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Association Between Breastfeeding Frequency and Neonatal Jaundice in the Perinatology Unit of Bhayangkara Hospital Bondowoso

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Abstract

Introduction: Low frequency of breastfeeding (<8 times per day) can reduce the infant's body fluid volume, thereby hindering bilirubin excretion and resulting in reabsorption into the bloodstream. This condition increases bilirubin levels and the risk of neonatal jaundice. If not properly managed, jaundice can develop into kernicterus, a condition of permanent brain damage caused by the accumulation of bilirubin in brain tissue. In Indonesia, the incidence rate of hyperbilirubinemia is 79.6%. At Bhayangkara Hospital Bondowoso in 2024, 25.7% of newborns experienced jaundice. This study aims to analyze the relationship between breastfeeding frequency and the incidence of neonatal jaundice in the Perinatology Unit of Bhayangkara Hospital Bondowoso.

Methods: This is a quantitative study with a cross-sectional design. The population consisted of all mothers who gave birth at Bhayangkara Hospital Bondowoso, totaling 103 individuals. The sample size was calculated using the Slovin formula, resulting in 83 respondents selected through purposive sampling.

Results: The results showed that the majority of respondents (54%) breastfed with a low frequency (<8 times per day), while 46% breastfed frequently (≥ 8 times per day). Furthermore, 53% of infants experienced jaundice, while 47% did not. Based on the chi-square statistical test, there was a significant relationship between breastfeeding frequency and the incidence of neonatal jaundice at Bhayangkara Hospital Bondowoso, with a p-value of 0.000 (<0.05).

Conclusions: This indicates that the lower the frequency of breastfeeding, the higher the risk of jaundice in newborns. The findings of this study are expected to serve as a foundation for enhancing education for breastfeeding mothers to prevent jaundice in newborns.

Keywords: Breastfeeding frequency, neonatal jaundice

Introduction

The frequency of breastfeeding in newborns significantly affects the balance of bilirubin metabolism in the body. Infants who receive breast milk less frequently—fewer than eight times a day—tend to experience a decrease in body fluid volume, which leads to reduced urine and stool output. This condition hinders the optimal excretion of bilirubin, thereby increasing the risk of bilirubin accumulation in the blood (Yuliana et al., 2018). Under normal conditions, newborns experience a higher rate of red blood cell breakdown compared to adults (Itoh et al.,

2023). The bilirubin produced from this process must be excreted through feces and urine. However, if the baby does not receive sufficient breast milk, bowel movements may slow down, leading to the reabsorption of bilirubin back into the bloodstream. This, in turn, increases the bilirubin levels in the infant's body and results in neonatal jaundice (Yusuf et al., 2021). If not properly managed, jaundice can progress to kernicterus, a condition of permanent brain damage caused by the accumulation of bilirubin in brain tissue. Kernicterus may lead to severe neurological impairments such as seizures, developmental delays, and hearing loss (Reddy & Pandey, 2023).

Approximately 60% of full-term infants and 80% of preterm infants experience jaundice within the first week of life (Okulu, 2023). According to data from the 2018 Basic Health Research, the incidence of hyperbilirubinemia in Indonesia was reported to be 79.6% (Kementrian Kesehatan Republik Indonesia, 2019). Data from the East Java Provincial Health Office also recorded a neonatal jaundice incidence rate of 23.3%, with the majority of cases attributed to low maternal awareness in providing optimal breastfeeding (Dinas Kesehatan Provinsi Jawa Timur, 2023). According to data from Bhayangkara Hospital Bondowoso in 2024, 25.7% of newborns in the perinatology unit experienced jaundice, including those delivered vaginally and via cesarean section.

Neonatal jaundice may appear within 24 to 48 hours after birth and typically peaks between the third and fifth day of life. In infants who do not receive optimal breastfeeding, bilirubin produced from the breakdown of red blood cells cannot be effectively excreted due to insufficient stimulation of bowel movements. This condition is often referred to as breastfeeding jaundice, which occurs as a result of inadequate breast milk intake in newborns. A newborn's liver enzyme system is still immature, making bilirubin metabolism less efficient. When an infant does not receive enough breast milk, they may become dehydrated and experience significant weight loss, which can further exacerbate jaundice (Assoku et al., 2024; Bratton et al., 2023).

To reduce the incidence of neonatal jaundice caused by infrequent breastfeeding, it is essential to raise maternal awareness about the importance of optimal breastfeeding frequency. The World Health Organization (WHO) and the Indonesian Pediatric Society recommend that newborns be breastfed at least eight to twelve times a day. Adequate breastfeeding not only fulfills the infant's nutritional needs but also accelerates the elimination of bilirubin through feces and urine. Therefore, educating mothers on the importance of frequent and effective breastfeeding should be strengthened by healthcare providers. In addition, rooming-in practices between mother and baby after delivery are highly recommended to increase the opportunity

for more frequent breastfeeding, thereby reducing the risk of neonatal jaundice (Firdaus et al., 2021; Shan et al., 2019).

Methods

The research design used in this study is an analytical observational design with a cross-sectional approach. Data collection was carried out through direct observation of newborns in the perinatology ward, interviews with the mothers to determine breastfeeding frequency, and clinical examinations to identify the occurrence of jaundice. The study was conducted from February 1 to 28, 2025, in the perinatology ward of Bhayangkara Hospital. Prior to data collection, the researcher obtained the necessary research permits and ethical approval from the relevant institution.

The researcher explained the purpose, benefits, and procedures of the study to the mothers of the infants who were selected as respondents. For those who agreed to participate, written informed consent was obtained. Data collection was conducted using two instruments. The variable of breastfeeding frequency was gathered through a structured questionnaire filled out by the mothers, focusing on the breastfeeding frequency within the first 24 hours up to the third day of life. A breastfeeding frequency of eight times or more per day is categorized as frequent, while less than eight times per day is categorized as infrequent. Meanwhile, data on the incidence of neonatal jaundice were collected using an observation sheet, based on the researcher's clinical assessment of changes in the infant's skin and scleral coloration.

After all data were collected, data processing and analysis were performed using statistical software. The population of this study consisted of 103 newborns at Bhayangkara Hospital Bondowoso in December 2024, with a sample size of 83 respondents determined using Slovin's formula. The sampling technique used was purposive sampling with inclusion and exclusion criteria. Inclusion criteria: mothers with newborns in the perinatology ward of Bhayangkara Hospital Bondowoso; newborns who received breast milk during hospitalization, term infants; and mothers who were willing to participate in the study. Exclusion criteria: newborns with congenital diseases or metabolic disorders affecting bilirubin levels; mothers who were unable to breastfeed or did not provide breast milk due to illness; and preterm or low birth weight infants (LBW < 2500 g).

The statistical test used was the Chi-Square test. The data scales used in this study were nominal and ordinal. This study received ethical clearance from the Health Research Ethics Committee (KEPK) of dr. Soebandi University, Jember, with approval number: 770/KEPK/UDS/II/2025.

Results

Table 1. Distribution of Respondents' Characteristics among Postpartum Mothers at Bhayangkara Hospital Bondowoso in February 2025

No	Respondent's Characteristics		Frequency	
			N	%
1	Age			
	Low risk	20-35 year	61	73%
	High risk	<20 year dan >35 year	22	27%
	Total		83	100%
2	Occupation			
	Housewife		20	24%
	Employee		25	30%
	Self-employed		17	20%
	Others		21	25%
	Total		83	100%
3	Education			
	Elementary School		25	30%
	Junior High School		21	25%
	Senior High School		19	23%
	University		18	22%
	Total		83	100%
4	Newborn's gender			
	Male		44	53%
	Female		39	47%
	Total		83	100%
5	Parity			
	Primipara		37	45%
	Multipara		35	42%
	Grand multipara		11	13%
	Total		83	100%
6	Mode of delivery			
	Vaginal birth		21	26%
	SC (<i>Sectio caesarea</i>)		62	74%
	Total		83	100%

Based on Table 1, it can be concluded that the majority of respondents were in the low-risk maternal age group, totaling 61 respondents (73%). Regarding the mothers' occupation, it was found that nearly half of them were employees, with 25 respondents (30%). In terms of maternal education, nearly half had only completed elementary school, also totaling 25 respondents (30%). For the baby's gender, the majority were male, with 44 respondents (53%). Based on parity, nearly half of the mothers gave birth to their first child, totaling 37 respondents (45%). Regarding the delivery method, most respondents delivered by Caesarean section (C-section), with 62 respondents (74%), while those who delivered spontaneously totaled 21 respondents (26%).

Table 2. Frequency Distribution of Breastfeeding among Postpartum Mothers at Bhayangkara Hospital Bondowoso in February 2025

Breastfeeding frequency		Frequency	
		N	%
Frequent	≥ 8 times/day	38	46%
Infrequent	< 8 times/day	45	54%
Total		83	100%

Based on Table 2 above, it can be concluded that out of 83 respondents, the majority had an infrequent breastfeeding frequency, totaling 45 respondents (54%).

Table 3. Frequency Distribution of Neonatal Jaundice Incidence among Newborns at Bhayangkara Hospital Bondowoso in February 2025

Dermal zone (area of body)		Frequency	
		N	%
With Neonatal jaundice	1 (face)	9	20%
	2 (chest + upper abdomen)	10	23%
	3 (lower abdomen + thighs)	12	27%
	4 (Arms + lower legs)	3	7%
	5 (Palms + soles)	10	23%
Total		44	53%
Without Neonatal jaundice		39	47%
Total		83	100%

Based on Table 3, it can be concluded that the majority of the 83 respondents experienced neonatal jaundice, totaling 44 respondents (53%). Meanwhile, nearly half did not experience neonatal jaundice, totaling 39 respondents (47%).

Table 4 The Relationship Between Breastfeeding Frequency and the Incidence of Neonatal Jaundice

		Neonatal jaundice					
		Neonatal jaundice				Total	
		Present		Absent			
		N	%	N	%	N	%
Breastfeeding frequency	Frequent	5	6%	33	40%	38	46%
	Infrequent	39	47%	6	7%	45	54%
Total		44	53%	39	47%	83	100%

Asymp. Sig. (2-sided) 0,000

Based on the research results from 83 respondents analyzed using SPSS with the chi-square test, a p-value of 0.000 was obtained. Since the p-value is less than 0.05, the result is considered significant, indicating that the alternative hypothesis (H_a) is accepted. Therefore, it can be concluded that there is a relationship between breastfeeding frequency and the incidence of neonatal jaundice.

Discussion

The research findings indicate a tendency for infants breastfed less than eight times per day to experience jaundice more frequently than those breastfed eight times or more. A study

by Sari & Ujati, (2023) showed that a high frequency of breastfeeding significantly reduces the risk of physiological jaundice in neonates. This finding is consistent with that of Latief & Rofiatun (2023), who stated that low breast milk intake is positively correlated with increased bilirubin levels in newborns. Infants who receive an adequate amount of breast milk within the first 24 hours of life tend to excrete meconium—which contains bilirubin—more quickly, thereby preventing the occurrence of physiological jaundice. Nur Susilahayati et al. (2022), emphasized that breastfeeding less than nine times a day can increase the risk of jaundice due to delayed bilirubin excretion through feces.

Jaundice occurs due to an increase in bilirubin levels in the infant's blood, which may result from elevated bilirubin production caused by red blood cell hemolysis or decreased bilirubin excretion due to delayed meconium elimination. Breast milk plays a crucial role in accelerating the excretion of bilirubin through feces and urine. By increasing the frequency of breastfeeding, infants are able to eliminate the accumulated bilirubin in their bodies more quickly (Bratton et al., 2023). The findings of this study are consistent with other research, which states that infants who are breastfed more than 8–12 times a day have a lower risk of developing jaundice. One of the main causes of the high incidence of jaundice is insufficient breastfeeding, which leads to dehydration and increased enterohepatic circulation of bilirubin (Kankaew et al., 2019). Therefore, adequate and frequent breastfeeding is strongly recommended to prevent and reduce the incidence of neonatal jaundice.

Neonatal jaundice can also be influenced by maternal characteristics. Primiparous mothers, young mothers (under 20 years old), and mothers with low educational attainment are considered high-risk groups. These groups tend to have limited experience and understanding of proper breastfeeding practices, which increases the likelihood of their infants developing jaundice. In contrast, mothers of safe reproductive age (20–35 years), multiparous mothers, and those with higher educational backgrounds are generally better prepared and more capable of breastfeeding effectively, thereby reducing the risk of neonatal jaundice in their infant (Harsha & Mevundi, 2023; Itova & Georgieva, 2022).

High-risk groups of mothers often face challenges in breastfeeding regularly and as recommended, due to factors such as doubt, lack of awareness about the importance of breastfeeding frequency, or limited knowledge of proper breastfeeding techniques. Therefore, the prevention of neonatal jaundice should focus on improving the quality of breastfeeding education starting from pregnancy, particularly for young mothers, mothers with low educational backgrounds, and first-time mothers. In addition, hospitals are expected to provide intensive breastfeeding support during postpartum care, facilitate early initiation of

breastfeeding (EIB), and ensure rooming-in between mothers and their newborns to allow for more frequent breastfeeding. With this support, breastfeeding frequency is expected to increase, and the incidence of neonatal jaundice can be significantly reduced.

Conclusion

Based on the results of the study, it can be concluded that there is a significant relationship between the frequency of breastfeeding and the incidence of neonatal jaundice. Infants who are breastfed less than eight times a day have a higher risk of developing jaundice compared to those who are breastfed eight times or more per day. These findings emphasize the importance of adequate and frequent breastfeeding from the early days of life to prevent the occurrence of neonatal jaundice.

Author Contributions

First author : Responsible for formulating the research idea, conducted data collection and statistical analysis, wrote manuscript

Second author : Provided guidance and feedback throughout the research process, and contributed to the manuscript preparation.

Third author: participated in manuscript drafting.

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None

Conflict of Interest

The authors state that this research was conducted without any conflicts of interest.

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