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Relationship Stress Levels, Knowledge and Compliance Antenatal Care (ANC) With Preeclampsia Incidence In Pregnant Women at the West City Health Center

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ABSTRACT

Preeclampsia is a complication of pregnancy characterized by hypertension after 20 weeks of gestation accompanied by proteinuria and contributes to increased maternal morbidity. In Gorontalo City, the prevalence of preeclampsia increased from 0.71% in 2023 to 1.73% in mid-2024. Data from the West City Health Center shows that 36 out of 259 pregnant women experience preeclampsia. The purpose of analyzing the relationship between the level of stress, knowledge and compliance of Antenatal Care (ANC) and the incidence of preeclampsia in pregnant women at the West City Health Center.
Quantitative research with a cross sectional study design. The population was 259 pregnant women and a sample of 72 using purposive sampling techniques. Data were collected through the Perceived Stress Scale (PSS-10) questionnaire, knowledge questionnaire, ANC compliance questionnaire and medical record data. Data analysis using the Chi-Square test. There was a significant relationship between stress levels ($p = 0.000$), knowledge ($p = 0.017$), and ANC compliance ($p = 0.003$) with the incidence of preeclampsia in pregnant women at the West City Health Center.
The level of stress, knowledge, and compliance of ANC are factors related to the incidence of preeclampsia. Health workers are advised to optimize ANC services through early detection, ongoing education and stress level screening to prevent pregnancy complications.

INTRODUCTION

Preeclampsia is one of the high-risk pregnancy complications and can cause morbidity and mortality in the mother and fetus. Preeclampsia is a disease characterized by high blood pressure (hypertension), tissue swelling (edema), and the discovery of proteins in the urine (proteinuria) that arise due to pregnancy (Rauf et al., 2023).

Based on data from the World Health Organization (WHO) in 2020, it is estimated that every day there are 934 cases of preeclampsia around the world. Preeclampsia is included in the top three causes of complications during pregnancy and childbirth, along with bleeding (30%), preeclampsia/eclampsia (25%), and infection (12%) (WHO, 2020). In Gorontalo City, the prevalence of pregnant women experiencing preeclampsia increased from 0.71% in 2023 to 1.73% in mid-2024. Data from the West City Health Center in 2024 shows that out of 259 pregnant women, there are 36 cases of preeclampsia.

Psychological and behavioral factors are thought to play a role in the occurrence of preeclampsia. Stress is a response to psychological stress that can trigger preeclampsia through the activation of the hypothalamus and the release of cortisol which increases sympathetic responses, heart rate, and blood pressure (Apriliyanti et al., 2023). Adequate knowledge about pregnancy and preeclampsia encourages pregnant women to behave healthily, including routinely performing antenatal care (Bandura, 1997; Rakhmawati et al., 2021). Good ANC adherence allows for early detection of signs of preeclampsia so that it can be treated early (Ziad et al., 2024).

This study aims to analyze the relationship between stress levels, knowledge, and compliance with Antenatal Care (ANC) and the incidence of preeclampsia in pregnant women at the West City Health Center, Gorontalo City.

RESEARCH METHODS

This study uses a quantitative method with a cross sectional study design which was carried out in the working area of the West City Health Center, Gorontalo City. The study population was 259 pregnant women who checked their pregnancy at the West City Health Center. Sampling was carried out using purposive sampling techniques and a sample of 72 respondents was obtained consisting of 36 case groups (pregnant women with preeclampsia) and 36 control groups (pregnant women without preeclampsia).

The independent variables in this study included stress levels, knowledge of preeclampsia, and ANC adherence. The bound variable is the incidence of preeclampsia. Data were collected through: (1) the Perceived Stress Scale (PSS-10) questionnaire to measure stress levels in the low, medium, and high categories; (2) a knowledge questionnaire with 10 question items with the categories of good, sufficient, and poor; (3) ANC compliance questionnaire with the categories of compliant, moderately compliant, and non-compliant; and (4) medical record data for preeclampsia status.

The research instrument has been tested for validity and reliability. The knowledge questionnaire had a Cronbach Alpha value of 0.926 and the ANC questionnaire had a Cronbach Alpha value above 0.7, indicating a reliable instrument. Data analysis was carried out univariate and bivariate using the Chi-Square test with a significance level of $\alpha = 0.05$.

RESULTS AND DISCUSSION

Of the 72 study respondents, most were at 20–24 weeks gestation (34.72%), followed by 25–29 weeks gestation (33.33%). Based on parity, the majority of respondents were in their first pregnancy (40.28%). As many as 37.50% of respondents had a history of hypertension, while 62.50% had no history of disease. The frequency of ANC visits shows that 68.1% of respondents make 4–6 visits.

Table 1. Characteristics of Respondents (n = 72)

Features	Category	Frequency (n)	Percentage (%)
Gestational Age (weeks)	20 – 24	25	34,72
	25 – 29	24	33,33
	30 – 34	13	18,06
	35 – 39	10	13,89
Parity	1st pregnancy	29	40,28
	2nd pregnancy	23	31,94
	3rd pregnancy	14	19,44
	4th pregnancy	6	8,33
Disease History	None	45	62,50
	Hypertension	27	37,50

Univariate Analysis

The distribution of respondents by stress level showed that the majority were in the moderate stress category (43%), followed by low stress (41.7%), and high stress (15.3%). Based on knowledge, most respondents had sufficient knowledge (50%), followed by good (34.7%), and less (15.3%). ANC compliance shows that 45.8% of respondents are compliant, 37.5% are quite compliant, and 16.7% are non-compliant. The incidence of preeclampsia is evenly distributed, namely 50% of each has and does not experience preeclampsia.

Table 2. Univariate Distribution of Research Variables (n = 72)

Variabel	Category	Frequency (n)	Percentage (%)
Stress Level	Height	11	15,3
	Medium	31	43,0
	Low	30	41,7
Knowledge	Good	25	34,7
	Enough	36	50,0
	Less	11	15,3

ANC Compliance	Obedient	33	45,8
	Simply Obey	27	37,5
	Non-compliant	12	16,7
Kejadian Preeclampsia	Experience	36	50,0
	Not Experiencing	36	50,0

Bivariate Analysis

The results of the analysis of the relationship between stress level and the incidence of preeclampsia are presented in the following table:

Table 3. The Relationship of Stress Levels to the Incidence of Preeclampsia

Stress Level	Experiencing n (%)	Not Experiencing n (%)	Sum n (%)	p-value
Low	5 (13,9%)	25 (69,4%)	30 (41,7%)	0,000
Medium	22 (61,1%)	9 (25,0%)	31 (43,0%)	
Height	9 (25,0%)	2 (5,6%)	11 (15,3%)	
Quantity	36 (100%)	36 (100%)	72 (100%)	

Table 4. The Relationship of Knowledge to Preeclampsia Incidence

Knowledge	Experiencing n (%)	Not Experiencing n (%)	Sum n (%)	p-value
Good	7 (19,4%)	18 (50,0%)	25 (34,7%)	0,017
Enough	21 (58,4%)	15 (41,7%)	36 (50,0%)	
Less	8 (22,2%)	3 (8,3%)	11 (15,3%)	
Quantity	36 (100%)	36 (100%)	72 (100%)	

Table 5. The Relationship of ANC Compliance to the Incidence of Preeclampsia

ANC Compliance	Experiencing n (%)	Not Experiencing n (%)	Sum n (%)	p-value
Obedient	10 (27,8%)	23 (63,9%)	33 (45,8%)	0,003
Simply Obey	16 (44,4%)	11 (30,6%)	27 (37,5%)	
Non-compliant	10 (27,8%)	2 (5,6%)	12 (16,7%)	
Quantity	36 (100%)	36 (100%)	72 (100%)	

DISCUSSION

The Relationship of Stress Levels to the Incidence of Preeclampsia

The results showed that there was a significant relationship between stress levels and the incidence of preeclampsia ($p = 0.000 < 0.05$). Of the 30 respondents with low stress levels, only 5 (13.9%) experienced preeclampsia. In contrast, of the 31 moderately stressed respondents, 22 (61.1%) experienced preeclampsia, and of the 11 respondents with high stress, 9 (25.0%) experienced preeclampsia.

These findings are in line with McEwen's (1998) Allostasis theory which states that prolonged stress causes physiological load leading to health complications, including preeclampsia. The underlying mechanism is that stress activates the hypothalamus, triggering the release of adrenaline, non-adrenaline, and cortisol that increase sympathetic responses, heart output, and blood pressure. In pregnant women with preeclampsia, there is no decrease in sensitivity to vasopeptides, so an increase in blood volume directly increases blood pressure (Apriliyanti et al., 2023). These results are also in line with the research of Apriliyanti et al. (2023) which found a significant relationship between stress levels and the incidence of severe preeclampsia (OR = 22.5).

The Relationship of Knowledge to Preeclampsia Incidence

The results showed that there was a significant relationship between knowledge and the incidence of preeclampsia ($p = 0.017 < 0.05$). Of the 25 respondents with good knowledge, only 7 (19.4%) experienced preeclampsia. Meanwhile, of the 11 respondents with less knowledge, 8 (22.2%) experienced preeclampsia.

These findings support Bandura's (1997) Health Knowledge and Behavior theory which states that the higher a person's knowledge of health, the more likely they are to adopt healthy behaviors. Pregnant women with good knowledge of preeclampsia will be more likely to follow the ANC program in an orderly manner, so that the risk of preeclampsia can be reduced (Rakhmawati et al., 2021). Research by Rakhmawati et al. (2021) at the Banyuanyar Health Center in Surakarta also supported this finding by finding a significant influence of knowledge on the incidence of preeclampsia.

The Relationship of ANC Compliance to the Incidence of Preeclampsia

The results showed that there was a significant relationship between ANC compliance and the incidence of preeclampsia ($p = 0.003 < 0.05$). Of the 33 ANC-compliant respondents, only 10 (27.8%) experienced preeclampsia, while of the 12 respondents who did not comply with ANC, 10 (27.8%) experienced preeclampsia.

These results are in line with research by Rauf et al. (2023) at the Tolangohula Health Center which found a significant relationship between ANC visits and the incidence of preeclampsia, where pregnant women who are less compliant have a greater risk. Regular ANC examinations allow healthcare workers to detect early signs of preeclampsia such as increased blood pressure and proteinuria, so that interventions can be carried out earlier. Lawrence Green's PRECEDE-PROCEED theory explains that ANC compliance is influenced by predisposing factors (knowledge, attitudes), supporting factors (availability of facilities), and driving factors (family and health worker support) (Green & Kreuter, 2005).

CONCLUSION

Based on the results of the study, it can be concluded that: (1) there is a significant relationship between stress levels and the incidence of preeclampsia in pregnant women at the West City Health Center ($p = 0.000$); (2) there was a significant relationship between knowledge and the incidence of preeclampsia ($p = 0.017$); and (3) there was a significant association between Antenatal Care (ANC) adherence and the incidence of preeclampsia ($p = 0.003$). Thus, the level of stress, knowledge, and ANC compliance are factors that are meaningfully related to the incidence of preeclampsia.

SUGGESTIONS

Health workers at the West City Health Center are advised to optimize ANC services through early detection, ongoing education on risk factors for preeclampsia, and stress level screening at each ANC visit. Pregnant women need to increase awareness and compliance with the recommendations of health workers. Follow-up research is recommended to examine other factors that contribute to the incidence of preeclampsia such as body mass index, diet, and social support.

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