

THE RELATIONSHIP BETWEEN EARLY BREASTFEEDING AND NEONATAL JAUNDICE AMONG NEWBORNS IN THE WORKING AREA OF PUSKESMAS PETANAHAN

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ABSTRACT

Introduction: The Ministry of Health of the Republic of Indonesia (2019) reports that neonatal jaundice cases reach 51.47% with a mortality rate of 6% among newborns in Indonesia. The government recommends early breastfeeding as a primary treatment for neonatal jaundice. Early breastfeeding can provide faster skin-to-skin contact between the mother and the baby. This helps reduce bilirubin levels and accelerate meconium excretion in newborns.

Objective: To identify the relationship between early breastfeeding and neonatal jaundice among newborns in the working area of Puskesmas Petanahan.

Method: This quantitative study used an observational analytical design. This study involved 41 respondents selected using a cross-sectional sampling technique. Data were analyzed using the Chi-square test with an error rate of five percent (α : 0.05).

Results: The Chi-Square test obtained a p-value of $0.001 < 0.05$ meaning that H_0 is rejected and H_a is accepted. This indicates that there is a relationship between early breastfeeding and neonatal jaundice among newborns in the working area of Puskesmas Petanahan.

Conclusion: Early breastfeeding is associated with neonatal jaundice among newborns in the working area of Puskesmas Petanahan



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1. Introduction

Public health can be measured using some health indicators. The success of efforts to improve maternal and child health which is a key priority of health development in Indonesia can be seen in the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR). Infant Mortality Rate refers to the number of infant deaths before the first 28 days of life per 1000 live births [1].

World Health Organization (WHO) reported that globally, the IMR reached 34 per 1,000 live births in 2020. However, it reached 3 per 1,000 live births in developing countries and 5

per 1,000 live births in developed countries. It varies in different regions such as 11 per 1,000 live births in East Asia, 43 per 1,000 live births in South Asia, 24 per 1,000 live births in Southeast Asia, and 21 per 1,000 live births in West Asia [2].

According to the Indonesian Demographic and Health Survey (SDKI) data, the Infant Mortality Rate (IMR) in Indonesia in 2019 reached 4,221 cases [1]. In Central Java Province, the IMR was 421 cases in 2019 as reported by the Provincial Health Office in Central Java. The IMR in 2019 significantly decreased compared to 2018 which reached 475 cases. Kebumen District Health Office reported that the IMR in this district reached 15 cases out of 19,548 live births in 2020 [3].

The Ministry of Health of the Republic of Indonesia reported that the causes of death in newborns in 2019 were hypothermia (29%), asphyxia (27%), neonatal tetanus (10%), feeding problems (10%), neonatal jaundice (6%), infection (5%), and congenital abnormalities (1%). The Central Java Provincial Health Office explained that the neonatal jaundice cases covered physiological neonatal jaundice (89%) and pathological neonatal jaundice (11%). The IMR caused by neonatal jaundice in Central Java Province reached 6% [1]. Kebumen District Health Office reported that the IMR caused by neonatal jaundice in this district was 1.99% [1].

Neonatal jaundice is characterized by yellow discoloration of the sclera, skin, or tissue due to the accumulation of bilirubin in the body. This condition is an important sign of hepatic jaundice or abnormal liver function and bile ducts. Jaundice occurs when the bilirubin level reaches <2 mg. However, in newborns, jaundice is not seen even though blood bilirubin levels exceed 5 mg. Jaundice is caused by hemolysis of fetal blood and its replacement into adult blood. Before the delivery, the fetus has a combination of fetal blood and adult blood that can draw O_2 s from the air and secrete CO_2 through the lungs. The destruction of fetal blood causes physiological jaundice. The indirect bilirubin level in preterm babies is 15 mg, but it reaches 10 mg in full-term babies. Thus, when the level exceeds those figures, the baby is considered to have hyperbilirubin [4]. The factor causing high bilirubin in newborns is the accumulation of bilirubin in body tissues resulting in the yellow discoloration of the skin, mucosa, and sclera [5].

Commonly, neonatal jaundice can be discovered in the first week of life [6]. Bilirubin production in newborns is 2 to 3 times higher than in normal adults because the number of erythrocytes in newborns is higher and their lifespan is shorter. Many newborns, especially low-birth-weight babies (< 2500 g or gestational age < 37 weeks) experience jaundice in the first week of life. In most cases of neonatal jaundice, bilirubin levels are not dangerous and do not require treatment. Moreover, they do not have an underlying cause commonly called physiological jaundice which will disappear by the end of the first week of life in full-term babies [7].

The recommended primary treatment for physiological neonatal jaundice is early breastfeeding. This aims to improve the health and life of the newborn. This can be started from the date of birth, without any additional food and drinks as recommended by the United Nations Children's Fund (UNICEF). Health experts recommend to breastfeed the baby every 3 hours with a frequency of at least 8 to 12 times per day for the first few days. Babies who receive breast milk tend to have lower bilirubin levels because they defecate more frequently. If the neonatal jaundice is not treated well, it can progress to pathological jaundice. The neonatal jaundice can be minimized by early breastfeeding. The provision of breast milk with sufficient calories can increase intestinal motility and bacterial introduction into the intestine [8]. Intestinal motility can help expel meconium which in turn decreases

enterohepatic circulation and serum bilirubin levels, while bacteria can convert direct bilirubin into urobilin which cannot be reabsorbed so serum bilirubin levels will decrease [9].

Newborn's bilirubin levels can decrease after providing breast milk to the baby because it contains fat emulsions in the protein solution, lactose, and organic salts secreted by the mother's breast glands as the main food for babies. The first breast milk that comes out is called colostrum which contains lots of IgA immunoglobulin which is good as the body's defense against disease [10]. Management of pathological neonatal jaundice or whose bilirubin levels reach hyperbilirubinemia value can be done with phototherapy for 24 hours, which is the main treatment for newborns with high bilirubin. Phototherapy is given at a distance of 10-20 cm. The closer the baby's position to phototherapy, the more effective in reducing total bilirubin levels [11]. Hospital phototherapy is an effective measure to prevent increasing Total Serum Bilirubin (TSB) levels. Clinical trials have validated the efficacy of phototherapy in reducing hyperbilirubinemia. This therapy works by changing bilirubin into a water-soluble form to be excreted through bile or urine. When the bilirubin absorbs light, a photochemical reaction occurs, namely isomerization. Besides, there is an irreversible conversion into another chemical isomer called lumirubin which can be cleared from plasma through bile [12].

A previous study reveals that breast milk provides great benefits to newborns. The colostrum contains a laxative effect which can help newborn babies to expel meconium from their intestines. With the release of meconium, bilirubin is released [13]. Another study [19] shows that there is a relationship between breastfeeding and the incidence of neonatal jaundice (63.3%) with a frequency of breastfeeding less than 8 times (53.2%) with a p-value (0.003). Thus, it can be said that there is a relationship between breastfeeding and the incidence of neonatal jaundice. Moreover, a frequency of breastfeeding more than 8 times can prevent the occurrence of neonatal jaundice and reduce bilirubin levels [6]. Considering the baby's frequency of urinating more than 6 times a day and urine color and smell can be useful indicators to see whether the breastmilk is sufficient or not for the baby.

Puskesmas Petanahan is a health facility located in Petanahan Sub-district, Kebumen District. The results of a preliminary survey conducted by researchers showed that there were 49 births from May – June. Some did not practice early breastfeeding even though breast milk is important for babies with neonatal jaundice. Therefore, this study aims to identify "The Relationship between Early Breastfeeding and Neonatal Jaundice in Newborns in the Working Area of Puskesmas Petanahan."

2. Design and Method

This quantitative study used an observational analytical design. This study involved 41 respondents selected using a cross-sectional sampling technique. Data were analyzed using a Chi-square test with a significance level of 95%.

3. Result and Discussion

3.1. Result

1. Characteristicst of respondents

Characteristics	Frequency (n)	Percentage (%)
Gestation Age		
Preterm	3	7.3%
Aterm /Full-tern	38	92.6%
Post-term	0	0%

Sex

Male	19	46.4%
Female	22	53.6%
Total	41	100%
Birth weight		
2500-4000 grams	41	100%
Total	41	100%

Source : Primary Data, 2022

The table above shows the frequency distribution of characteristics of newborns. The majority of pregnancies are full-term (92.6%). Most newborns are female (53.6%) with a birth weight of 2500-4000 (100%).

2. Early Breastfeeding for newborns in the working area of Puskesmas Petanahan

The following table shows the frequency distribution of early breastfeeding for newborns at Puskesmas Petanahan.

Early Breastfeeding	Frequency (n)	Percentage (%)
Not appropriate <10x/ 24 hours	6	14.6 %
Appropriate >10x/24 hours	35	85.3%
Total	41	100%

Source : Primary Data, 2022

The table above shows that the majority of early breastfeeding is appropriate >10x/24 hours, namely 85.3%.

3. Neonatal jaundice for newborns in the working area of Puskesmas Petanahan

The distribution of neonatal jaundice in the working area of Puskesmas Petanahan can be seen in the following table.

Neonatal jaundice	Frequency (n)	Percentage(%)
Jaundice	6	14.6 %
Non-jaundice	35	85.3%
Total	41	100%

Source : Primary Data, 2022

The table above shows that a small proportion of newborns experienced neonatal jaundice (14.6%) and the majority of newborns did not (83.5%).

4. The Relationship between Early Breastfeeding and Neonatal Jaundice Incidence among Newborns in the Working Area of Puskesmas Petanahan

The results of the Chi-Square Test concerning the relationship between early breastfeeding and neonatal jaundice among newborns in the working area of Puskesmas Petanahan Community are presented in the following table.

(Early Breastfeeding)	Neonatal Jaundice						<i>p-value</i>
	Non-jaundice		Jaundice		Total		
	f	%	f	%	f	%	
Not appropriate <10x/24 hours	6	14,6	6	14,6	4	100	0,001
Appropriate >10x/ 24 jam	35	85,3	35	85,3	35	100	
Total	40						

Source : Primary Data, 2022

The table above shows that the majority of respondents have appropriate early breastfeeding (85.3%) and only some have not appropriate early breastfeeding (14.6%) and experience neonatal jaundice. The Chi-Square Test obtained a p-value of $0.001 < 0.05$ so H_0 is rejected and H_a is accepted. This means that there is a relationship between early breastfeeding and neonatal jaundice among newborns in Puskesmas Petanahan.

3.2 Discussion

1. Early breastfeeding for newborns in the working area of Puskesmas Petanahan

The results of the study showed that the majority of early breastfeeding is successful (85.3%). This is because health workers provide education regarding the importance of early breastfeeding and provide opportunities for mothers to practice it.

State inadequate early breast milk and poor fluid intake cause worsening of meconium excretion in newborns and this will increase enterohepatic circulation. Besides, babies who don't get enough breast milk may have high bilirubin levels, which can cause dehydration/low-calorie intake. Providing formula milk or additional sugar water to newborns is associated with higher levels of bilirubin, partly due to a decrease in the intensity of early provision of breast milk which contains high calories [16].

2. Neonatal jaundice among newborns in the working area of Puskesmas Petanahan

The results of the study reveal that the majority of newborns do not experience neonatal jaundice (85.3%) and only 14.6% of newborns experience neonatal jaundice.

Jaundice is a yellow discoloration in the sclera, skin, mucous membranes, or other cavities due to a buildup of bilirubin/hyperbilirubinemia. Hyperbilirubinemia is a condition where the amount of bilirubin reaches a value that can cause kernicterus if it is not treated properly. Most hyperbilirubinemia processes have a pathological basis [17].

Babies with physiological jaundice do not need special treatment, but they only need frequent breastfeeding as early as possible with sufficient amounts of antibodies and fluids. Early breastfeeding will increase intestinal motility and introduce bacteria to the intestine. Bacteria can convert direct bilirubin into urobilin which cannot be absorbed anymore, so the amount of serum bilirubin will decrease [17]. Low breast milk intake can result in breastfeeding jaundice, namely jaundice that appears due to a lack of breast milk which appears on the 2nd or 3rd day when breast milk production is still low. This can get worse if the mother does not breastfeed her baby immediately to stimulate the release of breast milk. Breastfeeding duration can affect breast milk production. If the baby is given breast milk soon after birth, breast milk will be produced more quickly. Stimulating breast milk production can be done by facilitating early initiation of breastfeeding [18].

3. The relationship between early breastfeeding and neonatal jaundice among newborns in the working area of Puskesmas Petanahan

The results of the study show that the majority of newborns have appropriate early breastfeeding $>10x/24$ hours (85.3%). This is because mothers understand the explanation given by the health workers about the importance of providing early breast milk to avoid neonatal jaundice.

A previous study [6] found that mothers have inappropriate early breastfeeding causing the baby to experience neonatal jaundice (63.3%), while 36.7% have an appropriate frequency of early breastfeeding so the baby does not experience jaundice. Besides, the majority of babies of mothers with frequent early breastfeeding do not experience

neonatal jaundice (68.3%), while the rest experience neonatal jaundice (31.7%). The statistical testing obtains a p-value of $p = 0.016 = 0.05$. Thus, it can be said that there is a significant relationship between the frequency of early breastfeeding and the incidence of neonatal jaundice among newborns.

Early breastfeeding can decrease the bilirubin levels in newborns because breast milk contains ingredients such as fat emulsions in lactose solution, protein, and organic salts which can be secreted by the breast glands as the main food source for babies. The first breast milk that comes out is called colostrum, which contains lots of IgA immunoglobulin which is good for the baby's body's antibodies against disease [10]. The colostrum has a laxative effect which can help newborn babies to excrete meconium through the intestines. Bilirubin is also secreted together with the meconium [10].

Breast milk is the best source of food for newborns because it contains sufficient nutrition. Giving early breast milk can strengthen and increase the bond of affection between the baby and the mother and increase the baby's antibodies. Jaundice is a common disease for babies within twenty-four hours after birth. Frequent breastfeeding can help secrete the bilirubin which can cause jaundice. Therefore, breastfeeding is good and recommended to anticipate neonatal jaundice [19].

Neonatal jaundice can be treated by early breastfeeding at least eight to twelve times a day for the first few days. Lack of calorie intake or dehydration related to the breastfeeding process can cause neonatal jaundice. Increasing the frequency of breastfeeding can reduce the tendency for severe hyperbilirubinemia in newborns. A conducive environment for mothers can guarantee a good breastfeeding process [12].

Mothers with a high level of support from family and health workers frequently breastfeed the baby and have a high breast milk production. Breast milk production is influenced by some factors including hormones, namely oxytocin and prolactin. Prolactin influences the amount of breast milk production and oxytocin is related to the breast milk production process. However, expressing breast milk requires oxytocin whose work is influenced by the baby's sucking process. The more frequently the baby sucks on the nipple, the more breast milk comes out [20].

Referring to the theory concerning breastfeeding frequency, a full-term baby's frequency of breastfeeding ten times a day for the first 2 weeks after birth is associated with sufficient breast milk production. Therefore, mothers are advised that the frequency of breastfeeding is related to the ability to stimulate the two hormones, oxytocin and prolactin. A low breast milk production is due to the low baby's breastfeeding frequency. Babies can determine their own food needs when being breastfed by the mother [21].

The breastfeeding duration varies according to the baby's sucking pattern. As a reference, mothers can breastfeed for 10 minutes on the first breast as the suction is still strong and 20 minutes on the other breast because the suction is starting to weaken. Mothers need to empty one breast before offering the other breast to the baby. In the first week, mothers can use both breasts to breastfeed for maximum breast milk production. If breast milk production is stable, they can change from one to another breast each time they breastfeed the baby [21].

Newborns will breastfeed as often as possible with an average of 10-12 times or 18 times a day. On-demand breastfeeding is the best way to keep breast milk production high and make the baby full. A sufficient duration of breastfeeding can help give a balanced intake of hindmilk and foremilk [20].

4. Conclusion

Based on the results, it can be concluded that the respondents are dominated by females with a full-term gestation period and a birth weight of 2500-4000 grams,

most of the early breastfeeding processes are appropriate, most newborns do not experience neonatal jaundice, and there is a relationship between early breastfeeding and neonatal jaundice incidence among newborns in the working area of Puskesmas Petanahan.

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