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Factors Associated with Birth Asphyxia among Newborns at H. Damanhuri Barabai Regional General Hospital, Hulu Sungai Tengah

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Abstract: Introduction: Birth asphyxia remains a significant neonatal health problem because it may lead to hypoxia, metabolic acidosis, morbidity, and neonatal mortality. Maternal characteristics are important risk indicators that can be identified during pregnancy and childbirth. Objective: This study aimed to analyze the association between maternal age, parity, and a history of hypertension during pregnancy with birth asphyxia among newborns at H. Damanhuri Barabai Regional General Hospital, Hulu Sungai Tengah. Methods: This research used a descriptive correlational design with a cross-sectional approach. The study sample consisted of 310 newborns selected using purposive sampling based on inclusion and exclusion criteria. Secondary data were obtained from the newborn and maternal registers, then processed using Microsoft Excel and analyzed using the Chi-square test with SPSS version 29. Results: Birth asphyxia was identified in 96 newborns (31.0%). Maternal age was significantly associated with birth asphyxia ($p<0.001$), as were parity ($p<0.001$) and a history of hypertension during pregnancy ($p<0.001$). Conclusion: Maternal age, parity, and a history of hypertension during pregnancy were significantly associated with the occurrence of birth asphyxia among newborns. Strengthening early risk detection during antenatal and intranatal care is needed to reduce preventable neonatal complications.

Keywords: birth asphyxia; hypertension in pregnancy; maternal age; newborn; parity

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Introduction

Neonatal health remains a central priority in global and national health development. The Sustainable Development Goals emphasize the reduction of preventable neonatal deaths, while the neonatal period continues to be the most vulnerable phase of life. In Indonesia, a substantial proportion of infant deaths occurs during the neonatal period, and respiratory disorders as well as intrapartum complications remain important causes of neonatal mortality. A national analysis of the 2017 Indonesia Demographic and Health Survey found that delivery complications were associated with neonatal mortality after maternal age, antenatal care visits, birth weight, and infant sex were controlled, indicating the importance of early recognition of maternal and intrapartum risks (Anisa et al., 2022; Kementerian Kesehatan Republik Indonesia, 2024; World Health Organization, 2024).

Birth asphyxia is a condition in which a newborn fails to breathe spontaneously and regularly after birth. This condition may cause hypoxia, hypercarbia, and metabolic acidosis and requires prompt neonatal assessment and management. The APGAR score is commonly used as an early clinical indicator to assess neonatal adaptation after birth, although interpretation should also consider the newborn's overall clinical condition. From an obstetric perspective, impaired uteroplacental perfusion, prolonged fetal distress, and intrapartum hypoxia are important mechanisms underlying birth asphyxia (Cunningham et al., 2022; Kosim et al., 2014; Manggiasih & Jaya, 2022; Proverawati & Ismawati, 2010; Saifuddin et al., 2014; Sukarni & Sudarti, 2014; Weiner & Zaichkin, 2021; Wiknjosastro et al., 2014). Several studies have reported that maternal and obstetric factors are associated with birth asphyxia. Maternal age outside the optimal reproductive period may reflect biological immaturity or declining reproductive function, while high-risk parity may accompany obstetric complications. Local studies also reported associations of maternal age and parity with preeclampsia during labor and cesarean delivery. Although these outcomes are not equivalent to birth asphyxia, they indicate that age and parity may cluster with obstetric conditions that can affect fetal status during labor. Hypertension during pregnancy, including preeclampsia and eclampsia, may reduce

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uteroplacental blood flow and oxygen transfer to the fetus, thereby increasing the risk of fetal hypoxia and neonatal respiratory depression (Amalia et al., 2024; Ayebare et al., 2022; Lake et al., 2024; Norbaiti et al., 2024; Rustan, 2022; Sakunti et al., 2024; Sari et al., 2024; Sumantia et al., 2024).

At H. Damanhuri Barabai Regional General Hospital, Hulu Sungai Tengah, birth asphyxia remains a clinically relevant neonatal problem. Preliminary hospital data showed that asphyxia cases were still present each year and tended to increase in the latest observation period. Therefore, this study focused on maternal age, parity, and a history of hypertension during pregnancy as factors that can be identified from routine hospital records. Evidence on standardized antenatal care education and national data on delivery complications supports early recognition of maternal risk and timely preparation for neonatal care (Anisa et al., 2022).

Method

This study used a descriptive correlational design with a cross-sectional approach. This design was selected because the independent variables and the dependent variable were measured within the same observation period, making it appropriate to identify statistical associations between maternal risk factors and birth asphyxia (Creswell & Creswell, 2023). The research was conducted at H. Damanhuri Barabai Regional General Hospital, Hulu Sungai Tengah, South Kalimantan, from May to June 2026. The study population consisted of all newborns delivered at the hospital from January to December 2025 who fulfilled the predetermined inclusion and exclusion criteria. A total of 310 newborns were selected using purposive sampling after sample size calculation with the Slovin formula (Roflin et al., 2021).

The dependent variable was birth asphyxia, defined based on an APGAR score below 7 and/or an asphyxia diagnosis recorded in the medical register. The independent variables were maternal age, parity, and a history of hypertension during pregnancy. Data were collected from newborn and maternal registers using a structured data collection format, followed by editing, coding, entry, cleaning, and tabulation. Data validity was strengthened through double-checking a random subset of records. The data were analyzed using univariate analysis to describe frequency distributions and bivariate analysis using the Chi-square test at a significance level of 0.05 with SPSS version 29 (Morgan et al., 2020; Norfai, 2022; Wibowo, 2017). Ethical clearance was obtained before data collection with approval number 0128226371.

Results and Discussion

The study identified birth asphyxia in 96 of 310 newborns (31.0%). This proportion describes the selected sample rather than the incidence among all hospital births, but it confirms that asphyxia remains clinically important at the study site. Birth asphyxia reflects impaired fetal or neonatal oxygenation before, during, or immediately after delivery, which may disrupt the newborn's early respiratory adaptation. A local study involving 336 respondents at Dr. H. Moch. Ansari Saleh Hospital in Banjarmasin likewise reported significant associations between maternal age, parity, premature rupture of membranes, low birth weight, and neonatal asphyxia (Kosim et al., 2014; Cunningham et al., 2022; Tunggal et al., 2022). The Chi-square test showed a significant association between maternal age and birth asphyxia ($p<0.001$). Asphyxia occurred in 51.9% of newborns whose mothers were aged <20 or >35 years, compared with 20.4% among mothers aged 20-35 years. Pregnancy before age 20 may coincide with incomplete biological and psychological readiness, whereas pregnancy after age 35 is more frequently accompanied by declining physiological function, comorbidities, placental disorders, hypertension, and difficult labor. These complications can reduce fetal oxygen supply near delivery and increase the risk of impaired respiratory adaptation after birth (Alsharif et al., 2024; Sumantia et al., 2024).

Maternal age should not be interpreted as a single direct cause of asphyxia. Local studies reported associations of maternal age with preeclampsia during labor and cesarean delivery. Because neither study assessed birth asphyxia, these findings are used as contextual evidence that age-related risk may coexist with obstetric complications, rather than as direct proof of neonatal asphyxia. Studies that directly examined birth asphyxia have also produced different findings across populations, possibly because of differences in sample characteristics, referral patterns, inclusion criteria, obstetric complications, and the confounding variables considered. Maternal age should therefore be treated as an early risk marker that prompts assessment of accompanying maternal and intrapartum conditions (Amalia et al., 2024; Norbaiti et al., 2024; Sakunti et al., 2024; Sari et al., 2024).

Parity was also significantly associated with birth asphyxia ($p<0.001$). Asphyxia occurred in 47.2% of newborns in the high-risk parity group, comprising primiparous and grand multiparous mothers, compared with 20.3% in multiparous mothers. First births may be more vulnerable to prolonged labor, malpresentation, anxiety, and operative intervention, while very high parity may be accompanied by reduced uterine tone, placental disorders, abnormal fetal position, and hemorrhagic complications. An analysis of 8,888 deliveries identified parity as an

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important predictor of birth asphyxia, particularly in first-time mothers. Local studies also associated parity with preeclampsia and cesarean delivery; these outcomes differ from asphyxia but support closer intrapartum assessment of women with high-risk parity. Thus, parity is more appropriately interpreted as a marker of intrapartum complications that may interfere with fetal oxygenation, rather than as an isolated cause of asphyxia (Amalia et al., 2024; Darsareh et al., 2023; Norbaiti et al., 2024; Sari et al., 2024).

A history of hypertension during pregnancy showed the largest difference in proportions. Asphyxia occurred in 57.1% of newborns whose mothers had hypertension, preeclampsia, or eclampsia, compared with 25.2% among mothers without such a history (p<0.001). Hypertensive disorders can cause vasospasm and impaired uteroplacental perfusion, thereby reducing blood flow, oxygen, and nutrient transfer to the fetus. If this condition persists or worsens during labor, the fetus may develop intrauterine hypoxia and be born with respiratory depression or a low APGAR score. Research on preeclampsia during labor has also shown that maternal age and parity are related to preeclampsia, supporting the need to identify women at risk of hypertensive disorders; however, that study did not directly assess birth asphyxia. Direct evidence from Maros and a machine-learning analysis of 8,888 deliveries identified maternal hypertension and preeclampsia as relevant predictors of neonatal asphyxia (Amalia et al., 2024; Darsareh et al., 2023; Sarifuddin et al., 2023). The relationship is not explained by elevated blood pressure alone. In preeclampsia, placental vascular dysfunction can further restrict fetal oxygenation, and the risk rises when hypertension is severe or accompanied by organ dysfunction. A Vietnamese hospital study reported that diastolic pressure of at least 110 mmHg increased the likelihood of adverse perinatal outcomes and that 10.2% of infants born to women with hypertensive disorders had a five-minute APGAR score below 7. However, the present dataset grouped chronic hypertension, preeclampsia, and eclampsia together and did not record onset, severity, treatment, or fetal surveillance, so differences among hypertensive disorders could not be evaluated (Thi Huyen Anh et al., 2024).

These findings support consistent maternal risk screening from antenatal care through labor. Mothers with high-risk age, high-risk parity, or hypertension require closer monitoring of blood pressure, preeclampsia warning signs, fetal well-being, and labor progress, as well as timely referral and readiness for neonatal assessment and resuscitation. Local studies on standardized antenatal care education and midwife-assisted newborn care support continuity of education and maternal-newborn care before and after birth, although they should not be interpreted as direct evidence of the causes of asphyxia. The cross-sectional design, purposive sampling, secondary records, and bivariate analysis mean that the results demonstrate associations rather than direct causation or independent effects. Future studies should distinguish the types and severity of hypertension and use multivariable analysis to control for gestational age, birth weight, mode of delivery, fetal distress, placental disorders, and other intrapartum factors (Darsareh et al., 2023; Thi Huyen Anh et al., 2024; Ulfah et al., 2021).

Table 1. Distribution of birth asphyxia and maternal risk factors

Variable	Category	Frequency	Percentage
Birth asphyxia	Asphyxia	96	31.0
	No asphyxia	214	69.0
Maternal age	At risk (<20 or >35 years)	104	33.5
	Not at risk (20-35 years)	206	66.5
Parity	At risk (primipara or grand multipara)	123	39.7
	Not at risk (multipara)	187	60.3
History of hypertension	Yes	56	18.1
	No	254	81.9

The results in Table 1 indicate that most newborns did not experience birth asphyxia. The maternal profile also shows that most mothers were in the non-risk age category, had non-risk parity, and had no recorded history of hypertension during pregnancy.

Table 2. Association between maternal risk factors and birth asphyxia

Variable	Category	Asphyxia n (%)	No asphyxia n (%)	p-value
Maternal age	At risk	54 (51.9)	50 (48.1)	<0.001
	Not at risk	42 (20.4)	164 (79.6)	
Parity	At risk	58 (47.2)	65 (52.8)	<0.001
	Not at risk	38 (20.3)	149 (79.7)	
History of hypertension	Yes	32 (57.1)	24 (42.9)	<0.001
	No	64 (25.2)	190 (74.8)	

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The bivariate results in Table 2 show that maternal age, parity, and a history of hypertension during pregnancy were significantly associated with birth asphyxia. Newborns from mothers in the risk categories had a higher proportion of asphyxia than those from mothers in the non-risk categories.

Conclusion

Maternal age, parity, and a history of hypertension during pregnancy were significantly associated with birth asphyxia among newborns at H. Damanhuri Barabai Regional General Hospital. These findings support the need for early maternal risk identification, more intensive antenatal monitoring, and better preparedness for neonatal care during delivery, particularly among mothers with identifiable obstetric risks.

Declaration of Generative Ai

The author declares that this work was independently created and written without the assistance of generative artificial intelligence (AI) or automated content creation tools.

Authors' Contribution

All authors contributed equally to every aspect of this research, from the initial study design and data collection to the analysis, interpretation, manuscript preparation, and critical revisions. All authors have read and approved the final version for submission.

Conflict of Interests Statement

The authors declare no conflict of interest.

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Data Availability

The dataset presented in the study is available on request from the corresponding author during submission or after publication.

Informed Consent

Written informed consent was obtained from the participants.

References

Alsharif, A., Almatary, A. M., Ahmed, F., & Badheeb, M. (2024). Perinatal birth asphyxia among newborns at Jiblah Public Health Hospital in Ibb City, Yemen, during six years of conflict and its predictive factors: A retrospective cross-sectional study. Cureus, 16(2), e54100. https://doi.org/10.7759/cureus.54100

Amalia, R., Fathony, Z., Riska, R., & Hamidah, H. (2024). Determinants of risk factors for preeclampsia occurrence during labor. ProHealth Journal, 21(2), 74–78. https://doi.org/10.59802/phj.2024212145

Anisa, N., Astuti, A. W., & Hakimi, M. (2022). Correlation between complications during delivery and neonatal mortality: Data analysis of Indonesia Demographic and Health Survey (IDHS) 2017. JKKI: Indonesian Journal of Medicine and Health, 13(2), 125–138. https://doi.org/10.20885/JKKI.Vol13.Iss2.art5

Ayebare, E., Hanson, C., Nankunda, J., Hjelmstedt, A., Nantanda, R., Jonas, W., Tumwine, J. K., & Ndeezi, G. (2022). Factors associated with birth asphyxia among term singleton births at two referral hospitals in Northern Uganda: A cross-sectional study. BMC Pregnancy and Childbirth, 22(1), 767.

Creswell, J. W., & Creswell, J. D. (2023). Research design: Qualitative, quantitative, and mixed methods approaches (6th ed.). SAGE Publications.

Cunningham, F. G., Leveno, K. J., Dashe, J. S., Hoffman, B. L., Spong, C. Y., & Casey, B. M. (2022). Williams obstetrics (26th ed.). McGraw Hill.

Darsareh, F., Ranjbar, A., Vahidi Farashah, M., Mehrnoush, V., Shekari, M., & Shirzadfard Jahromi, M. (2023). Application of machine learning to identify risk factors of birth asphyxia. BMC Pregnancy and Childbirth, 23, 156. https://doi.org/10.1186/s12884-023-05486-9

P-ISSN 2301-8372 | E-ISSN 2549-7081
https://jurnal.unimus.ac.id/index.php/jur_bid

Kementerian Kesehatan Republik Indonesia. (2024). Indonesia health profile 2023. Ministry of Health of the Republic of Indonesia.

Kosim, M. S., Yunanto, A., Dewi, R., Sarosa, G. I., & Usman, A. (2014). Textbook of neonatology. Indonesian Pediatric Society.

Lake, E. S., Abita, Z., & Erega, B. B. (2024). Determinants of birth asphyxia among newborns in South Gondar Zone public hospitals, Northwest Ethiopia, 2021: A case control study. Heliyon, 10(9), e30093.

Manggiasih, V. A., & Jaya, P. (2022). Midwifery care for neonates, infants, toddlers, and preschool children. Trans Info Media.

Morgan, G. A., Leech, N. L., Gloeckner, G. W., & Barrett, K. C. (2020). IBM SPSS for introductory statistics: Use and interpretation (6th ed.). Routledge.

Norbaiti, N., Nuriaty, R. S., Ariady, D., & Anisa, N. (2024). Association of parity and maternal age with cesarean section at Ulin Regional General Hospital, Banjarmasin, in 2023. NAJ: Nursing Applied Journal, 2(1), 105–112. https://doi.org/10.57213/naj.v2i1.171

Norfai. (2022). Research data analysis: Univariate, bivariate, and multivariate analysis. Qiara Media.

Proverawati, A., & Ismawati, C. (2010). Neonatal emergencies: Birth asphyxia and low birth weight, including care for asphyxia and low birth weight infants. Nuha Medika.

Roflin, E., Liberty, I. A., & Pariyana. (2021). Population, sample, and variables in medical research. Penerbit NEM.

Rustan, H. (2022). Factors associated with neonatal asphyxia at ST. Madyang General Hospital, Palopo. Jurnal Fenomena Kesehatan, 5(2), 81–87.

Saifuddin, A. B., Wiknjosastro, G., & Affandi, B. (2014). Practical guidelines for maternal and neonatal health services. Bina Pustaka Sarwono Prawirohardjo.

Sakunti, S. S., Fitriani, R., Jalaluddin, S., & Tihardimanto, A. (2024). Analysis of risk factors for neonatal asphyxia at Labuang Baji Regional General Hospital, Makassar, in 2021. Alami Journal (Alauddin Islamic Medical) Journal, 8(2), 63–73.

Sari, G., Murdiningsih, & Indriani, P. L. N. (2024). Association of maternal age, premature rupture of membranes, and parity with birth asphyxia at Kayu Agung Regional General Hospital, OKI Regency. Jurnal Kesehatan dan Pembangunan, 14(2), 143–153.

Sarifuddin, M. J., Asriani, A., Fauziah, H., & Gama, A. W. (2023). Association between maternal hypertension and neonatal asphyxia at Salewangan Regional General Hospital, Maros Regency, 2018–2019. Jurnal Integrasi Kesehatan & Sains, 5(1), 18–22. https://doi.org/10.29313/jiks.v5i1.10653

Sukarni, I., & Sudarti. (2014). Pathology of pregnancy, childbirth, postpartum period, and high-risk neonates. Nuha Medika.

Sumantia, L., Ayatullah, & Jannah, N. (2024). Factors associated with neonatal asphyxia at Bima Regional General Hospital. The Scientific Journal Health (TSJH), 1(1), 74–84.

Thi Huyen Anh, N., Manh Thang, N., & Thanh Huong, T. (2024). Maternal and perinatal outcomes of hypertensive disorders in pregnancy: Insights from the National Hospital of Obstetrics and Gynecology in Vietnam. PLOS ONE, 19(1), e0297302. https://doi.org/10.1371/journal.pone.0297302

Tunggal, T., Dewi, V. K., Wulandari, W., & Sari, S. Y. (2022). Risk factors associated with neonatal asphyxia. Journal of Midwifery and Reproduction, 5(2), 58–65. https://doi.org/10.35747/jmr.v5i2.875

Ulfah, B., Fathony, Z., & Mariati, N. (2021). Midwife assistance and the independence of postpartum mothers in caring for their newborns at Martapura Public Health Center 1. SIKLUS: Journal Research Midwifery Politeknik Tegal, 10(2), 88–93. https://doi.org/10.30591/siklus.v10i2.250

Weiner, G. M., & Zaichkin, J. (Eds.). (2021). Textbook of neonatal resuscitation (8th ed.). American Academy of Pediatrics.

Wibowo, A. (2017). The chi-square test in statistics and SPSS. Jurnal Ilmiah SINUS, 4(2), 37–46.

Wiknjosastro, H., Saifuddin, A. B., & Rachimhadhi, T. (Eds.). (2014). Obstetrics (4th ed.). Yayasan Bina Pustaka Sarwono Prawirohardjo.

World Health Organization. (2024). Sexual, reproductive, maternal, newborn, child and adolescent health: Report on the 2023 policy survey. World Health Organization.