	141	100

**Table 6.** Distribution Based on Interpregnancy Interval

Interval	Number (n)	Percentage (%)
< 2 years	52	36.8
2-4 years	30	21.3
5-7 years	41	29
8-10 years	9	6.4
>10 years	9	6.4
Total	141	100

**Table 7.** Distribution Based on Obesity

Classification	Number(n)	Percentage (%)
Normal	21	14.9
Overweight	62	44
Obesity I	32	22.7
Obesity II	11	7.8
ObesityI II	15	10.6
Total	141	100

**Table 8.** Distribution Based on History of Chronic Diseases

Chronic Disease	Number (n)	Percentagee (%)
Yes	23	16.3
No	118	83.7
Total	141	100

**Table 9.** Distribution Based on Hormonal Contraceptive Use

Contraception Hormonal	Number (n)	Percentage (%)
Yes	43	30.5
no	98	69.5
Total	141	100

## DISCUSSION

The age during pregnancy is one of the factors associated with an increased risk of developing preeclampsia. The age range of 20-35 years is considered non-risk for preeclampsia. This age range is considered safe for pregnancy as it is associated with fewer complications. On the other hand, maternal age below 20 years or above 35 years is considered a risk factor as the occurrence of complications increases in these age groups. Based on the distribution table of preeclampsia patients according to age in this study, it is observed that the majority of preeclampsia patients fall within the age range of 26-30 years, comprising 47 individuals (33.3%). The number of samples in the at-risk age group (<20 years and >35 years) experiencing preeclampsia in this study is 42 individuals. A similar pattern was found in a study at the Palembang Bari Regional General Hospital, where the majority of patients with preeclampsia were in the at-risk age group, totaling 43 individuals (65.2%).<sup>16</sup> In the previous study conducted in 2020 at Prof. Dr. I. G. N. G. Ngoerah Teaching Hospital, it was found that the dominant age range for the occurrence of preeclampsia was in the 20-30 age group, comprising 142 individuals.<sup>17</sup> Individuals under the age of 20 are still undergoing growth, such as the uterus size that has not yet reached the normal size for pregnancy. This can increase the risk of preeclampsia. On the other hand, women aged over 35 are likely to have undergone degenerative processes affecting peripheral blood vessels, leading to functional and structural changes that contribute to alterations in blood pressure, making them more vulnerable to preeclampsia. Women over the age of 35 are more susceptible to experiencing preeclampsia compared to those in the 20-35 age range. Pregnant women above the age of 35 have a 1.5 times higher likelihood of developing preeclampsia compared to pregnant women under the age of 35.<sup>18</sup>

The results of the study on the characteristics of preeclampsia patients based on education show that the majority of patients have received education up to high school (SMA), totaling 69 individuals (48.9%). A similar finding was also noted in a study conducted in the working areas of Banjarsengon, Panti, and Tempurejo Primary

Health Care Centers, where 55 individuals fell into the education group up to high school (SMA).<sup>19</sup> Different results were found in the study at the Regional General Hospital of Prabumulih City, where the majority of patients experienced preeclampsia with education levels below high school (SMA).<sup>20</sup> Education indirectly influences decision-making. A woman's higher level of education is expected to increase her knowledge in anticipating challenges during pregnancy and childbirth, motivating her to undergo regular pregnancy monitoring. However, it's important to note that one's education does not guarantee whether or not they will suffer from a particular illness. Many other factors, including genetics and the environment, can also influence a person's health.<sup>20</sup>

From the results of this study, preeclampsia patients based on occupation were found to be 86 individuals (61%) identified as Housewives. This finding aligns with a study conducted in the Jambi City Health Center in 2022, which reported that the majority of pregnant women with preeclampsia were either unemployed or housewives, totaling 33 individuals (67.3%).<sup>21</sup> The same research findings were also identified at Abdoel Wahab Sjahranie Regional General Hospital, where 82 pregnant women working as housewives experienced preeclampsia. This can be associated with physical activity and stress, which are risk factors for the occurrence of preeclampsia. Pregnant women who work tend to have higher levels of stressors. Stress activates the hypothalamus, triggering a cascade of biochemical events that result in the release of adrenaline and non-adrenaline into the system, followed by cortisol hormone. Pregnant women who do not work are also at risk of experiencing preeclampsia during pregnancy because, as housewives, they also experience stress, including various household issues such as economic problems, family issues, and anxiety about pregnancy and childbirth.<sup>23</sup>

The results of the study on the characteristics of preeclampsia patients based on parity show that the sample size with parity 0 or nullipara is 45 individuals (31.9%). Similarly, this is consistent with the findings in a study conducted at the Kayon Health Center in 2018, where 59 individuals (39.3%) were categorized as nullipara.<sup>24</sup> A different result was found in the study at A Purwakarta Regional Hospital, where almost the majority of the samples were multiparous, totaling 64 individuals (49.2%).<sup>25</sup> Parity refers to the number of children born to a mother, whether alive or deceased. Unsafe pregnancy and childbirth occur during the first pregnancy and high parity (more than 3), while parity 2-3 is considered the safest in terms of maternal mortality.<sup>24</sup>

From the research results, the characteristics of preeclampsia patients based on ANC history show that almost all the samples underwent ANC examinations, totaling 136 individuals (96.5%). This finding is consistent with a study conducted at Prima Husada Hospital in Sidoarjo, where 18 individuals (60%) regularly underwent ANC examinations.<sup>26</sup> In the study at Panembahan Senopati Bantul Regional General Hospital, the same thing was also

found where the majority regularly underwent ANC examinations according to the standard, totaling 60 samples (69.8%). Preeclampsia is a continuous pregnancy complication that can be prevented with antenatal care. Therefore, through routine antenatal care, early detection of signs and symptoms of preeclampsia can be achieved. Pregnant women are encouraged to undergo ANC examinations regularly.<sup>27</sup>

The number of preeclampsia patient samples based on the interpregnancy interval in this study was found to be 52 individuals (36.8%) with a pregnancy interval of less than 2 years. The same was found in a study at PKU Muhammadiyah Hospital in Gamping, Yogyakarta, where 19 samples (54.3%) had a pregnancy interval of less than 2 years.<sup>28</sup> In the study at Dr. Soeselo Regional General Hospital in Tegal Regency, the majority of patients with preeclampsia had an interpregnancy interval of less than 2 years, totaling 20 samples.<sup>29</sup> An interpregnancy interval of less than 2 years can pose problems because the physical condition may not be adequately prepared for pregnancy and childbirth. This situation can lead to damage to the uterus or reproductive organs of the mother that have not returned to their original condition, and the mother's health may not have fully recovered.<sup>28</sup>

Based on the distribution table by obesity, a total of 62 samples (44%) fall into the overweight category. Similar findings were observed in another study at the Regional General Hospital of West Nusa Tenggara Province, with 42 individuals in this study who had preeclampsia falling into the overweight category. Women with overweight and obesity BMI have a 1.8 times greater risk of severe preeclampsia compared to women with normal BMI. Patients with overweight and obesity BMI cause chronic inflammation in the body, leading to an increase in C-reactive protein and cytokines in the plasma. This enhances the inflammatory response, releasing Reactive Oxygen Species (ROS) and Myeloperoxidase, damaging vascular endothelial cells and causing preeclampsia symptoms.<sup>30</sup>

Based on the distribution table of chronic disease history, it is dominated by samples without a history of chronic diseases, totaling 118 individuals (83.7%). Conversely, 23 individuals (16.3%) have a history of chronic diseases. Similar findings were observed in a community health center study in Cibereum, Kab. Kuningan, where almost the majority of samples did not have a history of chronic diseases when experiencing preeclampsia, totaling 202 individuals (90.6%).<sup>31</sup> The largest group of samples without a history of chronic diseases was found in the study in Probolinggo Regency, totaling 54 individuals (54%). A history of chronic diseases such as hypertension and diabetes mellitus can disrupt the health and growth of the fetus, leading to complications during pregnancy. If a pregnant woman has hypertension, the risk of stillbirth, fetal growth disorders, and preeclampsia increases. Mothers with diabetes mellitus (DM) increase perinatal mortality by 3-5%, while the risk of

congenital anomalies is higher at 6-12% compared to pregnant women without DM (2-3%).<sup>32</sup>

Based on the table of preeclampsia patients at RSUP Prof. Dr. I. G. N. G. Ngoerah, the majority of samples did not use hormonal contraception, totaling 98 individuals (69.5%), while the remaining 43 individuals (30.5%) did not use hormonal contraception. Similar findings were observed in the study at RSUD Bima, where a portion of the samples did not use hormonal contraception during preeclampsia, totaling 81 individuals (61.4%). Hormonal contraceptives such as pills, injections, and implants contain estrogen and progesterone hormones that can affect blood pressure elevation. This is because of cardiac hypertrophy and increased pressor response of angiotensin II involving the Renin-Angiotensin System pathway. Additionally, hormonal contraceptives contain ethinylestradiol, which is a cause of hypertension, while gestagens have minimal influence on blood pressure.<sup>33</sup>

## 1. CONCLUSIONS AND SUGGESTION

The results of this study indicate that the characteristics of preeclampsia patients are as follows: 33.3% are predominantly aged 26-30 years, 48.9% have education up to high school, 61% work as housewives, 31.9% are nulliparous patients, 36.8% have an interpregnancy interval of less than 2 years, 96.5% of patients undergo ANC examinations, 44% of the samples are overweight, 69.5% do not use hormonal contraception, and 83.7% do not have a history of chronic diseases.

This preliminary study provides valuable data that can be used for further research to explore the relationships between variables with a larger sample size.

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