Risk Factors of Childbirth Complication at Koya Barat Public Health Center, Jayapura City

Theresia Patipeme[a], Hasmi[b*], Semuel Piter Irab[c], Yacob Ruru[d]

[a]Postgraduate Master Program of Public Health, Faculty of Public Health, Cenderawasih University

[b,c]Faculty of Public Health, Cenderawasih University, Jayapura Papua, Indonesia, 99351

[d]Department of Satistics, Faculty of Mathematics and Natural Sciences, Cenderawasih University

[a]Email: theresiahpatipeme@gmail.com; [b]Email: hasmiuncen20@gmail.com

Abstract

Background: Labor complications are a sign of danger that occurs in a pregnant woman at the time of delivery. The incidence of childbirth complications needs to have a good health protection to save the health status of mothers and children according to the standard of delivery assistance that is covered by health workers. **Objective:** The aim of the study was to determine the risk factors for childbirth complications in mothers who gave birth at the Koya Barat Health Center. **Methods:** This research is a type of analytical survey research with a cross sectional approach using secondary data from the 2020 Maternal and Child Health Report (KIA). The population of this study was all mothers giving birth at the Koya Barat Puskesmas from January to December 2020, totaling 261 mothers giving birth. The sampling technique used in this study was total sampling. The data were processed using analysis, Frequency Distribution, Chi-square, Prevalence Ratio Test, Logistic Regression. **Results:** The results of the bivariate analysis found that variables age ($p < 0.01$; RP=1.862; 95%CI: 1.432-2.423), parity ($p = 0.045$; RP=1.385; 95%CI: 1.043-1.841), and Hb level ($p = 0.024$; RP=1.422; 95%CI: 1.059-1.908) has a significant relationship with the childbirth complication at Koya Barat Public Health Center. Meanwhile, education ($p = 0.095$; RP=1.306; 95%CI: 0.984-1.733) has no significant relationship with the childbirth complication at Koya Barat Public Health Center. Based on the results of multiple logistic regression analysis, the most dominant risk factors for childbirth complication at Koya Barat Public Health Center is age ($p < 0.01$; OR = 3.507; 95%CI: 1.922 – 6.401).

Keywords: Childbirth; Complication; Risk Factors.

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* Corresponding author.

1. Introduction

The high maternal mortality rate (MMR) is one of the challenges that must be faced by Indonesia so that it is one of the national priority commitments, namely ending maternal mortality during pregnancy and childbirth. Based on the 2015 Inter-Census Population Survey (SUPAS), Indonesia still ranks 305 per 100 thousand live births. This is very different from Singapore, which has 2-3 MMR per 100 thousand births. Meanwhile, data on the performance achievements of the Indonesian Ministry of Health in 2015-2017 shows that there has been a decrease in the number of cases of maternal death. If in 2015 MMR reached 4,999 cases, in 2016 it decreased slightly to 4,912 cases and in 2017 experienced a sharp decline to 1,712 MMR cases. Even though it has decreased, it seems that MMR is still one of the main focuses of the government in realizing a healthy Indonesian society. The Maternal Mortality Rate (MMR) is currently still far from the Sustainable Development Goals (SDGs) target of 70 per 100,000 live births by 2030. According to the Chair of the Scientific Committee of the International Conference on Indonesia Family Planning and Reproductive Health (ICIFPRH), Meiwita Budhiharsana, until 2019 Indonesia's MMR is still high, namely 305 per 100,000 live births. In fact, Indonesia's target in 2015 is 102 per 100,000 live births [1]. Meanwhile, according to the 2017 Indonesian Health Demographic Survey (IDHS) data, it is stated that for Papua Province the Maternal Mortality Rate (MMR) due to childbirth is quite high with 54 / 100,000 deliveries and 35 / 100,000 live births (IMR) of 35 / 100,000 live births [2], while the cases of maternal deaths in 2018 in Jayapura City were 58 / 100,000 live births [3]. Maternal mortality can occur as a direct result of complications that develop in pregnancy, childbirth or postpartum factors and as an indirect result of deteriorating existing clinical services [4]. The incidence of childbirth complications can be caused by risk factors during pregnancy. Based on the 2012 Basic Indonesian Health Survey (IDHS), the identification of complications associated with childbirth includes prolonged labor, premature rupture of membranes, bleeding, infection, and eclampsia. Meanwhile, the indirect causes are more related to the social, economic, geographic and cultural conditions of the community which are summarized in Four Too (too young, too old, too many children, too tight in pregnancy) and Three Too Late (late in making decisions, too late to bring to the health facilities, late in getting health services). The risk of maternal death can occur from early pregnancy to postpartum / childbirth with the highest risk occurring during the delivery period [5]. The fact is that more than 90 percent of maternal deaths are due to obstetric complications that are often unpredictable at the time of pregnancy. Most of these complications occur at or around delivery. Therefore the recommended approach is to assume that all pregnancies are risky and that every pregnant woman has access to safe delivery assistance and adequate obstetric care [6]. Obstetric complications are complications or diseases that arise in the mother during pregnancy, childbirth and the puerperium. Obstetric complications can actually be prevented, at least they can be mitigated, although 15% -20% of normal pregnancies can turn into complications during delivery. One of the effective ways is early detection of high risk pregnancy by regularly checking with health workers and getting adequate services. Based on the preliminary survey conducted at the Koya Barat Health Center in 2020 there were 261 births, 58% (151) mothers gave birth normally and of all births there were 42% (110) mothers with complications / complications of childbirth in the form of vaginal bleeding, preterm labor, premature rupture of membranes. / duration, fetal distress, multiple presentations, gamelium pregnancy, low placenta, hypertension and asthma, large babies, narrow pelvic deformities (CPD), oligo hydramion, overdue pregnancy, polyhydromion, Mothers with severe anemia, HIV, Rapid Positive Tests.

Seeing the number of deliveries with a fairly large complication, so that the tendency for labor to occur with treatment / referral increases and the number of risk factors associated with it is very much, it is necessary to conduct research to determine the risk factors associated with delivery complications at the Koya Barat Public Health Center.

2. Materials and Methods

This type of research is an analytic survey with a cross sectional approach. This research is a research in which the variables studied, both independent and dependent variables, are measured at the same time [7]. This research was conducted from January 2021 to February 2021. The sampling technique used was total sampling. It is the same with Sugiyono (2019) who said that total sampling can be done if the researcher wants to generalize with a small or relatively small population requirement with minimal errors [8]. The cases in this study were taken from medical record data with a total sample of 261 mothers giving birth. In this study, researchers collected secondary data from the KIA Puskesmas 2020 report. This data was obtained by asking permission from the Jayapura City Health Office and the Koya Barat Puskesmas, Muara Tami District, Jayapura City, which are responsible for collecting KIA data for 2020. The data then analyzed using chi-square for bivariate and multiple logistic regression for the multivariate data analysis.

3. Result and Discussion

3.1. Univariate Analysis

The univariate is used to classify each variable of the sample. This study only shows the frequency and percentage of each variable. This can be found in Table 1:

Table 1: Distribution of respondents based on education, age, parity, Hb level, childbirth complication of birth mother at Koya Barat Public Health Center.

No	Variable	Frequency (n)	Percentage (%)
1	Education		
	Basik (≤ JHS)	86	33.0
	Advanced (> JHS)	175	67.0
2	Age		
	Risky (< 20 and > 35 years old)	65	24.9
	Not risky (20 – 35 years old)	196	75.1
3	Parity		
	≥ 4	72	27.6
	< 4	189	72.4
4	Hb Level		
	Anemia	134	51.3
	Not anemia	127	48.7
5	Childbirth complication		
	Complication	110	42.1
	Normal	151	57.9
Total		261	100.0

Source: Primary Data, 2021

Based on Table 1, this study involved 261 respondents, with a known prevalence of complications of childbirth, which was 42.1%. The frequency distribution of most respondents has advanced education (67%), age is not at risk (73.6%), has parity <4 (72.4%), and has anemia (51.3%).

3.2. Bivariate Analysis

Bivariate analysis was performed to determine the relationship between independent and dependent variables, i.e. education, age, parity, and Hb level. In order to assess the association between the risk factors and the childbirth complication, the chi-square test was used at a significant level of 5%. The results of the bivariate analysis are shown in the Table 2:

Table 2: Summary of the results of the analysis of the relationship between education, age, parity, Hb level with childbirth complication at Koya Barat Public Health Center.

Variables	Childbirth compilcation						p-value	RP	CI (95%)	
	Complication		Normal		Total					
	n	%	n	%	n	%			Lower	Upper
Education							0.095	1.306	0.984	1.733
Basic (≤ JHS)	43	50.0	43	50.0	86	100				
Advanced (>JSH)	67	38.3	108	61.7	175	100				
Age							0.000	1.862	1.431	2.423
< 20 and >35	42	64.6	23	35.4	65	100				
20 – 35 years old	68	34.7	128	65.3	196	100				
Parity							0.045	1.385	1.043	1.841
≥ 4	38	52.8	34	47.2	72	100				
< 4	72	38.1	117	61.9	189	100				
Hb level							0.024	1.422	1.059	1.908
Anemia	66	49.3	68	50.7	134	100				
Not anemia	44	34.6	83	65.4	127	100				

Source: Primary Data, 2021

3.2.1. The Relationship between Education and the Childbirth Complication

The results of the analysis of the relationship between education and the incidence of childbirth complications indicated that 42 (48.8%) mothers with basic education experienced birth complications. Meanwhile, among mothers with further education there were 68 (38.9%) who experienced birth complications. Chi-square test

results obtained p-value = 0.095> α (0.05), it can be concluded that there is no relationship between maternal education and the incidence of childbirth complications at the Koya Barat Community Health Center. The prevalence ratio (RP) of education to the incidence of complications of childbirth at Puskesmas Koya Barat is more than 1, which is 1.306 with a 95% CI (0.984-1.733). This means that mothers with primary education have a 1.3 times greater risk of experiencing delivery complications than mothers with advanced education. Although the 95% CI of the OR was not significant.

3.2.2. The Relationship between Age and the Childbirth Complication

The relationship between age and delivery complications shows that mothers who give birth with age at risk, namely those aged <20 years and> 35 years have the potential to experience labor complications. Mothers with age <20 years and> 35 years, 56.5% experienced labor complications. The results of the chi-square test obtained p-value = 0.000 ≤ α (0.05), it was concluded that there was a significant relationship between maternal age and the incidence of labor complications in mothers who gave birth at the Koya Barat Community Health Center. The prevalence ratio (RP) of maternal age <20 years and> 35 years of the incidence of complications of childbirth at the Koya Barat Community Health Center is 1.862 with a 95% CI (1.432-2.423). This means that mothers with age at risk (age <19 years and> 35 years) have a 1.862 times greater risk of experiencing labor complications than mothers aged 20 - 35 years.

3.2.3. The Relationship between Parity and the Childbirth Complication

The relationship between parity and delivery complications shows that mothers who give birth with a number of children ≥4 are likely to have the potential to experience labor complications. Mother who gave birth with labor complications were 52.8%. The results of the chi-square test obtained p-value = 0.045 ≤ α (0.05), it was concluded that there was a significant relationship between parity and the incidence of labor complications in mothers who gave birth at the Koya Barat Public Health Center. The prevalence ratio (PR) of parity to the incidence of complications of childbirth at Koya Barat Public Health Center is 1.385 with 95% CI (1.043-1.841). This means that mothers with a number of children ≥4 have a risk of 1.385 times greater to experience delivery complications than mothers with a number of children <4.

3.2.4. The Relationship between Hb level and the Childbirth Complication

The association between hemoglobin levels and complications of delivery shows that women with anemia are most likely to have the potential for complications of delivery. 50% of mothers who gave birth with anemia experienced birth complications. The results of the Chi-Square test obtained p-value = 0.024 ≤ α (0.05), it was concluded that there was a significant relationship between Hb levels and the incidence of labor complications in mothers who gave birth at the Koya Barat Public Health Center. The prevalence ratio (PR) of anemia to the incidence of complications of childbirth at Puskesamas Koya Barat is 1.422 with a 95% CI (1.059-1.908). This means that mothers who give birth with anemia have a risk of 1.422 times greater to experience delivery complications than mothers who are not anemic.

3.3. Multivariate Analysis

Multivariate analysis used in this study was multiple logistic regressions. This analysis is a mathematical model used to study the relationship between two or several independent variables and one dichotomous dependent variable. This analysis was intended to determine the most dominant risk factors for childbirth complication at Koya Barat Public Health Center. The results of multivariate analysis can be found in Table 3.

Table 7: The result of Multiple Logistic Regression Analysis with Backward LR Method between Independent Variables on Childbirth Complication at Koya Barat Public Health Center.

Covariate	B	p	OR	95%CI	
Step-1					
Education	0.199	0.510	1.220	0.675	2.206
Age	1.229	0.000	3.419	1.868	6.270
Parity	0.545	0.082	1.724	0.932	3.189
Hb level	0.666	0.013	1.947	1.152	3.288
Constant	-1.438	0.000	0.237		
Step-2					
Age	1.255	0.000	3.507	1.922	6.401
Parity	0.618	0.036	1.855	1.043	3.301
Hb level	0.659	0.014	1.933	1.146	3.263
Constant	-1.374	0.000	0.253		

Source: Primary Data, 2021

Based on the results of multiple logistic regression analysis, the most dominant risk factors for Childbirth Complication at Koya Barat Public Health Center is age ($p < 0.01$; OR = 3.507; 95%CI: 1.922 – 6.401).

4. Discussion

In discussing the results of this study, the researcher describes the explanation of the relationship between variables. Although it cannot explain the causal relationship, by doing multivariate analysis it is hoped that it can provide a fairly good analysis of the determinants of the incidence of delivery complications in mothers who give birth at the Koya Barat Public Health Center.

4.1. The Relationship between Education and the Childbirth Complication

Suharjo (2007) in [9], states that education is formal education that forms values for someone to accept new things. The level of education has an effect on changes in attitudes and behavior in healthy life. A higher level of education will make it easier for a person or society to absorb information and implement it in everyday life, especially in terms of health. The level of education can be differentiated based on several levels, first, initial basic education for 9 years (SD / equivalent and SMP / equivalent), second, further education. This further education includes the secondary level (SMA / equivalent) and higher education including diplomas, undergraduate, masters, doctors and specialists organized by universities (Notoatmojo, 2003) in [9]. Based on

the frequency distribution, it is known that mothers giving birth at the Koya Barat Health Center, most of them have advanced education, namely 175 respondents (67%) and basic education as many as 86 respondents (33%). The results of statistical analysis, both bivariate and multivariate, show that there is no relationship between maternal education and the incidence of complications in childbirth, so the hypothesis that education is a risk factor for labor complications is not proven. The results showed that the level of education was not related to the incidence of complications of childbirth, this was indicated by the characteristics of the respondents, most of whom had advanced education but the incidence of complications in childbirth was still high. This can happen because mothers with further education (SMA and PT) do not always affect knowledge and behavior in maintaining the health of themselves and their families, especially in pregnancy care and nutritional intake during pregnancy. In addition, the incidence of complications of childbirth is not only caused by the level of education of the mother but can be caused by obstetric history, total parity, accompanying medical and pathophysiological history, so that the mother experiences a risky pregnancy. According to Fajrin (2009) without being balanced with the awareness of mothers to check their pregnancies and not trying to carry out early detection of dangers during pregnancy, it will not guarantee mothers with further education not to experience complications during delivery [10]. The results of this study are not in line with Armagustini (2010) which states that education is a contextual determinant (distant determinant) in maternal morbidity and mortality [11]. This determinant will affect the access and utilization of health services. Mothers who have tertiary education will pay more attention to the health of themselves and their families and seek antenatal care if pregnant, and choose birth attendants with health workers. It is easier for them to get and receive the information given regarding their health and pregnancy.

4.2. The Relationship between Age and the Childbirth Complication

Maternal age is a factor in reproductive status. The optimal reproductive age for a mother is between 20 - 35 years, below and above this age will increase the risk of pregnancy and childbirth. Based on table 1, most of the mothers who gave birth at the Koya Barat Health Center were not at risk, namely between 20 and 35 years. Maternal at risk age was 69 (26.4%) and age without risk was 192 (73.6%). The results of the bivariate analysis showed that there was a significant relationship between maternal age and the incidence of childbirth complications ($p = 0.007$, RP = 1.528). In this study, it was found that the characteristics of mothers with a relatively young age <20 years (as many as 31 pregnant women or 12%) who experienced labor complications. There are many problems that arise in pregnancies under the age of 20 years at the Koya Barat Health Center, which experience complications of childbirth, including anemia, HEG, KEK, CPD, STIs and psychological problems of prospective mothers to accept their pregnancies, especially those with pregnancies outside marriage. In addition, it was found that the characteristics of mothers with age> 35 years (as many as 37 or 14%) were at risk of experiencing complications of childbirth with the discovery of problems in pregnancy, including hypertension, HEG, anemia, mothers with parity ≥4 and mothers feeling tired more quickly. The age of the mother who is too young, less than 20 years, still does not have a mature reproductive organ and the uterus is not yet perfect for pregnancy and childbirth so that it can be detrimental to the mother's health and fetal development and growth, while for mothers who are too old more than 35 years it is possible to have complications. obstetrics because reproductive health has decreased and the mother is too weak to push during childbirth [5]. This is in accordance with the research of Mappaware (2019) which states that at a young age a

woman's reproductive organs are not yet perfect as a whole and her mental development is immature so that she is not ready to become a mother and accept her pregnancy, which can result in obstetric complications that can increase the number. maternal and perinatal mortality [12]. The results of bivariate and multivariate analysis showed that maternal age was significantly associated with the incidence of labor complications. Maternal age less than 20 years and more than 35 years is a risk factor for complications of childbirth.

4.3. The Relationship between Parity and the Childbirth Complication

Parity is the number of deliveries a mother has experienced before her current pregnancy or delivery. The frequency distribution of mothers with parity ≥ 4 was 72 (27.6%) and mothers with parity <4 were 189 (72.4%). The results of the bivariate statistical analysis showed that there was a relationship between parity and the incidence of labor complications (p = 0.045). Furthermore, the multivariate obtained parity as a risk factor (p = 0.036). Maternal who gave birth with parity ≥4 had a risk of 1.385 times for experiencing complications of delivery than mothers with parity <4 (RP = 1.385). At the Koya Barat Puskesmas it was found that most of the women with parity of ≥ 4 times were more than 35 years old, had a birth interval of <2 years and> 10 years and mothers with a bad obstetric history in previous pregnancies such as abortion and a history of CS. The number of parity ≥ 4 times and having a risk age makes the mother more at risk for experiencing complications of childbirth. This study supports the results of previous research conducted by Damayanti (2014) that mothers who give birth with parity ≥ 4 people tend to be 2.3 times (OR = 2.3) higher to experience labor complications than mothers who give birth with parity <4 people [13]. According to Carmo and his colleagues (2016), the number of previous deliveries was related to preterm delivery (p-value> 0.05) [14]. According to Armagustini (2010), reproductive status factors associated with the incidence of labor complications are parity of one or more children with four children, pregnancy complications and a history of previous birth complications [11]. A mother who gives birth frequently has the risk of experiencing complications of childbirth in subsequent pregnancies if she does not pay attention to nutritional needs. A parity number of 1 or more than 4 is very risky for the incidence of complications at the time of delivery. Because during pregnancy, the nutrients will be divided between the mother and the fetus she is carrying [10]. According to Prawirohadjo (2010) women with parity of four or more have the risk of experiencing post partum bleeding because the uterine muscles are too tense and can not contract normally [15]. The risks experienced when the mother gives birth more than 4 times are uterine rupture, prolonged labor and bleeding [16]. A mother who has had 6 or more pregnancies is more likely to have weak contractions at the time of delivery (due to weak uterine muscles); bleeding after childbirth (due to weak uterine muscles); rapid delivery which can increase the risk of heavy vaginal bleeding; placenta previa (low placenta) [5].

4.4. The Relationship between Hb level and the Childbirth Complication

Hb level is an indicator of a person's nutritional status. Anemia is a condition of low Hb levels so that the oxygen carrying capacity for the needs of vital organs is reduced. This condition, especially in pregnant women, greatly affects the condition of the fetus that is conceived and the labor process is experienced. Based on the results of the frequency distribution, the number of mothers giving birth who experienced anemia was 134 (51.3%) and women who gave birth who were not anemia were 127 (48.7%). The results of the bivariate and

multivariate analysis found a significant relationship between Hb levels and the incidence of labor complications. Mothers with anemia had a 1.422 times higher risk of experiencing delivery complications than mothers who were not anemic (RP = 1.422). In this study, it was found that mothers experienced anemia caused by factors of the age of pregnant women who were too young, KEK, and due to malaria comorbidities that resulted in the mother experiencing labor complications. This is in line with the results of previous research conducted by Raihanah (2017) that mothers with low Hb levels during pregnancy have an 8.3 times higher risk of experiencing labor complications [17]. In Arisandi's research (2016), it is stated that there is a relationship between nutritional status and labor complications and is the dominant variable [18]. Mothers with low hemoglobin levels are at risk of infection, prolonged labor due to fatigue of the uterine muscles in contraction (uterine inertia), postpartum bleeding due to absence of uterine muscle contractions (uterine atony), shock, abortion, premature birth, and severe anemia can cause decompensation cordis. Hypoxia due to anemia causes shock and maternal death during delivery. Repeated pregnancies in a short time can also be a factor in the mother's anemia because this will deplete the mother's iron reserves. It is important to pay attention to good pregnancy spacing (at least 2 years) so that the mother is ready to receive the fetus again without depleting its iron reserves [15]. According to Islamudin (2010), malaria can increase the incidence of anemia in mothers, which if severe, increases the risk of maternal death. Malaria causes 2-15% of anemia in pregnant women [19].

5. Conclusion

On the basis of the findings of the data analysis and the hypothesis testing, it can be concluded as follows:

1. There is no significant relationship between education and the childbirth complication at Koya Barat Public Health Center ((p = 0.095> 0.05, and RP = 1.306 (CI 95%: 0.984-1.733));

2. There is a significant relationship between age and the childbirth complication at Koya Barat Public Health Center ((p = 0.000 < 0.05, and RP = 1.862 (CI 95%: 1.431-2.423)). The mothers with age at risk (age <19 years and> 35 years) have a 1.862 times greater risk of experiencing labor complications than mothers aged 20 - 35 years;

3. There is a significant relationship between parity and the childbirth complication at Koya Barat Public Health Center ((p = 0.045 < 0.05, and RP = 1.385; (CI 95%: 1.043-1.841)). The mothers with a number of children ≥4 have a risk of 1.385 times greater to experience delivery complications than mothers with a number of children <4;

4. There is a significant relationship between Hb level and the childbirth complication at Koya Barat Public Health Center ((p = 0.024 < 0.05, and RP = 1.422; (CI 95%: 1.059-1.908)). The mothers who give birth with anemia have a risk of 1.422 times greater to experience delivery complications than mothers who are not anemic;

5. The most dominant risk factors for childbirth complication at Koya Barat Public Health Center is age (p < 0.01; OR = 3.507; 95%CI: 1.922 – 6.401).

6. Suggestion

1. For the Koya Barat Community Health Center, it is hoped that: a) Providing quality ANC services

according to Operational Standards (14T examination services) and implementing P4K (delivery planning and complication prevention programs); b) It is hoped that health workers, especially midwives, to promote health education about risky pregnancies and complications of childbirth as well as counseling on balanced nutrition in pregnancy and childbirth as a promotional and rehabilitative effort to control anemia and KEK in pregnant women; c) It is hoped that health workers, especially midwives, screen for risky pregnancies from the start of the ANC visit and be able to apply the pregnancy risk card Puji Rohjati Score as an effort to realize safe delivery as well as a planned referral model in a complete integrated referral system for mothers with childbirth complications (high risk who is still healthy and mothers with obstetric emergency); d) It is hoped that the Public Health Center will promote IEC (Communication, Information, Education) on adolescent reproductive health to reduce the number of early marriages as an initial step to prevent complications of childbirth in adolescents.

2. For the community, it is hoped that it can: a) Meet the nutritional needs of mothers during pregnancy and childbirth by eating a balanced nutritious diet and consuming blood-supplemented tablets.; b) Carry out pregnancy care, have pregnancy checks to health workers; c) Carry out a healthy and safe delivery in a health care facility; d) Spacing subsequent pregnancies using long-term contraceptive methods; e) Terminate pregnancy in mother> 35 with permanent contraception.

3. For the next researcher: a) It is also suggested to increase the number of variables studied outside the variables in this study such as maternal occupation, ANC visits, economic level, premature rupture of membranes, etc.; b) If possible, do further research with a larger sample for validity and reliability as well as generalization of research results. So that completeness, accuracy and thoroughness in obtaining information that can cause bias in measurement can be avoided.

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