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The overview of nurses' performance in low-birth-weight care in agricultural areas

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***Abstract*:**
Low birth weight (LBW) infants represent the second leading cause of neonatal mortality in Indonesia. These infants require intensive care after hospital discharge but are often readmitted due to dehydration, fever, respiratory distress, diarrhea, and vomiting conditions linked to families' inadequate preparedness for home care. Nurses play a critical role in LBW care, delivering promotive, preventive, curative, and rehabilitative services through a nursing process that addresses individuals, families, and groups. Enhancing nursing performance in LBW care necessitates the support of health workers and cadres. This support is best implemented through maternal and child health programs focused on preparation, implementation, assistance, monitoring, and evaluation for families managing low birth weight infants. Method: This study employed a descriptive quantitative design, targeting nurses who had managed low birth weight (LBW) infants in the Agricultural Health Center (Puskesmas) Ajung, Sumbersari, Rambipuji, Panti, and Kalisat. A total of 68 nurses were sampled using total sampling with a cross-sectional approach, utilizing a modified Multisource Feedback (MSF) Questionnaire as the research instrument. Results Respondents were aged 20-30 years (13.2%), 31-40 years (42.6%), 41-50 years (33.8%), and >51 years (10.3%). Most held a diploma (69.1%), while 30.9% had a bachelor's degree in nursing (News). Nurse performance in managing LBW infants and home visits was rated good in 63.2% of cases, low in 19.1%, and moderate in 17.6%. Most respondents were aged 31-40 years and held a diploma in nursing. Based on frequency and percentage distribution, 63.2% of nurses performed well.

***Keywords*:**
nurse; performance; low birth weight (LBW)

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INTRODUCTION

Low birth weight (LBW) babies are the most significant leading cause of neonatal deaths in Indonesia (Arsyi, 2021). These babies require intensive care during the transition from hospital to home. During this phase, they are prone to respiratory problems, hypothermia, and nutritional deficiencies due to weak immune systems and underdeveloped organs (Kono, 2020). In Jember, records from the hospital indicate that 243 LBW babies were readmitted due to dehydration, fever, breathing difficulties, diarrhea, and vomiting. These issues stem from families being unprepared for home care, partly due to the advanced NICU environment they relied on earlier and psychological stress like fear, feelings of incompetence, or unwanted pregnancies (Padila et al., 2023).

Families unable to provide proper LBW care require nurse support (Hurt et al., 2023). However, home visit programs for LBW babies face challenges. Inadequate parental understanding of LBW care and limited nurse involvement after hospital discharge were key issues (Aagaard et al., 2023). Preliminary studies in 2023 found the highest cases of LBW in Jember in areas such as Ajung (140), Sumberjambe (87), and Sumbersari (79). families in rural areas received limited support after hospital discharge, relying mainly on community health volunteers. Health centers typically send one midwife and nurse for home visits, but families are often uncooperative, and staffing is limited. This

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highlights the importance of involving community cadres to assist nurses in ensuring optimal LBW care (Bolan et al., 2021).

Nurses' performance in LBW care includes promotive, preventive, curative, and rehabilitative efforts (Mansourian et al., 2020). support from cadres and health workers is needed to improve nurse performance through maternal and child health programs focusing on preparation, implementation, assistance, monitoring, and evaluation (Mbachu et al., 2022). Nurses play a critical role in addressing these issues, with their performance encompassing promotive, preventive, curative, and rehabilitative efforts on Essential Neonatal Health Services (Sentika et al., 2023).

The research problem focuses on understanding the performance of nurses in caring for low birth weight (LBW) babies in agricultural regions. The study evaluates nurses' performance in LBW care in these areas. Specifically, it aims to identify the characteristics of nurses and assess their performance in LBW care. Theoretically, this study is expected to be an educational resource and reference for understanding nurse performance in LBW care, particularly for pediatric nursing courses. It also aims to contribute to further development in identifying nurse performance in LBW care, providing a reference for future research on similar topics.

Practically, the findings are intended to provide additional information and references for nurses, particularly those specializing in pediatric nursing, in hospitals and community health centers (Puskesmas). It also aims to offer valuable insights for healthcare institutions, such as hospitals and Puskesmas, to enhance the quality of healthcare services for LBW care in agricultural regions. Once discharged, LBW infants remain vulnerable. Exclusive breastfeeding (30-60 ml every 2-3 hours) is encouraged. Kangaroo Mother Care (KMC) is an effective home care method where the baby is placed skin-to-skin on the mother's chest to maintain warmth, provide protection from infections, and strengthen bonding (Aziz, 2024). KMC helps stabilize the baby's temperature, breathing, and heart rate as a substitute for an incubator (de Ocampo & Villanueva-Uy, 2021). If complications arise, the infant may require readmission (Gomes et al., 2021).

METHOD

This study utilizes a descriptive quantitative research design. It solely describes the content of a variable without testing specific hypotheses. The research aims to portray or identify the performance of nurses in caring for LBW (Low Birth Weight) infants in the Agricultural Region, Jember.

Population and Sample

Research Population: The population encompasses all elements in the study, such as objects and subjects with specific characteristics. The population for this research includes all nurses who have handled LBW cases in the Agricultural Region Health Centers, namely Ajung, Sumbersari, Rambipuji, Panti, and Kalisat.

Research Sample: The sample is a representative subset of the population used to collect research. The sample in this study consists of some nurses who have handled LBW infants in the Agricultural Region Health Centers, with a total sample size of 68, calculated from each health center.

Sampling Technique: The sampling technique employed is non-probability sampling, specifically total sampling, with a cross-sectional approach. Total sampling involves taking the entire population as the sample, suitable for populations smaller than 100.

Sample Criteria: Inclusion criteria refer to subjects that represent the sample and meet the requirements to be part of the study. In this research, the inclusion criteria are nurses at the health centers who have conducted home visits or cared for LBW patients. Exclusion criteria are those that do not represent the study sample, such as nurses unwilling to participate.

Location and Period

The research was conducted in the Agricultural Region Health Centers, including Ajung, Sumbersari, Rambipuji, Panti, and Kalisat. The study period was from October to December 2024.

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Procedure

Administrative procedures → Selection of research respondents → Explanation of the study's purpose → Respondents sign informed consent forms → Researchers distribute and explain the questionnaire mechanism → Researchers review completed questionnaires → Data analysis.

Data

Primary data was collected directly from respondents (research subjects) through questionnaires covering nurse performance, age, and highest educational attainment. Secondary data is sourced from indirect data that provides information about the subjects, such as journals, books, data from the Health Office, and preliminary studies.

Data Collection Technique, Validity, and reliability tests were conducted with at least 30 respondents, as a larger sample size improves validity. Data collection involved visiting predetermined health centers, explaining the research objectives, and seeking consent for participation. Respondents completed the MSF questionnaire, followed by home visits to LBW infants to cross-check whether nurses had provided LBW care.

Data processing includes four stages: editing, coding, entry, and cleaning. Univariate analysis is used for this study, which Describes frequency distribution and percentages for variables such as nurse performance, age, and educational attainment.

Research Tool/Instrument

A modified multisource feedback (MSF) questionnaire was used for this research. The MSF questionnaire assesses self and peer evaluations, providing formative and summative feedback (Lockyer & Sargeant, 2022). Validity tests involved 53 respondents, with decisions based on r calculated > r table calculated > r table, which was 0.2706 for df=53−2=51df=53−2=51. Items were valid if r-calculated > 0.05. Reliability tests using Cronbach's alpha yielded 0.971, indicating high reliability. Operational definitions and guidelines are used to guide the definition of the research process. The guidelines are as follows.

Table 1. Operational definitions

Variable	Operational Definition	Indicators	Measuring Instruments	Scale	Result
Nurse Performance in BBLR Care	The results of nurses' performance in providing nursing care to BBLR patients can affect the image of health institutions	Actions maintain the temperature of BBLR babies; Prevention of infection and nutritional intake of BBLR infants; Communication and counselling	Questionnaire Multisource Feedback	Ordinal	Good: 76%-100% Moderate: 56%-75% Low: < 56%

Research Ethics and Ethical Approval

All studies involving respondents must adhere to three principles. Respect for Person: The researcher respects the rights and decisions of others without coercion and avoids misconduct by obtaining informed consent. Beneficence and Non-Maleficence: The researcher maximizes benefits for institutions and society while minimizing risks and harm to respondents. Justice: The researcher ensures fair treatment and equal opportunities for respondents, regardless of race, ethnicity, or religion. Ethical approval is written permission granted by a Health Research Ethics Committee for conducting research. This study obtained ethical approval with certificate number 399/UN25.1.14/KEPK/2024, issued by the Health Research Ethics Committee, Faculty of Nursing, University of Jember. Below is the process for obtaining the ethical approval certificate.

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RESULT

Table 2. Frequency Distribution of Respondent Characteristics

Characteristics of Respondents	Frequency	Percentage (%)
Age		
20-30 years old	9	13.2%
31-40 years old	29	42.6%
41-50 years old	23	33.8%
>51 years	7	10.3%
Total	68	100%
Last Education		
D3	47	69.1%
S1(Ners)	21	30.9%
Total	68	100%
Origin of Puskesmas		
Ajung Health Center	12	17.6%
Sumbersari Health Center	19	27.9%
Nursing Home Health Center	11	16.2%
Rambipuji Health Center	5	7.4%
Kalisat Health Center	21	30.9%
Total	68	100%

Table 3. Distribution of actions to maintain the temperature of LBW babies

The act of maintaining the temperature of the low-birth-weight infants	Frequency (n)	Percentage (%)
Good	39	57.4%
Enough	16	23.5%
Low	13	19.1%
Total	68	100%

Table 4. Descriptive statistics of actions to maintain the temperature of LBW babies

No	Question	Minimum	Maximum	Mean	Standard Deviation
1.	Nurses teach mothers to make skin-to-skin contact with the body of low-birth-weight babies	1.00	4.00	2.9559	1.05708
2.	The nurse taught the mother to do the kangaroo method by placing the baby between the mother's breasts in an upright position	1.00	4.00	3.0000	1.10629
3.	Nurses provide physical support and provide information to mothers on how to maintain a low-birth-weight baby's body temperature	1.00	4.00	3.0882	1.00351
4.	Nurses teach parents to dress low-birth-weight babies in warm clothes, hats, and blankets	1.00	4.00	3.0588	1.02042

Table 5. Distribution of infection prevention and nutritional intake of LBW babies

Prevention of infection and nutritional intake of low-birth-weight infants	Frequency (n)	Percentage (%)
Good	40	58.8%
Enough	14	20.6%
Low	14	20.6%
Total	68	100%

Table 6. Descriptive Statistics of infection prevention measures and nutritional intake

No	Question	Minimum	Maximum	Mean	Standard Deviation
5.	Nurses teach mothers to wash their hands before and after breastfeeding low-birth-weight babies	1.00	4.00	3.2647	1.04550
6.	Nurses teach mothers when they are sick to try to prevent transmission to low birth-weight babies	1.00	4.00	3.2353	1.00918
7.	Nurses provide a way to prevent the entry of disease-causing bacteria into the diet of low birth-weight babies	1.00	4.00	3.1029	1.06700
8.	Nurses provide a way to prevent the entry of disease-causing bacteria in all objects that are directly related to the baby	1.00	4.00	3.1324	1.04958
9.	Nurses teach mothers how to breastfeed every 2 hours to low birth-weight babies	1.00	4.00	3.1471	1.05469
10.	Nurses teach mothers to give low birth weight babies formula milk	1.00	4.00	2.2794	1.15701

Table 7. Distribution of communication and counseling

Communication and Counselling	Frequency (n)	Percentage (%)
Good	39	57.4%
Enough	16	23.5%
Low	13	19.1%
Total	68	100%

Table 8. Descriptive Statistics of Communication and Counseling Actions

No	Question	Minimum	Maximum	Mean	Standard Deviation
11.	Nurses are willing to ask for input and learn from teammates regarding the care of low-birth-weight babies	1.00	4.00	3.0735	1.99725
12.	Nurses educate families about how to care for low-birth-weight babies properly	1.00	4.00	3.1618	1.01644
13.	Nurses communicate well with patients and families with low-birth-weight babies	1.00	4.00	3.1324	1.00602
14.	Nurses work teamwork with fellow nurses in the care of babies with low birth weight	1.00	4.00	3.2059	1.04466
15.	Nurses are actively involved in teams to treat infant patients with low birth weight	1.00	4.00	2.9265	1.02675
16.	Nurses can be relied upon to deliver information related to low birth weight	1.00	4.00	3.0000	1.02214

Table 9. Distribution of Nurse Performance in LBW Care

Nurse Performance	Frequency (n)	Percentage (%)
Good	43	63.2%
Enough	12	17.6%
Low	13	19.1%
Total	68	100%

DISCUSSION

Characteristic of Nurse

The research shows that most nurses caring for LBW (Low Birth Weight) babies are aged 31–40 years, totaling 29 people (42.6%). Early adulthood influences nurses' thinking, knowledge, and actions, directly impacting their performance. Nurses in this age group generally exhibit emotional

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maturity, social stability, and strong integrity, enabling them to perform better and communicate effectively in solving problems, particularly in LBW care (Maleki et al., 2022). The researcher believes age significantly impacts nurses' performance caring for LBW babies. Mature ages, such as 31–40 years, provide physical, mental, and emotional readiness for optimal LBW care (Novayelinda et al., 2024).

Most nurses who have cared for LBW babies hold a diploma (D3), with 47 nurses (69.1%), followed by bachelor's degrees (S1) with 21 nurses (30.9%). Higher education levels positively influence nurses' performance and improve healthcare services. Education impacts nurses' knowledge, theory, and practices in LBW care (Antar et al., 2024). Improving nurse education can involve training to ensure high-quality healthcare services that meet nursing professional standards (Baker et al., 2020). Effective communication, caring, and teamwork are essential for LBW care (Changiz & Namnabati, 2021). However, summative evaluations highlight a lack of neonatal emergency training among nurses, necessitating referrals in some cases due to inadequate resources at primary healthcare facilities. The researcher concludes that education level (D3 or S1) does not significantly affect performance, as other factors, such as training availability, play a role in LBW care at health centers.

Actions to Maintain LBW Baby Temperature

The research shows that most nurses (57.4%) perform well in maintaining LBW baby temperature, while 19.1% perform poorly. Nurses often provide physical support and educate mothers on maintaining LBW baby temperature (Halawani et al., 2023). nurses use kangaroo mother care (KMC) during home visits to stabilize the baby's temperature, preventing hypothermia. KMC also benefits the baby's emotional, physical, and mental development, promotes exclusive breastfeeding, and enhances mother-baby bonding (Durmaz et al., 2023). However, teaching mothers to maintain skin-to-skin contact with LBW babies is the least performed action. Skin-to-skin contact acts as a natural thermoregulator for LBW babies, transferring heat from the mother's body to the baby (Smith, 2024). The researcher stresses the importance of educating mothers on fundamental practices like skin-to-skin contact to prevent hypothermia during home care for LBW babies.

Infection Prevention and Nutrition Intake for LBW Babies

Most nurses (58.8%) perform well in preventing infections and ensuring proper nutrition intake for LBW babies, while 20.6% have average or low performance. Nurses frequently teach mothers to wash their hands before and after breastfeeding to reduce infection risks (Tomori et al., 2020). maintaining hygiene minimizes infection risks for LBW babies, whose immune systems are underdeveloped. Additional measures include limiting visitors, avoiding prolonged bathing, and ensuring a smoke-free environment (George et al., 2022).

The least performed action is educating mothers on formula feeding. Exclusively breastfed LBW babies gain weight faster due to breast milk's superior protein and energy content. Promoting exclusive breastfeeding, ensuring maternal nutrition, and providing infection prevention education are critical for LBW care (Khaira et al., 2022). The researcher concludes that infection prevention and proper nutrition intake are essential for LBW care to promote weight gain and reduce rehospitalization risks.

Communication and Counseling

Most nurses (57.4%) perform well in communication and counseling, while 19.1% perform poorly. Nurses frequently collaborate with colleagues to address LBW baby care issues. Teamwork during home visits is important to solving family-related problems. Collaboration among nurses, midwives, and other medical staff is necessary to ensure optimal LBW care (Schuler et al., 2023). However, active involvement in team efforts is the least performed action. Active teamwork enhances nurse performance, making tasks more efficient and effective. At the same time, nurses have sufficient competencies at primary healthcare levels, but inadequate supervision and organization hinder effective LBW care delivery (Baek et al., 2023). The researcher suggests that nurses should collaborate to improve LBW care and raise public awareness about proper home care practices.

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Nurse Performance in LBW Care

The study shows 63.2% of nurses perform well in LBW care, while 17.6% perform moderately. Good nurse performance positively impacts healthcare services and reflects their knowledge and competencies. Performance reflects the nurse's implementation of skills and adherence to professional ethics, influencing the healthcare facility's reputation (AlOmari, 2021).

Effective LBW care involves educating mothers about their baby's condition, infection prevention, weight gain strategies, and exclusive breastfeeding. Providing exclusive breastfeeding, immunizations, illness detection, and warmth through KMC is important. Nurses are also responsible for educating families, providing emotional support, and referring cases requiring advanced care (Hariati et al., 2022). The researcher concludes that nurse performance in LBW care at the agricultural health center is generally good (63.2%), but issues like teaching skin-to-skin contact and active teamwork need improvement.

LBW infants are cared for in Perinatology units or NICUs, focusing on maintaining body temperature (36.5-37.5°C). Infant warmers or incubators are used to prevent hypothermia. Newborns are dried, wrapped, and provided with hats and socks. Real-time monitoring of temperature, oxygen saturation, and infection risks is conducted. Nutritional needs, such as breastmilk or specialized formula, are provided every two hours. Discharge is considered when vital signs stabilize, and the infant gains weight, typically after 7 days. Nurses support mothers in adapting to their caregiving role, particularly for LBW infants (Bright et al., 2020). Factors like maternal stress, lack of support, or separation from the infant can affect the process. Nurses play a key role in educating, promoting health, and preventing illness to help mothers develop confidence and skills in infant care. Key milestones in maternal role attainment include Eye contact and bonding during communication; The infant responds calmly during care; Consistent mother-infant interaction; Mothers show increased confidence in caregiving. Nurses educate and assist parents in performing KMC daily (at least 60 minutes) (Fernández-Medina et al., 2024). This practice improves breastfeeding, reduces infection risk, and stabilizes the baby's temperature. Exclusive breastfeeding is recommended 8-12 times daily, ensuring adequate nutrients like carbohydrates, fats, proteins, and vitamins to prevent weight loss. Nurses support mothers psychologically, educate families on infection prevention, and guide parents to recognize warning signs that require medical attention. They empower mothers to confidently care for LBW infants at home (Brooks et al., 2020).

CONCLUSION

This study concludes that most respondents are nurses aged between 31 and 40 years, with most holding a D3 Nursing qualification as their highest level of education. Generally, the respondents are nurses working in community health centers (Puskesmas) within the Agricultural region (Jember) who have experience in home visits or caring for low birth weight (LBW) infants. Regarding providing LBW care, most nurses in the Agricultural Puskesmas work area of Jember demonstrated good performance, followed by low and moderate performance levels.

The performance of nurses in caring for LBW infants is already good. However, there are still moderate and low levels, which indicates the need for improvement through training on LBW care or knowledge-sharing with experienced nurses. This can help reduce the incidence of rehospitalization among LBW infants and enable mothers of LBW infants to understand better how to care for their babies.

Special programs for addressing LBW at primary healthcare facilities need to be enhanced to minimize the occurrence of LBW births. Providing basic training on LBW care and promoting active teamwork to optimize nurses' competencies is crucial. This can significantly impact the improvement of nurses' performance, leading to more effective service delivery and a reduction in LBW prevalence, as well as fostering a positive image of the healthcare institution in the eyes of the community.

Research Limitation

This study used a questionnaire based on perceptions, so the researcher heavily relied on the respondents' honesty when completing the questionnaire. The accuracy of the data is subjective to

each respondent. The researcher has conducted validation with the respondents, particularly families of LBW infants. However, the limited number of respondents led the researcher to believe that the results of this study are not yet representative.

The researcher also faced limitations in the available literature, which is still minimal regarding nurses' performance caring for LBW infants, particularly at primary healthcare facilities. Additionally, the researcher's knowledge in writing is still limited and imperfect, so further research on the performance of LBW care with potentially more comprehensive variables is needed for future studies.

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