

Risk factors for transient tachypnea of newborns in the NICU room at Sylvani Hospital, Pahlawan Village, North Binjai District, Binjai City in 2024

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ABSTRACT

According to WHO estimates, there were 5 million neonatal deaths and 4.5 million infant deaths worldwide in 2020, with 7.5% of these deaths occurring in the first year of life (Novitasari et al, 2020). The global incidence of LBW is 15.5% with a range of 10-50%. Since 2012, there has been a decrease in the number of newborns with low birth weight (LBW) by 29% to 30%, and efforts have been made to reduce the number of LBW babies by 30% by 2025. These statistics are supported by a decrease in LBW from 20 million to 14 million in 2012 to 2019 (Rizka P, 2021). Respiratory distress in newborns, or known as Respiratory Distress in Newborn (RDN), is often characterized by symptoms of tachypnea, namely a respiratory rate of more than 60 times per minute, accompanied by grunting, chest retraction, breathing through the nostrils, and cyanosis. Research conducted by Tochie, Choukem, Langmia, Barla, & Ndombo (2016) in Cameroon showed that RDN is a common emergency condition and has a high prevalence of morbidity and mortality. This statement is based on research findings from Nardello et al. (2017) and Babaei, Dehghan, & Pirkashani (2018), which showed that the most common cause of death in newborns was RDN, with a percentage of 72.2% of 79 babies born. Research Objective Risk Factors of Transient Tachypnea of Newborn in NICU Room at Sylvani Hospital, Pahlawan Village, North Binjai District, Binjai City in 2024. Research Method Retrospective survey using Cross Sectional approach. In this study using extensive dataset to see many cases and relationships between variables. The results of statistical analysis using Chi-Square test showed p value (Sign) = 0.001 ($p < \alpha = 0.05$), there is a significant relationship between maternal age and the risk of Transient Tachypnea of Newborn. significant relationship between KEK nutritional status and Transient Tachypnea of Newborn Chi-Square showed p value (Sig) = 0.027 ($p < \alpha = 0.05$).

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INTRODUCTION

SDGs are one of the carefully thought out initiatives developed by each country to maintain higher welfare along with development and governance in an effort to consistently improve the standard of living of the people. The 17 main goals of SDGs are achieved by reporting 69 indicators.(Agusiady et al., 2024),(Fathurrahman, nd). The national SDG target is aligned with the National Medium-Term Development Plan 2020-2024 (RPJMN)(ARIBAWA, 2021),(National, nd). This is included in the third goal, namely good health and well-being, especially those related to health. The main health indicators of the RPJMN are the Maternal Mortality Rate (MMR) and the Infant Mortality Rate (IMR) which are strengthened in the 2022 Government Work Plan (RKP), that these figures are a concern that needs to be considered in placing health efforts. development into practice (Ministry of Health of the Republic of Indonesia, 2023)(LARASWATI, 2023),(Hastutik et al., 2023),(Taslim, 2022).

According to WHO estimates, there were 5 million neonatal deaths and 4.5 million infant deaths worldwide in 2020, with 7.5% of these deaths occurring in the first year of life. (Charity, 2020),(Bidarti, 2020). The incidence of LBW globally is 15.5% with a range of 10-50%. Since 2012, there has been a decrease in the number of newborns with low birth weight (LBW) by 29% to 30%, and efforts are being made to reduce the number of LBW babies by 30% by 2025.(HERIANTI, 2019),(Stars & Salafas, 2022). This statistic is supported by the decline in LBW from 20 million to 14 million in 2012 to 2019.(Suryani et al., 2023),(Puspita et al., 2024).

Respiratory distress in newborns, or what is known as Respiratory Distress in Newborn (RDN), is often characterized by symptoms of tachypnea, namely a respiratory rate of more than 60 times per minute, accompanied by grunting, chest retraction, breathing through the nostrils, and cyanosis.(Banunu, 2023),(Lia Badria et al., 2022). Research conducted by Tochie, Choukem, Langmia, Barla, & Ndombo (2016) in Cameroon showed that RDN is a common emergency condition and has a high prevalence rate of morbidity and mortality.(ATIKA, 2019). This statement is based on research findings from Nardello et al. (2017) and Babaei, Dehghan, & Pirkashani (2018), which showed that the most common cause of neonatal death was RDN, with a percentage of 72.2% of 79 babies born.(Riastawaty, 2019),(Yanti, 2024).

Initial survey data conducted by researchers at RSUD Sylvani Jl. Perintis Kemerdekaan No. 21 Kelurahan Pahlawan, Binjai Utara District, Binjai City in 2024 through medical record data as many as 12 cases occurred in January-April, children were admitted to the NICU, there were 6 babies experiencing transient tachypnea of newborn(Dua Nurak & Nona Fembi, 2023),(MUT MAINATIN, 2023). Based on the description above, Low Birth Weight (LBW) is still a special health problem for the government. Early detection and intervention efforts for LBW will be able to reduce the high Infant Mortality Rate. Therefore, researchers are interested in studying "Risk Factors for Transient Tachypnea of Newborns in the NICU Room at Sylvani Hospital, Pahlawan Village, North Binjai District, Binjai City in 2024"(Source: Suarayasa, 2020),(Vizianti, 2022).

RESEARCH METHOD

This type of research uses quantitative methods. Through retrospective surveys, information about what is wanted to be known is analyzed using numerical data as part of quantitative techniques for knowledge discovery. Retrospective surveys are one way to collect historical data. This study uses a cross-sectional approach, which is a research methodology that combines measurements simultaneously.

Time and place of research

This study was conducted at Sylvani Hospital, Pahlawan Village, North Binjai District, Binjai City in 2024.

Operational Definition

Age: Counted from birth to birthday Parity: Number of children born alive or dead, Nutritional Status: Assessed from the mother including or not suffering from KEK (Chronic Energy Deficiency), Transient Tachypnea Of Newborn: Baby's weight at birth as seen from the patient's resume.

Population and Sample

Population is the entire object of research that will be studied.(Amin et al., 2023). The population in this study were all mothers who gave birth normally and by cesarean section who had medical record data at Sylvani Hospital, Pahlawan Village, North Binjai District, Binjai City for the period January-December 2023, which was 54 people. Therefore, the number of samples in this study was 54. The sampling technique is a sampling technique. So, to determine the sample to be used in this study using the total sampling technique.

Measurement Method

It is a type of analysis conducted to determine the relationship between 2 variables. Data collection uses the Chisquare Test to test whether there is a relationship between 2 variables.

Data analysis

Univariate data analysis is the process of analyzing one variable to understand its characteristics.(Gani & Amalia, 2021). If the data is categorical, the analysis is done by calculating the frequency and percentage, and can be presented in the form of a table or bar chart. Meanwhile, for numerical data, measures of central tendency (such as mean, median, mode) and measures of dispersion (such as standard deviation, range, and variance) are used, and are visualized through histograms or boxplots. The main purpose of univariate analysis is to describe and summarize information from each variable thoroughly before proceeding to further analysis.

RESULTS AND DISCUSSIONS

The study was conducted on 54 respondents of mothers who gave birth at RSU Sylvani, Kelurahan Pahlawan, Kecamatan Binjai Utara, Kota Madya Binjai, resulting in data obtained through a checklist. Univariate analysis was used to see the frequency distribution of the research variables, which included age, parity, nutritional status, and birth weight. The results of the distribution can be seen in the following table:

a. The Respondent Characteristics

1) Distribution of Respondent Characteristics

Table 1 shows that there were 54 respondents from all respondents, the frequency was obtained based on age at Sylvani Hospital, Pahlawan Village, North Binjai District, Binjai City in 2024.

Table 1.Distribution of Respondent Characteristics

No	Characteristics	Frequency (N)	Presentation
1	Age		
	At risk (<20 years and >35 years)	26	48.1
	No Risk (20 - 35 years)	28	51.9
2.	Amount	54	100
	At risk (>3 children)	20	37
	No risk (1-3 children)	35	63
	Amount	54	100

Based on Table 4.1, it can be seen that the majority of pregnant women are in the risky age category (<20 years and >35 years), which is 28 people (51.9%). Meanwhile, the group of mothers

with non-risk age (20-35 years) is 26 people (48.1%). Based on Parity, the majority of pregnant women are included in the non-risk parity category, which is 35 people (63%). Meanwhile, the group of mothers with risky parity (>3 children) is 20 people (37%).

Table 2. Frequency Distribution of Respondents Based on the Frequency of Nutritional Status (KEK) of Pregnant Women at Sylvani Hospital, Pahlawan Village, North Binjai District, Binjai City in 2024

Nutritional Status (KEK)	Frequency (N)	Presentation
KEK (LILA <23.5cm)	17	31.5
No KEK (LILA>23.5cm)	37	68.5
Amount	54	100%

experienced KEK (LILA >23.5 cm), which was 37 people (68.5%). Meanwhile, the group of mothers who experienced KEK (LILA <23.5 cm) amounted to 17 people (31.5%).

Table 3. Distribution of Risk of Transient Tachypnea of Newborn at Sylvani Hospital, Pahlawan Village North Binjai District, Binjai City, 2024

Tachypnea Of Newborn	Frequency (f)	%
Breathing <100x/i	24	44.4
Breathing >100x/i	30	55.6
Total	54	100

Based on Table 4.3 above, it can be seen that the majority of the number of respirations >100x/i in the ever category is 30 people (55.6%), the minority of the number of respirations <100x/i in the category is 24 people (44.4%).

Table 4. Relationship Between Age and Risk of Transient Tachypnea of Newborn in NICU Room at Sylvani Hospital

	Transient Tachypnea Of Newborn				Total		p-value
	Breathing <100x/i		Breathing >100x/i		f	%	
	f	%	f	%			
- At risk (<20 years and > 35 years)	18	33	8	14.8	26	48.1	0.001
- No Risk (20-35 years)	6	11.1	22	40.7	28	51.9	
Total	24	44.4	30	55.6	54	100	

Based on Table 4.4, it is known that in the risky age category (<20 years and >35 years), there were 26 people (48.1%), with 18 people (33.3%) experiencing the risk of Transient Tachypnea of Newborn (TTN) and 7 people (30.4%) giving birth to babies with normal birth weight. Meanwhile, in the non-risk age category (20-35 years), there were 31 people (100%) consisting of 10 people (32.3%) who experienced the risk of TTN and 21 people (67.7%) who did not experience the condition.

The results of statistical analysis using the Chi-Square test showed a p value (Sign) = 0.001 ($p < \alpha = 0.05$), so the hypothesis was accepted. This shows that there is a significant relationship between maternal age and the risk of Transient Tachypnea of Newborn in the NICU room of Sylvani Hospital, Pahlawan Village, North Binjai District, Binjai City, in 2024.

Table 5. The Relationship Between Parity and the Risk of Transient Tachypnea of Newborns in the NICU Room at Sylvani Hospital

	Transient Tachypnea Of Newborn				Total		p-value
	Breathing <100x/i		Breathing >100x/i		f	%	
	f	%	f	%			
At risk (>3 children)	13	24.0	7	13.0	20	37.0	0.004
No risk (1-3 children)	11	20.4	23	42.6	34	63.0	
Total	24	44.4	30	55.6	54	100	

Based on Table 4.5, it is known that in the risky parity category (≥ 3 children), there are 20 people (37.0%), with 13 people (24%) having a respiratory rate of <100x/minute and 7 people

(13%) having a respiratory rate of $>100x/\text{minute}$. Meanwhile, in the non-risk parity category (1-3 children), there are 34 people (63%), with 23 people (42%) experiencing a respiratory rate of $>100x/\text{minute}$.

The results of statistical analysis using the Chi-Square test showed a p value (Sig) = 0.004 ($p < \alpha = 0.05$), so the hypothesis was accepted. This shows that there is a significant relationship between maternal parity and the risk of Transient Tachypnea of Newborn in the NICU room of Sylvani Hospital, Pahlawan Village, North Binjai District, Binjai City, in 2024.

Table 6. The relationship between nutritional status (KEK) and Transient Tachypnea of Newborn in the NICU Room at Sylvani Hospital

Nutritional Status (KEK)	Transient Tachypnea Of Newborn				Total		p-value
	Breathing $<100x/i$		Breathing $>100x/i$		f	%	
	f	%	f	%			
KEK (LILA $\leq 23.5\text{cm}$)	12	22.2	5	9.3	17	31.5	0.027
No KEK (LILA $>23.5\text{ cm}$)	12	22.2	25	46.3	37	68.5	
Total	24	44.4	30	55.6	54	100	

Based on Table 4.6, it is known that in the category of KEK nutritional status (LILA $\leq 23.5\text{ cm}$), there were 24 people (100%) who experienced Transient Tachypnea of Newborn (TTN), with 24 cases (57.1%) of babies born with low birth weight and 18 cases (42.9%) experiencing TTN. Meanwhile, in the non-KEK category (LILA $>23.5\text{ cm}$), there were 12 people (100%), with 2 cases of TTN (16.7%) and 10 cases of babies born with normal birth weight (83.3%).

The results of statistical analysis using the Chi-Square test showed a p value (Sig) = 0.027 ($p < \alpha = 0.05$), so the hypothesis was accepted. This shows that there is a significant relationship between KEK nutritional status and Transient Tachypnea of Newborn in the NICU room of Sylvani Hospital, Pahlawan Village, North Binjai District, Binjai City, in 2024

CONCLUSION

Based on the research that has been conducted so far in the NICU room of Sylvani Hospital, Pahlawan Village, North Binjai District, Binjai City in 2024, the following results were obtained: Midwife Communication The results of the study on 54 mothers showed that in the at-risk category ($<20\text{ years}$ & $>35\text{ years}$), there were 23 people (100%), with Transient Tachypnea of Newborn (TTN) occurring in 16 people (69.6%) and the incidence of babies with normal birth weight as many as 7 people (30.4%). Meanwhile, in the non-risk category (20-35 years), there were 31 people (100%), with TTN occurring in 10 people (32.3%) and babies born with normal weight as many as 21 people (67.7%).

The results of statistical analysis using the Chi-Square test showed a p value (Sig) = 0.015 ($p < \alpha = 0.05$), which means there is a significant relationship between maternal age and Transient Tachypnea of Newborn.

Based on the research results according to the researcher's assumption, maternal age is related to the biological condition of the reproductive system. In mothers aged $<20\text{ years}$, their reproductive age is not yet mature, while at the age of $>35\text{ years}$ there is a decline in the mother's organ system and a decrease in the quality of the mother's egg cells which are susceptible to pregnancy complications that affect the growth process of the fetus in the womb, causing LBW. This is in line with research conducted by Sadarang (2021) which states that maternal age plays a role in the incidence of LBW. Because mothers under the age of 20 years are mostly identified as giving birth to low birth weight babies compared to mothers aged 20-35 years

The results showed that in the risk category ($\geq 3\text{ children}$), there were 18 people (100%), with Transient Tachypnea of Newborn (TTN) occurring in 14 people (77.8%) and the incidence of babies with normal birth weight was 4 people (22.2%). Meanwhile, in the non-risk category (1-3 children), there were 36 people (100%), with TTN occurring in 24 people (66.7%).

The results of statistical analysis using the Chi-Square test showed a p value (Sig) = 0.005 ($p < \alpha = 0.05$), which indicates a significant relationship between maternal parity and the incidence of Transient Tachypnea of Newborn.

According to the researcher's assumption, the relationship between parity and the incidence of LBW is because mothers who give birth to more than 3 children have a greater chance of LBW due to the condition of the mother's uterus which has not fully recovered, so that the reproductive organs do not work optimally causing blood circulation to the fetus in the growth and development process to be disrupted. In addition, mothers with high parity feel that they already have enough experience with previous pregnancies, so that mothers ignore pregnancy checks that can prevent pregnancy complications. Utilization of services during pregnancy or ANC (Ante Natal Care) has enormous benefits in preventing pregnancy complications in mothers that affect the baby's birth weight.

The results of the study showed that in the Chronic Energy Deficiency (CED) category (LILA \leq 23.5 cm), there were 24 people (100%) who experienced Transient Tachypnea of Newborn (TTN), with 24 people (57.1%) experiencing low birth weight (LBW) and 18 people (42.9%) giving birth to babies with normal birth weight. Meanwhile, in the category of not experiencing CED (LILA $>$ 23.5 cm), there were 12 people (100%), with 2 people (16.7%) experiencing LBW and 10 people (83.3%) experiencing normal birth weight.

The results of statistical analysis using the Chi-Square test showed a p value (Sig) = 0.032 ($p < \alpha = 0.05$), which indicates a significant relationship between the nutritional status of pregnant women (CED) and the incidence of Transient Tachypnea of Newborn.

According to the researcher's assumption, there is a relationship between nutritional status (KEK) and maternal nutrition that is lacking even before pregnancy begins. As the mother's body needs sufficient nutrition but is not met, so do the needs of the fetus in the uterus that require nutrition in the process of development and growth. Insufficient nutritional intake to the fetus causes complications of pregnancy and childbirth in the mother and also in her baby including preterm birth and low birth weight (LBW).

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