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Research/Review

Relationship Between Nutritional Status, Contact History, and BCG Immunization Status and Child TB in RSD Tidore City

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Abstract, Introduction: Children of all ages can get tuberculosis (TB), an infectious disease. With 500,000 child TB cases annually and 40–50% of the population in poor nations being categorized as children, child TB is a significant disease to research. This study's main goal was to ascertain how nutritional status, contact history, and BCG immunization status related to childhood tuberculosis at Tidore Hospital in 2025. Methods: This kind of study used a cross-sectional design and was analytically descriptive. In December 2025, there were 80 children with tuberculosis who visited the polyclinic on a regular basis, making up the study's population. Contact history has a significance level of 0.000 <0.05 and a t value of 3.564 > t table 1.665. This indicates that the Child TB variable is significantly impacted by the contact history variable to some extent. The t count value for immunization status is 4.055 > t table 1.665, with a significance of 0.000 <0.05. This indicates that the Child TB variable is significantly impacted by the Immunization Status variable to some extent. The Nutritional Status hypothesis was tested, and the results reveal a t value of 3.044 > t table of 1.665 with a significance of 0.000 <0.05. This indicates that the Child TB variable is significantly impacted by the Nutritional Status variable to some extent.So the advice for health workers is that it is hoped that they will be more active in providing counseling or KIE, putting up poster media, and providing leaflets related to TB in children.

Keywords: BCG Immunization; Childhood Tuberculosis; Factors Associated With Preeclampsia; Mothers With Preclampsia; Preeclampsia.

1. Introduction

Tuberculosis is a major infectious cause of mortality and morbidity in developing countries. It is estimated that pulmonary tuberculosis infects as many as 1 million children worldwide and causes 210,000 deaths annually. 1 TB is an infectious disease that can affect all ages, including children. 2 Childhood TB is an important disease to study, considering that 40-50% of the total population in developing countries is affected by children, with 500,000 cases of TB per year.

Data from the World Health Organization (WHO) in 2018 also indicates that there are 1.1 million cases of TB in children each year. According to a report from the Ministry of Health, there were 385,295 cases of TB detected and treated in Indonesia throughout 2021. 3 Indonesia is the country with the third-highest number of TB cases in the world after India and China. 4 According to a journal, data from the WHO indicates that in 2018, approximately 10 million people worldwide suffered from TB. Approximately 5.7 million are men, 3.2 million women, and 1.1 million children. North Maluku Province is one of the provinces in Indonesia consisting of 26 districts/cities. At the national level, North Maluku province ranks first in contributing to the number of TB sufferers, with a total of 62,218 cases. 5 For TB cases in North Maluku itself, the trend increased in 2019. The number was found to be 3,633 cases. Meanwhile, data obtained from the polypoint register book at Tidore Regional Hospital shows that the number of TB patients from year to year has increased. In 2019 there were 99 cases of TB in children and in 2020 there were 103 cases of TB in children while in 2021 there were 306 cases. Of the 306 cases, 109 cases of childhood tuberculosis were found. 6 Tuberculosis is a health problem throughout the country. 7

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Research in Garut conducted by Desi et al. concluded that risk factors for tuberculosis in children include nutritional status, contact history, age of BCG immunization, and exclusive breastfeeding. 8 Another thesis study conducted by Nana Marlina in 2016 also showed a relationship between the age of BCG immunization, maternal education, and frequency of roommates, relatives, and contact with family. 9 Based on this, this study is needed. It is hoped that the results of this study can identify TB risk factors, thus enabling early detection and prevention of TB cases, especially in children. Research by Dinar Werdiningsih, Joko Susilo, Niken Meilani entitled The Relationship Between Contact History and BCG Immunization Status with TB Incidence in Children at Panembahan Senopati Bantul Regional Hospital in 2021. The purpose of this study is analytical observational, with a case control design or approach carried out in February 2025. The sampling technique used total sampling with a sample size of 42. Data analysis used the Chi Square test. Details of the Relationship Between Contact History and BCG Immunization Status with the Incidence of TB in Children at Panembahan Senopati Bantul Regional Hospital in 2021. The results of the chi-square test showed that contact history and TB incidence in children were

0.000, which is <0.05. Meanwhile, for BCG immunization status, there was a relationship with the Asymp.Sig value (2-sided) in the chi-square test of 0.000, which is <0.05.10

Alya Salsabilla with the Relationship Between BCG Immunization Status and Household Contact History with the Incidence of Pulmonary Tuberculosis in Children in the Surakarta Area. This study aims to determine the Relationship Between BCG Immunization Status and Household Contact History with the Incidence of Pulmonary Tuberculosis in Children in the Surakarta Area. Data collection results using the title of the study showed that there was no relationship between BCG immunization status and the incidence of pulmonary tuberculosis in children with a result of ϱ 1.000, but there was a relationship between household contact and the incidence of pulmonary tuberculosis in children with a result of ϱ 0.000 in Questionnaire and Interviews for the Surakarta Health Office Region.11

I Gusti Ayu Sri Dhyanaputri, Cok. Dewi Widhya Hana Sundari, Nyoman Mastra, I Nyoman Jirna, I.A. Md. Sri Arjani, I Wayan Merta, IG Sudarmanto, IGA Dewi Sarihari, entitled "The Relationship between BCG Therapy, Nutritional Status, and the Home Environment with the Incidence of Pulmonary TB in Toddlers."

To determine the relationship between BCG therapy, nutritional status, and the home environment with the incidence of pulmonary tuberculosis in toddlers. This study was an observational analytical study with a case-control approach. There was no association between BCG vaccination and the incidence of pulmonary tuberculosis in toddlers (p = 0.076; OR = 2.111). There was an association between nutritional status and the incidence of pulmonary tuberculosis in toddlers (p = 0.000; OR = 2.750). Home environment: There is a relationship between residential density and the incidence of pulmonary tuberculosis in toddlers (p = 0.000; OR = 7.538).12

This research is crucial because the high number of TB cases in children necessitates the identification of risk factors for TB in children. This research is expected to provide information on the relationship between nutritional status, contact history, and BCG immunization status and TB in children. The aim of this study was to determine the relationship between nutritional status, contact history, and BCG immunization status and TB in children.

2. Research Method

This study was a descriptive analytical study with a cross-sectional design. This study examined the effect of nutritional status, contact history, and BCG immunization status on childhood TB at Tidore Regional Hospital in 2025. The study was conducted at Tidore Regional Hospital, North Maluku. The aim of this study was to determine the effect of nutritional status, contact history, and BCG immunization status on childhood TB at Tidore Regional Hospital in 2025.

The population included in this study were parents of children with TB who regularly visited the clinic, a total of 80 children in December 2025. Sampling in this study was carried out using the total sampling method, which involves taking the entire population as a sample. Therefore, the sample size for this study was 80 children. The research instrument is a tool

used to measure variables in order to collect data. In this study, the research instrument or tool used to collect data was the patient's medical record sheet.

3. Results and Discussion

Table 1. Table 1. Frequency Distribution of Nutritional Status, Contact History, BCG Immunization Status for Children with TB at Tidore Regional Hospital in 2025.

Variabel	Frequency (N)	(%)
Nutritional Status		
Severly underweight	2	2,5
Very underweight	2	2,5
Underweight	26	32,5
Normal	50	62,5
Contact History	5	6,25
Unclear	17	21,25
No	58	72,5
Yes		
Imunization Status		
Yes	34	42,5
No	46	57,5

Based on the analysis of Table 1, it is known that the number of detailed categories of malnutrition is 2 people (2.5%), the number of very thin is 2 people (2.5%), thin is 26 people (32.5%) and the number of normal is 50 people (62.5%). These results indicate that nutrition in this study is dominated by normal. and it is known that the number of respondents with an unclear contact history is 5 people (6.25%), the number of respondents who have no contact history is 17 people (21.25) and the number of respondents who have a contact history is 58 people (72.5%). These results indicate that the number of respondents with a contact history is greater. Based on the analysis of Table 5.3, it is known that the number of respondents who answered Yes is 34 people (42.5%) and the number of respondents who answered No is 46 people (57.5%). These results indicate that the number of respondents who answered Yes is greater than the number of respondents who answered No.

Multiple Regression Test Results: Partial T-Test

Table 2. Results of the Partial T-Test of Nutritional Status on Childhood TB.

Model		Coefficients			t	Sig
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	Constant	42.965	8.618		5.560	0,001
	Nutritional Status	.360	.027	.241	3.044	0,001
	History Status	.215	.027	.107	3.564	0,001
	Imunization Status	.108	.027	.771	4.055	0,001

a Dependent Variabel: TB anak

Based on the table above, it shows that the calculated t of the Nutritional Status variable is 3.044 with a significance value of 0.000. The t table value obtained for an error rate of 5% is 1.665. So it is known that the calculated t of the Nutritional Status variable is 3.044> t table 1.665 with t-sig 0.000 <0.05, it can be concluded that the Nutritional Status variable partially has a positive effect on the Child TB variable. Therefore, in this study, H0 is rejected and Ha is accepted.

Table 3. Results of Partial t-Test of Contact History for TB in Children.

Model		Coefficients			t	Sig
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	Constant	42.965	8.618		5.560	0,001
	Nutritional Status	.360	.027	.241	3.044	0,001
	History Status	.215	.027	.107	3.564	0,001
	Imunization Status	.108	.027	.771	4.055	0,001

a Dependent Variabel: TB anak

Based on the table above, it shows that the calculated t of the Contact History variable is 3.564 with a significance value of 0.000. The t table value obtained for an error rate of 5% is 1.665. So it is known that the calculated t of the Contact History variable is 3.564> t table 1.665 with a significance of 0.000 <0.05, it can be concluded that the Contact History variable partially has a positive effect on the Childhood TB variable. Therefore, in this study H2 is rejected and H3 is accepted.

Table 4. Results of the Partial t-Test of Immunization Status for Children with TB.

Model		Coefficients			t	Sig
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	Constant	42.965	8.618		5.560	0,001
	Nutritional Status	.360	.027	.241	3.044	0,001
	History Status	.215	.027	.107	3.564	0,001
	Imunization Status	.108	.027	.771	4.055	0,001

a Dependent Variabel: TB anak

Based on the table above, it shows that the t count of the Immunization Status variable is 4.055 with a significance value of 0.000. The t table value obtained for an error rate of 5% is 1.665. So it is known that the t count of the Immunization Status variable is 4.055> t table 1.665 with t-sig 0.000 <0.05, it can be concluded that the Immunization Status variable partially has a positive effect on the Childhood TB variable. Therefore, in this study H4 is rejected and H5 is accepted.

Discussion

The Influence of Nutritional Status on Childhood TB

Nutritional status is a measure of a person's physical condition, as determined by the food consumed and the body's utilization of nutrients. Nutritional status reflects the extent to which nutritional needs are met through nutrient intake and utilization. Nutritional status can be determined through clinical examination, anthropometric measurements, biochemical analysis, and history. Nutritional status is divided into three categories: undernutrition, normal nutrition, and overnutrition.13

This is in line with research conducted by I Gusti Ayu Sri Dhyanaputri, Cok. Dewi Widhya Hana Sundari, Nyoman Mastra, I Nyoman Jirna, I.A. Md. Sri Arjani, I Wayan Merta, I G Sudarmanto, and IGA Dewi Sarihari. 2018 in "The Relationship Between BCG Therapy, Nutritional Status, and the Home Environment with the Incidence of Pulmonary TB in Toddlers," the results showed no association between BCG vaccination and the incidence of pulmonary TB in toddlers (p=0.076; OR=2.111). There is a relationship between nutritional status and the incidence of pulmonary tuberculosis in toddlers (p = 0.000; OR = 2.750). Home environment: There is a relationship between residential density and the incidence of pulmonary tuberculosis in toddlers (p = 0.000; OR = 7.538).12

The Influence of Contact History on Childhood TB

This is in line with research conducted by Alya Salsabilla, 2019, in "The Relationship Between BCG Immunization Status and Household Contact History with the Incidence of Pulmonary Tuberculosis in Children in the Surakarta Area." The results showed no relationship between BCG immunization status and the incidence of pulmonary tuberculosis in children, with a p value of 1.000. However, there was a relationship between household contact history and the incidence of pulmonary tuberculosis in children, with a p value of 0.000 in the Surakarta Area.11

The Influence of Immunization Status on Childhood TB

Basic BCG immunization protects people from the risk of contracting germs, such as viruses or bacteria, that are harmful to health. These germs include Mycobacterium tuberculosis, which causes tuberculosis.14 To ward off this bacteria, the World Health Organization (WHO) recommends early vaccination with the BCG (Bacille Calmete Guerin) vaccine. According to the WHO, tuberculosis kills more adults aged 15 to 59 than any other disease. In Indonesia, at least 840,000 people suffered from tuberculosis in 2018. This data demonstrates the need for BCG immunization for the public. The main benefit of the BCG vaccine is reducing or preventing the risk of contracting the germs that cause tuberculosis.15 Severe tuberculosis, one of which is tuberculous meningitis, can also be prevented by up to 70%.

This is in line with research conducted by Dinar Werdiningsih, Joko Susilo, and Niken Meilani. 2021 in the Relationship between Contact History and BCG Immunization Status with TB Incidents in Children at Panembahan Senopati Bantul Regional Hospital in 2021, the results of the chi-square test showed that contact history with TB incidents in children was 0.000 where <0.05, while for BCG immunization status, there was a relationship with the Asymp.Sig value (2-sided) in the chi-square test of 0.000, where <0.05.10

The Relationship between Parity and Preeclampsia

Based on the research results, the Chi-Square statistical test yielded a p-value of 0.001 (Sig. < 0.05). Ho was rejected, indicating a significant correlation between parity and the incidence of preeclampsia at Tidore City Regional Hospital. Based on the researcher's assumption, parity is associated with preeclampsia because delivering more than three pregnancies carries a high risk for pregnant women. This condition can cause reproductive organs, especially the uterine muscles, to weaken, which can complicate labor and increase the risk of preeclampsia.

Parity is the number of live births a woman has had. Parity is divided into three categories: primiparous, multiparous, and grandemultiparous. Parity is one of the most common causes of preeclampsia in pregnant women. The earlier a woman's pregnancy or the more births she has had, the greater the risk of developing preeclampsia. This is because women who are pregnant early and even at a young age are more susceptible to preeclampsia due to the reproductive system not being ready for pregnancy. Women who have given birth repeatedly are more likely to develop preeclampsia due to their physical condition and declining health, which then increases the risk of developing preeclampsia (Rohmah, 2019). This research aligns with Laila's (2019) study of 45 respondents. The study found a relationship between parity and the incidence of preeclampsia in the Whale Ward of Pelabuhan Ratu Regional Hospital, Sukabumi Regency. The study found that preeclampsia was more common in pregnant women with low parity (low parity) than in pregnant women with high parity (high parity). Consistent with this study, the majority of preeclampsia cases were found in respondents with low parity (≤3). Parity is a significant predisposing factor for preeclampsia. Based on the theory that parity is a predisposing factor for preeclampsia (Laura et al., 2021),

Relationship between Age and Preeclampsia Incidence

Based on the research results, the Chi-Square statistical test yielded a p-value of 0.426 (Sig. <0.05), indicating that Ho is accepted, indicating no significant relationship between age and preeclampsia incidence at Tidore City Regional Hospital. Based on the researcher's assumptions, this result is likely due to the fact that the study showed that several respondents were aged 20-35, which aligns with this research. Therefore, it can be assumed that mothers aged 20-35 are the lowest contributors to maternal and infant mortality, while very young and elderly mothers are at greater risk.

This finding is possible because the majority of mothers in this study were of mature age (20-35). According to the WHO (2023), teenage pregnancy carries a higher risk of complications than pregnancy ages 20-35. Mothers aged 20-29 are at a lower risk for maternal and infant mortality, while both young and older mothers are at higher risk. Pregnant women aged 16 years and over are at increased risk of preeclampsia, those aged 35 and over are at higher risk, and those aged 40 years and over are at increased risk. If the mother is older than 35, it can lead to problems, especially hypertension, which can later lead to preeclampsia. In the 20s, uterine size often develops below the standard for pregnancy. This can lead to a higher risk of preeclampsia. Furthermore, at this age, mothers are generally less mentally and physically capable (Andriani et al., 2022).

This research is supported by Rukiah et al. (2021) who studied 130 pregnant women. The analysis found no correlation between age and the incidence of preeclampsia at RSU A Purwakarta in 2020. The study found that maternal deaths due to excessive bleeding occurred in mothers aged 20–35, which is considered the optimal age for childbirth. This is because the age group of 20–25 is the age group for managing pregnancy and is considered mature for pregnancy and childbirth, while mothers are often less active and less familiar with their pregnancies. This coincides with a study by Palupi & Indawati (2014) of 373 respondents. This study found that several respondents were aged 20–35, which aligns with this study. Therefore, it can be assumed that mothers aged 20–35 have the lowest rates of maternal and infant mortality, while very young and even elderly mothers have higher risks.

The Relationship between Education and Preeclampsia

Based on the research findings, the Chi-Square statistical test yielded a p-value of 0.569 (Sig. <0.05), indicating that Ho is accepted, indicating no significant correlation between education and preeclampsia incidence at Tidore City Regional Hospital. Based on the researcher's assumption, respondents experiencing preeclampsia with minimal education do not necessarily have limited knowledge.

This is due to the knowledge they gained through training provided by health workers, which is routinely conducted every few months. This understanding of health practices, such as undergoing comprehensive antenatal checkups, is also evident. There is no correlation between education level and preeclampsia.

Education is an activity and effort that enhances characteristics, leading to transformational actions that lead to maturity and even individual perfection. This study concluded that mothers with higher education and those without education have a similar risk of developing preeclampsia. This study essentially influences decision-making and choices. Women with higher levels of education have the skills to obtain, organize, and learn information related to healthy lifestyles. They can discuss and ask health workers and even make informed choices. However, an individual's education cannot determine whether or not they suffer from a specific disorder (Hutabarat et al., 2016). This is in line with research by Nursal et al., (2020) conducted on pregnant women with 34 case samples and 34 control samples. The study showed no significant correlation between education level and the occurrence of preeclampsia. This finding was obtained if mothers with higher education and mothers with less certainly have a similar chance of contracting preeclampsia. This is also in line with a study by Saraswati & Mardiana (2016), which conducted on 145 respondents in each case and control category. The study found no correlation between education level and the occurrence of preeclampsia in pregnant women.

The Relationship between Occupation and Preeclampsia

Based on research findings, the Chi-Square statistical test yielded a p-value of 0.001 (Sig. < 0.05), meaning Ho is rejected, indicating a significant correlation between occupation and preeclampsia at Tidore City Regional Hospital. Based on the researcher's assumptions,

occupation is also related to physical activity. For housewives, some physical activities such as cleaning the home, helping children with school, preparing meals, and other monotonous daily activities can increase stress. This stress can stimulate endothelial damage to blood vessels and blood vessels, which can lead to vasoconstriction, which increases blood pressure and can lead to preeclampsia. An individual's work activities can affect muscle performance and blood flow. In pregnant women, blood flow can undergo changes as the pregnancy progresses due to the pressure exerted by the enlarging uterus. Increasing gestational age increases the risk of heart failure, which increases the need for adequate support during pregnancy. Pregnant women who work are more susceptible to preeclampsia because they experience higher levels of stress than unemployed women. According to Karrar & Hong (2023), the heavy workload experienced by mothers is a real explanation for the stress experienced by mothers during pregnancy. While heavy work is not performed outside the home to earn a living, working at home as a housewife is a recognized significant task. Therefore, the work performed by pregnant women can complicate the development of preeclampsia.

This study is supported by Agustina et al., (2022), which conducted a study on 93 pregnant women. The study found a correlation between work and preeclampsia. The study showed that employed respondents had a 3.615 times higher risk of preeclampsia than unemployed respondents. The study found that mothers with large jobs did not experience preeclampsia disorders, as did those without jobs. However, the rate of preeclampsia disorders tended to be higher in working mothers. This is because working mothers experience greater stress than unemployed mothers, which then affects muscle performance and blood flow, which can lead to increased blood pressure, which later leads to preeclampsia. This study aligns with the research of Yani et al., (2023), which was conducted on 60 pregnant respondents. The study showed a correlation between the mother's occupation and preeclampsia in pregnant women in the Banda Raya Community Health Center Work Area, Banda Aceh City in 2021. This study is in line with the assumption of this study that work has an influence on an individual's body activity, which causes preeclampsia. The impact on mental health will then flow the kidneys and adrenal glands to produce the hormone adrenaline. Adrenaline hormone then works and increases the heart rate, which affects increased blood pressure, thus risking preeclampsia.

The Relationship between a History of Hypertension and the Incidence of Preeclampsia

Based on the research results, the Chi-Square statistical test yielded a p-value of 0.000 (Sig. < 0.05), meaning Ho is rejected, indicating a significant correlation between a history of hypertension and the incidence of preeclampsia at Tidore City Regional Hospital. Based on the researchers' assumptions, high blood pressure experienced before pregnancy causes problems and damage to organs. Pregnancy causes weight gain, which can then lead to serious problems, manifested as edema and even proteinuria. Proteinuria can be caused by leaky kidneys due to the excretion of too much protein in the urine. This can disrupt pregnancy, as preeclampsia is prone to organ system dysfunction.

A history of hypertension is a significant risk factor for the development of preeclampsia, as preexisting high blood pressure can cause organ problems. Furthermore, pregnancy leads to weight gain, which then causes significant problems and damage. The incidence of preeclampsia increases in women with chronic high blood pressure, as placental blood flow is compromised. One predisposing factor for severe preeclampsia is high blood pressure, preexisting vascular hypertensive disorders, and even essential hypertension. This finding is consistent with a study by Andriani et al. (2022) conducted on 34 pregnant women. The study found a relationship between a history of hypertension and the development of preeclampsia and pregnancy outcomes at Sekayu Regional Hospital, Musi Banyuasin Regency. The study concluded that mothers with a history of high blood pressure in a previous pregnancy are more likely to develop hypertension in subsequent pregnancies. This finding is consistent with the study, which found that 26 respondents in both the problem and control categories had a history of hypertension. This could be due to the mother's medical history being a predictor of complications in subsequent pregnancies.

The Relationship between Multiple Pregnancy and Preeclampsia

Based on the study's findings, the Chi-Square statistical test yielded a p-value of 0.559 (Sig. < 0.05), indicating that Ho is accepted, indicating no significant correlation between multiple pregnancy and preeclampsia at Tidore City Regional Hospital. This assumption is based on the researcher's assumption that the majority of respondents in this study had no

history of multiple pregnancies. Multiple pregnancies, which involve two or more fetuses, can pose significant risks to both the fetus and the mother. Twin fetuses are more likely to develop preeclampsia due to the increased blood flow to the fetus. This study, conducted by Sutrimah et al. (2015), found no significant correlation between multiple pregnancies and the risk of preeclampsia. This finding is explained by the significantly higher proportion of respondents who had singletons compared to mothers who had multiples, suggesting that twin pregnancies were not associated with preeclampsia. Preeclampsia in twin pregnancies can be caused by excessive uterine stretching, which reduces blood flow to the uterus, which can then lead to preeclampsia in pregnant women with twins. However, this study did not identify a risk factor for preeclampsia in twin pregnancies, as it is often associated with decreased fetal weight in the mother.

This study is supported by Tonasih & Kumalasary (2020) which was conducted on 1271 respondents of mothers treated in the Maternity Room of Gunung Jati Regional Hospital, Cirebon City in 2018. The study showed that multiple pregnancies had no correlation with the occurrence of preeclampsia. In the study, it was assumed that there was no correlation between twin pregnancies and preeclampsia because the majority of respondents in the case category did not have a history of multiple pregnancies. In line with this study, it was found that most respondents in the case category did not have multiple pregnancies. In line with the study of ZA et al., (2016) which was conducted on 20 respondents in the control category and 20 respondents in the case group. The study can be concluded that there is no correlation between risk factors for multiple pregnancies and the occurrence of preeclampsia in mothers giving birth at Meuraxa Regional Hospital, Banda Aceh in 2014-2015. Mothers carrying twins have a very low chance of developing preeclampsia six times lower than mothers who do not have twin pregnancies. The study concluded that risk factors for preeclampsia include a history of chronic hypertension before pregnancy, a previous history of preeclampsia, a history of preeclampsia in the mother or female relatives, obesity, and even multiple pregnancies. This research also found a correlation between a history of hypertension and preeclampsia. This is in line with Sarli's (2016) study, which included 13 respondents. The study showed no correlation between diabetes mellitus and preeclampsia. In this study, preeclampsia often occurs in pregnancies that experience endocrine and carbohydrate metabolism transformations that lead to gestational diabetes. Other causes include bacteria, genetics, and even viruses.

The Relationship between a History of Diabetes Mellitus and Kidney Disease with Preeclampsia

According to the study findings, the Chi-Square statistical test yielded a p-value of 0.042 (Sig. <0.05), meaning Ho is rejected, indicating a significant correlation between a history of diabetes mellitus and kidney disease with preeclampsia at Tidore City Regional Hospital. Based on the researchers' assumptions, this occurs because a history of chronic disorders causes problems with the placental blood vessels before pregnancy. This increases the incidence of preeclampsia in pregnant women with chronic disorders such as diabetes and kidney disease. A study by Nurhasanah (2020) found that pregnant women with a history of chronic disorders such as diabetes and kidney disease have a twofold higher risk of developing preeclampsia than those without such disorders, due to preexisting problems with placental blood flow. Women with chronic disorders have a higher risk of developing preeclampsia. Preexisting kidney problems increase the risk of adverse pregnancy outcomes, particularly preeclampsia.

Concurrently, a study by Tangren et al. (2018) found a correlation between a history of kidney disease and the incidence of preeclampsia. According to this study, pregnant women with a history of kidney problems had a 2.9 times higher risk of developing preeclampsia than those without them. Preexisting kidney problems are detrimental, particularly increasing the risk of preeclampsia. Pregnancy is associated with high transformations in renal plasma flow, resulting in a 50% increase in the glomerular filtration rate (GFR) during midgestation. Low pregnancy hyperfiltration has been shown to reduce the risk of preeclampsia, prematurity, and even birth burden.

4. CONCLUSION

There is a correlation between parity, occupation, history of hypertension, history of diabetes mellitus and kidney disease with the occurrence of preeclampsia, there is no correlation between age, education, multiple pregnancy with the occurrence of preeclampsia.

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