

FACTORS RELATED TO THE INCIDENCE OF ASPHYXIA IN NEW BORN INFANTS AT RSUD SUBULUSSALAM CITY

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Abstract

Asphyxia in newborns is a condition where the baby cannot breathe spontaneously and regularly immediately after birth. Data from Subulussalam City Hospital in 2021 there are 19 cases of newborn deaths with 8 cases of asphyxia. The purpose of this study was to analyze the factors associated with the incidence of asphyxia in newborns at Subulussalam City Hospital. In this study using a type of quantitative research with cross sectional design. The location of this research was carried out at the Subulussalam City Hospital, to be precise, in the perinatology room. This research was carried out in January-November 2022. The sample in this study was 34 respondents using the total sampling technique. The types of data used are primary data and secondary data. The results of the study showed that out of 34 cases of asphyxia, $p=0.006$ for maternal age, $p=0.015$ for gestational age, $p=0.039$ for normal weight, $p=0.063$ for infant condition, p value <0.05) meaning that there is a relationship between maternal age, gestational age, birth weight with the incidence of asphyxia in newborns at Subulussalam City Hospital. The conclusion from the results of the research carried out at Subulussalam City Hospital, it can be concluded that the p -value <0.05 has a significant relationship to the incidence of asphyxia in newborns which has been tested based on the chi square test SPSS analysis. It is recommended that it is necessary to increase socialization by health workers to mothers regarding diseases and complications that can arise during pregnancy, childbirth and postpartum as a preventive measure against the occurrence of asphyxia in newborns.

Keywords : *Occurrence of Asphyxia, Infant Condition, LBW, Gestational Age, Mother's Age*

1. INTRODUCTION

Asphyxia in newborns is a condition where the baby cannot breathe spontaneously and regularly after birth. This is caused by hypoxia (lack of oxygen) of the fetus in the womb that occurs during pregnancy, childbirth or immediately after the baby is born. Hypoxia can hinder the adaptation of newborns to life outside the mother's womb. The incidence of asphyxia in newborns greatly contributes to the neonatal mortality rate where this neonatal mortality rate is an indicator of a country's health (Kemenkes RI, 2019). Asphyxia is a cause of high newborn mortality after neonatal infection and low birth weight babies (LBW), asphyxia is associated with long-term morbidity, namely mental retardation, cerebral palsy and the occurrence of learning disorders in infants (Sa'danoer,

Data from the World Health Organization (WHO) annually in poor and developing countries, infant mortality is the biggest problem, the number of deaths that occur ranges from 3% (3.6 million) of 120 million newborns experiencing asphyxia and nearly 1 million of these babies die. WHO, 2019). In 2019 the factors of death in newborns are premature (29%), asphyxia (23%), and severe infections such as sepsis and pneumonia (25%). From the 2020 World Health Organization (WHO) data report around the world there are 500,000 maternal deaths per year and

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10,000,000 infant deaths, especially neonates per year, it is known that the infant mortality rate in the world due to asphyxia is 4.6 per 1000 live births (WHO, 2021).

Based on data reported to the Directorate of Family Health in 2019, out of 29,322 under-5 deaths, 69% (20,244 deaths) occurred during gestation or gestational age, of all reported neonatal deaths, 80% (16,156 deaths) occurred in the first 6 days life. Meanwhile, 21% (6,151 deaths) occurred at the age of 29 days -11 months and 10% (2,927) occurred at the age of 12-593 months. In 2019, the most common cause of neonatal death was low birth weight, other causes including asphyxia, congenital abnormalities, sepsis, neonatal tetanus and others (Ministry of Health, 2020). Whereas in Indonesia in 2020 the high infant mortality rate is caused by asphyxia as much as 27.4% (Indonesia's health profile, 2021). then in 2021 as many as 517 babies with asphyxia cases as many as 27,

According to reports from district/city Health Service data, it is known that infant mortality in Aceh in 2019 totaled 924 cases, a decrease from 936 cases in the previous year. The highest cases reported were in Pidie Regency with 128 cases, followed by Bireuen with 121 cases. The lowest cases were in Sabang City with 8 cases, followed by Banda Aceh City and Gayo Lues Regency each with 9 cases. From data sourced from the district/city health office, it is known that infant mortality in Aceh was caused by 22 cases of pneumonia, followed by 14 cases of diarrhea, 5 cases of malaria, 3 cases of neurological disorders and 1 case of gastrointestinal disorders, as well as other causes reaching 144 cases. Aceh Health Profile, 2020). In 2020 there were 1,024 infant deaths with asphyxia deaths of 163 cases (Aceh health profile,

Based on data obtained from the Subulussalam City District Health Office, the asphyxia mortality rate in 2019 was 13 cases out of 64.46 births per 1,000 live births. The asphyxia mortality rate in 2020 was 15 cases with a birth rate of 78.75 per 1,000 live births (Subulussalam Health Office, 2020), then from data obtained by the Subulussalam City Health Office in 2021 the asphyxia mortality rate was 858 cases or 9 deaths per 1,000 births living with asphyxia as many as 3 cases (Subulussalam City Health Office, 2021).

Data obtained from medical records from the results of initial data collection obtained at Subulussalam City Hospital regarding the number of cases of asphyxia in newborns. In Subulussalam City Hospital in 2019 there were 12 cases of death with asphyxia as many as 7 cases, in 2020 there were 12 cases of newborn death with asphyxia as many as 3 cases, in 2021 there were 19 cases of asphyxia with asphyxia as 8 cases and in January-November 2022 there were 13 cases with 9 cases of asphyxia.

Based on the USCF Benioff Children's Hospital, asphyxia will clearly affect the baby's growth and development process when the body's organs don't get enough oxygen, so their performance will decrease. As a result, the growth and development of the baby will also be hampered. Based on research that has been done by veraMuana & idham amin, the impact that occurs is caused by asphyxia, namely the impact of the cardiovascular system on babies affected by asphyxia can experience transient myocardial ischemia clinically, symptoms of the heart kidney can be found such as enlarged liver, impact on the kidneys causing impaired perfusion and dilution of the kidneys and glomerular filtration disorders

Onduring the initial survey conducted by researchers on mothers giving birth at Subulussalam City Hospital, babies who experienced asphyxia. Of the 5 mothers who gave birth, the mother stated that the baby had low birth weight (LBW), the mother gave birth too young, the baby was born prematurely and the baby was born because the umbilical cord was entangled. Based on the problems above, it is necessary to do research on the factors associated with the incidence of asphyxia in newborns at Subulussalam City Hospital.

2. RESEARCH METHOD

This research uses quantitative research, which is a research whose data is in the form of numbers and analysis using statistics using a cross-sectional design, research using data involving dependent data and independent data to answer current problems. This study aims to determine the factors associated with the incidence of asphyxia in newborns at Subulussalam City Hospital.

The location of this research was carried out at the Subulussalam City Hospital, to be precise, in the perinatology room. This research was conducted in January-November 2022, the population is the total number of units or individuals whose characteristics are to be studied, the population in this study were mothers who gave birth to babies with cases of asphyxia at Subulussalam City Hospital. The sampling technique was carried out as a total sample, i.e. all those in the population who had asphyxia cases were taken as a sample of 34 respondents.

3. RESULTS AND DISCUSSION

3.1. Univariate analysis

This analysis was conducted to determine the frequency distribution and percentage of birth weight, mother's age, gestational age and baby's condition.

Table 1. Frequency distribution based on the incidence of asphyxia according to birth weight, age of the mother, gestational age and condition of the baby.

Univariate analysis	Amount	
	F	%
Mother's age		
<20 and > 35 Years	20	58,8
20-35 Years	14	41,2
Gestational Age		
Aterm	13	38,2
Premature	18	52,9
Postmature	3	8,8
Birth Weight		
Normal	18	52,9
LBW	14	41,2
Obesity	2	5,9
Baby Condition		
No Winding Occurs	18	52,9
Coil Occurs	16	47,1
Asphyxia incident		
Medium	24	70,6
Weight	10	29,4

Based on table 1 above, the results of the frequency distribution of 34 respondents were obtained, the variable age of the mother showed that 20 respondents (58.8%) stated that the mother's age was <20 and > 35 years, and 14 respondents stated that the mother's age was 20-35 years (41.2%). The frequency distribution of the gestational age variable shows that of the 34 respondents, the respondents stated 18 respondents (52.9%) were premature, 13 respondents (38.2%) stated term term, then 3 respondents (8.8%) stated postmature. The frequency distribution of the birth weight variable shows that out of 34 respondents, 18 respondents (52.9%) stated that the baby had normal birth weight, 14 respondents (41.2%) stated low birth weight (LBW) and Respondents who stated obesity were 2 respondents (5.9%). The frequency distribution of the

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variable condition of the baby shows that of the 34 respondents, 18 respondents (52.9%) stated that there was an umbilical cord coil, and 16 respondents (47.1%) who experienced no umbilical cord. The distribution of the frequency of asphyxia incident variables shows that out of 34 respondents,

3.2. Bivariate analysis

This analysis was conducted to determine the relationship between the independent variables (age of the mother, birth weight, gestational age and condition of the baby) and the dependent variable (asphyxia in newborns) by using the chi-square test where the significance level is $\alpha = 0.05$.

Table 3. The relationship between the age of the mother and the incidence of asphyxia at the Subulussalam City Hospital

MOTHER'S age	Asphyxia						P-value
	Moderate		Weight		Total		
	f	%	f	%	f	%	
<20 and > 35 year	18	52,9	2	5,9	20	58,8	0,006
20 – 35 year	6	17,6	8	23,5	14	41,2	
Total	24	70,6	10	29,4	34	100	

Based on table 3 above, the results show that of the 34 respondents with the variable age of the mother, there were 20 respondents (58.8%) who stated that the mother's age was <20 and > 35 years, with moderate asphyxia, 18 respondents (75.0%) and 2 respondents (20.0%) experienced severe asphyxia, then 14 respondents (41.2%) stated maternal age, 6 respondents (25.0%) experienced moderate asphyxia and 25.0% experienced severe asphyxia 8 respondents (80.0%) with the results of the chi-square test showed a p value = (0.006) < (0.05) meaning that there was a significant relationship between the age of the mother and the incidence of asphyxia in newborns.

Table 4. The relationship between gestational age and the incidence of asphyxia at Subulussalam City Hospital

Birth Weight	Asphyxia						P-value
	Moderate		Weight		Total		
	f	%	f	%	f	%	
Aterm	11	32.4	2	5.9	13	38.2	0.015
Premature	13	38.2	5	14.7	18	52.9	
Postmature	0	0.0	3	8.8	3	8.8	
Total	24	70.6	10	29.4	34	100	

Based on table 4 above, the results obtained from the gestational age variable showed that out of 34 respondents, 18 respondents (52.9%) stated premature with moderate asphyxia experienced 13 respondents (54.8%), and 5 experienced severe asphyxia. respondents (50.0%), then 13 respondents (38.2%) stated term term, 11 respondents (45.8%) experienced moderate asphyxia and 2 respondents (20.0%) experienced severe asphyxia then there were 3 respondents (8.8%) who stated that they were postmature, and 3 respondents (30.0%) who experienced severe asphyxia with the results of the chi-square test showing a p value = (0.015) < (0.05) meaning there is a significant relationship between gestational age and the incidence of asphyxia in newborns.

Table 5. The relationship between birth weight and the incidence of asphyxia at Subulussalam City Hospital

Birth Weight	Asphyxia						P-value
	Moderate		Weight		Total		
	f	%	f	%	f	%	
Normal	15	44.1	3	8.8	18	52.9	0.039
LBW	9	26.5	5	14.7	14	41.2	
Obesity	0	0.0	2	5.9	2	5.9	
Total	24	70.6	10	29.4	34	100	

Based on table 5 above, the results obtained from the birth weight variable showed that out of 34 respondents, 18 respondents (52.9%) stated that the baby had normal birth weight, 15 respondents (62.5%) experienced moderate asphyxia and 3 respondents (30.0%) experienced severe asphyxia, 14 respondents (41.2%) stated LBW, 9 respondents (37.5%) experienced moderate asphyxia and 5 respondents experienced severe asphyxia (50.0%), in respondents who were obese as many as 2 respondents (5.9%) with severe asphyxia as many as 2 respondents (20.0%) with the results of the chi-square test showing p value = (0.039) < (0.05) means that there is a significant relationship between birth weight and the incidence of asphyxia in newborns.

Table 6. The relationship between the condition of the baby and the incidence of asphyxia

Baby Condition	Asphyxia						P-value
	Moderate		Weight		Total		
	f	%	f	%	f	%	
No winding	10	29.4	8	23.5	18	52.9	0.063
Coils Occur	14	41.2	2	5.9	16	47.1	
Total	24	70.6	10	29.4	34	100	

Based on table 6 above, the results obtained from the variable condition of the baby showed that out of 34 respondents, 18 respondents (52.9%) stated that there was no umbilical cord entanglement, 10 respondents (29.4%) experienced moderate asphyxia and those who experienced 8 respondents (23.5%) had severe asphyxia, then 16 respondents (47.1%) stated that there was a twist of the umbilical cord, 14 respondents (41.2%) experienced moderate asphyxia and 2 respondents experienced severe asphyxia (5.9%), with the results of the chi-square test showing a p value = (0.063) < (0.05) meaning that there is no significant relationship between the condition of the baby and the incidence of asphyxia in newborns.

3.3. DISCUSSION

According to the American College of Obstetrics and Gynecology (ACOG) and the American Academy of Paediatrics (AAP) asphyxia is a condition of impaired blood gas exchange that causes progressive hypoxemia and hypercapnia with acidosis. Significant brakes. Whereas in the standard of medical services in pediatrics from the Indonesian Pediatrician Association (IDAI), asphyxia neonatorum is the failure of a baby to breathe spontaneously and regularly at birth or several times after birth which is characterized by hypoxemia, hypercarbia, and acidosis. Asphyxia in newborns can be caused by several factors, including the presence of maternal disease during pregnancy such as hypertension or pulmonary disease, in mothers whose pregnancies are at risk, placental factors, fetal factors or also compression of the umbilical cord between the fetus and the birth canal and delivery factors such as actions performed on mothers who give birth (Ervin Rufaindah, 2022).

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Correlation between Mother's Age and Asphyxia Incidence

Based on the research that has been done, it was found that of the 34 respondents with the variable mother's age, it was shown that 20 respondents (58.8%) had moderate asphyxia, 18 respondents (75.0%) stated that the mother's age was <20 and > 35 years. and 2 respondents (20.0%) experienced severe asphyxia, then 14 respondents (41.2%) stated maternal age, 6 respondents (25.0%) experienced moderate asphyxia and those with severe asphyxia as many as 8 respondents (80.0%) with the results of the chi-square test showed a p value = (0.006) < (0.05) meaning that there was a significant relationship between the age of the mother and the incidence of asphyxia in newborns.

According to the assumptions of the researchers in this study, the age of the mother seems to have a significant influence on the incidence of asphyxia in infants. This has been proven where mothers who are of a risky age in childbirth generally have babies born in a state of asphyxia. This is because the young mother's age makes the reproductive organs grow in immature conditions to receive the products of conception, so the baby is born in a state of fetal distress such as asphyxia, respiratory distress and the baby is born in a state of immature organs. And vice versa if the mother gives birth at a past age, the baby to be born will have an impact on health.

Young people <20 years old are at risk because the mother is not ready medically (reproductive organs) or mentally. Age > 35 years physically the mother has a setback to undergo pregnancy and is a predisposing factor for the occurrence of hypertension. In mothers who experience hypertension, there is a decrease in blood flow to the placenta resulting in impaired function of the placenta which can result in asphyxia of the newborn and fetal distress due to lack of oxygen (Wiksastri, 2017).

This is in line with the study of Indri Marasing, et al (2022) at Bitung Hospital with the title analysis of risk factors for neonatal asphyxia showing that as many as 111 children with chi-square results on the variable maternal age = 0.000, which means that there is a significant relationship to the incidence of asphyxia. This study is also in line with research conducted by Eka Susanti (2022) with the title determinants of neonatal asphyxia, showing that as many as 90 samples with the results of the chi-square test on the variable mother's age = 0.001, which means that it has a significant relationship to the incidence of asphyxia.

Relationship between gestational age and the incidence of asphyxia

Based on research that has been carried out, the results of the gestational age variable show that out of 34 respondents, 18 respondents (52.9%) who stated premature were experiencing moderate asphyxia, 13 respondents (54.8%) experienced moderate asphyxia, and 5 experienced severe asphyxia. respondents (50.0%), then 13 respondents (38.2%) stated term term, 11 respondents (45.8%) experienced moderate asphyxia and 2 respondents (20.0%) experienced severe asphyxia then there were 3 respondents (8.8%) who stated that they were postmature, and 3 respondents (30.0%) who experienced severe asphyxia with the results of the chi-square test showing a p value = (0.015) < (0.05) meaning there is a significant relationship between gestational age and the incidence of asphyxia in newborns.

According to the assumptions of the researchers, based on the above data, gestational age seems to be sufficient to influence the incidence of asphyxia at Subulussalam City Hospital. Where mothers are born at risky age generally experience babies born in a state of asphyxia or difficulty breathing. Less gestational age causes lung organ conditions to be imperfect, while postdate because the function of the placenta has decreased so that oxygen exchange from the mother is disrupted. The gestational age that is not enough months will make the baby born in an immature state, especially the lung area, namely the immature lungs make a surfactant substance that functions as a fluid to provide elasticity for the inflating and deflating of the lungs to be disturbed or less than normal limits, so that the shift between the lungs and the chest wall is disturbed. This is what makes it difficult for newborns to breathe. But as for babies born with sufficient gestation but

experiencing respiratory problems or mild asphyxia, this is due to other factors that interfere with lung development Gestational age.

This research is in line with the research of Yuli Fitriana, et al (2021) at the Nosarara and Pantoloan Health Centers in Palu City with the title risk factors for asphyxia neonatorum showing that as many as 111 with chi-square results on the variable gestational age = 0.041, which means there is a significant relationship to the incidence of asphyxia . This study is also in line with the study of Indri Marasing, et al (2022) at Bitung Hospital with the title analysis of risk factors for neonatal asphyxia showing that as many as 111 children with chi-square results on the variable gestational age = 0.002, which means that there is a significant relationship to the incidence of asphyxia.

Relationship between birth weight and the incidence of asphyxia

Based on the research that has been carried out, the results of the birth weight variable show that out of 34 respondents, 18 respondents (52.9%) stated that the baby had normal birth weight, 15 respondents (62.5%) experienced moderate asphyxia and 3 respondents (30.0%) experienced severe asphyxia, 14 respondents (41.2%) stated LBW, 9 respondents (37.5%) experienced moderate asphyxia and 5 respondents experienced severe asphyxia (50.0%), in respondents who were obese as many as 2 respondents (5.9%) with severe asphyxia as many as 2 respondents (20.0%) with the results of the chi-square test showing p value = (0.039) < (0.05) means that there is a significant relationship between birth weight and the incidence of asphyxia in newborns.

According to the researchers' assumptions, the weight of the babies born in this study seems to have a significant influence on the incidence of asphyxia experienced in newborns. Where babies born with low birth weight generally experience asphyxia, and vice versa, babies born with normal birth weight generally do not experience asphyxia. It is clear that the baby's weight depends on the period of pregnancy experienced by the mother. However, there are also babies who are born at normal weight but experience breathing problems. This is due to other trigger factors that make the baby born with difficulty breathing or asphyxia.

Birth weight is part of the neonatal factors that can cause neonatal asphyxia and is an indicator of newborn health. Babies with low birth weight and birth weight babies show higher death and health rates than babies with sufficient birth weight. Low birth weight babies and birth weight babies are more of an important problem in their management because they have a tendency towards an increase in the occurrence of infections, asphyxia, jaundice and hypoglycemia (Fajarwati, 2015).

This study is in line with the research by Chengqiu LU, et al (2021) at the Obstetrics and Gynecology Hospital of Fudan University with the title risk factors for neonatal asphyxia in twin pregnancies showing that there were 211 samples with chi-square results on the variable birth weight = 0.001, which means there are significant relationship to the incidence of asphyxia. This study is also related to Kusumaningrum's research (2019) with the title low birth weight, prematurity and preeclampsia as risk factors for neonatal asphyxia which showed 150 samples with the results of the chi-square test on the variable birth weight = 0.001, which means that there is a significant relationship to the incidence of asphyxia.

Relationship between Infant Condition and Asphyxia

Based on the research that has been carried out, the results of the baby's condition variable show that out of 34 respondents, 18 respondents (52.9%) stated that there was no umbilical cord entanglement, 10 respondents (29.4%) experienced moderate asphyxia and those who experienced 8 respondents (23.5%) had severe asphyxia, then 16 respondents (47.1%) stated that there was a twist of the umbilical cord, 14 respondents (41.2%) experienced moderate asphyxia and 2 respondents experienced severe asphyxia (5.9%), with the results of the chi-square test showing a p

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value = (0.063) < (0.05) meaning that there is no significant relationship between the condition of the baby and the incidence of asphyxia in newborns.

According to the researchers' assumptions, based on the results of research conducted at the Subulussalam City Hospital, it was found that there was no relationship between the condition of the baby and the incidence of asphyxia experienced in newborns because the number of respondents experienced no umbilical cord coils compared to the occurrence of umbilical cord coils.

A baby wrapped in the umbilical cord is a condition that often occurs during pregnancy. This condition is generally harmless, but must be monitored regularly because it can sometimes cause complications. Babies wrapped in the umbilical cord are not always dangerous because the umbilical cord is not always dangerous because a healthy umbilical cord is protected by a jelly called Wharton's jelly. This jelly functions to keep the umbilical cord elastic, so that the baby can move freely (Tasew, 2020).

This researcher is in line with Novisye Katiandagho's study (2015) with the title factors related to the incidence of neonatal asphyxia showing that 165 respondents with chi-square results on the infant condition variable = 0.099, which means that there is no significant relationship to the incidence of asphyxia. This study is also in line with Suharti's research (2019) with the title description of the factors that cause asphyxia in newborns showing that 135 respondents with the results of the chi-square test on the baby's condition variable = 0.083, which means that there is no significant relationship to the incidence of asphyxia in infants Newborn.

4. CONCLUSIONS AND SUGGESTIONS

4.1. CONCLUSION

The conclusion from the results of the research that has been carried out at Subulussalam City Hospital can be concluded that from the results of the p-value <0.05, which means that there is a significant relationship between the several variables of asphyxia in newborns that have been tested based on univariate analysis and bivariate analysis of 34 respondents . From the independent variables based on the age of the mother at a p-value = 0.006 indicating a significant relationship with the incidence of asphyxia, gestational age at a p-value = 0.015 indicates a significant relationship between gestational age and the incidence of asphyxia, birth weight on the p-value value = 0.039 indicates a significant relationship between birth weight and the incidence of asphyxia and the condition of the baby at a p-value = 0,

4.2. SUGGESTIONS

It is recommended that the development of public health science need to increase counseling by health workers to mothers regarding diseases and complications that can arise during pregnancy, childbirth and postpartum as a preventive measure against asphyxia in newborns and for research institutions and the public it is recommended to the perinatology and obstetrics departments RSUD Kota Subulussalam to increase the delivery of information about the importance of prenatal checks to detect early the health condition of the mother and fetus during her womb.

REFERENCES

- Abubakari, A., Taabia, FZ, & Ali, Z. (2019). Maternal determinants of low birth weight and neonatal asphyxia in the Upper West region of Ghana. *Midwifery*, 73, 1–7. <https://doi.org/10.1016/j.midw.2019.02.012>
- Alake, O., Rana, R., Jain, A., & Chakkarapani, E. (2021). Therapeutic hypothermia and outcome in hyponatraemic encephalopathy secondary to maternal water intoxication. *BMJ Case Reports*, 14(3). <https://doi.org/10.1136/bcr-2020-237213>
- Albab, MU, Widyaningsih, H., Hartini, S., & Ambarwati, A. (2020). Incidence of Neonatal Asphyxia Events In Mothers Maternity With Early Ruptured Amniotic Fluid. *South East Asia Nursing Research*, 2(3), 99. <https://doi.org/10.26714/seanr.2.3.2020.99-104>
- Apriani, W., Isgiyanto, A., & Yuliana, Y. (2018). Age of Mother, Age of Pregnancy, and Neonatorum Asphyxia in Kaur Hospital. *Journal of Health Sciences*, 25(2), 86–92. <https://doi.org/10.37638/jsk.25.2.86-92>
- Bustani, B., Khaddafi, M. ., & Nur Ilham, R. (2022). REGIONAL FINANCIAL MANAGEMENT SYSTEM OF REGENCY/CITY REGIONAL ORIGINAL INCOME IN ACEH PROVINCE PERIOD YEAR 2016-2020. *International Journal of Educational Review, Law And Social Sciences (IJERLAS)*, 2(3), 459–468. <https://doi.org/10.54443/ijerlas.v2i3.277>
- Bonnevier, A., Maršál, K., Brodski, J., Thuring, A., & Källén, K. (2021). Cerebroplacental ratio as predictor of adverse perinatal outcome in the third trimester. *Acta Obstetrica et Gynecologica Scandinavica*, 100(3), 497–503. <https://doi.org/10.1111/aogs.14031>
- Barkovich, AJ, & Truwit, CL (1990). Brain damage from perinatal asphyxia: Correlation of MR findings with gestational age. *American Journal of Neuroradiology*, 11(6), 1087–1096.
- Boskabadi, H., Ashrafzadeh, F., Doosti, H., & Zakerihamidi, M. (2015). Assessment of risk factors and prognosis in asphyxiated infants. *Iranian Journal of Pediatrics*, 25(4). <https://doi.org/10.5812/ijp.2006>
- Secondary Data. (2022). Subulussalam City Hospital Medical Records.
- Subulussalam City Health Office. (2021). Subulussalam City Health Profile 2020.
- Dwilda Ferdinandus, E., & Devianti Putri, B. (2020). Early Onset Neonatal Sepsis in Low Birth Weight and Birth Asphyxia Infants at Haji Hospital Surabaya, Indonesia. *Indian Journal of Public Health Research & Development*, 11(1), 1076. <https://doi.org/10.37506/v11/i1/2020-ijphrd/193981>
- De Almeida, MFB, Moreira, LMO, Vaz Dos Santos, RM, Kawakami, MD, Anchieta, LM, & Guinsburg, R. (2015). Early neonatal deaths with perinatal asphyxia in very low birth weight Brazilian infants. *Journal of Perinatology*, 35(11), 954–957. <https://doi.org/10.1038/jp.2015.114>
- Ervin, Rufainda. (2022). *Newborn Management*. Bandung: Indonesian science media.
- Enweronu-Laryea, CC, Nsiah-Boateng, E., Andoh, HD, Frimpong-Barfi, A., Asenso-Boadi, FM, & Aikins, M. (2019). Evaluating services for perinatal asphyxia and low birth weight at two

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- hospitals in Ghana: A micro-costing analysis. *Ghana Medical Journal*, 53(4), 256–266. <https://doi.org/10.4314/gmj.v53i4.2>
- Fajarwati, et al. (2015). The Relationship Between Birth Weight And The Incidence Of Asphyxia Neonatorum. *Medical Periodic Journal*, 12 (1): 33-39.
- Falahuddin, F., Fuadi, . F., Munandar, M., Juanda, R. ., & Nur Ilham, R. . (2022). INCREASING BUSINESS SUPPORTING CAPACITY IN MSMES BUSINESS GROUP TEMPE BUNGONG NANGGROE KERUPUK IN SYAMTALIRA ARON DISTRICT, UTARA ACEH REGENCY. *IRPITAGE JOURNAL*, 2(2), 65–68. <https://doi.org/10.54443/irpitage.v2i2.313>
- Fattuoni, C., Palmas, F., Noto, A., Fanos, V., & Barberini, L. (2015). Perinatal asphyxia: A review from a metabolomics perspective. *Molecules*, 20(4), 7000–7016. <https://doi.org/10.3390/molecules20047000>
- Gallo, D., De Bijl-Marcus, KA, Alderliesten, T., Lilien, M., & Groenendaal, F. (2021). Early Acute Kidney Injury in Preterm and Term Neonates: Incidence, Outcome, and Associated Clinical Features. *Neonatology*, 118(2), 174–179. <https://doi.org/10.1159/000513666>
- Geovani, I. ., Nurkhotijah, S. ., Kurniawan, H. ., Milanie, F., & Nur Ilham, R. . (2021). JURIDICAL ANALYSIS OF VICTIMS OF THE ECONOMIC EXPLOITATION OF CHILDREN UNDER THE AGE TO REALIZE LEGAL PROTECTION FROM HUMAN RIGHTS ASPECTS: RESEARCH STUDY AT THE OFFICE OF SOCIAL AND COMMUNITY EMPOWERMENT IN BATAM CITY. *International Journal of Educational Review, Law And Social Sciences (IJERLAS)*, 1(1), 45–52. <https://doi.org/10.54443/ijerlas.v1i1.10>
- Hassan, SB, Rana, SM, Hanif, A., Gilani, SA, Afzal, S., Fatima, W., ... Faridi, TA (2022). Risk Factors Associated with Birth Asphyxia: A Case Control Study. *Annals of King Edward Medical University*, 27(4), 508–514. <https://doi.org/10.21649/akemu.v27i4.4883>
- Ilham, Rico Nur. et all (2019). Investigation of the Bitcoin Effects on the Country Revenues via Virtual Tax Transactions for Purchasing Management. *International Journal of Supply Management*. Volume 8 No. 6 December 2019.
- Ilham, Rico Nur. et all (2019).. Comparative of the Supply Chain and Block Chains to Increase the Country Revenues via Virtual Tax Transactions and Replacing Futures of Money. *International Journal of Supply Management*. Volume 8 No. 5 August 2019.
- Indra, M. (2022). Analysis of Risk Factors Of Asphyxia Neonatorum At Bitung Regional General Hospital. *Journals. pixie. Air conditioning*. id. 3(1):7-15.
- Januadi, Judi. (2017). *Pregnancy Checkup Smart Guide*. Jakarta: Mother Library, Puspa Swara Group, IKAPI Member.
- Kawakami, MD, Sanudo, A., Teixeira, MLP, Andreoni, S., de Castro, JQX, Waldvogel, B., ... de Almeida, MF (2021). Neonatal mortality associated with perinatal asphyxia: a population-based study in a middle-income country. *BMC Pregnancy and Childbirth*, 21(1). <https://doi.org/10.1186/s12884-021-03652-5>

- Khoiriah, A. (2019). Factors Influencing the Incidence of Asphyxia in Newborns. Taken from: Journal 'Aisyiyah Medika, 4(2): 174-187.
- Republic of Indonesia Ministry of Health. (2020). Indonesian Health Profile. 2020. Jakarta: RI Ministry of Health.
- Republic of Indonesia Ministry of Health. (2021). Indonesian Health Profile. 2021. Jakarta: RI Ministry of Health.
- Kusumaningrum. (2019). Low Birt, Prematurity, And Pre-eclampsia As Risk Factors Of Neonatal Asphyxia. Sebelas Maret University Surakarta : Journal Of Maternal And Child Health (2019), 4 (1) : 49-54.
- Laptop, AR (2016, Sept. 1). Birth Asphyxia and Hypoxic-Ischemic Brain Injury in the Preterm Infant. Clinics in Perinatology. WB Saunders. <https://doi.org/10.1016/j.clp.2016.04.010>
- Lasta Irawan, A. ., Briggs, D. ., Muhammad Azami, T. ., & Nurfaliza, N. (2021). THE EFFECT OF POSITION PROMOTION ON EMPLOYEE SATISFACTION WITH COMPENSATION AS INTERVENING VARIABLES: (Case Study on Harvesting Employees of PT. Karya Hevea Indonesia). International Journal of Social Science, Educational, Economics, Agriculture Research, and Technology (IJSET), 1(1), 11–20. <https://doi.org/10.54443/ijset.v1i1.2>
- likdanawati, likdanawati, Yanita, Y., Hamdiah, H., Nur Ilham, R., & Sinta, I. (2022). EFFECT OF ORGANIZATIONAL COMMITMENT, WORK MOTIVATION AND LEADERSHIP STYLE ON EMPLOYEE PERFORMANCE OF PT. ACEH DISTRIBUS INDO RAYA. International Journal of Social Science, Educational, Economics, Agriculture Research, and Technology (IJSET), 1(8), 377–382. <https://doi.org/10.54443/ijset.v1i8.41>
- Lu, H., Wang, Q., Lu, J., Zhang, Q., & Kumar, P. (2016). Risk Factors for Intraventricular Hemorrhage in Preterm Infants Born at 34 Weeks of Gestational or Less Following Preterm Premature Rupture of Membranes. Journal of Stroke and Cerebrovascular Diseases, 25(4), 807–812. <https://doi.org/10.1016/j.jstrokecerebrovasdis.2015.12.011>
- Lu, H., Wang, Q., Lu, J., Zhang, Q., & Kumar, P. (2016). Risk Factors for Intraventricular Hemorrhage in Preterm Infants Born at 34 Weeks of Gestational or Less Following Preterm Premature Rupture of Membranes. Journal of Stroke and Cerebrovascular Diseases, 25(4), 807–812. <https://doi.org/10.1016/j.jstrokecerebrovasdis.2015.12.011>
- Majied Sumatrani Saragih, M. ., Hikmah Saragih, U. ., & Nur Ilham, R. . (2021). RELATIONSHIP BETWEEN MOTIVATION AND EXTRINSIC MOTIVATION TO ICREASING ENTREPRENEURSHIP IMPLEMENTATION FROM SPP AL-FALAH GROUP AT BLOK 10 VILLAGE DOLOK MASIHUL. MORFAI JOURNAL, 1(1), 1–12. <https://doi.org/10.54443/morai.v1i1.11>
- Marniati, M. (2016, December). The Influence of People's Knowledge and Attitudes Toward Traditional Treatment. In 1st Public Health International Conference (PHICo 2016) (pp. 159-162). AtlantisPress.
- Marniati, M. (2017, November). Mother's Socio-Cultural Identification of Prevention of Diarrhea in Toddlers. In Proceedings of SEMDI-UNAYA (UNAYA Multi-Disciplinary National Seminar) (Vol. 1, No. 1, pp. 146-154).
- MARNIATI, M. (2022). UTILIZATION OF TODDLER POSYANDU. Zarubin, AA, Filippov, ES, Vanyarkina, AS, Ivanova, OG, & Shishkina, AA (2021). Comparison of uncontrolled

FACTORS RELATED TO THE INCIDENCE OF ASPHYXIA IN NEW BORN INFANTS AT RSUD SUBULUSSALAM CITY

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and device-induced therapeutic hypothermia in newborn infants with hypoxic ischemic encephalopathy. *Acta Biomedica Scientifica*, 6(1), 88–93. <https://doi.org/10.29413/ABS.2021-6.1.13>

Mehar, MF, Khan, MA, Saleem, R., Zafar, F., Naqqash, AB, Shahid, S., & Hassan, R. (2020). Risk factors of perinatal asphyxia at Nishtar Hospital Multan. *The Professional Medical Journal*, 27(03), 487–492. <https://doi.org/10.29309/tpmj/2020.27.03.3176>

Mooney, C., O'Boyle, D., Finder, M., Hallberg, B., Walsh, BH, Henshall, DC, ... Murray, DM (2021). Predictive modeling of hypoxic ischemic encephalopathy risk following perinatal asphyxia. *Heliyon*, 7(7), e07411. <https://doi.org/10.1016/j.heliyon.2021.e07411>

Nataraja, NP (2019). Analysis of Crying of Infants with Asphyxia. *International Journal of Health Sciences & Research (Www.Ijhsr.Org)*, 9(November), 11. Retrieved from www.ijhsr.org

Nur Ilham, R. ., Arliansyah, A., Juanda, R., Multazam, M. ., & Saifanur, A. . (2021). RELATHIONSIP BETWEEN MONEY VELOCITY AND INFLATION TO INCREASING STOCK INVESTMENT RETURN: EFFECTIVE STRATEGIC BY JAKARTA AUTOMATED TRADING SYSTEM NEXT GENERATION (JATS-NG) PLATFORM. *International Journal of Economic, Business, Accounting, Agriculture Management and Sharia Administration (IJEBAS)*, 1(1), 87–92. <https://doi.org/10.54443/ijebas.v1i1.27>

Nur Ilham, R., Heikal, M. ., Khaddafi, M. ., F, F., Ichsan, I., F, F., Abbas, D. ., Fauzul Hakim Hasibuan, A. ., Munandar, M ., & Chalirafi, C. (2021). Survey of Leading Commodities Of Aceh Province As Academic Effort To Join And Build The Country. *IRPITAGE JOURNAL*, 1(1), 13–18. <https://doi.org/10.54443/irpitage.v1i1.19>

Nur Ilham, R., Likdanawati, L., Hamdiah, H., Adnan, A., & Sinta, I. . (2022). COMMUNITY SERVICE ACTIVITIES “SOCIALIZATION AVOID STUDY INVESTMENT” TO THE STUDENT BOND OF SERDANG BEDAGAI. *IRPITAGE JOURNAL*, 2(2), 61–64. <https://doi.org/10.54443/irpitage.v2i2.312>

Nur Ilham, R., Arliansyah, A., Juanda, R. ., Sinta, I. ., Multazam, M. ., & Syahputri, L. . (2022). APPLICATION OF GOOD CORPORATE GOVERNANCE PRINCIPLES IN IMPROVING BENEFITS OF STATE-OWNED ENTERPRISES (An Emperical Evidence from Indonesian Stock Exchange at the Moment of Covid-19). *International Journal of Economic, Business, Accounting, Agriculture Management and Sharia Administration (IJEBAS)*, 2(5), 761–772. <https://doi.org/10.54443/ijebas.v2i5.410>

Nur Ilham, R., Likdanawati, L., Hamdiah, H., Adnan, A., & Sinta, I. . (2022). COMMUNITY SERVICE ACTIVITIES “SOCIALIZATION AVOID STUDY INVESTMENT” TO THE STUDENT BOND OF SERDANG BEDAGAI. *IRPITAGE JOURNAL*, 2(2), 61–64. <https://doi.org/10.54443/irpitage.v2i2.312>

Aceh Health Profile 2020. Program Sector and Reporting Data and Information Section.

Aceh Health Profile 2021. Program Sector and Reporting Data and Information Section.

Rahmaniar, R., Subhan, S., Saharuddin, S., Nur Ilham, R. ., & Anwar, K. . (2022). THE INFLUENCE OF ENTREPRENEURSHIP ASPECTS ON THE SUCCESS OF THE CHIPS INDUSTRY IN MATANG GLUMPANG DUA AND PANTON PUMP.

International Journal of Social Science, Educational, Economics, Agriculture Research, and Technology (IJSET), 1(7), 337–348. <https://doi.org/10.54443/ijset.v1i7.36>

- Rasheed, J., Isa, S., Rasheed, F., Siddiq, K., Saqlain, Z., & Nasir, Z. (2021). Perinatal outcome in diabetic mothers with relation to glycemic control during pregnancy. *The Professional Medical Journal*, 28(03), 382–386. <https://doi.org/10.29309/tpmj/2021.28.03.4084>
- Rico Nur Ilham, Irada Sinta, & Mangasi Sinurat. (2022). THE EFFECT OF TECHNICAL ANALYSIS ON CRYPTOCURRENCY INVESTMENT RETURNS WITH THE 5 (FIVE) HIGHEST MARKET CAPITALIZATIONS IN INDONESIA. *Journal of Economics*, 11(02), 1022–1035. Retrieved from <http://ejournal.seaninstitute.or.id/index.php/Ekonomi/article/view/481>
- Sa'danoer, I, M and Dina Ayuning Tyas. (2020). Factors Associated with Neonatal Asphyxia. *Journal of Communication Midwives*, 3 (3): 93-98.
- Sandi, H. ., Afni Yunita, N. ., Heikal, M. ., Nur Ilham, R. ., & Sinta, I. . (2021). RELATIONSHIP BETWEEN BUDGET PARTICIPATION, JOB CHARACTERISTICS, EMOTIONAL INTELLIGENCE AND WORK MOTIVATION AS MEDIATOR VARIABLES TO STRENGTHENING USER POWER PERFORMANCE: AN EMPIRICAL EVIDENCE FROM INDONESIA GOVERNMENT. *MORFAI JOURNAL*, 1(1), 36–48. <https://doi.org/10.54443/morai.v1i1.14>
- Sinta, I. ., Nur Ilham, R., Kumala Sari, D. ., M, M., Khaidir, K., & Ekamaida, E. (2021). Training The Processing Of Tomato Sauce For A Home-Based Business The Scale Of SMES. *IRPITAGE JOURNAL*, 1(1), 26–28. <https://doi.org/10.54443/irpitage.v1i1.24>
- Sinurat, M. ., Heikal, M. ., Simanjuntak, A. ., Siahaan, R. ., & Nur Ilham, R. . (2021). PRODUCT QUALITY ON CONSUMER PURCHASE INTEREST WITH CUSTOMER SATISFACTION AS A VARIABLE INTERVENING IN BLACK ONLINE STORE HIGH CLICK MARKET: Case Study on Customers of the Tebing Tinggi Black Market Online Store. *MORFAI JOURNAL*, 1(1), 13–21. <https://doi.org/10.54443/morai.v1i1.12>
- Sijian Li et al. (2021). Perinatal Outcomes And Risk Factors For Preterm Birth In Twin Pregnancies In Chinese Population: A Multi-center Retrospective Study.
- Tasew. (2020). Analysis of Fetus and Umbilical Cord Factors on the Risk of Perinatal Asphyxia in Surakarta. *Journal of Pediatric Nursing*, 3 (1), 16-28. <https://doi.org/10.32584/jika.v3i1.521>
- Torres-Muñoz, J., Rojas, C., Mendoza-Urbano, D., Marín-Cuero, D., Orobio, S., & Echandía, C. (2017). Risk factors associated with the development of perinatal asphyxia in neonates at the Hospital Universitario del Valle, Cali, Colombia, 2010-2011. *Biomedica*, 37, 51–56. <https://doi.org/10.7705/biomedica.v37i1.2844>
- Van Anh, TN, Kiem Hao, T., & Huu Hoang, H. (2020). The Role of Plasma Lactate Dehydrogenase Testing in the Prediction of Severe Conditions in Newborn Infants: A Prospective Study. *Research and Reports in Neonatology*, Volumes 10, 31–35. <https://doi.org/10.2147/rn.s254500>
- Vera Muna, A, M. (2016). *Impaired Multi Organ Function in Infants with Severe Asphyxia*. Jakarta: Indonesian Pediatrician Association (DP-IDAI).

FACTORS RELATED TO THE INCIDENCE OF ASPHYCIA IN NEW BORN INFANTS AT RSUD SUBULUSSALAM CITY

Putri Mika Hutari Ningsih, Marniati, Dian Fera, Susy Sri Wahyuni

Wiksastri. (2017). Gynecology. Jakarta: Sarwono Prawirohardjo Library Development Foundation.

Yolla Asmaul N, & Suci Ananda. (2021). Factors that influence the incidence of asphyxia in newborns at Fauziah Bireuen Hospital in 2021.7(2): 69-71.

Yuli F, et al. (2021). Risk Factors For Asphyxia Neonatorum In Public Health Centers Of Nosarara And Pantoloan Palu City. Essay. Graduate program. Hasanuddin University: Makasar.

Yusuf Iis, E., Wahyuddin, W., Thoyib, A., Nur Ilham, R., & Sinta, I. (2022). THE EFFECT OF CAREER DEVELOPMENT AND WORK ENVIRONMENT ON EMPLOYEE PERFORMANCE WITH WORK MOTIVATION AS INTERVENING VARIABLE AT THE OFFICE OF AGRICULTURE AND LIVESTOCK IN ACEH. International Journal of Economic, Business, Accounting, Agriculture Management and Sharia Administration (IJEBAS), 2(2), 227–236.<https://doi.org/10.54443/ijebas.v2i2.191>