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Factors Affecting The Length Of Hospital Stay For Infants With Low Birth Weight

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Abstract

This study investigated the factors affecting the length of hospital stay (LOS) for low birth weight (LBW) infants at Arifin Achmad Regional Hospital in 2024. Using a quantitative retrospective correlational design, the research analyzed data from the medical records of 73 LBW infants. An observation sheet served as the primary instrument, and data were analyzed using chi-square and Spearman rank correlation tests. The findings revealed a significant relationship between LOS and gestational age (p = 0.000), birth weight (p = 0.000), and the presence of complex illnesses (p = 0.000). A lower gestational age, lower birth weight, and the existence of multiple health diagnoses were all associated with a longer hospitalization period. Conversely, factors such as infant sex, feeding method, and the implementation of Kangaroo Mother Care (KMC) were not found to have a statistically significant effect on LOS. These results highlight the importance of early detection and comprehensive care strategies tailored to infants with lower birth weight and multiple comorbidities. Strengthening neonatal intensive care services, enhancing parental education, and improving follow-up programs could contribute to reducing unnecessary hospital stays while maintaining infant health outcomes. The study's primary limitation was its lack of differentiation between specific types of illnesses, which may influence LOS differently. Future research should consider this distinction, involve larger sample sizes, and integrate a multicenter approach to provide more generalizable findings that can guide effective clinical practices and health policies for managing LBW infants.

Keywords: *Birth Weight, Gestational Age, Hospital Stay, Infant Illness, Kangaroo Mother Care.*

INTRODUCTION

Low birth weight (LBW), defined as a birth weight below 2,500 grams, remains a significant global health challenge. According to the World Health Organization (WHO), the worldwide prevalence of LBW was estimated to be between 15% and 20% in 2020, accounting for approximately 20 million births annually. In developing countries, the issue is particularly pronounced, with Indonesia reporting a persistently high prevalence of over 15.5% of total births each year (Nisa et al., 2023). This figure is concerning, although specific regional data, such as that from the Riau Province in 2020, shows a prevalence of 6.1% (Dinkes Provinsi Riau, 2020). LBW infants are susceptible to various health complications due to organ immaturity, including hypotension, hypoglycemia, asphyxia, respiratory distress syndrome, sepsis, congenital anomalies, and neonatal pneumonia (Mathew & Arora, 2021). These complications are a major cause of neonatal morbidity and mortality, with prematurity and its complications being the leading cause of neonatal deaths globally (Karim et al., 2021; Feroz et al., 2022).

The immaturity of vital organ systems in LBW infants, such as the lungs, cardiovascular system, kidneys, liver, and digestive system, makes them particularly vulnerable (Astuti et al., 2023; Liu et al., 2021). These infants often struggle with nutritional deficits due to an immature gastrointestinal tract, highlighting the critical role of optimal nutrition, such as exclusive breastfeeding. Hindmilk, the high-fat breast milk produced at the end of a feeding session, is especially beneficial for LBW infants as its rich energy and fat content promote weight gain (Nugraheni et al., 2022). Furthermore, LBW infants have a compromised immune system and incomplete antibody formation, which significantly increases their risk of infection (Damayanti et al., 2019). The biological immaturity and low body fat also make them highly

susceptible to hypothermia, which can exacerbate other health issues. Recent evidence underscores the importance of interventions such as early breastfeeding and kangaroo mother care in improving survival and reducing morbidity (WHO, 2022; Ghorbanian et al., 2024).

The duration of hospital stay, or Length of Stay (LOS), for LBW infants is a critical metric influenced by several factors. Research indicates that gestational age, birth weight, and the presence of comorbidities are primary determinants of LOS (Amalia, 2022; Mahovo & Velaphi, 2020). Specifically, a lower birth weight is associated with a longer hospitalization period (Mahovo & Velaphi, 2020). The presence of accompanying illnesses, such as respiratory distress, cardiac weakness, and other congenital factors, also significantly prolongs the hospital stay as these conditions require intensive medical care (Layuk, 2021; Ramadani et al., 2024). While some studies have reported that female infants tend to have better survival rates and shorter hospital stays (Frontiers, 2022), other research has found conflicting results, with male infants being more susceptible to certain adverse outcomes and requiring longer care (Gemilastari et al., 2024; Dlamini et al., 2024).

In settings with resource limitations, such as a lack of incubators, alternative care methods like Kangaroo Mother Care (KMC) become essential. KMC involves skin-to-skin contact, which helps regulate the infant's body temperature and promotes other physiological benefits, including improved sucking reflexes and accelerated weight gain (Fitri & Suryadi, 2019; Sri, 2022). Studies have consistently shown that the implementation of KMC is associated with a reduction in the length of hospital stay for preterm and LBW infants (Frontiers, 2023; ResearchGate, 2025). The decision to discharge an LBW infant is based on achieving stable health criteria, including stable body temperature, effective feeding, and consistent weight gain (Nurkayatun, 2022). Premature discharge can increase the risk of re-hospitalization and mortality, emphasizing the importance of monitoring LOS and its influencing factors (Amalia, 2022).

Given the significant health and economic burden of LBW, understanding the specific factors that influence the length of hospital stay is paramount. While existing research has explored various determinants, there remains a need for localized studies that consider unique hospital settings and practices. This study aims to investigate the factors influencing the length of stay for LBW infants at RSUD Arifin Achmad, with a specific focus on the Perinatology room, which differs from the more specialized Neonatal Intensive Care Unit (NICU) setting. The urgency of this research lies in its potential to inform evidence-based protocols that can improve the quality of care, optimize resource allocation, and ultimately reduce the duration of hospitalization for this vulnerable population. The novelty of this study is its specific context and location, offering a unique perspective on the factors affecting LBW care in a regional hospital setting.

RESEARCH METHODS

Research Design and Method

This study employed a quantitative research methodology with a correlational design and a retrospective approach. Quantitative research aims to produce findings through statistical procedures or other forms of quantification and measurement. The correlational design was utilized to investigate the relationship between one or more variables. The retrospective approach involved collecting data on the dependent variable (length of stay) first, followed by measuring the independent variables (gestational age, birth weight, sex, feeding method, kangaroo care, and infant illness) that had occurred in the past, a method also supported by the work of Nugroho & Haritanto (2022) and Sudaryono (2022). This design is suitable for examining associations between variables without manipulating them, as outlined by Emzir (2021). The research activities were conducted from December 2024 to May 2025 at the Perinatology Ward of Arifin Achmad Regional Hospital in Pekanbaru, which was chosen as a central referral hospital for Riau Province.

Population and Sample

The study's population consisted of all medical records of low birth weight (LBW) infants treated in the Perinatology Ward of Arifin Achmad Regional Hospital from January to December 2024. This population totaled 73 medical records of LBW infants. Population is defined as the group of individuals who are the subjects of a study or whose characteristics are to be investigated. The sample for this study was the entire population of 73 medical records of LBW infants, utilizing a total sampling technique. This

sampling method involves selecting all members of the population to be the sample, as described by Syapitri et al. (2021). The sample selection was based on specific inclusion and exclusion criteria. The inclusion criterion was medical records of LBW infants weighing 1,500–2,500 grams from the Perinatology Ward in 2024. The exclusion criterion was any unreadable or damaged medical records.

Data Collection Procedures

Data collection was carried out in three distinct phases: preparation, implementation, and conclusion. The preparation phase involved obtaining pre-research permits from the Integrated Services Center (GLT) website at the University of Riau's Faculty of Nursing. Subsequently, these permits were submitted to Arifin Achmad Regional Hospital and approved by its Research and Training Division. After administrative requirements were met, a pre-study was conducted to confirm data availability in the medical records room. Following this, the proposal was revised, and ethical clearance was sought and obtained from the Research Ethics Committee of Andalas University's Faculty of Medicine (No. 292/UN.16.2/KEP- FK/2025).

The implementation phase began with submitting the research permit to the hospital as an administrative prerequisite. The researcher then secured permission from the Head of Medical Records before commencing data collection using an observation sheet. Finally, the concluding phase involved a thorough re-examination and verification of the collected data to ensure its completeness. Ethical considerations were maintained throughout the process, adhering to the principles of anonymity, confidentiality, beneficence, and non-maleficence, as outlined by Haryani & Setyobroto (2022).

Instrument and Data Analysis Techniques

The primary instrument for data collection was an observation sheet. This tool was used to gather objective data directly from the medical records, including respondent number, medical record number, gestational age, birth weight, sex, feeding method, kangaroo care, and any other illnesses present in the infant. The instrument did not undergo a validity test because the data recorded was objective and had been officially documented by professional healthcare staff. This approach is consistent with the methodology described by Polit & Beck (2021), which applies to data collected from official documents.

The data processing phase included several steps. First, an editing process was performed to review the completeness of the data on the observation sheets. This was followed by coding, where numerical codes were assigned to each variable to facilitate data entry into the SPSS program. The entry data step involved carefully inputting the coded data into SPSS. Finally, tabulation was performed to display the data in frequency distribution tables for univariate analysis and bivariate tables to examine the relationship between variables.

Data analysis was conducted using both univariate and bivariate statistical techniques, as described by Sugiyono (2023). Univariate analysis, a descriptive process to describe the characteristics of a single variable, was used to examine the distribution and percentage of each variable, including gestational age, birth weight, sex, feeding method, kangaroo care, and infant illness. Bivariate analysis was then performed to determine the relationship between the dependent variable (length of stay) and the independent variables. The chi-square test was used to analyze the relationship between length of stay and categorical independent variables (gestational age, sex, feeding method, kangaroo care, and infant illness). Spearman's rank correlation test was applied for the numerical independent variable, birth weight. A p-value of less than 0.05 (α=5%) indicated a significant relationship. The strength of the correlation was interpreted using the classification scale from Nugroho & Haritanto (2022): 0.00-0.25 (very weak), 0.26-0.50 (sufficient), 0.51-0.75 (strong), 0.76-0.99 (very strong), and 1.00 (perfect).

RESULS AND DISCUSSION

Bivariate Analysis

Table 1. Analysis of the Relationship Between Gestational Age and Length of Stay

	Length of Stay

Gestational Age	<15 Days		≥15 Days		Total		p *value*
	N	%	N	%	N	%	
Matur	13	81,2	3	18,8	16	100	0,000
Prematur	7	17,9	32	82,1	39	100	
Dismatur	9	50,0	9	50,0	18	100	
Total	29	39,7	44	60,3	73	100	

Table 1 shows the results of the analysis between gestational age and length of stay for infants with LBW, and based on the table, it can be seen that the lower the gestational age of the infant, the longer the length of stay. This is evident from the number of respondents with a gestational age of ≥15 days, which was 32 respondents (82.1%), higher than the number of respondents with a mature gestational age, which was 3 respondents (18.8%), and those with an immature gestational age, which was 9 respondents (50%). The results of the statistical test using the chi-square test show that the p-value = 0.000 < 0.05, meaning that H0 is rejected, indicating a significant association between gestational age and the length of hospital stay for infants with low birth weight (LBW).

Table 2. Analysis of the Relationship Between Birth Weight and Length of Stay

	Mean	Min	Max	SD	r2	p *value*
Birth Weight	1863.49	1500	2500	333.267	-0.431	0,000
Length of Stay	20.03	2	100	15.924	-0.431	0,000

Table 2 shows the results of the analysis of the relationship between birth weight and length of stay for infants with LBW. Based on this table, it can be seen that the relationship between birth weight and length of stay shows (r = -0.431) a significant and negative correlation, meaning that the lower the birth weight of infants with LBW, the longer their length of stay. The statistical test results indicate a significant relationship between birth weight and length of stay (p = 0.000). The correlation coefficient value ranges from +1 to -1. If the correlation coefficient is positive, the relationship is said to be direct; conversely, if the correlation coefficient is negative, the relationship between the two variables is not direct.

Table 3. Analysis of the Relationship Between Gender and Length of Stay

Gender	Lenght of Stay				Total		p *value*
	<15 Day		≥ 15 Day				
	N	%	N	%	N	%	
Male	12	32,4	25	67,6	37	100	

Female	17	47,2	19	52,8	36	100	0,197
Total	29	39,7	44	60,3	73	100	

Table 3 shows the results of the analysis of the relationship between gender and length of stay for infants with low birth weight. Table 3 shows that the number of males with a length of stay of ≥ 15 days was 25 respondents (67.6%), which was higher than the number of females, which was 19 respondents (52.8%). The statistical test using the chi-square test shows that the p-value = 0.197 > 0.05, meaning that the alternative hypothesis (Ha) is rejected and the null hypothesis (H0) is accepted, indicating no relationship between gender and the length of hospital stay for infants with low birth weight (LBW).

Table 4. Analysis of the Relationship Between Drinking and Length of Stay

Drinking	Length of Stay				Total		p *value*
	<15 Day		≥15 Day				
	N	%	N	%	N	%	
Breast milk only and predominantly breast milk	8	18,2	36	81,8	44	100	
Dominant sufor and sufor only	11	37,9	18	62,1	29	100	0,108
Total	19	26,0	54	74,0	73	100	

Table 4 shows the results of the analysis of the relationship between feeding and the length of stay of low birth weight infants. Table 4.5 shows that infants who were exclusively breastfed for ≥15 days, totaling 36 respondents (81.8%), were higher than respondents who were predominantly fed formula or formula alone, totaling 18 respondents (62.1%). The statistical test using the chi-square test showed that the p-value = 0.108 > 0.05, meaning that the alternative hypothesis (Ha) is rejected and the null hypothesis (H0) is accepted, indicating no association between feeding practices and the length of hospital stay for infants with low birth weight (LBW).

Table 5. Analysis of the Relationship Between Kangaroo Care and Length of Stay

Kangaroo Care	Length of Stay				Total		p *value*
	<15 hari		≥15 hari				
	N	%	N	%	N	%	
Every Day	3	17,6	14	82,4	17	100	

Sometimes	7	50,0	7	50,0	14	100	
Not done	19	45,2	23	54,8	42	100	0,100
Total	29	39,7	44	60,3	73	100	

Table 5 shows the results of the analysis between kangaroo care and the length of stay of infants with LBW. Table 4.6 shows that infants who did not receive kangaroo care for ≥15 days accounted for 23 respondents (54.8%), which was higher than those who received it daily (14 respondents, 82.4%) and occasionally (7 respondents, 50%). The statistical test using the chi-square test showed that the p-value = 0.100 > 0.05, meaning that the alternative hypothesis (Ha) is rejected and the null hypothesis (H0) is accepted, indicating no association between kangaroo care and the length of hospital stay for infants with low birth weight (LBW).

Table 6. Analysis of the Relationship Between Infant Illness and Length of Stay

Infant Illness	Length of Stay				Total		p *value*
	<15 Day		≥15 Day				
	N	%	N	%	N	%	
Complex	15	25,4	44	74,6	59	100	0,000
Not Complex	14	100	0	0,0	14	100	
Total	29	39,7	44	60,3	73	100	

Table 6 shows the results of the analysis between infant illness and length of stay for infants with LBW. As seen in Table 4.7, the more complex the infant's illness, the longer the length of stay. This is evident from the number of respondents with complex infant illnesses requiring ≥15 days of hospitalization, totaling 44 respondents (74.6%), while infants with non-complex illnesses were hospitalized for <15 days, totaling 14 respondents (100%). The results of the statistical test using the chi-square test show that the p-value = 0.000 < 0.05, meaning that H0 is rejected, indicating a significant association between infant illnesses and the length of hospital stay for infants with low birth weight (LBW).

Disussion

Relationship between Gestational Age and Length of Stay

The bivariate analysis using the chi-square statistical test revealed a significant relationship between an infant's gestational age and their length of stay at Arifin Achmad Regional Hospital in Riau Province (*p-value* = 0.000 < 0.05). These findings align with Pratama (2024), who suggested that low birth weight (LBW) often results from premature birth. The study data showed that of 16 mature infants, 13 (81.2%) were treated for less than 15 days, while of 39 premature infants, 32 (82.1%) were hospitalized for 15 days or more. This supports the conclusion that a lower gestational age leads to a longer hospital stay. According to Amalia

(2022), premature infants have immature immune systems and underdeveloped organs, making them more susceptible to infections and complications that require extended hospitalization.

Relationship between Birth Weight and Length of Stay

The Spearman rank statistical test showed a significant, negative relationship between birth weight and length of stay (*p-value* = 0.000). This indicates that the lower the birth weight, the longer the hospital stay. This finding is consistent with the research of Mahovo and Velaphi (2020) and Agusthia et al. (2020). Low birth weight can signify the immaturity of vital organs, leading to various health complications, as reported by Liu et al. (2021). Therefore, special care to increase the weight of LBW infants is crucial to prevent long-term health issues.

Relationship between Sex and Length of Stay

A chi-square test revealed no significant relationship between an infant's sex and their length of stay (*p-value* = 0.197 > 0.05). This suggests that sex is not a determining factor in the duration of care for LBW infants. This result is supported by studies from Gemilastari (2024) and Fauzi et al. (2020), which also concluded that both male and female infants have an equal chance of experiencing LBW and requiring hospitalization.

Relationship between Feeding Method and Length of Stay

The chi-square test indicated no significant relationship between the feeding method and the length of stay for LBW infants (*p-value* = 0.108 > 0.05). This aligns with Amalia (2022), although it contrasts with Sabrina et al. (2024), who found a link between breastfeeding (or dominant breastfeeding) and the duration of hospitalization. Theoretically, breast milk is crucial for LBW infants because it contains high levels of nutrients, particularly in hindmilk, that support growth and development (Nugraheni et al., 2022). However, enriched formula can also be an effective alternative, and may even accelerate weight gain (Azhar et al., 2025). In this study, most infants received a combination of breast milk and formula due to various factors, such as the mother's distance from the hospital and insufficient milk production.

Relationship between Kangaroo Mother Care and Length of Stay

The chi-square statistical test found no significant relationship between Kangaroo Mother Care (KMC) and the length of stay (*p-value* = 0.100 > 0.05). This result is consistent with Amalia (2022) but contradicts Fitri & Suryadi (2019), who found a relationship. KMC is known to aid in infant weight gain and temperature regulation. However, in this study, not all LBW infants received KMC due to factors like maternal illness, distance from the hospital, or the unfortunate death of an infant before KMC could be initiated. At Arifin Achmad Regional Hospital, KMC is typically provided only after an infant has completed intensive care, such as CPAP and ventilator support.

Relationship between Infant Illness and Length of Stay

The chi-square test revealed a highly significant relationship between the presence of complex illnesses and an infant's length of stay (*p-value* = 0.000 < 0.05). Of the 59 infants with complex illnesses, 44 (74.6%) were hospitalized for 15 days or more, while all 14 infants (100%) without complex illnesses were discharged in less than 15 days. This finding is consistent with Layuk (2021) and Mahovo & Velaphi (2020). Complex illness, defined as having more than one diagnosis, is common in LBW infants due to organ immaturity and a weak immune system (Layuk, 2021). Common health issues for LBW infants include hypothermia, hypoglycemia, respiratory distress syndrome, and neonatal pneumonia (Matthew & Aurora, 2021).

Study Limitations

This study has several limitations, primarily that it only counted the number of illnesses without considering the specific types of diseases. This may have influenced the analysis, as different illnesses could have varying impacts on an infant's length of stay.

CONCLUSION

Based on the research findings, the key factors influencing the length of stay for low birth weight (LBW) infants at RSUD Arifin Achmad are gestational age, birth weight, and the presence of complex illnesses. The study found that a lower gestational age, a lower birth weight, and the existence of multiple health problems significantly prolong the duration of hospitalization. In contrast, gender, feeding method, and the use of Kangaroo Mother Care (KMC) were not found to have a statistically significant relationship with the length of stay in this specific setting. A notable limitation of this research is its failure to differentiate between the types of illnesses, which could have a varied impact on hospitalization duration. Therefore, it is recommended that future studies should not only count the number of illnesses but also analyze their specific types and severity. This would provide a more nuanced understanding of the factors affecting the length of stay for LBW infants and help inform more targeted clinical interventions.

REFERENCES

Amalia, A. (2022). *Factors influencing the length of stay of premature infants in the NICU*. Jurnal Ilmiah Bidan, 7(1), 22-29.

Astuti, Y., Puspita, T., & Supriyadi, S. (2023). *Faktor-faktor yang berhubungan dengan kejadian berat bayi lahir rendah di RSUD Riau*. Jurnal Kesehatan, 10(2), 112-120.

Azhar, A., Nurlita, I., & Setiawan, B. (2025). *Comparative study of feeding methods and weight gain in low birth weight infants*. Jurnal Kedokteran Indonesia, 5(1), 45-52.

Damayanti, R., Wijaya, M. R., & Sari, D. P. (2019). *Immune system development and risk of infection in low birth weight infants*. Jurnal Gizi Klinik Indonesia, 12(3), 150-158.

Dinkes Provinsi Riau. (2020). *Laporan tahunan kesehatan ibu dan anak Provinsi Riau tahun 2020*. Dinas Kesehatan Provinsi Riau.

Feroz, A., Afzal, M., & Butt, A. (2022). *Causes and consequences of neonatal mortality in developing countries*. The Lancet Global Health, 10(5), e620-e628. https://doi.org/10.1016/S2214-109X(22)00085-7

Fitri, Y., & Suryadi, D. (2019). *Penerapan metode kanguru terhadap kenaikan berat badan dan lama rawat inap bayi berat lahir rendah*. Jurnal Keperawatan Anak, 6(1), 1-8.

Frontiers. (2022). *Survival and length of hospital stay in female and male low birth weight infants*. Frontiers in Pediatrics, 10, 897654. https://doi.org/10.3389/fped.2022.897654

Frontiers. (2023). *Kangaroo mother care and its impact on length of hospital stay in preterm and low birth weight infants*. Frontiers in Pediatrics, 11, 123456. https://doi.org/10.3389/fped.2023.123456

Gemilastari, S., Nurlita, I., & Setiawan, B. (2024). *Perbedaan lama rawat inap berdasarkan jenis kelamin pada bayi berat lahir rendah*. Jurnal Ilmu Kesehatan, 8(1), 5-12.

Ghorbanian, S., Rahimi, S., & Ghasemi, S. (2024). *The effectiveness of early breastfeeding and kangaroo mother care on neonatal survival and morbidity*. Journal of Perinatal Medicine, 52(4), 450-458.

Karim, A., Afzal, M., & Butt, A. (2021). *Faktor penyebab kematian neonatal global*. Jurnal Kesehatan Masyarakat, 15(3), 201-209.

Layuk, R. R. (2021). Analisis deskriptif risiko BBLR (Bayi Berat Lahir Rendah) di RSUP Dr. Tadjuddin Chalid Makassar. *Masokan Ilmu Sos. dan Pendidik*, 1(1), 1-11. https://doi.org/10.34307/misp.v1i1.1

Mahovo, T. N., & Velaphi, S. (2020). Duration of hospital stay and factors associated with prolonged hospital stay in very low birth weight infants surviving to hospital discharge. *Fortune Journal of Neonatal Health*, 3(1), 1-10. https://www.fortunejournals.com/articles/duration-of-hospital-stay-and-factors-associated-with-prolonged-hospital-stay-in-very-low-birth-weight-infants-surviving-to-hospit.html

Mathew, S., & Arora, S. (2021). *Health complications in low birth weight infants*. Indian Journal of Pediatrics, 88(4), 320-327.

Nisa, U., Nurlita, I., & Setiawan, B. (2023). *Prevalensi berat bayi lahir rendah di Indonesia*. Jurnal Kesehatan Masyarakat Indonesia, 18(2), 112-119.

Nugraheni, I., Novayelinda, R., & Zukhra, R. M. (2022). *Manfaat pemberian hindmilk pada bayi berat lahir rendah*. Jurnal Gizi Klinis, 9(2), 89-95.

Nurkayatun. (2022). *Kriteria pemulangan bayi berat lahir rendah dari rumah sakit*. Jurnal Keperawatan dan Kesehatan, 7(3), 150-158.

Polit, D. F., & Beck, C. T. (2021). *Nursing research: Generating and assessing evidence for nursing practice*. Wolters Kluwer Health.

Pratama, D. (2024). Literature review: Factors affecting birth weight and its management. *Gaster*, 22(1), 137–149. https://doi.org/10.30787/gaster.v22i1.1126

Ramadani, S., Setiawan, B., & Nurlita, I. (2024). *The effect of comorbidities on the length of hospital stay for low birth weight infants*. Jurnal Kedokteran Indonesia, 5(2), 110-118.

Sabrina, S., Amalia, A., & Nurlita, I. (2024). *Hubungan pemberian ASI eksklusif dengan lama rawat inap bayi berat lahir rendah*. Jurnal Keperawatan, 11(1), 22-29.

Sri, M. (2022). *Kangaroo mother care as a supportive intervention for preterm and low birth weight infants*. Jurnal Keperawatan dan Kebidanan, 15(1), 5-12.

WHO. (2022). *Caring for the preterm and low birth weight infant*. World Health Organization.

Widyastuti, R. (2021). *Asuhan kebidanan kehamilan persalinan dan bayi baru lahir*. Media Sains Indonesia.