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MANAGEMENT OF RISK FACTORS FOR PRE-ECLAMPSIA

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ABSTRAK

Angka kejadian preeklamsia masih menjadi masalah global, 10% ibu hamil di seluruh dunia mengalami preeklamsia, dan setiap tahunnya ditemukan 76.000 kasus kematian ibu dan 500.000 kematian bayi. Angka kematian ibu di Provinsi Lampung tercatat masih cukup tinggi, data SDKI tahun 2018 menunjukkan Kabupaten Tanggamus dengan AKI tertinggi sebanyak 818 orang (87,99/100.000 KH) dengan angka kematian sebanyak 16 orang dari 10.000 kelahiran. Preeklamsia disebut "penyakit teori" karena penyebabnya belum diketahui secara pasti. Penelitian ini bertujuan untuk mengetahui faktor risiko terjadinya preeklampsia di Kabupaten Tanggamus, Lampung. Penelitian ini merupakan penelitian kuantitatif dengan pendekatan cross sectional. Populasi penelitian adalah ibu hamil di wilayah Tanggamus, Lampung. Penelitian ini menggunakan instrumen angket dan alat pemeriksaan antropometri (IMT), uji univariat untuk memperoleh informasi, uji bivariat menggunakan uji Chi square dan uji relaps dihitung secara mutivariat. Hasil penelitian menunjukkan terdapat hubungan antara umur, kesetaraan, BMI, berat badan, riwayat penyakit persisten, pergerakan fisik, status pola makan dan sikap terhadap kejadian preeklamsia dengan p-value 0,05. Riwayat penyakit yang persisten adalah faktor penyebab dominan dengan p-value 0,000 dan OR: 70,636. Ibu harus rajin melakukan kontrol untuk deteksi dini agar terapi diberikan secara cepat dan tepat untuk mencegah komplikasi kehamilan bahkan saat melahirkan.

Kata Kunci : Faktor, preeklampsia, determinasi

ABSTRACT

The incidence of preeclampsia is still a global problem, 10% of pregnant women worldwide experience preeclampsia, and every year 76,000 cases of maternal death and 500,000 infant deaths are found. The maternal mortality rate in Lampung Province is recorded as still quite high, the 2018 SDKIdata shows Tanggamus Regency with the highest MMR of 818 people (87.99/100,000 KH) with a death toll of 16 people out of 10,000 births. Preeclampsia is called "the disease of theories" becausethe cause is not known for certain. This study purpose to determine the risk factors for preeclampsia inTanggamus Regency, Lampung. This research is a quantitative research with a cross sectional approach. The research population is pregnant women in the Tanggamus area, Lampung. This study used a questionnaire instrument and an anthropometric examination tool (BMI), Univariate tests were carried out to obtain information, Bivariate tests used the Chi square test and the relapse test was calculated as mutivariate. The results of the study showed there was a relationship between age, equality, BMI, body weight, history of persistent disease, physical movement, dietary status and attitudes on the frequency of preeclampsia with a p-value 0.05. A history of persistent disease is the

dominant causal factor with a p-value of 0.000 and OR: 70.636. Mothers should be diligent in carryingout controls for early detection so that therapy is given quickly and precisely to prevent pregnancy complications even during childbirth..

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Keywords: Factors, pre-eclampsia, determine

BACKGROUND

Globally, preeclampsia is still a cause of maternal death, 10% of pregnant women worldwide experience preeclampsia, and every year it causes 76,000 maternal deaths and 500,000 infant deaths. Based on research by USAID (2016), as many as 99% of pregnant women's deaths are related to countries with low and middle economic income. The first cause of maternal death in Indonesia is preeclampsia at 33% (Ministry of Health, 2021).

Lampung Province is one of the provinces with the highest MMR cases, the 2018 SDKI shows the MMR was 818 people (87.99/100,000 KH), the highest in Tanggamus Regency. The main cause is bleeding followed by eclampsia (Lampung Health Service, 2019).

The cause of preeclampsia is not known for certain, so it is called a "theoreticaldisease". Factors causing preeclampsia are mothers aged >35 years, nulliparous, interval between pregnancies, previous pregnancies with preeclampsia, family history of preeclampsia, multiple pregnancies, obesity before pregnancy and Body Mass Index (BMI) for the first time. ANC, history of disease (diabetes, kidney, hypertension) (POGI, 2016). Research by Sepriadi, et al (Sepriadi, 2017) states that there is a relationship between family history of preeclampsia/eclampsia and the incidence of preeclampsia and eclampsia at Dr. Hi. Abdul Moeloek Hospital Lampung Province as well as other factors such as reproductive status, medical history, excessive uterine distension and diet.

Research, Y; Yenie, H (2019) regarding factors related to the incidence of preeclampsia in Lampung Province hospitals, obtained results from 15 pregnant women with multiple pregnancies, 1 person (6.7%) experienced mild preeclampsia, and 14 people (93.3%) experienced severe preeclampsia, as well as Aprina's research (2016) which stated that factors causing mild preeclampsia include body weight, multiple pregnancies, history of preeclampsia, history of ANC, hypertension and history of ANC as the dominant factors causing preeclampsia in the Gedong Tataan Inpatient Health Center Working Area. Pesawaran. Tanggamus Regency is the area with the highest incidence of preeclampsia in Lampung, included in the top five in Lampung Province. It was reported that maternal deaths per 11,084 births were caused by bleeding, infection and eclampsia/preeclampsia. Urgency and relation to the scheme This research is basic research to determine the risk factors for preeclampsia. The difference between this research and the previous one is that an in-depth and comprehensive research was carried out by researchers regarding all factors in the occurrence of preeclampsia, which will be continued for the science of reproductive health and adaptation to technological developments, as well as becoming the basis for new theories,methods or policy principles and as the next initial step in developing science. knowledge in accordance with strategic plans and research excellence.

Specific Objectives: This research has a specific objective, namely to determine the influence of age, education, employment, parity, pregnancy spacing, BMI, obesity, history of chronic disease, diet, physical activity, smoking habits, nutritional status, ANC visits, family support, status economy, knowledge and attitudes towards the incidence of preeclampsia in Tanggamus Regency, Lampung..

METHOD

The research is quantitative research with a cross sectional approach. The population of this study were pregnant women in Tanggamus Regency, Lampung. Research Instruments used questionnaires and anthropometric examination tools (BMI), Independent Variables: Age, Education, Occupation, Parity, Pregnancy Interval, BMI, Obesity, History of Chronic Disease, Diet, Physical Activity, Smoking Habits, Nutritional Status, ANC Visits, Support

Family, Economic Status, Level of Knowledge and Attitudes and Dependent Variable: Incidence of Preeclampsia. Data analysis in this study was Univariate, Chi Square test as a bivariate test and using logistic regression test as a multivariate.

RESULT

1. Univariate Analysis

Table 1.
Frequency Distribution of Preeclampsia, Age, Education Level, Occupation, Parity, Pregnancy Interval, BMI, Obesity, History of Chronic Disease, Diet, Physical Activity, Smoking Habit, Nutritional Status, ANC Visits, Family Support, Economic Status, Knowledge and Attitudes

Variable	Frequency	Percentage (%)
Preeklamsia		
- No Preeklamsia	150	75,8 24,2
- Preeklamsia occurs	48	
Age		
- Age <20 Years and >35 Years	56	28,3
- Age 21-35 Years	142	71,7
Education		
- Low	94	47,5
- High	104	52,5
Work		
- Work	18	9,1
- Doesn't Work	180	90,9
Parity		
- Multiparous	137	69,2
- Primipara	61	30,8
Pregnacy Spacing		
- < 24 Months	75	37,9
- > 24 Months	123	62,1
BMI		
- Underweight and Overweight	72	36,4
- Normal	126	63,6
Obesity		
- Not Obesity	165	16,7
- Obesity	33	83,3
Chronic Disease History		
- Yes	28	14,1
- No	170	85,9
Dietary Habit		
- Good	78	39,4
- Not Enough	120	60,6
Physical Activity		
- Organized	98	49,5
- Not Regular	100	50,5
Smoking Habit		
- Passive and Active	83	41,9
- Not A Smoker	115	58,1
Nutritional Status		
- Good	172	86,9
- Not Enough	26	13,1
ANC Visit		
- Complete	159	80,3
- Incomplete	39	19,7

Family Support	185	93,4
- Good	13	6,6
- Not Enough		
Knowledge		
- Good	118	59,6
- Not Enough	80	40,4
Attitude		
- Positive	180	90,9
- Negative	18	9,1
Family Economic Status		
- High	67	33,8
- Low	131	66,2

Based on table 1. It shows that the majority of respondents who did not experience preeclampsia were 150 (75.8%), aged 20-35 years, 142 (71.1%), the majority of respondents had high education, 104 (52.5%), occupation. Most of the respondents did not work as many as 180 (90.9%), most of the respondents' income was low as many as 131 (66.2%), Most of the respondents with parity status were Multiparous as many as 137 (69.2%), Most of the birth interval was >24 months as many as 123 (62.1%), BMI is mostly Normal as many as 126 (63.6%), most respondents are not obese as many as 165 (83.3%), most respondents have a history of chronic diseases as many as 170 (85.9%). %), the majority of respondents with poor eating patterns were 120 (60.6%), the majority of respondents with irregular physical activity were 100 (50.5%), the majority of respondents did not smoke as many as 115 (58.1%) , the nutritional status of most of the respondents was good as many as 172 (86.9%), the ANC visits of most of the respondents Complete as many as 159 (80.3%), as many as 185 (93.4%) the family support was good, as many as 118 (59.6%) respondents with good knowledge, the attitudes of respondents were mostly positive, 180 (90.9%). and 150 respondents (75.8%) did not experience pre-eclampsia.

2. Bivariate Analysis

Table 2.
Relationship between Age, Education, Occupation, Parity, Pregnancy Spacing, BMI, Obesity,History of Chronic Disease, Diet, Physical Activity, Smoking Habits, Nutritional Status, ANC Visits, Family Support, Economic Status,Knowledge, Attitudes with Preeclampsia

Variable	Preeclampsia		No Preeclampsia		Sum	p-Value	OR
	n	%	n	%			
Age							
- Age <20 Years and >35 Years	22	39,3	34	60,7	56	0,002	2,88
- Age 21-35 Years	26	18,3	116	81,7	142		
Education							
- Low	19	20,2	75	79,8	94	0,208	
- High	29	27,9	75	50,0	104		
Work							
- Work	4	22,2	14	77,8	18		
- Doesn't Work	44	24,4	136	75,8	180	0,834	
Parity							
- Multiparous	40	29,2	97	70,8	137	0,015	6.45
- Primipara	8	13,1	53	86,9	61		
Pregnacy Spacing							
- < 24 Months	15	20,0	60	80,0	75	0,277	
- > 24 Months	33	26,8	90	73,2	123		
BMI							
- Underweight and Overweight	24	33,3	48	66,7	72	0,024	4,11

- Normal	24	19,0	102	81,0	126		
Obesitas							
- Not Obesity	35	21,2	130	78,8	33	0,026	2,41
- Obesity	13	39,4	20	60,6	165		
Chronic Disease History							
- Yes	24	85,7	4	14,3	28	0,000	36,50
- No	24	14,1	146	85,9	170		
Dietary Habit							
- Good	17	21,8	61	78,2	120	0,517	
- Not Enough	31	25,8	89	74,2	78		
Physical Activity							
- Organized	15	15,3	67	67,0	98	0,004	5,43
- Not Regular	33	33,0	83	84,7	100		
Smoking Habit							
- Passive and Active	16	19,3	67	80,7	83	0,166	
- Not A Smoker	32	27,8	83	72,2	115		
Nutritional Status							
- Good	46	95,8	126	73,3	172	0,035	5,46
- Not Enough	2	7,7	24	92,3	26		
ANC Visit							
- Complete	39	24,5	120	75,5	159	0,850	
- Incomplete	9	23,1	30	76,9	39		
Family Support							
- Good	42	22,7	143	77,3	185	0,056	2,91
- Not Enough	6	46,2	7	53,8	13		
Knowledge							
- Good	27	22,9	91	73,8	118	0,587	
- Not Enough	21	26,2	59	77,1	80		
Attitude							
- Positive	40	22,2	140	77,8	180	0,036	7,56
- Negative	8	44,4	10	55,6	18		
Family Economic Status							
- High	17	25,4	100	76,3	131	0,791	
- Low	31	23,7	50	74,6	67		

Based on table 2, it shows that there is a relationship between Age, Parity, BMI, Obesity, History of chronic disease, Physical activity, Nutritional Status, and Attitude towards the incidence of pre-eclampsia with a p-value <0.05 meaning Ha is accepted and Ho is rejected, while p- A value >0.05 indicates that Ha is rejected and Ho is accepted so that there is no relationship between the variables of education level, employment, pregnancy interval, diet, smoking habits, ANC visits, family support, knowledge and economic status with the incidence of preeclampsia.

3. Multivariate Analysis

Multivariate analysis aims to look at more than 1 independent variable which is most dominant over the dependent variable (Hastono, 2016). To obtain information on which variables are most dominantly associated with preeclampsia, multiple logistic regression analysis of the prediction model needs to be carried out in the following stages:

a. Bivariate Selection

Each variable with a p-value ≤0.25 was subjected to bivariate selection one by one and entered into the multivariate model. Variables with a p-value >0.25 but which are substantially important are included in the model. Variables that remain in the multivariate model are those that have a p-value >0.05. If the p-value is >0.05 then the variables starting from the largest p- value are removed one by one. Following are the bivariate selection results:

Table 3.
Bivariate Analysis for Multivariate Model Candidate Selection

Variable	*p-Value*
Age	0,002
Level Of Education	0,208
Work	0,834
Parity	0,015
Pregnancy Spacing	0,277
BMI	0,024
Obesity	0,026
Chronic Disease History	0,000
Dietary Habit	0,517
Physical Activity	0,004
Smoke	0,166
Nutritional Habit	0,035
ANC Visit	0,850
Family Support	0,056
Knowledge	0,587
Attitude	0,036
Family Economic Status	0,791

Based on table 3, there are 11 variables with a p-value ≤ 0.25 which are candidates for modeling.

a. Modelling stage

All candidate variables were evaluated using the Wald statistical test with an alpha standard of 0.05. The model results with an alpha value > 0.05 are removed one by one starting with the largest alpha value. The Odds Ratio (OR) value before and after the covariate variable is taken into consideration, the variable is retained if the OR value is more than 10%.

1) Stage 1 model

The following are the results of the evaluation selection in the stage 1 model:

Table. 4
Stage 1 Multiple Logistic Regression Multivariate Model

Variabel	Sig.	OR
Ages	0,985	0,990
Level Of Education	0,069	0,429
Parity	0,190	2,010
BMI	0,479	1,443
Physical Activity	0,385	1,480
Smoke	0,013	0,235
Nutritional Status	0,228	0,322
Family Support	0,085	4,202
Disease History	0,000	55,572

Based on table 4, it shows the results of stage 1. The variable with the highest p-valueis the Age variable (p=0.985). So the first variable that is released is the age variable.

Table 5.
Multivariate Model After the Age Variable Was Removed

Variable	Sig.	OR
Level Of Education	0,069	0,429
Parity	0,190	2,010
BMI	0,478	1,441
Phsical Activity	0,384	1,479
Smoke	0,013	0,235
Nutritional Status	0,228	0,322
Family Support	0,073	4,183
Disease History	0,000	55,334

Table 6.
Change In OR Value After Risk Factors Are Removed

Variable	OR1	OR2	Change OR (%)
Level Of Education	0,429	0,429	0,000
Parity	2,010	2,010	0,000
BMI	1,443	1,441	0,002
Phsical Activity	1,480	1,479	0,001
Smoke	0,235	0,235	0,000
Nutritional Status	0,322	0,322	0,000
Family Support	4,202	4,183	0,019
Disease History	55,572	55,334	0,238

Because an OR value > 10% was not found before and after removing age from the model, the risk factor variable was still removed from the model. The next stage was to create a multivariate model without the BMI variable and perform multiple logistic regression analysis.

2) Stage 2 Model

Based on the evaluation of the selection results in the stage 2 model, the following resultswere obtained:

Table 7.
Multivariate Model Multiple Logistic Regression Stage 2

Variable	Sig.	OR
Level Of Education	0,069	0,429
Parity	0,190	2,010
BMI	0,478	1,441
Physical Activity	0,384	1,479
Smoke	0,013	0,235
Nutritional Status	0,228	0,322
Family Support	0,073	4,183
Disease History	0,000	55,334

Based on the table above, the multivariable model in Step 2 shows that the variable with the highest p-value is the BMI variable (p=0.478). Thus, the education variable is anothervariable that must be excluded from the model.

Table 8.
Multivariate Model After the BMI Variable Was Removed

Variable	Sig.	OR
Level Of Education	0,078	0,443
Parity	0,175	2,059
Physical Activity	0,379	1,486
Smoke	0,013	0,238
Nutritional Status	0,306	0,402
Family Support	0,088	3,785
Disease History	0,000	62,265

Table 9.
Change In OR Value After Education Is Excluded

Variabel	OR1	OR2	Change OR (%)
Level Of Education	0,429	0,443	-0,014
Parity	1,441	2,059	-0,618
Physical Activity	1,479	1,486	-0,007
Smoke	0,235	0,238	-0,003
Nutritional Status	0,322	0,402	-0,080
Family Support	4,183	3,785	0,398
Disease History	55,334	62,265	-6,931

Because the OR value did not change >10%, in the next step, a multivariate model was created without the physical activity variable and multiple logistic regression analysis was carried out.

3) Stage 3 model

Based on the evaluation of the selection results in the stage 3 model, the following results wereobtained:

Table 10.
Stage 3 Multiple Logistic Regression Multivariate Model

Variable	Sig.	OR
Level Of Education	0,066	0,429
Parity	0,167	2.089
Smoke	0,010	0,226
Nutritional Status	0,241	0,353
Family Support	0,096	3,623
Disease History	0,000	70,636

Based on table 10. above, it can be seen that the variables that are significantly related to preeclampsia have a p-value of < 0.05 or smoking variables and health history with values (P-value 0.010 and 0.000). Based on the OR value, the smoking variable was obtained (OR: 0.226), the health history variable (OR: 70.636). The most dominant variable in cervical cancer is a history of chronic disease.

DISCUSSION

1. Relationship Between Age And The Incidence Of Preeclampsia

The results obtained p-value 0.002 < 0.05, there is a relationship between age and the prevalence of preeclampsia, the OR is 2.88, which means age has a 2.8 times greater chance of experiencing preeclampsia.

Rifaldi's research wrote that 257 people aged <20 or >35 experienced preeclampsia or around 62.4% of respondents. Tonasih's research wrote that 93 respondents aged <20 or >35 experienced preeclampsia.

Age is a very important aspect of reproduction, which is closely related to the increase or decrease in a person's bodily functions. A good age for a woman to get pregnant is 20-35 years. Adolescents who are pregnant for the first time or women aged >35 years will be at risk of experiencing preeclampsia (Tambunan et al., 2020).

The best age for pregnant women is 20-35 years. Apart from the risk of spontaneous abortion, stillbirth, placental abruption and placenta previa, pregnancy over the age of 35 years is also accompanied by an increase in blood pressure (Andri Yanuarini et al., 2020). The reproductive age of a woman is 20 years. 35 years old. This age is the safest time to get pregnant and give birth, because at this age the risk of pregnancy complications is lower. People aged under20 years and over 35 years are also known as the age at risk of experiencing complications during pregnancy. In people under 20 years of age, the size of the uterus has not yet reached normal gestational age, so the possibility of pregnancy disorders such as preeclampsia is higher. Old> At the age of 35 years a degenerative process occurs which causes structural and functional changesin peripheral blood vessels which are responsible for changes in blood pressure making them moresusceptible to preeclampsia (Mustaghfiroh et al., 2020).

2. Relationship Between Parity And The Incidence Of Pre-Eclampsia

The research results obtained a p-value of 0.015<0.05, there is a relationship between parity and the prevalence of preeclampsia, the OR is 6.45 which means the chance of preeclampsia is 6 times higher.

In Hutahaean's research, it was explained that primigravidas were the most respondents who experienced preeclampsia, namely 18 respondents or around 60%. Rifaldi's research explained that grandemultigravidas were the most respondents who experienced preeclampsia,namely 174 respondents or around 42.2%, while Tonasih's research explained thatgrandemultigravidas and primigravidas were the most respondents who experienced preeclampsia.

Parity is the number of live births or number of children a woman has. The parity factor has an impact on childbirth because pregnant women have a higher risk of experiencing problems during pregnancy, especially mothers who are giving birth for the first time (Tambunan et al., 2020). Primitive women or women who have never given birth are risk factors for severe preeclampsia. It is true, during the first pregnancy, placental antigen-blocking antibodies are formed incompletely, causing an unfavorable immune response. Primigestavid is associated with maternal lack of experience and knowledge in prenatal care. Multiple pregnancies or womengiving birth 2 to 3 times is the safest birth rate. Neonatal and multiple cases (>3) are children atrisk of developing preeclampsia. Mothers with grandemultigradida experience impaired reproductive system function. Apart from that, mothers are often too busy taking care of thefamily so they often feel tired and pay less attention to nutritional needs (Tonasih & Kumalasary, 2020).

Pregnant women often experience stress when facing childbirth. The emotional stress that occurs in primigradida species increases the release of adrenocorticotropic releasing hormone (CRH) from the hypothalamus, which then causes an increase in cortisol, the

effect of which prepares the body to deal with all stress factors by increasing the sympathetic response, including the response displayed. to increase cardiac output and maintain blood pressure. In women with preeclampsia/eclampsia, sensitivity to these vasopeptides is not reduced, so a large increase in blood volume directly increases cardiac output and blood pressure. Based on the facts and theories above, researchers believe that every pregnant woman is atrisk of experiencing preeclampsia, not only primigravida or grande multigravida. Large-scale leveraged equity is the equity with the highest risk compared to other equity classes. Emotional stress in primigravidae increases the release of corticotropin-releasing hormone (CRH) in the hypothalamus, which causes an increase in cortisol levels and thereby increases blood pressure. Grandemultigravida sufferers experience decreased reproductive function, fatigue, or poor nutrition. All women are at risk of developing preeclampsia during pregnancy, labor, or postpartum. Preeclampsia can occur in all conditions of pregnancy/pregnancy.

3. Relationship between BMI and the incidence of pre-eclampsiaeklamsia

The research results obtained a p-value of 0.024<0.05, there is a relationship between BMI and the prevalence of preeclampsia, OR is 4.11 which means BMI is 4 times more likely to experience preeclampsia.

According to Morteza (2019), the results of this study show that there is a significant relationship between BMI and the risk of preeclampsia, so it can be said that BMI can be a way to diagnose preeclampsia.

In accordance with the theory that Body Mass Index is one of the factors that causes preeclampsia where excessive BMI is associated with reduced organ perfusion due to vasospasm and endothelial activation. In pregnant women, endothelial dysfunction occurs which is triggered by excessive BMI or obesity, which will cause damage to the endothelium and cause preeclampsia(Wafiyatunisa, 2016).

It can be concluded that BMI is related to the incidence of preeclampsia because excessive BMI can cause endothelial dysfunction. Excessive BMI also causes hypertension, so pregnant women who have a BMI ≥ 30 are at risk of developing preeclampsia.

4. The Relationship Between Obesity and the Incidence of Preeclampsia

The research results obtained a p-value of 0.026<0.05, which means there is a relationship between obesity and the incidence of pre-eclampsia, with an OR of 2.41, meaning obesity is 2 times greater risk of experiencing pre-eclampsia.

Obesity is a condition that commonly occurs in women of reproductive age. (Catalano and Shankar, 2017), this situation is in accordance with the research results which can be seen in table 1 majority of respondents are in reproductive age. However, if it is associated with preeclampsia, the age of 20-35 years is an age that is not at risk for preeclampsia. Excessive and sudden weight gain is an early sign of preeclampsia, generally this is caused by abnormal fluid retention (Saito, 2018).

According to theory, the greater the degree of obesity, the greater the incidence of preeclampsia and its severity, which may be the basis for obesity increasing the risk of preeclampsia, namely the placenta, adipose tissue and endothelial dysfunction (Spradley, 2016). The condition of obese mothers is characterized by hyperlipidemia, inflammation

and excessive oxidative stress compared to normal pregnancies (Myatt and Maloyan, 2016). Obesity can affect the function and perfusion of the placenta (Lopez-Jaramillo et al., 2018), high inflammation and oxidative stress are found in the placenta with placental dysfunction (Myatt and Maloyan, 2016).

Obesity in pregnancy has a negative impact on health, especially for pregnant women, where it can cause hypertension, hypercholesterolemia, hyperglycemia known as (3H). Hypertension in pregnancy can trigger preeclampsia (Patonah et al., 2021).2021).

5. Relationship between history of chronic disease and the incidence of pre-eclampsia

The research results obtained a p-value of 0.000<0.05, there is a relationship between chronic disease and the prevalence of preeclampsia, the OR is 36.5, which means a history of chronic disease is 36 times more likely to experience preeclampsia.

The results of this study are similar to research conducted by Lidya Zita at Hermina Palembang Hospital which found a significant relationship between a history of hypertension and the prevalence of preeclampsia with a P-value of 0.001. This is in accordance with Sarwono's hypotension theory which states that mothers with chronic hypertension have a higher risk of developing preeclampsia. One of the factors associated with preeclampsia is chronic hypertension or pre-existing hypertension. A history of hypertension associated with preeclampsia is thought to be caused by dysfunction of the blood vessel endothelium (cells lining blood vessels) causing blood vessel spasm (contraction of blood vessel muscles, causing narrowing/narrowing of the lumen diameter). from the ship). Preeclampsia is more likely to occur in mothers with a history of hypertension. If hypertension occurs during pregnancy, the growth of the fetus in the womb becomes difficult, so that blood flow to the uterus increases or decreases, so that the oxygen available to the baby is not perfect, as a result the baby experiences changes. the mother is strainedin the womb or dies in the womb. High blood pressure can also cause pregnant women to experience shock due to the sudden increase in blood pressure during childbirth, making them unable to control themselves. One of the predisposing factors for preeclampsia or eclampsia is chronic hypertension or previous hypertension or essential hypertension. Most pregnancies with essential hypertension usually continue (Akri and Yunamawan, 2021).

In contrast to research conducted by (Kasriatun et al., 2019) that a history of hypertension is the most important risk factor for preeclampsia rates, where a history of hypertension is themost important risk factor for preeclampsia rates with a risk of preeclampsia 7.38 times higher than that of mothers. without a history of preeclampsia.

The basic cause of the history of hypertension with pre-eclampsia is thought to be a disturbance in the function of the blood vessel endothelium (cells lining the inside of blood vessels) which causes blood vessel vasospasm (contraction of blood vessel muscles which causes the diameter of the blood vessel lumen to shrink/shrink). However, a history of hypertension is not the only cause of preeclampsia. There are many other factors that increase the risk of preeclampsia such as internal factors (maternal age, BMI, parity, pregnancy interval, hereditary history, history of preeclampsia, stress and anxiety. External factors such as exposure to cigarette smoke, status education, history of antenatal care and the influence of nutrients consumed by the mother (Quedarusman et al., 2016; Syaflindawati, 2019).

Based on the research that has been carried out, researchers can state that a history of hypertension is one of the causes of pre-eclampsia due to disturbances in the function of the blood vessel endothelium which causes blood vessel vasospasm (contraction of blood vessel muscles which causes the diameter of the blood vessel lumen to shrink or shrink. Therefore It is hoped that all health workers wherever they are must know about the history of hypertension in pregnant women so that pregnant women who have a history of hypertension receive close supervision during pregnancy so that there are no complications

that are dangerous for the mother and baby. And it is also recommended that mothers who have a history of hypertension should regular pregnancy check-ups with health workers to find out how the pregnancy is going.

6. Relationship between physical activity and the incidence of pre-eclampsia

The results obtained p-value 0.004 <0.05, there is a relationship physical activity and the incidence of pre-eclampsia, with OR of 5.43, meaning physical activity is 5 times greater risk of experiencing pre-eclampsia.

The results of this study are in line with Aripin's research that physical activity independently influences the occurrence of hypertension. The results of bivariate analysis in this study show that physical activity can increase the risk 24.89 times of hypertension (OR: 24.89; p=0.001) (Huzaipah, 2021).

According to the results of research conducted, it was found that excessive physical activity can cause hypertension which forces the heart to work faster. But according to researchers, doing light activities can help improve blood circulation and train the lungs.

During pregnancy, mothers still need physical activity, but it is limited to light activity. Heavy physical exertion can cause a miscarriage, especially if the exercise is done in the first months of pregnancy. Heavy physical exertion can cause fatigue, and in pregnant women who experience physical fatigue too often, the size of the fetus decreases or the fetus does not develop well (Irianto, 2014). According to (American College of Obstetricians and Gynecologists in Catov et al., 2018), pregnant women are recommended 20-30 minutes of moderately intense activity every day of the week. In pregnant women who do not make light physical effort during pregnancy, the risk of heart failure increases and circulation in the uterus is also disturbed (Zsafira, 2017).

7. Relationship between nutritional status and pre-eclampsia

The research results obtained a p-value of 0.035<0.05, there is a relationship between nutritional status and the incidence of pre-eclampsia, with an OR of 5.46, meaning nutritional status is 5 times greater risk of experiencing pre-eclampsia.

Prabowo (2018) et al.'s research entitled Trigger Factors for the High Incidence of Preeclampsia in Pregnant Women also agrees that BMI and preeclampsia are not related. Obesityis a nutritional problem due to excess calories, usually accompanied by excess fat and animal protein, excess sugar and salt which can later become a risk factor for various types of degenerative diseases (Muzalfah et al., 2018).

Anggasari (2018) The results of the Mann Whitney test with α= 0.05 showed that ρ = 0.079 > 0.05, meaning that Ho was accepted, the conclusion was that there was no relationship between nutritional status and the incidence of preeclampsia in pregnant women at the Sidotopo.

Wetan Surabaya Community Health Center, it was found that the majority Mothers with better nutritional status do not experience preeclampsia. In reality, from the research results, the majority of people with malnutrition and normal nutritional status experience preeclampsia. (Rofifah,2020).

Based on the results of research that has been carried out, it was found that the nutritional status of Preeclampsia mothers has no relationship because nutritional status influences the mother's weight gain. If the mother's nutritional status is low, it is feared that the mother will experience Chronic Energy Deficiency (CED) which can harm the mother and fetus. Meanwhile,if the mother's weight exceeds the normal limit for weight gain, Gestational Diabetes will occur.

8. Relationship between attitude and pre-eclampsia

The results obtained were p-value 0.036<0.05, there is a relationship between attitude and the incidence of pre-eclampsia, with an OR of 7.56, meaning attitude is 7 times greater risk

of experiencing pre-eclampsia.

According to research conducted by Tigor, 2020, it was stated that mothers with a second or more pregnancies usually have more experience than those with their first pregnancy so that mothers with more than one pregnancy have a better attitude than mothers with their first pregnancy regarding their pregnancy. Increasing gestational age can have an influence on the mother's attitude, because in the final period of pregnancy and before delivery the mother will be more mature and will have more preparation to face the birth so she will have a tendency to have agood attitude.

The results of previous research are also supported by the results of research from Nurnaningsih, 2021 that the majority of respondents have a positive attitude towards (carryingout) prevention of pre-eclampsia/eclampsia. Attitude is an individual's thoughts which will then produce encouragement in behavior to prevent pre-eclampsia/eclampsia which will have an impact on reducing the incidence of pre-eclampsia/eclampsia and reducing the maternal mortality rate (MMR).

The mother's attitude is that on average mothers think that high blood pressure in pregnancy is not dangerous, but according to existing references, high blood pressure in pregnancyis very dangerous during pregnancy.a

9. Relationship between level of education and pre-eclampssia

The results obtained p-value 0.208>0.05, there is no relationship between education and the incidence of pre-eclampsia.

Education is associated with the mother's ability and knowledge in maintaining and improving health during pregnancy. A low level of education will increase the risk of preeclampsia in pregnant women (Ahmad & Nurdin, 2019).

The results accordance research by Veftisia (2018) which states that pregnant women who don't complete 12 years of compulsory education (SD-SMP) will increase the risk of preeclampsia by 4.1 times greater than pregnant women who complete 12 years of compulsory education (SMA-Academy). /PT). This is supported by Ahmad (2019) proving that mothers with loweducation have a 3.7 increased risk of experiencing preeclampsia compared to pregnant women with higher education. Pregnant women with higher education can avoid risks that can increase blood pressure during pregnancy and are able to try to find information about pregnancy (Emha, Hapsari, & Lismidiati, 2017).

This is different from research by Zam (2021) and Zahrotun (2022) which no significant relationship education level and the incidence of preeclampsia. Mothers who have a low level of education gain knowledge from counseling, the surrounding environment and any media so that they can pay attention to their health during pregnancy (Zam, Kumaladewi, & Rustam, 2021).

10. Relationship between work and the incidence pre-eclampsia

The results obtained p-value 0.834 >0.05, there is no relationship between work and the incidence of pre-eclampsia.

The results accordance research by Zahrotun (2018) and Ahmad (2019) which proves that there is no relationship between work and the incidence of preeclampsia. The risk of preeclampsia is the same for working and non-working pregnant women. This is because pregnant women who do not work can still experience stress due to problems at home such as financial problems, relationships between families, and anxiety due to pregnancy and childbirth (Zahrotun Ni, Kusuma Widyaningsih, & Muniroh, 2022).

This is different from research by Shao (2017) which proves that there is a relationship between work and the incidence of preeclampsia (Prasetyo, Wijayanegara, & Yulianti, 2015). Pregnant women who work will increase the risk of preeclampsia due to stress and additional activities from their work (Setyawati, Widiasih, & Ermiati, 2018).

11. Relationship between pregnancy spacing and the incidence pre-eclampsia

The results obtained p-value 0.208 >0.05, there is no relationship between education and the incidence of pre-eclampsia.

These in line with research in Jambi which proves that there is no relationship between pregnancy spacing and the incidence of preeclampsia (Nengsih, 2020). A pregnancy gap of two to five years is ideal in minimizing the risk of recurrent preeclampsia. This is because angiogenic factors are not the main cause of mothers experiencing recurrent preeclampsia (Njoroge et al., 2021).

This is different from Kartikadewi's (2019) research which proves that there is a relationship between a pregnancy interval of 5 years (p=0.013) and the incidence of preeclampsia.

12. Relationship between diet and the incidence pre-eclampsia

The results obtained p-value 0.517 >0.05, there is no relationship between diet and the incidence of pre-eclampsia.

According to Abgail (2022) Recommendations To reduce the risk of pre-eclampsia, women planning to become pregnant should take daily multivitamin/mineral supplements containing folic acid (400 μg) and vitamin D (≥10 μg), and in countries with selenium status low, selenium (eg, 50 mcg). If pregnancy is not planned, such supplements should be started as soon as possible in pregnancy; it should be taken at least in the first trimester. This is in line with research by Astin, Nurmaity and Sitti (2019) which found a link between pregnant women's dietary habits and preeclampsia at the Kendari Regional Hospital in 2019. Poor dietary habits had a 5.4 times greater risk of experiencing preeclampsia.

Researchers assume that diet plays a major role in preeclampsia. Several things were found that influence the lack of pregnant women's intake, such as: food portions = when they are not yet pregnant, lack of variety of food consumed, there are still pregnant women who believe in food restrictions such as watermelon because they assume it can cause more amniotic fluid than it should and other foods such as cucumber. because it will cause a lot of vaginal discharge, pregnantwomen who from the start don't like consuming vegetables and pregnant women who don't like consuming milk.

13. Relationship between smoking and the incidence pre-eclampsia

The results obtained p-value 0.166 > 0.05, there is no relationship between smoking habits and the prevalence of preeclampsia.

Tobacco use is the leading cause of cancer and cancer deaths. Using tobacco products such as secondhand smoke (also called secondhand smoke) increases the risk of cancer because tobacco products and secondhand smoke contain many chemicals that damage DNA. Tobacco use causes several types of cancer, including cancer of the lung, larynx, mouth, esophagus, larynx, bladder, kidney, liver, smokeless tobacco (smoking or chewing tobacco) increases the risk of cancer of the mouth, esophagus, and pancreas (NIH, 2017).

14. Relationship between ANC visit and the incidence pre-eclampsia

The results obtained p-value 0.850 > 0.05, there is no relationship between ANC visits and the prevalence of preeclampsia.

In line with research by Destri Wulandari (2022), univariate analysis explains that of the 32 samples studied, there were 9 respondents (28.1%) with irregular ANC visit coverage, and 23 (71.9%) with regular ANC visit coverage. Bivariate analysis showed that of the 9 mothers with irregular ANC visits, 4 (44.4%) experienced preeclampsia and 5 (55.6%) did not. Of the 23 mothers with regular ANC visits, 12 (52.2%) experienced preeclampsia and 11 (47.8%) did not. PValue = 1,000 means there is no significant association between coverage of ANC visits and preeclampsia in TM III pregnant women. OR = 0.733, which means that irregular ANC visits protect against preeclampsia.

Tutik Ekasari (2019) noted that pregnant women should receive regular ANC to reduce pregnancy complications. ANC is a pregnancy test that aims to monitor the course of pregnancy, ensure the well-being of the mother and the growth and development of the fetus. To improve and maintain the physical, mental and social health of mothers and babies. Identify problems/diseases and possible complications during pregnancy. Prepares mother and baby for a safe pregnancy and birth with minimal trauma. The mother's preparation for a normal postpartum period and exclusivebreastfeeding.

According to the researchers' assumptions, the coverage of ANC visits is not related to preeclampsia because ANC is not a causal factor in the occurrence of preeclampsia. The irregular coverage of ANC visits is caused by many factors, namely the long distance between home and health services, lack of funds, no support from family or husband, mothers who still lack knowledge about the importance of carrying out pregnancy checks.

15. Relationship between family support and the incidence pre-eclampsia

The results obtained p-value 0.056 >0.05, there is no relationship between family support and the incidence of pre-eclampsia.

The results conducted by Widiarti (2017) show that support from husbands in the form of attitudes, actions to accept new families in the form of informational, instrumental and emotional support reduces anxiety levels in third trimester pregnant women.

During pregnancy, by providing antenatal education to prospective fathers, it is hoped that husbands can provide support to pregnant women so that pregnant women can have their pregnancy checked regularly. This research provides an illustration that the involvement of men orhusbands in providing assistance or support in the form of information, suggestions or advice during pregnancy will have a positive influence on the health of pregnant women.

According to researchers, family/husband support plays an important role in life, if the family supports the pregnancy of the child/wife or daughter-in-law, then the pregnant mother is enthusiastic or has the motivation to have her pregnancy checked every time she checks or has the slightest complaint. The family acts as the closest support system for pregnant women because in the family there will be different emotional relationships, so that pregnant women will feel more comfortable, confident, ready and safe, happy and safe in the process of pregnancy and birth until the postpartum period. The family plays a supportive role during recovery and healing. The function of family support for pregnant women is that it will create a feeling of comfort, satisfaction, security, and a smile that will make the pregnant mother happy, which will affect her soul and emotional health.

16. Relationship between knowledge and the incidence pre-eclampsia

The research results obtained a p-value of 0.587, meaning >0.05, which means there is no relationship between knowledge and the incidence of pre-eclampsia.

Knowledge is the result of "knowing" and occurs after humans perceive a certain object. Sensing objects is done through the five human senses, namely sight, hearing, smell, taste and touch. Some human knowledge is obtained through the eyes and ears. Knowledge is one of three areas that influence human behavior. Information plays an important role in shaping human activities (Notoatmodjo, 2018).

Research conducted by Tariq May ulfa, 2017 at the Padang Bulan Community Health Center, Medan City regarding knowledge of preeclampsia in pregnant women showed that 51.0% of pregnant women had good knowledge about preeclampsia and 40.6% had sufficient knowledge.class, poor class 8. 0.3%. And based on research, the results showed that the majority of respondents had good preeclampsia prevention. This is in line with research conducted by (Sofia, 2021) and (Yunus et al, 2021) which means that preventing preeclampsia provides the best results. These results are due to a number of factors, including education, age, employment, equality, environment, realized interests, and current health trends.

Knowledge of pregnant women about the incidence of high blood pressure and severe preeclampsia, attitudes of pregnant women about high blood pressure and the incidence of severe preeclampsia, and the relationship between knowledge and attitudes of pregnant women between high blood pressure and the incidence of severe preeclampsia.

17. Relationship between economic status and the incidence pre-eclampsia

The results obtained p-value 0.791 >0.05, there is no relationship between economic status and the incidence of pre-eclampsia.

This research states that it is supported research by Muzalfah et al, 2018 economic factors, where mothers who have a high economic status in pregnant women with preeclampsia can easily access health services. This is in line with research by Nurhayati & Dartiwen, 2019 on the financial aspect. Problems can occur if pregnant women have husbands who stop working, have insufficient income and are not yet working. Apart from that, pregnant women who migrate abroad have to live in rented houses that are not clean because it makes pregnant women susceptible to disease. To reduce expenses, sometimes pregnant women don't want to eat a lot of non-nutritious food and mothers who work to help support the family's income, so they don't have time to rest and check their pregnancy.

Low economic conditions play an important role in problems with examinations, transportation and other costs that affect pregnancy. Even though health services are free, the quality of service that pregnant women receive is not good. Apart from administrative problems, itis also a problem for pregnant women in seeking health services (Nurhayati & Dartiwen, 2019).

18. Dominant factors in the incidence pre-eclampsia

The statistical test results for variables that are significantly related to pre-eclampsia have a p-value <0.05, namely the smoking variable and disease history with values (P-value 0.010 and 0.000). Based on the OR value, the smoking variable is (OR: 0.226), the disease history variable. (OR: 70.636) So the most dominant variable associated with cervical cancer is history of chronic disease.

The exact cause of preeclampsia / eclampsia is still unclear. However, an abnormally implanting placenta is considered a major predisposition. (Grum et al., 2017). Apart from the mainpredispositions above, risk factors for preeclampsia include a previous history of preeclampsia, maternal age, history of hypertension, and history of obesity before pregnancy (Demissie et al., 2022).

Research from Muzalfah et al (2018) concluded that there is a significant relationship between a history of hypertension and preeclampsia with a p value = 0.026 (Muzalfah et al., 2018). Women who have microvascular disease, such as hypertension, have an increased incidence of preeclampsia; It is possible that preeclampsia begins with impaired blood flow to the placenta. In preeclampsia, blood pressure is unstable. The occurrence of hypertension is caused by an increase in vascular resistance.

Preeclampsia is the main cause of maternal death, and the most common cause of premature birth, fetal death and increased disability rates. Most complications and deaths due to preeclampsia/eclampsia can be prevented through timely and effective treatment. An important step to reduce maternal and infant mortality and morbidity is through optimizing health services toprevent and treat pregnant women with hypertension (Grum et al., 2017).

According to Thilaganathan B, & Kalafat E (2019), quoted by Sudarman (2021), women with a history of preeclampsia are a predisposing factor for preeclampsia, possibly because the cardiovascular system cannot recover from preeclampsia, because women with recurrent preeclampsia have worse cardiovascular conditions. than women after a normal pregnancy. Women with recurrent preeclampsia experience increased carotid intima-media thickness, cardiac output (CO) and left ventricular mass compared to normal pregnant women (Sudarman et al., 2021).

Researchers assume that a previous history of preeclampsia is related to the reaction or response of each pregnant woman's body. Every pregnant woman has a different response, so adaptation is needed to face the next pregnancy and childbirth. This factor can also be related to the mother's psychological situation in previous pregnancies. If previous psychological pressure cannot be managed well, it will have a negative impact on subsequent pregnancy and childbirth.

CONCLUSION

1. The research results show that there is relationship between age, parity, BMI, obesity, history of chronic disease, physical activity, nutritional status and attitudes towards the incidence of preeclampsia with a p-value < 0.05, meaning that Ha is accepted and Ho is rejected, while there is no relationship between the educational variables. , employment, pregnancy spacing, diet, smoking habits, ANC visits, family support, knowledge and economic status with the incidence of preeclampsia p-value >0.05, meaning Ha is rejected and Ho is accepted.
2. It turns out that the variables that are significantly related to preeclampsia have p-value <0.05, the variables smoking and history of disease have values (p-value 0.010 and 0.000). Based on the OR value, the smoking variable was obtained (OR: 0.226), the disease history variable (OR: 70.636). So the most dominant variable related to cervical cancer is a history of chronic disease.

SUGGESTION

It is hoped that pregnant women must be diligent in carrying out controls for early detection so that therapy is given quickly and precisely to prevent pregnancy complications even during delivery.

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