

The Influence of Body Mass Index (BMI) on Pre-Eclampsia in Pregnant Women at the Purwasari Community Health Center, Karawang Regency Year 2023

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Article Info	Abstract
Article History: Received Junl 7, 2024 Revised Junl 30, 2024 Accepted Jul 10, 2024	Background: Preeclampsia is a specific condition in pregnancy which is characterized by placental dysfunction and maternal response to systemic inflammation with endothelial activation and coagulation. Pregnant women with an obese body mass index (BMI) have an increased risk of high blood pressure, pre-eclampsia/eclampsia, labor induction, gestational diabetes, increased risk of cesarean delivery, premature labor, malformations and birth defects. Purpose of Writing: The purpose of writing this thesis is to determine the effect of Body Mass Index (BMI) on the incidence of preeclampsia in pregnant women at the Purwasari Community Health Center, Karawang Regency in 2023. Research method: using quantitative research, where the researcher aims to find the influence between variables with a research design using descriptive analytics with a cross sectional design. Research Results: Of the 81 respondents, none had an underweight BMI. And those who had a normal BMI in mothers who experienced preeclampsia were 11 people (45.8%) while those who did not experience preeclampsia were 13 people (54.2%). And those who were overweight experienced preeclampsia as many as 47 people (82.5%) while those who did not experience preeclampsia were 10 people (17.5%). Through the chisquare test, the P result was $0.001 < P \text{ value } 0.05$, meaning that there is a significant influence of Body Mass Index (BMI) on the incidence of preeclampsia at the Purwasari Community Health Center, Karawang Regency in 2023. Conclusion: There is a significant influence of Body Mass Index (BMI) on the incidence of preeclampsia at the Purwasari Community Health Center, Karawang Regency in 2023 because the P result is $0.001 < P \text{ value } 0.05$, with an odds ratio value of 0.063 - 0.516, which means that mothers who experience overweight BMI are at least at least 0.063 times greater risk and at most 0.516 times greater risk of suffering from preeclampsia compared to mothers who have a normal BMI. Suggestion: It is hoped that pregnant women will care more about their pregnancy and often check with health workers, especially community health centers so that community health centers can carry out screening.
Keywords: Preeclampsia, Body Mass Index (BMI)	
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1. Introduction

Improving the quality of maternal health is part of the Sustainable Development Goals (SDGs), including reducing the maternal mortality rate (MMR) and reducing the infant mortality rate (IMR), which is an important part of national development which contains two main goals. According to WHO, there were 303,000 maternal deaths worldwide in 2019. ASEAN MMR was 235 per 100,000 live births. The world is on track to reduce MMR to less than 70 per 100,000 live births by 2030 (WHO, 2019). Many problems that can cause death occur during pregnancy and childbirth, including: Pre-eclampsia, eclampsia, gestational diabetes, placenta previa and infection. The exact cause of pre-eclampsia is unknown, but several factors are believed to cause the condition. Age, number of previous pregnancies, family history of preeclampsia, chronic hypertension, kidney disease, and obesity. (Fatmawati, 2016). There are several criteria for determining the nutritional status of pregnant women, but the most widely used is calculating the Body Mass Index (BMI). Women with a pre-pregnancy BMI greater than 35 are four times more likely to develop preeclampsia compared to women with a BMI between 19 and 27. Several studies have shown that a BMI of 20 reduces the risk of pre-eclampsia. The risk of pre-eclampsia with a high BMI may be associated with an increased risk of hypertension. (Guelinckx I et al, 2013).

From the register data of the Purwasari Community Health Center, Karawang Regency, it is known that the number of pregnant women in 2021 was 1154 pregnant women and of this number, 78 of them had preeclampsia and 32 people were overweight or obese (41%) while in 2022 there were 1368 visits by pregnant women and 95 of them had preeclampsia and 45 had overweight or obese BMI (47%), this number was the second highest after anemia.

This study aims to determine the effect of Body Mass Index (BMI) on the incidence of preeclampsia at the Purwasari Community Health Center, Karawang Regency in 2023.

2. Methods

This research uses a quantitative research method where the researcher tries to determine the influence between variables using a research design using descriptive analysis with a cross sectional design. This research was carried out in April-June 2023 in the work environment of the Purwasari Community Health Center, Purwasari District, Karawang Regency, West Java. The population in this study was all pregnant women from January-March 2023 who experienced preeclampsia and who visited the Purwasari Community Health Center, Karawang Regency, totaling 415 people. The sampling method in this research used purposive sampling. This is a sample based on special conclusions made by the researcher himself using the Slovin formula, based on the Slovin formula the minimum sample obtained is 80.5 or 81 minimum samples. The inclusion criteria are pregnant women in the second and third trimesters diagnosed with pre-eclampsia and not pre-eclampsia, pregnant women who have complete data on weight and height. The exclusion criteria are pregnant women who have diseases other than preeclampsia and the data held by pregnant women is incomplete. Data analysis was carried out by analyzing univariate data consisting of the frequency distribution of characteristics of age, parity and occupation of pregnant women

who experienced preeclampsia and the frequency distribution of body mass index (BMI) of pregnant women who experienced preeclampsia at the Purwasari Community Health Center, Karawang Regency in 2023. Bivariate analysis used tests. chi-square correlation to determine the effect of BMI on preeclampsia at the Purwasari Community Health Center, Karawang Regency in 2023.

3. Results

a. Respondent Characteristics

From table 1, it can be seen that the majority of respondents who experienced preeclampsia were aged 20-35 years, 43 or 71.7%. Meanwhile, the majority of respondents who experienced preeclampsia were multigravida, 32 or 74.2% based on gender. The majority of respondents who experienced preeclampsia worked were 25 people or 80.6%. Table 1. Distribution of age of premature gestation of babies treated at Nicu Early Bros Bekasi Hospital (N=36)

Table 1.
Frequency
Distribution
of
Characterist
ics of
Pregnant
Women

No	IMT	Ibu hamil			
		Preeklamsi		Tidak Preeklamsi	
		F	%	F	%
1	Underwight	0	0	0	0
2	Normal	11	45,8	13	54,2
3	Overwight	47	82,5	10	17,5
	Total	58	71,6	23	28,4

Respondents at Purwasari Community Health Center (n=81)

Distribution of Pregnant Women Who Experience Preeclampsia and Those Who Do Not Have Preeclampsia Based on table 1.2, it shows that none of the 81 respondents had an underweight BMI. And those who had a normal BMI in mothers who experienced preeclampsia were 11 people (45.8%) while those who did not experience preeclampsia were 13 people (54.2%). And those who were overweight experienced preeclampsia as many as 47 people (82.5%) while those who did not experience preeclampsia were 10 people (17.5%).

Table 2 Frequency Distribution of Pregnant Women Who Experience Preeclampsia and Who Do Not Experience

stational Age	Minimum	Vlaximum	Mean	Std.Deviation
ition	30	37	34.56	1.886
	31	36	34.17	1.383

Preeclampsia

Karakteristik		Ibu Hamil Preeklamsi		Ibu Hamil Tidak Pre Eklamsi	
		F	%	F	%
Usia					
1	<20 th dan >35 th	15	71,4	6	28,6

2	20 th - 35 th	43	71,7	7	28,3	
Paritas						
1	Primigravida	19	65,5	10	34,5	
2	Multigravida	32	74,2	11	25,6	
3	Grandemultipara	7	77,8	2	22,2	
Pekerjaan						
1	Bekerja	25	80,6	6	19,4	
2	Tidak Bekerja	33	66,0	17	34,0	a. U

ji *Chis-quare*

Tabel 3 Pengaruh Indeks Massa Tubuh (IMT) terhadap kejadian Preeklamsi di Puskesmas Purwasari Kabupaten Karawang Tahun 2023

No	IMT	Ibu hamil				P Value	P hasil	OR
		Preeklamsi		Tidak Preeklamsi				
		F	%	F	%			
1	Underwight	0	0	0	0	> 0,05	0,001	0,063 - 0,516
2	Normal	11	45,8	13	54,2			
3	Overwight	47	82,5	10	17,5			
	Total	58	71.6	23	28.4			

Based on table 3 above, using the chisquare test, the P result is $0.001 < P \text{ value } 0.05$, meaning that there is a significant influence of Body Mass Index (BMI) on the incidence of preeclampsia at the Purwasari Health Center, Karawang Regency in 2023, with an odds ratio value of 0.063 - 0.516, which means that the mother Those who have an overweight BMI are at least 0.063 times more at risk and at most 0.516 times more at risk of suffering from preeclampsia compared to mothers who have a normal BMI.

Discussion

Based on table 1.3 above, using the chisquare test, the P result is $0.001 < P \text{ value } 0.05$, meaning that there is a significant influence of Body Mass Index (BMI) on the incidence of preeclampsia at the Purwasari Health Center, Karawang Regency in 2023, with an odds ratio value of 0.063 - 0.516, which means that mothers Those who have an overweight BMI are at least 0.063 times more at risk and at most 0.516 times more at risk of suffering from preeclampsia compared to mothers who have a normal BMI.

Based on table 5.2, it shows that none of the 81 respondents had an underweight BMI. Pregnant women who had a normal BMI experienced preeclampsia as many as 11 people (45.8%) while those who did not experience preeclampsia were 13 people (54.2%). There were 47 overweight pregnant women who experienced preeclampsia (82.5%) while 10 people (17.5%) did not experience preeclampsia.

Another study conducted by Ida Susiana (2019) regarding the correlation between BMI in the first trimester and the incidence of preeclampsia at the Menteng Health Center UPT, Palangkaraya City, shows that there is a significant association between the body mass index of pregnant women and the incidence of preeclampsia with a p value of 0.000 and OR 9.5 (2.73-32.94).

Pre-eclampsia is a specific condition that occurs during pregnancy and is characterized by damage to the placenta and a maternal response to systemic

inflammation that activates the endothelium and blood clotting. The diagnosis of pre-eclampsia is based on the presence of high blood pressure and the presence of protein in the urine after 20 weeks of gestation. Edema is no longer used as a diagnostic criterion because it often occurs in women who have normal pregnancies. (POGI, 2016).

Being overweight and obese is one of the main risk factors that can cause pre-eclampsia and eclampsia. About 30% of pre-eclampsia cases in the United States are caused by obesity. Obesity is weight gain that exceeds the needs of the bones and body due to the accumulation of excess fat in the body. Meanwhile, according to WHO, obesity is the accumulation of excess fat evenly throughout the body's tissues, which can trigger various diseases such as diabetes, high blood pressure, heart attacks, and even death. (P2TM Ministry of Health of the Republic of Indonesia (2022)).

In the opinion of researchers, pregnant women should have frequent check-ups with health workers or community health centers at least 4 times during pregnancy or preferably every month during pregnancy so that their pregnancy can be monitored and minimize the occurrence of preeclampsia and if it occurs, pregnant women can be detected early so that it can be treated further and so that pregnant women are more alert about their pregnancy. By checking with a health worker at the beginning of pregnancy, the pregnant mother can see her BMI so that the pregnant mother can monitor how much weight she has gained during pregnancy so that she is not overweight which will trigger preeclampsia.

Conclusion

There is a significant influence of Body Mass Index (BMI) on the incidence of preeclampsia at the Purwasari Community Health Center, Karawang Regency in 2023 because the P result is $0.001 < P \text{ value } 0.05$, with an odds ratio value of $0.063 - 0.516$, which means that mothers who experience overweight BMI are at least more the risk is 0.063 times higher and the greatest risk is 0.516 times more likely to suffer from preeclampsia compared to mothers who have a normal BMI.

References

- Arikunto, S. 2012. *Prosedur Penelitian: Suatu Pendekatan Praktik*. Jakarta : Rineka cipta.
- Asrinah, dkk. (2015). *Asuhan Kebidanan Masa Kehamilan*. Yogyakarta: Graha Ilmu
- Badan Pusat Statistik. (2022). *Angka Kematian Ibu/AKI Hasil Long Form SP2020 Menurut Provinsi*
- Data Register Puskesmas Purwasari Tahun 2021 - Maret 2023
- Laporan Kinerja Instansi Pemerintah Jawa Barat. (2020). *Dinkes Jabar*
- Fatmawati dkk. (2016). Pengaruh Status Kesehatan Ibu terhadap Derajat Preeklampsia/Eklampsia di Kabupaten Gresik. *Buletin Penelitian Sistem Kesehatan*, 20 (2), 5
- Fatimah, N. (2017). *Buku Ajar Asuhan Kebidanan Kehamilan*. Jakarta: Fakultas Kedokteran dan Kesehatan Universitas Muhammadiyah Jakarta

- Guelinckx I, Devliegers R, Beckers K, Vansant G. (2013). Maternal obesity: Pregnancy complication, gestational weight gain, and nutrition. *The International Association for the Study of Obesity. Obesity reviews*, 9 (2), 60
- Kristiyanasari, W. 2014. *Gizi Ibu Hamil*. Bantul: Nuha Medika
- Kementrian Kesehatan RI. (2020). *Pedoman Pelayanan Antenatal, Persalinan, Nifas dan Bayi Baru Lahir Di Era Adaptasi Kebiasaan Baru* . Jakarta: Kemenkes RI
- Notoatmodjo, Soekidjo. (2018). *Metodologi Penelitian Kesehatan*. Jakarta: PT. Rineka Cipta
- POGI. (2016, 4 Juni). Hipertensi dalam Kehamilan. *Kemkes*, 04, 01
- P2PTM. (2022). *Epidemi Obesitas*. Jakarta: Kemenkes RI
- Manuaba, I. (2014). *Asuhan Kebidanan Pada Masa Kehamilan*. Jakarta: EGC
- Nugroho, T dan Utama I.B. (2014). *Masalah Kesehatan Reproduksi Wanita*. Yogyakarta: Nuha Medika
- Romauli. (2014). *Asuhan Kebidanan Konsep Dasar Asuhan Kehamilan*. Yogyakarta: Nuha Medika
- Saifuddin,A. (2014). *Buku Panduan Praktis Pelayanan Kesehatan Maternal dan Neonatal*. Jakarta: Yayasan Bina Pustaka Sarwono Prawiharohardo
- Susiana, Ida. (2019). Hubungan Indeks Massa Tubuh Ibu Hamil Trimester I Dengan Kejadian Preeklamsi Trimester III Di UPT Puskesmas Menteng Palangkaraya. *Jurnal Poltekkes Kemenkes Palangkaraya*, 3 (7), 1
- Yulizawati. (2017). *Asuhan Kebidanan Pada Kehamilan*. Padang: CV. Rumahkayu Pustaka Utama