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Risk Factor for Postpartum Hemorrhage in The Post-Disaster (2019-2021)

Sitti Radhiah[1]*, Nur Khairul Fatassya[1], Hasanah Hasanah[2], Elvaria Mantao[3]
[1] Department of Reproductive Health, Tadulako University, Indonesia
[2] Department of Epidemiology, Tadulako University, Indonesia
[3] Department of Biostatistics, Family Planning and Population, Tadulako University, Indonesia
*Corresponding author, contact: radhiahkasim@gmail.com

Abstract

The earthquake disaster in Palu in 2018, followed by the pandemic in 2020, caused mobility to be hampered and affected people's habits and lifestyles, who mostly stayed at home and had no activities. This also affected pregnant women who just stayed at home because they were afraid. The impact of the pandemic will result in less physical activity and less interaction with health workers, causing pregnant women to experience macrosomia. This research aims to determine the risk factors for postpartum hemorrhage at Anutapura Public Hospital in Palu. This research was an analytic observational with a case-control approach. Case subjects were mothers who experienced postpartum hemorrhage, and controls were mothers who did not experience postpartum hemorrhage. Case samples were 67 people, and controls were 67 people with age matching. A simple random sampling technique was carried out for sampling. The data source used secondary data, medical records for 2019-2021. Data analysis used the odds ratio test. The results showed that macrosomia (OR=4.543 and CI=1.421-14.528), prolonged labor (OR=3.674 and CI=1.720-7.850), and parity (OR=2.452 and CI=1.199-5.014) a risk factor for postpartum hemorrhage. Postpartum hemorrhage is significantly associated with low-risk macrosomia, low-risk parity, and safe parity.

Keywords: Maternity, Postpartum, Macrosomia, Long Partition, Parity

Key Messages:

- Postpartum hemorrhage is significantly associated with macrosomia, prolonged labor, and parity
- Pregnant women should be encouraged to maintain a healthy lifestyle, including regular physical activity and good nutrition.
- Healthcare providers should be aware of the risk of postpartum hemorrhage in women with macrosomia, prolonged labor, or multiple births. These women should be closely monitored during and after childbirth

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1. Introduction

Maternal mortality and morbidity remain serious health problems in developing countries (1). Maternal Mortality Report, it is estimated that 529,000 women in the world die every year due to complications arising

from pregnancy and childbirth (2). The Inter-Census Population Survey (SUPAS) results in 2015 show that the maternal mortality rate is three times higher than the MDG's target (3). The number of maternal deaths in Central Sulawesi experienced fluctuations in 2017-2021, namely from 166/100,000KH to 207/100,000KH (4). This condition is in accordance with data on the number of maternal deaths in the city of Palu, which continued to fluctuate in 2019-2020; in 2019, there were 8 cases (8.2%); in 2020, there were 6 cases (7.4%); and in 2021, there were 7 cases (6.4%).

Medical record data from the Public Hospital of Anutapura Palu shows that the number of postpartum hemorrhages in 2019-2021 has fluctuated, namely in 2019 (3.6%), in 2020 (7.5%), in 2021 (5.5%) and is still a cause maternal death. The Palu City Government, as the center, reflection, and example for the surrounding districts, is intensively providing health services for married couples to reduce the risk of maternal and child mortality. This is done to prevent too many cases of maternal death.

After the earthquake disaster in Palu in 2018, it was followed by the Covid 19 pandemic in 2020, causing people's mobility to be hampered; this affected the habits and lifestyle of people who mostly stayed at home and did not do activities. This also affects pregnant women who consume foods rich in fat due to the earthquake disaster, which has not yet recovered and coupled with the COVID-19 pandemic, which causes pregnant women to stay at home because they are afraid of the impact of the pandemic and end up doing less physical activity and interacting less with officers. Health ultimately causes pregnant women to experience macrosomia as a risk factor for postpartum hemorrhage in pregnant women (5).

Maternal death is an iceberg phenomenon (6). Many overcome death, but many more end up with permanent disabilities. The most frequent obstetric complications that occur and result in death are bleeding, infection, and eclampsia (7). Postpartum hemorrhage is the main cause of maternal death throughout the world, with an incidence of 5% -10% of all births (8). Large baby weight (macrosomia), length of labor (long labor), and number of live births (parity) in this case are often risk factors that trigger postpartum hemorrhage (8). This research aims to determine the risk factors for postpartum hemorrhage in the work area of the Anutapura Palu General Hospital.

2. Methods

The type of research used was quantitative research with a case-control research design, namely a study design that studies whether or not there is a level of exposure to disease events. In this case, to determine the risk factors for postpartum hemorrhage at the Anutapura General Hospital in 2019-2021. The case population in the study was all mothers giving birth with indications of postpartum hemorrhage recorded in the medical record, namely 81 patients. The sample in this study was 134 mothers who experienced postpartum hemorrhage and mothers who did not experience postpartum hemorrhage with a ratio of 1:1. This sampling was carried out using a simple random sampling technique. The data used in this research was secondary data taken from medical record reports at the Anutapura General Hospital in 2019-2021.

Characteristic data collected and recorded based on medical record information is age in the range 16 – 45 years, education level includes no school, elementary school, junior high school, high school, and university. Types of work are housewife, entrepreneur, honorary, civil servant. Types of Childbirth namely normal, Cesarean. Postpartum hemorrhage is case and control. Gender of infants is female and male. Macrosomia is high and low risk. Prolong Parturition is high and low risk. Parity is safe and not safe.

Data processing used an application based on SPSS Statistics 26, using univariate and bivariate analyses. The data presented was in the form of tables accompanied by narration.

3. Results

Based on the results of research conducted at Anutapura General Hospital, Palu, in 2019-2021, the

distribution of characteristics of mothers who experienced postpartum hemorrhage and mothers who did not experience postpartum hemorrhage was as follows table 1.

Table 1. Characteristics of mothers giving birth

Characteristics of mothers giving birth	n	%
Age (y.o)		
16-20	17	12.7
21-25	21	15.7
26-30	55	33.6
31-35	26	19.4
36-40	19	14.1
41-45	6	4.5
Education		
No schooling	2	1.5
Elementary school	8	6.0
Junior High School	14	10.4
Senior High School	93	69.4
College	17	12.7
Occupation		
Housewife	112	83.5
Entrepreneur	2	1.5
Honorary	10	7.5
Civil Servant	10	7.5
Types of Childbirth		
Normal	87	64.9
Cesarean	47	35.1
Postpartum hemorrhage		
Case	67	50.0
Control	67	50.0
Gender of infant		
Female	63	47.0
Male	71	53.0
Macrosomia		
High risk	19	14.2
Low risk	71	53.0
Prolong Parturition		
High risk	47	35.1
Low risk	87	64.9
Parity		
Safe	82	61.2
Not safe	52	38.8

Source: Secondary Data source from 2019-2021

Table 1 shows the characteristics of mothers giving birth from 134 respondents; the age of 26-30 years is the age most mothers give birth, about 55 people (33.6%). The highest level of education of mothers giving birth is high school level, about 93 people (69.4%); the employment status of the mothers giving birth is mostly

housewives, about 112 people (83.5%). The type of birth of most women giving birth is normal, about 87 people (64.9%).), the sex of the most babies was male, 71 people (53%). The most macrosomia was low risk (< 4000 grams), about 115 people (85.8%). The most prolonged labor was low risk (< 18 hours) as many 87 people (64.9%), and the highest parity was safe (giving birth ≤ 3 times) as many as 82 people (61.2%).

Based on the results of research conducted at Anutapura General Hospital, Palu, in 2019-2021, the risk of macrosomia, prolonged labor, and parity regarding postpartum hemorrhage was obtained as follows table 2.

Table 2 Macrosomia Risk of Postpartum Hemorrhage

	Postpartum hemorrhage				Total	OR (CI 95%)
	Case		Control			
	n	%	n	%		
Macrosomia						
High risk	15	22.0	4	6.0	19	4.543
Low risk	52	78.0	63	94.0	115	(1.421-14.528)
Prolong Parturition						
High risk	33	49.0	14	21.0	47	3.674
Low risk	34	51.0	53	79.0	87	(1.720-7.850)
Parity						
Safe	48	72.0	34	51.0	82	2.452
Not safe	19	28.0	33	49.0	52	(1.199-5.014)
Total	67	100.0	67	100.0	134	

Table 2 shows that respondents who experienced postpartum hemorrhage were more likely to be at low risk (not macrosomia) as many as 52 people (78%) compared to 15 people at high risk (22%). Meanwhile, respondents who did not experience postpartum hemorrhage were more likely to be at low risk (no macrosomia) as many as 63 people (94%) compared to 4 people at high risk (6%). The OR value was obtained based on statistical tests, namely 4.543 (CI 95% 1.421-14.528). Respondents who experienced postpartum were more likely to be at low risk, 34 people (51%) compared to 33 people at high risk (49%). Meanwhile, respondents who did not experience postpartum hemorrhage were more likely to be at low risk, 53 people (74%) compared to 14 people at high risk (21%). Based on statistical tests, the OR value was 3.6 (CI 95% 1.720-7.850). Respondents who experienced postpartum had more safe parity, 48 people (72%), compared to 19 unsafe people (28%). Meanwhile, respondents who did not experience postpartum hemorrhage were more likely to be safe, 34 people (51%) compared to 33 people who were unsafe (49%). Based on statistical tests, the OR value was 2.4 (CI 95% 1.199-5.014).

4. Discussion

Macrosomia Risk of Postpartum Hemorrhage

Macrosomia was defined as birth weight ≥4000 grams (9). Macrosomia is one of the complications in pregnancy that will have a negative impact on labor and when the baby is born if the complication is not detected early and treated immediately (10). The results of research conducted at Anutapura General Hospital showed that mothers who gave birth to babies with macrosomia had a 4.5 times greater risk than mothers who gave birth without macrosomia. This means that mothers who give birth to babies with macrosomia have risks that can threaten the safety of the mother and baby during pregnancy and the birthing process. This condition is caused by the large size of the fetus, causing tension in the uterus from pregnancy to delivery, thus causing myometrial fatigue and disruption of uterine contractions after birth; in normal delivery of babies with macrosomia, it can cause perineal rupture, which can trigger postpartum bleeding.

Wardani's (2017) research shows that there is no relationship between macrosomia and the incidence of

postpartum hemorrhage, with a p-value of 0.185 (11). The results of the study are not in line with research by Anggriani (2020) that there is a significant relationship between macrosomia and the incidence of postpartum hemorrhage (12). This condition is because the uterus experiences overdistension, so it experiences hypotony or uterine atony after delivery. Several conditions of uterine overdistension can also cause uterine atony, namely multiple pregnancies and hydramnios (13).

Afrika research (2021), shows that there is a significant relationship between the birth weight of the baby and postpartum bleeding, this shows that the bigger the baby is born, the higher the incidence of postpartum bleeding (14). Risk factors for macrosomia include maternal diabetes, post-term pregnancy, maternal obesity, multiparity, history of macrosomia, male baby, advanced maternal age, high weight gain during pregnancy, and ethnicity (15). Several things can cause macrosomia, both internal to the mother and external factors to the mother. Internal maternal factors include genetics, diabetes mellitus, maternal BMI, parity, maternal age, and complications experienced by the mother during pregnancy due to the mother's history of illness (16).

Indonesia has a fairly high percentage of macrosomia births, namely 6.4% (15). This figure reaches the world's macrosomia rate, ranging from 6-10%. Risk factors that influence this condition in Indonesia are the high rate of teenage pregnancies, lack of maternal knowledge about proper nutritional intake, and the high rate of obesity in pregnant women. Efforts that can be made to minimize the possibility of macrosomia occurring during childbirth are by reducing the number of early pregnancies, regular and timely prenatal examinations, monitoring the baby's growth and the mother's health condition regularly, controlling risk factors that can increase the possibility of macrosomia, such as gestational diabetes, obesity, and a history of previous large births, maintaining a healthy diet, paying attention to adequate and balanced nutritional intake, maintaining physical fitness by doing light exercise regularly, such as walking or swimming and maintaining blood sugar control in mothers with gestational diabetes.

Risk of Prolonged Parturition on Postpartum Hemorrhage

Prolonged or slow labor lasts more than 24 hours in primi and more than 18 hours in multi. Prolonged labor is a latent phase of more than 8 hours, lasting 12 hours or more. Factors that cause prolonged labor include abnormalities in the fetal position, stage abnormalities, birth defects, incorrect delivery, large fetus or congenital abnormalities, primitua, grandemulti, and premature rupture of membranes. The characteristics of prolonged active labor are that the contractions weaken so that they become less strong, shorter, and less frequent, the quality of the contractions remains as long as before, does not progress or weaken, and on vaginal examination, the cervix does not change. Contractions usually take several hours or days before the woman's cervix opens about 3 or 4 cm. Generally, the prelabor period or latent phase of the first stage of the cervix occurs when contractions begin. Prelabor and a prolonged latent phase of labor indicate a frightening and tiring complication for the mother.

The results of research conducted at Anutapura General Hospital, Palu, showed that mothers who labored > 18 hours had a 3.6 times greater risk of experiencing postpartum hemorrhage compared to mothers who labored > 18 hours. The most common causes are weakness of uterine contractions, large fetal size, and disturbances in the birth canal. Yanti's research (2022) shows that there is no difference in the proportion of postpartum bleeding events between mothers with normal labor and mothers with prolonged labor (17). This means there is no significant relationship between the length of labor and the occurrence of postpartum hemorrhage. From the results of the analysis, the OR value = 1.20 was also obtained, meaning that mothers with long labor had a 1.20 times chance of experiencing postpartum hemorrhage compared to mothers with normal labor(17).

Anggriani's research (2020) shows that there is a significant relationship between prolonged labor and the incidence of postpartum hemorrhage; this is because prolonged labor, both the active phase and the prolonged second stage, affects the mother and fetus due to an increase in the incidence of uterine atony, lacerations, bleeding, infection, maternal fatigue, and shock(12). Mothers giving birth with prolonged labor > 18 hours have a 3.5 times

risk of experiencing postpartum hemorrhage compared to prolonged labor ≤ 18 hours; this shows that prolonged labor is very significant as a risk factor for postpartum hemorrhage. Prolonged labor can cause infection, dehydration in the mother, exhaustion of energy, and postpartum bleeding, which can cause the mother's death (18).

Prolonged labor in mothers giving birth in developed countries, such as the United States and European countries, is relatively rare due to the availability of good medical facilities and care, as well as the existence of strict standards for monitoring and treatment of labor. Prolonged labor will be closely monitored, and if necessary, medical procedures such as induction of labor or cesarean section can be performed to avoid complications for the mother and baby. Prolonged labor in developing countries occurs more frequently due to a lack of access to medical care and a lack of adequate monitoring of labor. Other factors such as poor nutrition, fatigue, and infection can also worsen the mother's condition and prolong the labor process.

One effort that can be made to reduce the possibility of prolonged labor during labor is administering Oxytocin, generally used to maintain uterine contractility during labor and to stop bleeding after delivery (19). Another effort is to improve maternal nutrition and health by providing support and education about healthy eating patterns and appropriate health care to help prevent health problems related to pregnancy and improve healthy birth outcomes (20). Not all prolonged labor should be treated as a medical condition requiring intervention. Prolonged labor can occur due to individual differences in the birthing process and does not require medical treatment as long as the condition of the mother and baby remains stable. It is important for birth mothers and health workers to monitor labor conditions closely and take necessary action if conditions worsen.

Parity Risk of Postpartum Hemorrhage

Parity is the condition of giving birth to children, either alive or dead, but not abortion, regardless of the number of children, and multiple births are only counted as one parity. Parity is the number of pregnancies that are capable of producing a fetus that is capable of surviving outside the womb or a gestational age of 28 weeks (21). Women with high parity are at risk of experiencing uterine atony, which, if not treated properly, will result in postpartum bleeding. This condition also makes it more likely for mothers to undergo labor induction and cesarean section and be referred to other health service facilities.

The results of research conducted at Anutapura General Hospital, Palu, found that mothers who gave birth > 3 times were at risk of experiencing postpartum hemorrhage 2.4 times greater than mothers who gave birth ≤ 3 times. Based on the concept quoted from Manuaba (2010), parity > 3 has a higher incidence of postpartum hemorrhage. The more often a mother gives birth, the more her reproductive function decreases; the uterine muscles are too stretched and less able to contract normally, so the possibility of postpartum bleeding is greater (22). Komariah's research (2019) shows that there is a relationship between parity and the incidence of pregnancy complications in pregnant women in the third trimester at the Aisyiyah Samarinda Mother and Child Hospital, so the higher the risk of parity, the higher the pregnancy complications in pregnant women. Mothers who give birth more than 3 times have a 6.1 times higher risk of postpartum hemorrhage compared to mothers who give birth less than 3 times (23). Afifah's research (2020) shows that mothers with a risk parity >2 have a 2.365 times higher risk of experiencing postpartum hemorrhage than those who are not at risk with parity ≤ 2. Parity, fetal size, and number of pregnancy fetuses do not have a statistically significant relationship with the incidence of postpartum hemorrhage but are empirically significant with the incidence of postpartum hemorrhage (24).

Parity 2-3 is the safest parity in terms of maternal mortality. First parity and more than four parities increase the risk of maternal death. Mortality rates usually increase starting with the fourth birth, and will increase dramatically with the fifth birth and each subsequent child. Mothers who are pregnant for the first time and give birth will be at risk because the mother is not ready medically or mentally, and if parity is more than four, the mother will experience physical setbacks in carrying out her pregnancy.

The risk of maternal death can increase significantly with high parity, especially if there are other health risk factors associated with pregnancy and childbirth. To reduce high parity and reduce maternal mortality, several efforts can be made, including first, education and counseling about family planning, namely by providing education and counseling about appropriate family planning that can help couples determine the ideal time and number of children for their family. , thereby reducing the risk of high parity. Second, access to quality health services, namely efforts to strengthen the health service system and expand access to quality antenatal, delivery, and postpartum services, can help prevent pregnancy complications and improve healthy birth outcomes. Third, advocacy and community participation, involving communities and society in efforts to increase awareness and access to health services and improve the quality of life of mothers and children, can help reduce maternal mortality rates and improve family welfare.

5. Conclusion

Based on the results of the study, it was found that mothers who gave birth with macrosomia were at risk of postpartum hemorrhage 4.5 times greater than women who gave birth without macrosomia. Mothers who gave birth with labor > 18 hours had a risk of postpartum hemorrhage 3.6 times greater than mothers who gave birth less than ≤ 18 hours and women giving birth with >3 births are at risk of experiencing postpartum hemorrhage 2.4 times greater than mothers giving birth ≤ 3 times.

It is recommended that pregnant women pay more attention to the routine prenatal care visit schedule as recommended by midwives or health workers. There is a need to optimize the classes for pregnant women in health facilities in order to help mothers make their births easier. Support from the husband and family is very important in planning a pregnancy so that the mother is better prepared to undergo the pregnancy process.

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