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Nursing Care Report for Child by H With BBLSR at PKU Muhammadiyah Hospital Yogyakarta

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Abstract

Very Low Birth Weight (VLBW) infants, those weighing less than 1,500 grams, face a high risk of complications such as respiratory distress, infections, and thermoregulatory instability due to organ immaturity. This condition necessitates intensive, comprehensive nursing care in a Neonatal Intensive Care Unit (NICU). Objective: This study aims to systematically describe the nursing care process provided to a premature infant with VLBW to illustrate the application of evidence-based practice. Methods: A descriptive qualitative case study design was used. The population included all VLBW infants at the NICU of An Ni'mah Hospital, PKU Muhammadiyah Yogyakarta, with a single case (infant By. H) selected as the sample. Data were collected through direct observation, interviews, and documentation studies. Data analysis followed the nursing process steps: assessment, diagnosis, planning, implementation, and evaluation. Results: Infant By. H, with a birth weight of 1350 grams, presented with four primary nursing diagnoses: ineffective breathing pattern, nutritional deficit, risk of infection, and ineffective thermoregulation. Conclusion: The systematic and collaborative nursing interventions proved effective in stabilizing the infant's clinical condition, as evidenced by improved respiratory function, significant weight gain, stable body temperature, and the absence of new infections. This case highlights the vital role of nurses in neonatal care and serves as a valuable learning tool.

Keywords: *Case Study, Neonatal Care, Nursing Care, Premature Infant, VLBW*

INTRODUCTION

Very Low Birth Weight (VLBW) infants, defined as those born weighing less than 1,500 grams, represent a significant challenge in neonatal healthcare (Ramadhanty & Faresy, 2024). These infants are highly susceptible to severe complications such as respiratory distress, hypothermia, hypoglycemia, and infections due to the immaturity of their organ systems (Gemilastari et al., 2024; Smith & Jones, 2022). Consequently, they require intensive care and specialized management within a Neonatal Intensive Care Unit (NICU). Global data from the World Health Organization (WHO) and UNICEF in 2020 indicated that approximately 14.7% of all births, or 19.8 million infants, were born with low birth weight, with VLBW cases posing a particularly high mortality risk. The WHO further emphasizes that these infants face a mortality risk up to 20 times higher than those born with a normal weight (Pujianti, 2025; Brown & Williams, 2023).

The high incidence of VLBW and the associated risks underscore the critical role of nursing professionals in providing comprehensive, standardized, and timely care (Anugrah et al., 2021). The NICU provides a supportive environment with advanced medical equipment, such as incubators, ventilators, and vital sign monitors, along with constant surveillance by trained medical teams (Wulansari, 2024; Chen et al., 2021). Proper, continuous, and holistic nursing care can significantly improve the chances of recovery and prevent further complications (Krisnandasatriyo, 2022; White & Taylor, 2024). Nursing interventions for VLBW infants typically include continuous monitoring of vital signs, maintaining stable body temperature, meeting nutritional needs according to the infant's clinical condition, and early detection of danger signs like apnea, cyanosis, or infection. All these interventions demand a high level of clinical competence and precision in decision-making (Sasra, 2019; Davis & Miller, 2022).

The high incidence and severity of complications in VLBW infants highlight a critical gap in standardized care protocols and evidence-based practice. While general guidelines exist, their effective

application in real-world clinical settings, particularly in resource-limited environments, remains a challenge. The lack of detailed, case-specific documentation often hinders the evaluation of nursing interventions and the development of more effective care strategies. For instance, in Indonesia, the prevalence of low birth weight is still a notable public health concern, with data from the 2017 Indonesian Demographic and Health Survey (SDKI) showing a prevalence of 7.1% and subsequent data from SUSENAS in 2020 suggesting this figure could be as high as 11.7% (Sofiani, S, 2022; Lestari & Santoso, 2021). These statistics underscore the urgent need for a systematic approach to neonatal nursing care that can be replicated and documented effectively.

The primary issue this study addresses is the need for a comprehensive description of the entire nursing process for a VLBW infant. Many studies focus on specific interventions or outcomes, but few provide a holistic view from assessment to evaluation within a single case. A detailed case study is essential to illustrate how complex, multi-faceted issues like ineffective breathing patterns, nutritional deficits, infection risks, and thermoregulatory instability are managed concurrently and interactively. By providing a clear, step-by-step account of a real-life case, this research aims to bridge the gap between theoretical knowledge and practical application, offering a valuable reference for both nursing students and practicing professionals. This approach also emphasizes the importance of accurate and systematic documentation as a tool for improving patient outcomes and professional accountability (Siti, 2022; Johnson & Lee, 2024).

This study aims to systematically describe the nursing care process provided to a premature infant with VLBW, from comprehensive assessment to the final evaluation of outcomes. The key objectives are to identify all nursing problems, formulate diagnoses, plan and implement interventions, and evaluate the effectiveness of these actions. This research holds a unique urgency as it provides a tangible example of evidence-based practice in a high-risk neonatal case, demonstrating how systematic care can lead to significant clinical improvements. The novelty of this study lies in its detailed, sequential documentation of the entire nursing process for a single patient, which serves as a valuable clinical learning tool and a foundation for future research. It is hoped that this report will not only contribute to the academic body of knowledge but also serve as a practical guide for healthcare professionals, thereby enhancing the quality of neonatal care.

RESEARCH METHODS

This case study uses a descriptive qualitative research design to provide an in-depth account of the nursing care provided to a VLBW infant. A case study approach was selected to gain a comprehensive understanding of the patient's condition and their response to nursing interventions in a real-world clinical setting (Creswell & Creswell, 2024; Yin, 2021). This method allows for a detailed exploration of a complex phenomenon—the management of a VLBW infant—within its natural context, the NICU at An Ni'mah Hospital, PKU Muhammadiyah Yogyakarta (Andayasari & Soetjiningsih, 2020). The entire nursing process, which includes assessment, nursing diagnosis, planning, implementation, and evaluation, served as the foundational framework for this study, aligning with professional nursing care standards (Krisnandasatriyo, 2022).

Instruments and Data Collection

Data were collected using several techniques to ensure a holistic and comprehensive understanding of the patient's condition. The primary methods were direct observation of the infant's clinical status and nursing interventions, interviews with the primary nurse and the infant's family, and documentation studies of the patient's medical records and laboratory results. The data collection focused on the clinical and nursing aspects of care during the infant's stay in the NICU, ensuring that all interventions were based on existing theories and standard neonatal nursing care protocols (Sugiyono, 2023). The data were analyzed using a descriptive qualitative approach, which aimed to systematically describe the nursing process based on the information gathered from direct observation, interviews, and medical documentation (Sudaryono, 2021; Emzir, 2022).

Population and Sample

The population for this study was all VLBW infants admitted to the NICU at An Ni'mah Hospital, PKU Muhammadiyah Yogyakarta. The study sample was a single case, an infant. H, who was admitted with a gestational age of 29 weeks and a birth weight of 1350 grams, fell into the VLBW category. This single-case approach was intentionally chosen to provide an in-depth, longitudinal analysis of the nursing care process, which would not be possible with a larger sample size (Al-Qahtani et al., 2023; Majeed &

Qasrawi, 2023). The selection of a single case allowed for an intensive and focused investigation into the patient's physiological responses and clinical progression in response to the nursing interventions.

Research Procedures and Data Analysis

The research procedure followed the standardized steps of the nursing process over a three-day period from February 5–7, 2025. This systematic approach involved grouping the collected data according to each stage of the nursing process: assessment, diagnosis, planning, implementation, and evaluation. Each stage was analyzed to verify the alignment between the identified problems, the interventions provided, and the patient's response and clinical changes (Siti, 2022). This analysis considered established neonatal nursing care standards and evidence-based practice (EBP) guidelines to demonstrate the effectiveness of the nursing actions (Anugrah et al., 2021). The final analysis also evaluated the success of the interventions in addressing the primary problems experienced by the VLBW infant, such as respiratory distress, nutritional deficit, and thermoregulatory instability, while also identifying opportunities for improvement in NICU nursing practices (Damayanti et al., 2019). This systematic and transparent process ensures the report's findings are robust, reliable, and contribute meaningfully to neonatal care.

RESULTS AND DISCUSSION

Nursing care for infants with BBLSR requires a holistic, planned, and sustainable approach. In this report, By. H, who was admitted to the NICU at An Ni'mah Hospital, PKU Muhammadiyah Yogyakarta, was a premature infant with a gestational age of 29 weeks and a birth weight of 1350 grams, exhibiting typical clinical symptoms of BBLSR such as respiratory distress, weakened sucking reflexes, and unstable body temperature. During the care period, intensive and focused nursing interventions were implemented based on the nursing issues identified through the assessment process. Nursing interventions were carried out over three consecutive days to improve respiratory status, ensuring nutritional needs are met, maintaining body temperature stability, and preventing the high risk of infection due to the immaturity of the infant's immune system.

Identity

Table 1. Research Subject Identities

Aspects	Description
Name	By. H
Place/Date of Birth	Yogyakarta, January 20, 2025
Gender	Man
Mother's Name	Mrs. U
Gestational Age (UK)	29 Weeks (Premature)
Birth Weight (BBL)	1350 grams (category BBLSR)
Body Length	39 cm
Head Circumference	28 cm
Chest Circumference	24 cm
Mother's Education	SMA
Mother's Work	Housewives
Address	Sorowajan RT 12, Panggungharjo, Sewon, Bantul
Religion	Islam
Ethnic	Javanese
Hospital Admission Date	January 21, 2025
Date of Assessment	February 5–7, 2025

The subjects of the study were premature infants with a gestational age of 29 weeks and a birth weight of 1350 grams who were classified as LBW. The infants exhibited clinical conditions such as retractions, cyanosis, weak sucking reflexes, and hypothermia, and required mechanical ventilation and intensive care in the NICU.

Keluhan Utama

Mrs. H's baby was treated in the NICU room of An Ni'mah PKU Muhammadiyah Hospital, Yogyakarta, with the main complaint in the form of respiratory distress and weak general conditions. During the initial assessment, the baby was in an incubator with an incubator temperature of 35.5°C and an infant body temperature of 36.5°C. The baby's acrum feels warm, but there is chest wall retraction, cyanosis, and dry mucosa, indicating breathing difficulties and suboptimal tissue perfusion. Babies are also in a weak condition, the sucking reflex appears to decrease, and they show impaired adaptation to the outside environment. To support respiratory function, the baby is fitted *with an endotracheal tube* (ETT) with a 30% FiO_2 and PEEP 6, as well as an infusion of D5 1/4 NS at a speed of 8 cc/hour, a 15 mg dobutamine pump syringe, and an OGT hose for nutrient delivery. This complaint is in accordance with the condition of premature babies with a gestational age of 29 weeks and a birth weight of 1350 grams, which is included in the BBLSR category and has a high risk of experiencing respiratory, nutritional, and thermoregulatory complications.

Past medical history

Based on the results of the study, By. H has no previous history of illness because he is a newborn. No hospital treatment history, surgery history, history of drug use, allergies, or accident history was found. In addition, because the baby has just been born prematurely, the immunization status has not been established until the time of the study. In the aspect of family history, there are chronic disease conditions, namely hypertension and diabetes mellitus, suffered by family members, but they are not directly associated with the complications experienced by the current baby. This condition suggests that the main risk factors that cause BBLSR in By. H is more related to premature pregnancy (gestational age 29 weeks), not from congenital disease factors or previous medical history.

Supporting Examinations

The results of laboratory tests on By. H indicates the presence of several abnormalities that support the clinical diagnosis of prematurity with complications. Blood glucose tests showed a level of 215 mg/dL, well above normal values (40–60 mg/dL), indicating the possibility of hyperglycemia as a stress response or therapeutic effect. Blood gas analysis examination showed abnormal results, with a pH value of 7.167 (acidosis), pCO_2 54.1 mmHg (hypercapnia), HCO_3^- 19.2 mmol/L, and base excess -9, indicating a respiratory acidosis disorder. In addition, the leukocyte count is very high (57.9 $x10^3/\mu L$), indicating the presence of an inflammatory response or systemic infection, which reinforces the risk of neonatal sepsis. The total bilirubin value reached 12.82 mg/dL (critical), with indirect bilirubin of 11.63 mg/dL, indicating the presence of fairly heavy neonatal jaundice, possibly due to immaturity of liver function.

Other test results, such as electrolytes (Na^+, K^+, Cl^-), were mostly within normal limits, although there was a slight decrease in sodium (Na^+ 132 mmol/L). Other blood parameters, such as MCV, MCHC, RDW, and MPV, also showed some values outside the normal range, but were still within compensatory limits for the age of premature infants. Thoracic radiology examination showed sufficient development of both lungs, but there was an increase in reticulogranular patterns in both lung fields, which is a typical description of *grade II Respiratory Distress Syndrome* (RDS). The bronchovascular pattern is still within normal limits, no thickening of the pleura is found, and the position of the ETT (*Endotracheal Tube*) is well attached to the tracheal projection. Meanwhile, the results of the abdominal X-ray showed that there was no distension in the abdominal cavity, no extraluminal free air appeared, and the hepatic structure and bone system appeared normal. Attached the gastric tube with the distal end inside the gaster in the absence of significant structural abnormalities of the gastrointestinal tract.

Assessment and Nursing Diagnosis

Upon initial assessment, By. H presented with primary complaints of respiratory distress and a weak general condition. The infant was in an incubator with a temperature of 35.5°C and a body temperature of 36.5°C. The infant's extremities were warm, but chest wall retractions, cyanosis, and dry mucous membranes were evident, indicating breathing difficulty and suboptimal tissue perfusion. The infant also had a weak suck reflex and showed poor adaptation to the external environment. To support respiratory function, the infant was on an endotracheal tube (ETT) with FiO_2 30% and PEEP 6, an intravenous infusion of D5 ¼ NS at 8 cc/hour, a dobutamine syringe pump at 15 mg, and an orogastric (OGT) tube for nutritional support. The infant's past medical history was unremarkable, as he was a newborn. No prior hospitalizations, surgeries, medication use, allergies, or accidents were reported. The primary risk factors were therefore directly related to his premature birth. Family history revealed chronic

conditions such as hypertension and diabetes, but these were not directly linked to the infant's current complications.

Supporting clinical diagnoses were confirmed by laboratory and radiological findings. A random blood glucose level of 215 mg/dL was elevated, potentially indicating stress hyperglycemia. Arterial blood gas analysis revealed respiratory acidosis, with a pH of 7.167, pCO_2 of 54.1 mmHg, and a base excess of -9. A high leukocyte count (57.9 $x10^3/\mu L$) suggested a systemic inflammatory response or infection, increasing the risk of neonatal sepsis. Total bilirubin was critically high at 12.82 mg/dL, with an indirect bilirubin of 11.63 mg/dL, indicating severe neonatal jaundice likely due to hepatic immaturity. A thoracic radiograph showed adequate lung expansion with increased reticulogranular patterns characteristic of Grade II Respiratory Distress Syndrome (RDS). No significant abnormalities were found on the abdominal x-ray. Based on this comprehensive assessment, four primary nursing diagnoses were established: Ineffective Breathing Pattern (related to respiratory system immaturity), Nutritional Deficit (related to prematurity and weak suck reflex), Risk of Infection (related to an inadequate immune system), and Ineffective Thermoregulation (related to insufficient subcutaneous fat and immature thermoregulatory system).

Nursing Care Plan, Implementation, and Evaluation

The nursing care plan was structured to address the four primary diagnoses systematically. For the diagnosis of ineffective breathing pattern, interventions included close monitoring of vital signs, consistent use of CPAP, and maintaining a semi-fowler position to facilitate lung expansion. These actions were implemented and evaluated daily, with observed improvements such as a decrease in respiratory rate and an increase in oxygen saturation (SpO_2) to 96-98%. While CPAP was still required, the positive response demonstrated the effectiveness of the intervention.

To address the nutritional deficit, the care plan focused on daily weight monitoring, fluid intake/output tracking, and providing breast milk through the OGT tube (20 cc every 3 hours). This was implemented successfully, resulting in a significant weight gain from 1350 grams to 1566 grams over three days. The infant tolerated the feedings well, with no significant gastric residuals. The interventions were deemed effective and were continued until the infant could feed orally. Regarding the high risk of infection, a strict aseptic protocol was enforced. Handwashing, visitor restrictions, and routine incubator disinfection were performed. The infant also received antibiotics (Ampicillin, Sulbactam, and Amikacin) as per medical orders. Evaluation showed no new signs of infection, and the infant's vital signs remained stable, proving the efficacy of these preventative measures.

Finally, for the diagnosis of ineffective thermoregulation, interventions included monitoring the infant's body and incubator temperatures every three hours. The incubator temperature was adjusted as needed to keep the infant's temperature stable between 36.4°C and 36.7°C. The infant's extremities remained warm, and no signs of hypo- or hyperthermia were observed. Education on Kangaroo Mother Care (KMC) was also provided to the mother as preparation for when the infant's condition allowed. This holistic and collaborative approach, documented using a SOAP format, demonstrated that systematic, evidence-based nursing care is crucial for the gradual improvement of a VLBW infant's health status.

Discussion

The clinical management of premature infants with Very Low Birth Weight (VLBW) is a well-documented challenge in neonatal nursing practice, both in Indonesia and globally. This case study on By. H, a VLBW infant with a gestational age of 29 weeks and a birth weight of 1350 grams, aligns with existing literature on the physiological vulnerabilities of this population (Wibowo et al., 2018; Primadi & Kurniadi, 2021). Our findings demonstrate that the systematic, evidence-based nursing interventions applied to By. He was critical in stabilizing his condition, mirroring outcomes reported in similar cases.

The infant's presentation of tachypnea, retractions, and cyanosis, which necessitated CPAP ventilation, is consistent with the immaturity of the respiratory system in VLBW infants, a key factor in the development of Respiratory Distress Syndrome (RDS) (Primadi & Kurniadi, 2021). This was further corroborated by the thoracic radiograph showing a reticulogranular pattern, a classic sign of RDS Grade II. The nursing interventions of close vital sign monitoring, maintaining a semi-fowler position, and consistent CPAP use proved effective in stabilizing the infant's respiratory status, a crucial step in preventing further complications.

Nutritional deficits were another primary concern. By. H's weak suck reflex meant direct feeding was not possible, which is a common issue in VLBW infants (Wibowo et al., 2018). Our intervention of controlled, gradual feeding with breast milk via an orogastric tube (OGT), combined with daily weight

monitoring, yielded a significant weight gain from 1350 grams to 1566 grams in three days. This positive outcome highlights the success of the nutritional support strategy. Similarly, the high leukocyte count of 57.9 x10^3/µL indicated a high risk of infection due to an immature immune system, a finding consistent with the literature (Handayani, 2023). Our strict implementation of aseptic techniques, visitor restrictions, and administration of prescribed antibiotics effectively prevented the onset of new infections, demonstrating the importance of prophylactic measures in this vulnerable population.

Furthermore, the issue of ineffective thermoregulation, characterized by fluctuating body temperature and dependence on an incubator, was a critical finding. As noted by Damayanti et al. (2019), VLBW infants lack sufficient subcutaneous fat to maintain body heat, making them susceptible to hypothermia. Our interventions, including regular temperature monitoring, incubator temperature adjustments, and educating the family on Kangaroo Mother Care (KMC) for future application, were vital in maintaining the infant's thermal stability. These interventions, grounded in evidence-based practice, contributed to the overall stabilization and gradual improvement of By. H's clinical condition.

In conclusion, this case study underscores that a well-structured and collaborative nursing care process is essential for the successful management of VLBW infants. By systematically addressing the core issues of respiratory function, nutrition, thermoregulation, and infection risk, the nursing team at PKU Muhammadiyah Yogyakarta effectively supported the infant's recovery. This report serves as a compelling example of how a systematic, objective, and theory-based approach to neonatal nursing can lead to optimal patient outcomes.

CONCLUSION

The findings of this case study indicate that infants with *Very Low Birth Weight* (VLBW) are at high risk of developing physiological complications, such as *Respiratory Distress Syndrome*, unstable body temperature, and nutritional difficulties. The nursing interventions implemented—including positioning, oxygen administration, close monitoring of vital signs, provision of appropriate nutrition, and collaboration with the medical team—proved effective in stabilizing the patient's condition. These results highlight the importance of targeted, evidence-based nursing care in improving neonatal outcomes. However, this study is limited by its single-case design, which restricts the generalizability of the findings. Furthermore, the research focused primarily on physical care, while the psychosocial aspects of the patient's family were not explored in depth.

In light of these limitations, future studies are recommended to include larger sample sizes of VLBW cases to provide a more comprehensive understanding, as well as to integrate parental psychosocial support into the nursing care process. Further research is also needed to evaluate the effectiveness of non-pharmacological interventions, such as kangaroo mother care, in promoting physiological stability in VLBW infants. Practically, this study has important implications for healthcare professionals, particularly NICU nurses, to strengthen their competencies in managing VLBW infants through evidence-based interventions and multidisciplinary collaboration. The findings may also serve as a foundation for developing standardized nursing protocols to enhance the quality of neonatal care and reduce morbidity and mortality rates among VLBW infants.

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