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The Correlation between Occupation and Birth Interval in Primary Postpartum Hemorrhage

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ABSTRACT

Introduction: Postpartum hemorrhage stands as one of the major contributors to maternal mortality globally. Postpartum hemorrhage is a rapid heavy vaginal bleeding that can cause signs and symptoms of hypovolemic shock. Many factors cause postpartum hemorrhage classified into indirect causes, namely type of delivery, age, parity, birth spacing, family income, education, and occupation.

Objective: This study aims to determine the correlation between occupation and birth spacing with primary postpartum hemorrhage.

Method: This study uses a case-control approach with a purposive sampling technique. The sample for this study included multigravida mothers and mothers diagnosed with primary postpartum hemorrhage at Ananda Maternity and Child Hospital, Makassar, in 2021. The total sample was 174 consisting of 84 cases and 84 control samples. The research instrument data is in the form of secondary data, namely medical records. Data analysis employed the chi-square test for bivariate analysis and multiple logistic regression for multivariate analysis, with a significance level of 0.05

Result: The results of the bivariate analysis showed a relationship between occupation (p-value: 0.000) and delivery distance (p-value: 0.000). Working mothers are 6 times at risk for experiencing primary postpartum hemorrhage (OR= 5.833) while mothers whose delivery interval is < 2 years or > 5 years have 4 times the risk (OR= 3.719). The results of the multivariate analysis show that the work and pregnancy distance is significantly related to the risk of postpartum hemorrhage (value P: 0,000) where the odds ratio for work (OR = 6,178) is higher than the distance of pregnancy (OR = 4.008).

Conclusion: Occupational factors and birth spacing are significantly associated with primary postpartum hemorrhage, working mothers have a higher risk of experiencing primary postpartum hemorrhage. Pregnant women and women of childbearing age should receive more education about postpartum hemorrhage and its influencing factors to help prevent and identify it early.

Keywords: Occupation; Birth Spacing; Primary Postpartum Hemorrhage

INTRODUCTION

Postpartum hemorrhage is the loss of blood > 500 cc that occurs after vaginal delivery or > 1,000 ml after abdominal delivery.[1] Based on the time of occurrence, it is classified into primary postpartum hemorrhage if it occurs within 24 hours after delivery and secondary postpartum hemorrhage, namely bleeding after a period of 24 hours to 6 weeks postpartum.[2] Postpartum hemorrhage is a rapid heavy vaginal bleeding that can cause signs and symptoms of hypovolemic shock.[3] Many factors cause postpartum hemorrhage classified into direct causes, namely uterine atony, rupture of the birth canal, placental retention, and placental rest, as well as indirect causes, namely type of delivery, age, parity, pregnancy spacing, family income, education, and employment.[4], [5]

In Indonesia, the Maternal Mortality Rate (MMR) reaches 4482 with primary postpartum hemorrhage as the second cause of 360 causes of death. This needs to be a concern where the causative factors can aggravate the risk of primary postpartum bleeding both the causes of the direct and Indirect.[6] In 2020, the maternal and child mortality rate (MMR) in South Sulawesi province was 95 cases with the highest cause being bleeding with 44 cases followed by hypertension in pregnancy with 30 cases.[7] Based on medical record data at RSIA Ananda, Makassar City for the period January-December 2021, 113 mothers gave birth who experienced primary postpartum hemorrhage.

Pregnant women who work often experience increased fatigue due to heightened physical activity in the workplace[8]. Heavy labor during pregnancy may contribute to postpartum hemorrhage due to insufficient rest time, which prevents proper recovery [9]. Additionally, physical exertion and high stress levels can worsen conditions such as anemia or hypertension—common among pregnant women—thus raising the risk of complications like postpartum bleeding, which prompts many pregnant women to begin leave before delivery[8].

Furthermore, non-ideal birth spacing, such as intervals shorter than two years or longer than five years, can increase the risk of postpartum hemorrhage. In cases of short birth intervals, the mother's body may not have had adequate time to fully recover, leading to potential nutrient deficiencies and heightened susceptibility to complications [10], [11], [12]. Conversely, if the interval between births is significantly prolonged, the uterus may not return to its pre-pregnancy condition, potentially compromising maternal health resilience during the next pregnancy [13], [14]. Both factors can impact maternal immune function during pregnancy and adversely affect both maternal and neonatal health outcomes [15], [16]. Consequently, this study aims to examine the relationship between maternal employment and birth spacing on the incidence of primary postpartum hemorrhage.

METHOD

The method used in this study is observational analytics using a case-control approach. The research design was used to determine the relationship between independent variables, namely occupation and birth spacing, with the dependent variable, namely primary postpartum hemorrhage. The study was conducted in October-December 2022 at the Ananda Hospital for Women and Children in Makassar City and was by ethical feasibility with the number B.328/KEPK/FKIK/X/2022. The population in this study were all mothers in labor who were diagnosed with primary postpartum hemorrhage. Sampling was carried out using a purposive sampling technique with a total sample of 174 consisting of 87 case samples and 87 control samples that met the applicable inclusion and exclusion criteria.

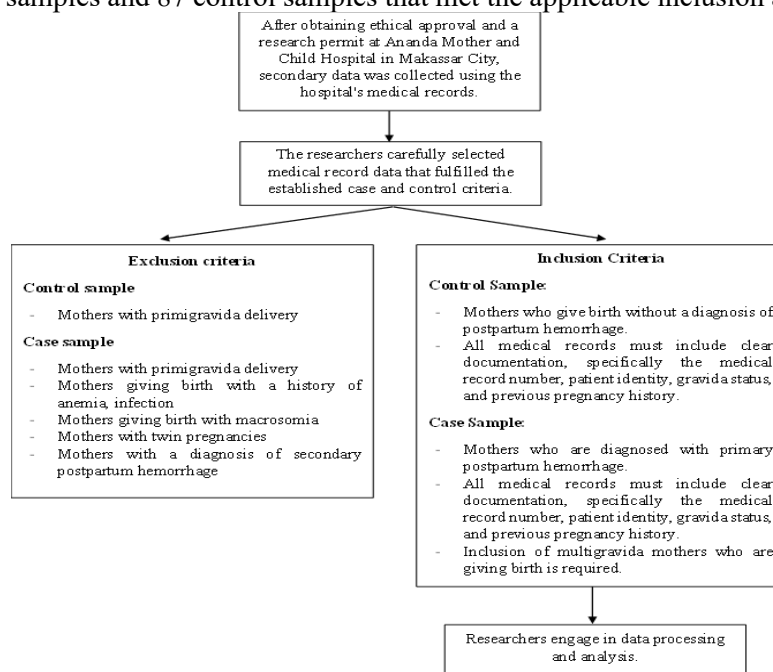


Figure 1. Research flow

This study presents the criteria for inclusion and exclusion of participants in both case and control samples, as illustrated in the research flow (Figure 1). The case sample comprises mothers who delivered and were diagnosed with postpartum hemorrhage at Ananda Maternity and Children's Hospital in Makassar City in 2021. The medical records of these individuals were comprehensive, providing critical information, including medical record numbers, personal identities, gravida status, and prior pregnancy history. Conversely, the control sample consisted of mothers who were not diagnosed with primary postpartum hemorrhage.

To ensure the integrity of the study, specific inclusion and exclusion criteria were established. The exclusion criteria for the case sample included mothers classified as primigravida, those with a history of anemia or infection, those who delivered macrosomic infants, mothers of twins, and individuals who experienced secondary postpartum hemorrhage. Similarly, the control group excluded mothers classified as primigravida. This meticulous selection process was conducted to minimize potential bias and uphold the reliability of the study findings. The data for this study were obtained from medical records at Ananda Maternity and Children's Hospital in Makassar City, Indonesia. The analysis employed univariate methods to assess the frequency distribution of respondent characteristics, dependent variables, and independent variables. Additionally, bivariate analysis was conducted using the chi-square test to evaluate the significance of the relationships between variables. Finally, multivariate analysis incorporated the odds ratio to determine which independent variables exerted the most significant influence on the dependent variable.

RESULT

This study analyzed 174 participants, consisting of 87 cases and 87 controls. Most respondents had low-risk employment or were unemployed, although the majority of employed respondents in the case group were private employees.

Table 1 outlines that, among the 174 participants, the perineal rupture was the primary cause of postpartum hemorrhage, affecting 69 individuals (39.7%). Regarding occupational risk, 78 participants (45.8%) held high-risk jobs, such as civil servants, teachers, lecturers, health professionals, or temporary employees, with a high distribution in these categories at 30 individuals (17.2%). Conversely, low-risk or unemployed mothers comprised 84 participants (48.3%). For birth spacing, 75 mothers (43.1%) had high-risk intervals, with a substantial distribution exceeding five years (70 participants, 40.2%), while low-risk intervals included 99 mothers (56.9%).

Table 1. Distribution of Sample Characteristics

Characteristics of Respondents	F	%
Type of Work		
High Risk	78	45.8
Civil servants/ Teachers/ Lecturers/ Health workers/ Honorary	30	17.2
Private employees	40	23
Self-employed	20	11.5
Low Risk (Housewife)	84	48.3
Birth spacing		
High Risk	78	45.8
< 2 years	30	17.2
> 5 years	40	23
Low Risk	20	11.5
2 – 5 years	84	48.3
Diagnoses		
Primary postpartumhemorrhage	87	50
Atonia uteri	16	9.2

Ruptur perineum	69	39.7
Rest placenta	1	0.6
Retensio placenta	1	0.6
Vaginal birth	87	50
Total	174	100

The data in Table 2 reveals that mothers in high-risk jobs were notably more prevalent among those experiencing postpartum hemorrhage, with 63 participants (72.4%) in this category, showing a significant association (p -value 0.000). The Odds Ratio (OR) of 5.833 at a 95% Confidence Interval suggests that working mothers face a 5.8 times higher risk of postpartum hemorrhage than those who are unemployed. Moreover, high-risk birth intervals were more common in the case group (51 participants, 58.6%), with a significant relationship confirmed by a p -value of 0.000.

Table 2. Analysis of the relationship between occupation and birth spacing with primary postpartum hemorrhage at Ananda Maternity and Child Hospital, Makassar, Indonesia

Variabels	Case		Control		Total		p -value	OR	CI 95%	
	N	%	n	%	n	%			Lower	Upper
Birth spacing										
High risk	51	58.6	24	27.6	75	56.9	0.000	3.719	1.971	7.016
Low risk	36	41.4	63	72.4	99	43.1				
Occupation										
High risk	63	72.4	27	31	90	51.7	0.000	5.833	3.034	11.216
Low risk	24	27.6	60	69	84	48.3				

DISCUSSION

Relationship between Occupation in Primary Postpartum Hemorrhage

Analysis of the relationship between work and the incidence of primary postpartum hemorrhage showed an Odds Ratio (OR) value of 5.833. This shows that women with high-risk jobs are 5.833 times more likely to experience primary postpartum hemorrhage compared to women who do not work or are housewives. Thus, it can be concluded that there is a relationship between work and the incidence of primary postpartum hemorrhage. This study is supported by Pitriani's 2017 study at Arifin Achmad Hospital, Riau Province with a sample size of 144 samples consisting of 72 case samples and 72 control samples. The results of the study showed that work was related to the incidence of postpartum hemorrhage with an Odds Ratio value of 7.600 (95% CI = 3.587-16.101) and a p value of 0.000 [17].

The relationship between postpartum hemorrhage (PPH) and maternal work needs to be considered, especially in contexts involving heavy physical activity or high stress levels. Performing heavy work during pregnancy can increase the risk of PPH, as it affects the mother's energy and nutrient reserves, which are essential for maintaining a healthy pregnancy and preparing for labor.[18] Women who perform heavy physical tasks during pregnancy can develop conditions such as anemia and hypertension, which are often the result of fatigue and inadequate nutrition. Both anemia and hypertension are known to be significant risk factors for PPH. Anemia can compromise the immune system and interfere with blood clotting, while hypertension can put extra pressure on blood vessels during labor, leading to a greater risk of postpartum hemorrhage. These conditions pose serious health risks to both the mother and the newborn.[19]

Relationship between Birth Spacing in Primary Postpartum Hemorrhage

The Odds Ratio (OR) for the birth interval variable concerning the incidence of primary postpartum hemorrhage is 3.719. This indicates that mothers with high-risk birth intervals are 3.719 times more likely to experience primary postpartum hemorrhage compared to those with low-risk birth intervals. The lower limit (LL) and upper limit (UL) values at a 95% confidence interval (95% CI = 1.971-7.016) with a p -value of $0.000 < 0.05$ suggest a significant relationship between birth intervals and the incidence of primary postpartum hemorrhage.

This finding is supported by research conducted by Tangahu et al. in 2018 at Undata Palu Hospital, which included a sample size of 74 participants divided into 37 cases and 37 controls. Their study also concluded that birth intervals are associated with primary postpartum hemorrhage, as indicated by a chi-square test result that

demonstrated a p-value < 0.001 . [12] Additionally, a study by K. Irene Martha et al. in 2018 at Temanggung District Hospital, which included 110 participants (55 cases and 55 controls), found a similar relationship, reporting an OR of 2.67 (95% CI = 1.14-6.26, $p = 0.022$). [20] Strengthening this evidence, research by Jena et al. in 2022 in urban areas of southern Ethiopia showed that over half (66%) of cases of primary postpartum hemorrhage were linked to birth spacing of less than 24 months (AF = 66.3%, 95% CI: 37.5-82.5%).

The findings indicate a clear relationship between birth spacing and the incidence of primary postpartum hemorrhage. Close pregnancy spacing negatively impacts both maternal and fetal health. [21] The uterus typically requires about six months to recover after delivery; however, if pregnancies occur too soon, uterine contractions may not be optimal, leading to an increased risk of complications, including postpartum hemorrhage. [22] Conversely, birth intervals that are too far apart can also pose risks for maternal morbidity, with some studies suggesting that they are linked to conditions such as preeclampsia, bleeding, and intrapartum fever. [12] It is recommended to maintain birth intervals of 24 to 60 months to minimize these risks. [18]

Furthermore, the analysis showed a strong relationship between job acquisition and primary postpartum hemorrhage, with a p-value of 0.000 and an OR of 6.178 (95% CI = 3.076-12.412). This association demonstrates how socioeconomic status and the activities of pregnant women can affect their health. Limitations in socioeconomic resources may hinder a mother's access to proper antenatal care and adequate nutrition, while additional job responsibilities can increase physical stress, potentially leading to fatigue during pregnancy. These physical demands may, in turn, contribute to the risk of postpartum hemorrhage. [17]

It is important to note that this study had limitations, such as the reliance on data from medical records, which may affect data validity. Additionally, other potentially relevant factors, such as delivery type, maternal age, parity, birth spacing, family income, education, and occupation, were not examined, which could influence the study's results. To aid in prevention and early identification of postpartum hemorrhage, pregnant women and those of childbearing age should receive education on the condition and the various influencing factors.

CONCLUSION

This study's findings indicate a significant relationship between employment status and birth spacing in relation to primary postpartum hemorrhage. It has been observed that working mothers face a higher risk of experiencing this condition. Consequently, it is essential to prioritize optimal antenatal care and effective family planning strategies to space pregnancies appropriately. These measures not only facilitate readiness for childbirth but also help prevent complications, particularly postpartum hemorrhage. Therefore, it is advisable for working mothers to manage their professional responsibilities during pregnancy and ensure that they maintain adequate nutritional intake to support their energy requirements during this critical period.

SUGGESTION

For future research initiatives, it is essential to undertake ongoing studies to investigate the relationship between occupational types and the incidence of primary postpartum hemorrhage (PPH). Furthermore, examining additional factors that may contribute to the occurrence of primary PPH will help to establish a more comprehensive understanding of how specific jobs may influence these outcomes. This research could ultimately provide valuable guidance for pregnant women concerning occupational considerations.

In light of the limitations identified in this study, it is recommended that hospitals enhance and modernize their medical record systems. Improved documentation practices will facilitate more robust research based on accurate medical data. Additionally, health professionals are integral to promoting the health of pregnant women and women of childbearing age. By offering thorough education on postpartum hemorrhage and its contributing factors, they can significantly aid in the prevention and early identification of bleeding, thereby ensuring the health and safety of both mothers and their infants.

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