

Analysis of Breastmilk-Based Nutrition on Reducing Morbidity in Premature Infants

Dessy Pratiwi^{1*}, Riska Anggraeni³, Ray Wagiu Basrowi^{1,2}

¹Danone SN Indonesia, Jakarta, Indonesia

²Universitas Indonesia, Jakarta, Indonesia

³Ridwan Institute, Cirebon, Indonesia

*Correspondence: dessy.pratiwi@danone.com

ABSTRACT: Preterm and low birth weight (LBW) births remain a health challenge in Indonesia, with the prevalence of preterm births reaching 7-16% and LBW babies at 11.5%. Preterm infants are prone to various health complications, such as respiratory distress and infections, which increase morbidity rates. Breastfeeding is an important strategy in the care of preterm infants because it contains components that strengthen the immune system, prevent health complications, and support optimal growth and development. This study aims to provide more specific scientific evidence on the effectiveness of breastfeeding in reducing the risk of health complications in preterm infants. The results showed that breastfeeding plays a crucial role in reducing morbidity rates in premature infants, as it contains nutrients, antibodies and growth factors that strengthen the infant's immune system. Exclusive breastfeeding helps reduce the risk of complications such as gastrointestinal infections and respiratory distress, which premature infants often experience. In addition, breastmilk supports brain and nervous system development, increasing preterm infants' chances of healthy growth and development, making it an important intervention in efforts to reduce morbidity rates in preterm infants.

Keywords- Breast milk, morbidity, preterm infants

INTRODUCTION

Preterm birth and low birth weight (LBW) remains a significant health challenge in Indonesia, with high prevalence rates. Premature babies are generally born LBW, which increases the risk of health complications. Data shows that the prevalence of preterm births in Indonesia is in the range of 7-14%, even reaching 16% in some districts, much higher than the rate in other developing countries which ranges from 5-9%. In comparison, the prevalence rate in the United States is 12-13%. Meanwhile, the

“Analysis of Breastmilk-Based Nutrition on Reducing Morbidity in Premature Infants”

national prevalence of LBW in Indonesia is 11.5%, emphasizing the need for special attention to prevention and treatment of this condition (Kemenkes, 2022).

Preterm infants require special care because their organs are not fully mature, making them vulnerable to various health complications, such as respiratory disorders, infections, and digestive disorders. These conditions lead to high morbidity rates in premature infants (Pratama, 2024). Therefore, an effective care approach is needed to support the survival and improve the quality of life of preterm infants. One important strategy in this care is the provision of optimal nutrition, which not only supports physical growth but also strengthens the infant's immune system (Kamila & Elisa, 2020).

Breastfeeding practices have been extensively proven to have incredible benefits for the health of mothers and babies (Basrowi et al., 2023). Breastfeeding is the best form of nutrition for preterm infants because breast milk contains immunological components, enzymes, and growth factors that are not found in formula. Breast milk helps prevent various health problems such as necrotizing enterocolitis (NEC), nosocomial infections, and other digestive problems that often occur in premature infants (Rambu & Ilyas, 2024). In addition, breast milk is also more easily digested by the infant's immature digestive system. Optimal breastfeeding support, whether through direct feeding or other methods such as expressed breast milk, can significantly reduce morbidity rates in premature infants, while improving their overall growth and development. Breastmilk offers essential nutrients that are perfectly suited to meet the dietary needs of infants (Basrowi et al., 2018).

Previous research conducted by Artiani et al., (2021) stated that kangaroo care in premature babies has a simple implementation and provides various benefits, both for babies and parents. From the baby's side, this method is very useful, especially in supporting his physical health. In addition, kangaroo care also has a positive impact on parents, strengthening emotional relationships and supporting successful breastfeeding. Basrowi et al., (2019) stated that specific interventions to improve education and knowledge of health and lactation in a working mother population helps to improve the health behaviour and attitude.

The novelty of this study lies in its focus on deeply analyzing the relationship between breastmilk-based nutrition and reduced morbidity rates in preterm infants, taking into account contributing factors such as maternal health conditions, breastfeeding techniques, and neonatal care policies. This study aims to provide insight on the effectiveness of breast milk in reducing the risk of health complications, such as necrotizing enterocolitis (NEC) and nosocomial infections, while offering recommendations that can be implemented in clinical practice to improve the survival and quality of life of preterm infants.

“Analysis of Breastmilk-Based Nutrition on Reducing Morbidity in Premature Infants”

METHODS

This research uses the literature review method which is collecting, analyzing, and synthesizing existing research and scholarly works on a particular topic or question. This method aims to identify trends, gaps, and key findings in the existing body of knowledge, providing a comprehensive understanding of the subject matter (Andriani, 2022). Researchers usually collect literature from various sources such as journal articles, books, conference proceedings, and credible online databases. The process involves a critical evaluation of the relevance, quality, and findings of the selected studies to build a solid foundation for future research or to draw appropriate conclusions. A literature review can serve as a stand-alone study or as the first step in a broader research project.

DISCUSSION

Premature refers to a baby born before reaching 37 weeks of gestation. Normally, a normal pregnancy lasts about 40 weeks. Babies born prematurely often face various health challenges as their organs are not fully developed (Sidauli et al., 2024). Preterm infants are divided into several categories based on gestational age at birth: very preterm (born before 28 weeks), moderate preterm (born between 28 to 32 weeks), and mild preterm (born between 32 to 37 weeks). The earlier the preterm birth, the greater the risk of serious complications (Utami et al., 2022).

The morbidity rate in preterm infants tends to be higher compared to infants born at term because preterm infants have not fully developed the body systems needed to survive and develop optimally (Rachmantiawan & Rodiani, 2022). Morbidity is a medical term that refers to the condition or severity of disease or health problems experienced by individuals or groups within a certain period of time (Azizah et al., 2023). Meanwhile, morbidity of preterm infants refers to the incidence of disease or health problems experienced by infants born before 37 weeks of gestation. Preterm infants tend to have higher health risks because their organs and body systems are not yet fully developed, making them more vulnerable to various medical problems (Sari et al., 2021).

Morbidity in premature infants often includes a variety of health problems, such as respiratory distress, infections, gastrointestinal disorders, and problems with the central nervous system (Astuti et al., 2022). One common condition in preterm infants is respiratory distress due to lung immaturity, which may require intensive care with a ventilator or other breathing apparatus. Preterm infants are also more susceptible to infections, such as pneumonia or sepsis, due to their poorly developed immune systems (Kurdaningsih et al., 2024).

“Analysis of Breastmilk-Based Nutrition on Reducing Morbidity in Premature Infants”

In addition, premature babies are at high risk of neurological developmental disorders, such as cerebral palsy (CP) or delays in motor and cognitive development. Disorders of the digestive system, such as necrotizing enterocolitis (NEC), are also more common in premature infants, which can cause inflammation of the intestines and require intensive medical treatment (Rohsiswatmo, 2021). Therefore, although many preterm infants can survive with proper care, the higher morbidity rate remains a major challenge to their health in the short and long term. Supportive care such as exclusive breastfeeding, proper ventilation, and intensive medical monitoring are essential to reduce morbidity rates in preterm infants.

Care for premature babies requires special attention, both in terms of fulfilling nutritional needs, regulating body temperature, to strict medical supervision to avoid infections and other health problems. Therefore, premature babies need extra medical support and attention in order to grow and develop well (Novryanti, 2024).

Providing proper nutrition is very important in caring for premature babies because they often face various health problems due to incomplete development of organs and body systems. One of the most recommended forms of nutrition is breast milk, which is proven to contain all the nutritional components needed by premature babies (Hendrawati et al., 2024). Breast milk provides not only protein, fat, carbohydrates, vitamins and minerals, but also enzymes that support the baby's metabolism and digestive processes. These nutritional components are very important in supporting the physical growth and brain development of premature infants who need extra attention (Ramadhani et al., 2024).

In addition to complete nutritional components, breast milk also contains antibodies and immune cells that help boost the immune system of premature infants. Premature infants have an immune system that is not fully developed, making them highly susceptible to infections. By consuming breast milk, premature infants gain natural protection from infection, which can reduce the risk of serious illness (Sulastri et al., 2023). Therefore, exclusive breastfeeding is highly recommended to support the health of preterm infants, speed up the recovery process, and improve their quality of life in the long term.

Premature infants tend to have a weak immune system and often experience digestive problems and difficulty in regulating body temperature (Hafidiani & sari, 2024). Exclusive breastfeeding can help reduce the risk of infection and gastrointestinal disorders in premature infants (Fatmawati et al., 2022). As well as Purnamasari & Rahmawati (2021) who explained that breastfed infants have a lower risk of developing gastrointestinal infections (necrotizing enterocolitis/NEC), which is one of the serious

“Analysis of Breastmilk-Based Nutrition on Reducing Morbidity in Premature Infants”

complications in premature infants. Breast milk also contains prebiotics that support the growth of good bacteria in the baby's digestive tract.

Another advantage of exclusive breastfeeding is its ability to support the brain development of premature babies. Breast milk contains omega-3 fatty acids, especially DHA, which are important for brain and eye development (Khalid et al., 2022). Exclusive breastfeeding can also speed up the recovery process of premature babies, increase their weight, and reduce the risk of long-term complications such as developmental or respiratory disorders. Therefore, exclusive breastfeeding is the best option to support the optimal growth and development of premature babies and increase their chances of growing up healthy and strong (Chen & Dong, 2022).

In addition to digestive and immune benefits, breast milk also plays an important role in increasing the weight of premature infants by providing the energy needed for growth (Anissa & Dewi, 2021). The nutrients contained in breast milk are easily digested by premature infants, who have a rudimentary digestive system. Breastfeeding can help infants grow better and faster, and reduce the likelihood of growth-related complications, such as failure to thrive or growth retardation (Kasmawati & Jumrana, 2024).

Overall, breastfeeding preterm infants has been shown to reduce morbidity rates, reducing the risk of developing infections, gastrointestinal disorders, and other health problems. With adequate breastfeeding, preterm infants can increase their immunity, speed up recovery, and improve their quality of life. Therefore, breastmilk is the most ideal and important form of nutrition for premature babies, which can support their optimal recovery and growth.

CONCLUSION

Analysis of breastmilk-based nutrition has shown that breastmilk plays an important role in reducing morbidity rates in preterm infants. Breast milk contains a variety of nutrients, antibodies and growth factors that are essential for strengthening the immune system of preterm infants who are vulnerable to infections and other health problems. Exclusive breastfeeding helps reduce the risk of complications such as gastrointestinal infections and respiratory distress, which are common in premature infants. It also supports optimal brain and nervous system development, increasing the chances of preterm infants to grow and develop healthily. Therefore, breastfeeding is an important intervention to reduce morbidity in preterm infants.

“Analysis of Breastmilk-Based Nutrition on Reducing Morbidity in Premature Infants”

REFERENCES

- Andriani, W. (2022). Penggunaan Metode Sistematis Literatur Review dalam Penelitian Ilmu Sosiologi. *Jurnal PTK Dan Pendidikan*, 7(2). <https://doi.org/10.18592/ptk.v7i2.5632>
- Annisa, D., & Dewi, R. K. (2021). Peran protein: ASI dalam meningkatkan kecerdasan anak untuk menyongsong generasi Indonesia Emas 2045 dan relevansi dengan Al-Qur'an. *Jurnal Tunas Ilmu*, 1(3), 427–435.
- Artiani, L., & Ningsih, S. R. (2021). Efektifitas perawatan kanguru pada bayi prematur: Scoping review. *Jurnal Riset Kebidanan Indonesia*, 5(1), 51-62.
- Astuti, E. S., Solikhah, F. K., & Ernawati, N. (2022). Peningkatan pengasuhan bayi berat lahir rendah (BBLR) oleh tenaga kesehatan dan kader. *Jurnal Kreativitas Pengabdian kepada Masyarakat (PKM)*, 5(12), 4311-4322. <https://doi.org/10.33024/jkpm.v5i12.7950>.
- Azizah, A. N., Azzizah, W. G., Syahidin, Y., & Sari, I. (2023). Tata kelola sistem informasi rekam medis berbasis elektronik pada pelaporan morbiditas pasien rawat inap. *ZN*, 5(3), 505-514.
- Basrowi, R. W., Khoe, L. C., & Yosia, M. (2023). Prevalence Of Breastfeeding And Its Supporting Factors During Covid-19 Pandemic In Indonesia. *General Medicine*, 25(5).
- Basrowi, R. W., Sastroasmoro, S., Sulistomo, A. W., Bardosono, S., Hendarto, A., Soemarmo, D. S., ... & Vandenplas, Y. (2018). Challenges and supports of breastfeeding at workplace in Indonesia. *Pediatric gastroenterology, hepatology & nutrition*, 21(4), 248-256.
- Basrowi, R. W., Sulistomo, A. W., Adi, N. P., Widyahening, I. S., & Vandenplas, Y. (2019). Breastfeeding knowledge, attitude, and practice among white-collar and blue-collar workers in Indonesia. *Journal of Korean medical science*, 34(45).
- Binuko, K. P., & Ugantoro, T. (2022). Berat Lahir Bayi Lahir Sangat Rendah dengan Asfiksia Sedang. *Proceeding Book Call for Papers Fakultas Kedokteran Universitas Muhammadiyah Surakarta (Synapse)*, 995–1004.
- Chen, H., & Dong, L. (2022). The effect of family integrated care on the prognosis of premature infants. *BMC Pediatrics*, 22, 668. <https://doi.org/10.1186/s12887-022-03298-w>
- Fatmawati, Z., Barir, B., & Kristianingrum, D. Y. (2022). Hubungan inisiasi menyusui dini dan sunbathing terhadap penurunan ikterus fisiologis pada neonatus di Mombykids Jombang. *Midwifery: Jurnal Ilmu Kebidanan*, 8(1), 33–43. <https://doi.org/10.21070/midwifery.v8i1.1638>

“Analysis of Breastmilk-Based Nutrition on Reducing Morbidity in Premature Infants”

- Hafidiani, N., & Sari, R. S. (2024). Asuhan Keperawatan pada Bayi BBLR dengan Penerapan Terapi Pijat Bayi terhadap Peningkatan Berat Badan Bayi Prematur di Ruang Perinatologi RSUD Kabupaten Tangerang. *Nusantara Hasana Journal*, 3(12), 39–46. <https://doi.org/10.59003/nhj.v3i12.1122>
- Kasmawati, K., & Jumrana, J. (2024). Pengaruh pijat bayi terhadap peningkatan berat badan bayi umur 3 bulan di Rumah Sakit Wisata UIT Kota Makassar. *Jurnal Ventilator*, 2(2), 181–210. <https://doi.org/10.59680/ventilator.v2i2.1340>
- Kamila, L., & Elisa, F. (2020). Perawatan metode kanguru (PMK) sebagai pengganti inkubator untuk bayi prematur. *Jurnal Soshum Insentif*, 3(1), 92-98. <https://doi.org/10.36787/jsi.v3i1.227>.
- Kementerian Kesehatan Indonesia. (2022). Kelahiran Bayi Prematur. Indonesia.
- Khalid, W., Gill, P., Arshad, M. S., Ali, A., Nawaz Ranjha, M. M. A., & Mukhtar, S. (2022). Functional behavior of DHA and EPA in the formation of babies' brains at different stages of age, and protection from different brain-related diseases. *International Journal of Food Properties*, 25(1), 1021–1044. <https://doi.org/10.1080/10942912.2022.2070642>
- Khotimah, H., & Subagio, S. U. (2021). Analisis hubungan antara usia kehamilan, berat lahir bayi, jenis persalinan, dan pemberian ASI dengan kejadian hiperbilirubinemia. *Faletahan Health Journal*, 8(2), 115-121.
- Kurdaningsih, S. V., Nuritasari, R. T., Zahirah, E., Sylvia, E., & Rasyada, A. (2024). Penerapan posisi quarter prone terhadap peningkatan saturasi oksigen pada bayi prematur dengan gangguan pernafasan. *Jurnal 'Aisyiyah Medika*, 9(2), 43-51.
- Novryanti, S. (2024). The Effect of Infant Massage Therapy on Premature Infant Weight Gain. *Jurnal Health Society*, 13(2), 148–155. <https://doi.org/10.62094/jhs.v13i2.182>
- Pratama, B. A. (2024) "Hubungan Usia Kehamilan dan Jenis Persalinan dengan Lama Rawat Inap Kasus Low Birth Weight di RS PKU Muhammadiyah Surakarta Tahun 2022", *Indonesian Journal on Medical Science*, 11(1). doi: 10.55181/ijms.v11i1.474.
- Purnamasari, M. and Rahmawati, T. (2021) "Relationship between Exclusive Breastfeeding and Stunting for toddlers aged 24-59 months", *Jurnal Ilmiah Kesehatan Sandi Husada*, 10(1), pp. 290-299. doi: 10.35816/jiskh.v10i1.490.
- Rachmantiawan, A., & Rodiani, R. (2022). Persalinan Preterm pada Kehamilan Remaja. *Jurnal Penelitian Perawat Profesional*, 4(4), 1135-1142. <https://doi.org/10.37287/jppp.v4i4.1217>

“Analysis of Breastmilk-Based Nutrition on Reducing Morbidity in Premature Infants”

- Ramadhani, A., Wahyuni, S. D., Agusfiranda, A., Elvania, E., Seftiani, N., & Khairati, S. (2024). Optimization of nutrition in supporting child growth and development. *INTERDISIPLIN: Journal of Qualitative and Quantitative Research*, 1(5), 338–355. <https://doi.org/10.61166/interdisiplin.v1i5.67>
- Rambu, S. H., & Ilyas, A. S. (2024). Hubungan ASI eksklusif dengan kejadian stunting pada balita 6-24 bulan pada tiga kecamatan kasus tertinggi stunting di Kabupaten Jeneponto, Sulawesi Selatan. *EcoVision: Journal of Environmental Solutions*, 1(2), 77–89. <https://doi.org/10.61511/evojes.v1i2.2024.1103>
- Rohsiswatmo, R. (2021). Tata laksana dan rekomendasi gizi bagi bayi prematur: Sebuah kajian pustaka. *Amerta Nutr*, 5(1), 1-13. <https://doi.org/10.20473/amnt.V5i1SP.2021.1-13>.
- Sari, I. M., Subadiyasa, I. M. A., & Riani, F. (2021). Hubungan karakteristik sosio-demografi dengan kejadian persalinan prematur di RSUD Cilegon. *Jurnal Ilmu Kesehatan Masyarakat*, 13(4), 167-172. <https://doi.org/10.52022/jikm.v13i4.250>
- Sidauli, S., Handayani, S., & Indriani, P. L. N. (2024). Faktor-Faktor Yang Berhubungan Dengan Persalinan Prematur Di Rsd Kota Prabumulih Tahun 2024. *Jurnal Review Pendidikan Dan Pengajaran (JRPP)*, 7(4), 15703–15712. <https://doi.org/10.31004/jrpp.v7i4.36797>
- Sulastri, S., Mustikaningrum, A. C., & Anindito, T. (2023). Determinan Kejadian Stunting Pada Balita Di Kabupaten Kendal. *Jurnal Surya Muda*, 5(2), 218–236. <https://doi.org/10.38102/jsm.v5i2.322>
- Utami, R. A., Mastuti, N. L. P. H., & Agustasari, K. I. (2022). Literature Review: Hubungan Antara Riwayat Kelahiran Prematur dengan Tingkat Kecerdasan Intelektual (Intelligence Quotient - IQ) pada Anak Usia Sekolah Dasar. *Journal of Issues in Midwifery*, 6(1), 26–42. <https://doi.org/10.21776/ub.JOIM.2022.006.01.3>