

Analysis of Maternal and Infant Risk Factors Associated with Early Breastfeeding Initiation

Muhammad Noor Aditya Pratama^{1,2}, Nia Kania², Mohammad Bakhriansyah^{3*}, Triawanti⁴, Eko Suhartono²

¹STIKES Abdi Persada, Banjarmasin, Indonesia

²Public Health Study Program Master's Program, Faculty of Medicine and Health Sciences, Universitas Lambung Mangkurat, Banjarbaru, Indonesia

³Department of Pharmacology, School of Medicine Undergraduate Program, Faculty of Medicine and Health Sciences, Universitas Lambung Mangkurat, Banjarmasin, Indonesia

⁴Medical Study Program Undergraduate Program, Faculty of Medicine and Health Science, Universitas Lambung Mangkurat, Banjarmasin, Indonesia

Correspondence Email: bakhriansyah@gmail.com

ABSTRACT

Early Initiation of Breastfeeding (EIB) is the process of breastfeeding a baby to his/her mother within 1 hour of delivery. Newborns with EIB in Banjarmasin decreased from 98.38% in 2020 to 42.32% in 2021 with the lowest rate found in Kuin Raya Primary Health Center by 29.8%. This study aims to discover the association between maternal factors and infant factors and EIB status in Kuin Raya Primary Health Center in 2023. This was an analytic observational study using a cross-sectional approach. Samplings were recruited by using simple random technique. All data were collected by using questionnaire distributed to respondents. Prevalence Odds Ratios (PORs) and 95% Confidence Intervals (95% CIs) were calculated by using binomial logistic regression analysis with stepwise technique. The research results show that there are p-values for LBW (p=0.002), premature birth (p=0.007), knowledge (p=0.419), age (p=0.145), parity (p=0.954) and multiple births (p =cannot be measured because 100% singleton births). The conclusion is that there is a relationship between LBW and premature birth with maternal IMD status, there is no relationship between knowledge, age, parity and multiple births with maternal IMD status. The variable most associated with maternal IMD status is LBW.

Keywords: Early initiation of breastfeeding, mother's knowledge, mother's age, mother's parity, birth weight

INTRODUCTION

Early Initiation of Breastfeeding (EIB) is the process of suckling the baby to the mother within 1 hour after birth. The baby is placed on the mother's chest immediately after birth. Thus, skin contact immediately occurs between the baby and the mother.¹ EIB has been proven to reduce infant morbidity and mortality. A study by Edmond et al² showed that EIB within the first hour after birth can reduce the risk of death for infants aged 0-28 days by 22%. In contrast, delayed EIB can increase the risk of death.

Indonesian Demographic Health Survey (IDHS) in 2017 data indicated that the Infant Mortality Rate (IMR) is still very high, i.e., 35 per 1,000 live births. The Ministry of Health (DepKes) in 2017 mentioned that several causes of infant mortality are due to Low Birth Weight (LBW) (29%), asphyxia (27%), tetanus (10%), infection (5%), hematological problems

(6%), drinking problems (10%), and other problems (27%). In the Millennium Development Goals (MDGs), Indonesia is targeting that in 2022 IMR will decrease to 17 babies per 1,000 live births. Facing the challenges and targets of the MDGs, it is necessary to have child health programs that are able to reduce morbidity and mortality rates in children.

Some of programs in the process of accelerating the reduction of IMR include the Early Breastfeeding Initiation (EIB) program, exclusive breastfeeding, provision of exclusive breastfeeding consultants at hospitals/primary health Center, injection of vitamin K1 in newborns, hepatitis immunization in infants less than 7 days old, and nutritional management.

EIB done later (after the first day of delivery) can increase the risk of neonatal death by 2-4 times. The Lancet Breastfeeding Series

(2016) mentioned that EIB can reduce infant-mortality due to infection by 88%. In addition, breastfeeding also contributes to reduce the risk of stunting, obesity, and chronic diseases in the future. About 31.36% of 37.94% of sick children did not receive EIB. Furthermore, several studies mentioned that investing in efforts to prevent low birth weight (LBW) babies and stunting and increasing EIB and exclusive breastfeeding contribute to reduce the risks of obesity and chronic diseases.³

According to the Indonesian Health Profile in 2019 - 2021, newborns who received EIB in 2019 was 51.90% exceeded the target (41%), in 2020 there was 73.06% of the target (44%), and in 2021 as much as 71.70% of the target (47%). Newborns who received EIB in South Kalimantan Province in 2019 was 98% of the target (44%), in 2020 it was 98.28% of the target (47%), but in 2021 it declined to 42.32% of the target (50%).

However, a city with the lowest ranking for the coverage of newborns who get EIB in South Kalimantan Province is still exist, which is Banjarmasin, which was 42.32% in 2021 of the target (50%). Furthermore, the coverage of newborns who get EIB in Banjarmasin also decreased from 2020 to 2021, from 98.38% to 42.32%. Kuin Raya Primary Health Center had the lowest EIB coverage in Banjarmasin, which was 29.8%.

According to Rollins et al⁴, there are several factors that influence the implementation of EIB including maternal, infant, and health service factors which have not fully become supporting factors for improving breastfeeding programs. Factors originating from the mother are namely knowledge, attitude, age, antenatal care (ANC), parity, type of delivery, and medical history. While the baby factors are LBW, multiple births, and premature births. Factors of health services include health assistants and place of delivery.

According to Khoniasari⁵ factors that influence the implementation of EIB include parity, mother's knowledge, family support, and health workers who do not fully support some programs to increase breastfeeding use. The age range of 20-35 years is a period of achieving work success, stability of lifestyle, attitudes, life values, and eating patterns for maintaining maternal health. Mature mothers understand more about the production and needs of EIB for their babies.⁶

In contrast to a study conducted by Zaskiyah, et al⁷ in Surabaya. They concluded that there is no correlation between knowledge of the implementation of EIB. Research by Ariyah⁸ also mentioned that there is no

correlation between maternal age and parity in the implementation of EIB. Furthermore, research by Masni also showed that there is no correlation between multiple births, LBW, and premature birth on the implementation of EIB.

Since we found many discrepancies on the risk factors of the implementation of EIB, we then conducted a research to figure out the association between maternal risk factors (age, knowledge, and parity) and infant factors (birth weight, multiple births, and premature birth) towards EIB among mothers in Kuin Raya Primary Health Center Banjarmasin.

METHOD

This was an observational analytic study using a cross-sectional approach. This research was conducted among mothers in the working area of Kuin Raya Primary Health Center, Banjarmasin, South Kalimantan Province from March to May 2023. The population of this study was mothers who have babies aged 0-1 years. Based on the Primary Health Center data taken on March 2022, there were 87 mothers who had babies aged 0–1 years. We included the mothers who fulfilled these inclusion criteria:

- Respondents live in the working area of the Kuin Raya Primary Health Center Banjarmasin;
- Mothers who had babies aged 0-1 years; and
- Willing to be a respondent by signing the informed consent form

Sample size was calculated by using the Slovin formula with 0.05 error rate. So, the minimum number of samples to be recruited for this study was 40 mothers. The sample was chosen using simple random sampling technique. The data taken is primary data.

We developed a questionnaire to assess mother's knowledge about EIB. Prior to data collection, we tested the validity and reliability of the questionnaire. This test was carried out at Belitung Primary Health Center in April-May 2023 involving 30 respondents. This is located as adjacent area to the Kuin Raya Primary Health Center. Hence, the characteristics of respondents are more or less the same. The items of question were statistically both valid and reliable because the values of total item correlation value (corrected item total correlation) was greater than the r table of 0.361 and the Cronbach alpha value was 0.694, respectively. To assess the association between dependent variables and the outcome, we applied chi-square test. Adjusted Prevalence Odds Ratios (PORs) and 95% Confidence Intervals (95% CIs) were calculated by using binomial logistic regression test with

stepwise technique. PORs were adjusted to all listed variables. All statistical analyses were

carried out by using IBM SPSS version 26.

RESULT AND DISCUSSION

Table 1. Baseline Characteristics of Respondents and Crude Prevalence Odds Ratios for The Association between Maternal and Infant Factors towards Early Breastfeeding Initiation

Characteristics	Early Breastfeeding Initiation		p-value	Crude POR (95%CI)
	Yes (n=34)	No (n=6)		
Knowledge, n (%)				
Poor-moderate	18(52.9)	2 (33.3)	0.384	2.20 (0.362-13.240) 1
Good	16 (47.1)	4 (66.7)		
Age, n (%)				
Healthy (20-35 years old)	28 (84.2)	4 (66.7)	0.385	2.30 (0.350-15.800) 1
High Risk (<20 and >35 years old)	6 (17.6)	2 (33.3)		
Parity, n (%)				
1	28 (82.4)	5 (83.3)	0.954	0.950 (0.090-9.510) 1
>1	6 (17.6)	1 (16.7)		
Low Birth Weight, n (%)				
No	33 (97.1)	2 (33.3)	0.002*	1 0.015 (0.001-0.210)*
Yes	1 (2.9)	4 (66.7)		
Premature Birth, n (%)				
No	33 (97.1)	3 (50.0)	0.007*	1 0.030 (0.002-0.390)*
Yes	1 (2.9)	3 (50.0)		
Multiple Birth, n (%)				
No	34 (100.0)	6 (100.0)	NA	NA
Yes	0 (0.0)	0 (0.0)		

We recruited 40 mothers who fulfilled the criteria. Most of them (34 mothers, 85.0%) did EIB, but 6 mothers (15.0%) did not. Among mothers who did EIB, they had healthy reproductive age (28 mothers, 82.4%), poor-moderate knowledge (18 mothers, 52.9%), and 1 baby (28 mothers, 82.4%). Their baby was mostly likely to be born with normal weight (33 babies, 97.1%), not premature (33 babies, 97.1%), and all single delivery (34 babies, 100%). Meanwhile, mothers who did not perform EIB, mostly had healthy reproductive age (4 mothers, 66.7%), good knowledge (4 mothers, 66.7%), and also 1 baby (5 mothers, 83.3%). Their babies were most likely to be born with low birth weight (4 babies, 66.7%), and all single delivery (6 babies, 100%) (Table 1).

When all the analysis was adjusted for all listed variables, among all variables only birth weight of baby was significantly associated with EIB. Mothers with baby born less than normal weight was associated with a lower event to perform EIB by 98.5% than with baby born with normal weight (adj POR 0.015, 95%CI; 0.001-0.207, p-value=0.002). A variable of premature birth was not statistically associated with EIB. We suspect an issue of multicollinearity between variables of birth weight and premature birth occurred. A variable of multiple birth was not able to be statistically analyzed due to we found no multiple birth at all in our study.

The relationship between Mother's knowledge and EIB status in The working area of the Kuin Raya Community Health Center, Banjarmasin

The results of the analysis showed that the maternal knowledge variable had no relationship with early breastfeeding initiation (EIB) status. However, the results of this study are not in line with research conducted by Amaliyah⁹, (p-value = 0.000).

EIB is a natural process of returning human babies to breast-feeding, namely by giving babies the opportunity to find and suck their own breast milk, within the first hour at the beginning of life, to ensure that the breastfeeding process takes place properly, by breastfeeding properly and correctly the baby's death and disorders development of the baby can be avoided. The benefits of EIB are that if there is skin contact and the baby's head is pushed against the mother's chest, the touch of the baby's hand on the mother's nipple and its surroundings, squeezing, the baby licking the mother's nipple, stimulates the release of the hormone oxytocin, this oxytocin hormone really helps the mother's uterus to contract so that it stimulates expulsion of the placenta and reducing bleeding after delivery.¹⁰

EIB can train baby's motor skills and is a first step in forming an inner bond between mother and child. It is best to place the baby directly on the mother's chest before cleaning the baby. Touch with skin can have a strong psychological effect on both of them. To carry out EIB, it takes time, patience and support from the family. In fact, babies born under normal conditions with birth without surgery can breastfeed their mothers without assistance in about an hour. There is a lack of understanding about early initiation of breastfeeding and exclusive breastfeeding so that the implementation of EIB is ignored, babies are not given EIB, even though education about EIB and exclusive breastfeeding is increasingly intensive, many health workers have been trained in both EIB and exclusive breastfeeding training, posyandu are becoming more active, promotion pomegranate midwife and others. Understanding EIB and exclusive breastfeeding is a very important issue that makes it possible to implement EIB and exclusive breastfeeding if individuals, families, health workers and the community already understand the meaning, benefits and objectives of EIB and exclusive breastfeeding. The failure of mothers to breastfeed their babies until the age of six months is actually just one problem, namely that mothers do not fully understand how to breastfeed properly, including techniques and

how to obtain breast milk, especially when they have to work.¹⁰

Based on the results of this research, it is known that there are several respondents who have good knowledge but do not initiate early breastfeeding. This is because respondents receive information that did not come from health workers, but from the mass media. The information that respondents get about EIB from the mass media is not routine so mothers easily forget. If information is obtained continuously, it will increase the mother's knowledge about early initiation of breastfeeding. Apart from that, this condition is also suspected from the level of education of the respondents, most of whom have completed secondary education.

This causes mothers to lack understanding about EIB. Therefore, the mother's lack of understanding will influence the mother's attitude in deciding on an action such as not carrying out EIB after giving birth. The importance of maternal understanding and experience can increase maternal motivation in fostering maternal readiness to implement EIB well.

The relationship between maternal age and EIB status in the working area of The Kuin Raya Community Health Center, Banjarmasin

The results of this study show that there is no relationship between age and EIB status in the work area of the Kuin Raya Community Health Center, Banjarmasin. Research conducted by Asriyyah¹¹ also showed that there was no significant relationship between maternal age and EIB status. This is in line with

The mother's age determines maternal health because it is related to the conditions of pregnancy, childbirth and postpartum, as well as how to care for and breastfeed the baby. Mothers who are less than 20 years old are still immature and not ready physically and socially to face pregnancy, childbirth and breastfeeding the baby they are born with. At the age of 20 years and under, physical, psychological and social development is not yet ready, meanwhile at the age of 35 years and over, hormone production is relatively reduced, resulting in a decreased lactation process, which can disrupt psychological balance and can affect breast milk production.

The age of 20-35 years is a healthy and mature reproductive age so it can be very supportive for exclusive breastfeeding. Even if you are 35 years old, even if you have a baby with good nutritional status, this age is considered dangerous, because both the reproductive organs and the mother's physical

condition have declined. Apart from that, there can be a risk of congenital disease in the baby and can also increase difficulties in pregnancy, childbirth and postpartum.

The relationship between maternal parity and EIB status in the working area of The Kuin Raya Community Health Center, Banjarmasin

Based on the results of this research, the parity variable has no relationship with EIB status. This is in line with research from Renfrew¹² which shows that primiparous mothers are more enthusiastic about welcoming their first child than multiparous mothers. Multiparous mothers are less enthusiastic about proving their abilities. Therefore, the mother's enthusiasm in welcoming her first child allows primiparous mothers to find out more about EIB.

In terms of parity history, mothers with a history of high parity tend not to carry out EIB, one of the inhibiting factors is increasing age and various difficulties in childbirth so that mothers with a history of high parity will experience physical fatigue and therefore lack motivation to carry out EIB. It is confirmed by the results of the Prawirohardjo cohort research that mothers with low parity tend to be more motivated to know things that are beneficial for their babies.¹³

Based on the results of Sari's¹⁴ research, the result was p value = 0.002 ($p < 0.05$), which means that there is a significant relationship between maternal parity and early breastfeeding initiation. afraid to do EIB.

Relationship between LBW and EIB status in The Kuin Raya Community Health Center Working Area, Banjarmasin

The results of this study show that the LBW variable has a significant relationship with EIB status in the work area of the Kuin Raya Banjarmasin Community Health Center. Mothers who have babies born with LBW have a 98.5% risk of not having EIB compared to mothers who give birth to babies with normal weight. Several studies explain that the lower the birth weight, the lower the survival rate. What influences the low LBW survival rate in groups whose status is unknown is the influence of birth complications. LBW in this group is LBW with mothers who experience complications during childbirth such as: obstructed labor, bleeding, fever/nausea, seizures, and rupture of membranes. The effects of first breastfeeding were riskier in the group weighing 2201-2499 grams. This could be because the postnatal management of the LBW group was not as careful as the smaller

babies were thought to be better able to survive. For this reason, LBWs are allowed to breastfeed without paying attention to proper breastfeeding techniques so that LBWs may choke or experience disturbances in the function of other organs and result in death.

Impaired motor development in toddlers can be exacerbated if the baby is born with Low Birth Weight (LBW),¹⁵ and at birth does not receive breast milk (ASI), which begins with EIB activities, namely skin contact between the baby and mother immediately after birth and self-feeding. within the first hour after giving birth. The process of licking the surface of the skin and starting to suck on the mother's nipple during IMD stimulates the baby's psychomotor development more quickly.¹⁶

Babies with LBW are at risk of health problems and short-term or long-term growth retardation. The duration of breastfeeding is associated with a reduced risk of motor development in toddlers, especially for babies born with LBW. It can help the process of catching up on growth and development. The interaction between mother and child and the nutritional value of breast milk are very necessary in the process of developing the nervous system in the brain, so that it can help increase the baby's intelligence. Breastfeeding can have a positive impact on the cognitive development of babies, having a higher Intelligence Quotient (IQ) compared to babies who do not receive breast milk.¹⁷

Relationship between premature birth and EIB status in The working area of The Kuin Raya Community Health Center, Banjarmasin

The results of research regarding the relationship between premature birth variables and EIB status showed that there was a significant relationship between premature birth and EIB status with an adjusted OR of 0.03 (95% CI 0.002-0.39). This means that mothers who have babies born prematurely have a 97% risk of not having EIB compared to mothers who give birth to babies normally (not prematurely).

According to Proverawati and Rahmawati¹⁸, babies born prematurely will affect the breast milk intake given. The baby is weak and unable to suck effectively. This is due to their low body weight and imperfect body organ function. Babies born prematurely have a high risk of poor lactation, including the risk of premature cessation of breastfeeding, jaundice, slow weight gain and dehydration. This is because they are physiologically, metabolically and neurologically immature. And than,

Premature birth is defined when a child is born less than 37 weeks old. Low birth weight (LBW) is measured after 1 hour of birth which is then categorized as LBW if < 2500 grams and normal birth weight (BBLN) if ≥ 2500 grams.¹

IMD is an important primary health care practice as optimal care for newborns within the first hour of birth. IMD allows the provision of immunoglobulin and colostrum rich in bioactive molecules that are important for newborns as antibodies, supports growth and development, increases mother-infant bonding, has short-term and long-term benefits for mothers because it reduces postpartum bleeding, reduces the risk of postpartum obesity, increases the birth interval period, reduces the

risk of breast and ovarian cancer in the long term and plays a role in reducing IMR. IMD can prevent 22% of infant deaths in the first hour at the age of under 28 days and prevent 16% of infant deaths under 28 days if the baby is first breastfed within a time span of over 2 hours and under 24 hours. The World Alliance for Breastfeeding Action (WABA) states that IMD followed by exclusive breastfeeding will save around 1 million babies per year.

The Relationship between knowledge, age, parity, LBW, Multiple Births, and premature births on the status of early breastfeeding initiation in The Working Area of The Kuin Raya Public Health Center, Banjarmasin

Table 2. Adjusted Prevalence Odds Ratios for The Association between Maternal and Infant Factors towards Early Breastfeeding Initiation

Characteristics	Early Breastfeeding Initiation		p-value	Adjusted POR* (95%CI)
	Yes (n=34)	No (n=6)		
Birth Weight, n (%)				
Normal	33 (97.1)	2 (33.3)	0.002*	1
Underweight	1 (2.9)	4 (66.7)		0.015 (0.001-0.207)*

Among all risk factors for the mother (knowledge, age, parity), and the baby (LBW, premature birth, and, multiple births), only a variable of birth weight had a significance of p<0.05 (p=0.002 with adj. POR is 0.015 (95% CI; 0.001-0.207). It indicates that babies born with LBW have a 98.5% risk of not having EIB compared to babies born with normal weight. Thus the LBW is most dominant variable correlated to EIB than any other variables. Several studies indicated that the lesser birth weight is associated with the lesser life survival rate of the baby. This lesser survival rate is affected by high risk factors during delivery. LBW is most commonly found in mother with complications during delivery such as delayed labour, bleeding, fever, nausea, convulsion, and early rupture of membrane. Furthermore, early breastfeeding is high risk for babies with LBW. Thus, babies with LBW are allowed to be breastfed without using proper technique that might lead to choking, organ dysfunction or even death.

Mother's risk factors (age, knowledge, and parity) and number of baby delivered were not associated with EIB. Some studies supported these findings. Sugianto (2016) also showed that there is no significant correlation between maternal age and exclusive breastfeeding (p=0.927). Even though knowledge is an affecting factor for people to healthy behave, some respondents in our study did not show so. We suspect our respondents

were not exposed to health information from health professionals, but mass media. This might be a temporary exposure, hence the mothers easily forget. Furthermore, education level of the mothers also influence the knowledge. Our respondents were more likely in high schools rather than colleges or universities. Renfrew¹⁰ also demonstrated that primiparous mothers are more enthusiastic to have a baby compared to multiparous mothers. The early mothers tend to seek more information about babies including EIB.

Our study proved that birth weight was significantly associated with EIB. Hence, this finding could serve as a scientific evidence for Kuin Raya Primary Health Center to both increase and improve their services especially for pregnant and breastfeeding mothers. The health center needs to educate them all information about ANC and post natal care including the benefits of EIB.

In addition, the public health center need to conduct health education programs on nutrition and health during their Posyandu activity including education on EIB, to establish cross-program and cross-sector collaboration such as PKK and local Posyandu cadres. So that EIB program can be achieved. The role of Posyandu cadres is also very much needed. They are expected to be more active in monitoring the health and nutrition conditions of the people in their working areas, especially pregnant women.

We also expect the mothers regularly visit health facilities to ensure their health condition and also their babies', also to obtain information/knowledge about infant and knowledge correlated to EIB. Ultimately, mother and children mortality rates are decreased.

We identified several strengths in our study. Ours is the first study assessing maternal and infant factors associated with EIB at Kuin Raya Public Health Center, Banjarmasin. Hence, our findings could serve as scientific data to plan programs in order to decrease mother and children mortality and morbidity rates. We also included several important risk factors that have been associated to EIB.

Nevertheless, some limitations are needed to acknowledge such as mother's health behaviour, type of delivery of baby, economic status, etc. Small sample size is also an issue for this study.

CONCLUSION

As conclusion, among all research variables only birth weight variable is associated significantly towards EIB. LBW is associated with a decreased event of EIB by 98.5% (adj. POR 0.015, 95%CI: 0.001-0.207, p-value=0.002) compared to normal baby weight. However, we found no association between mother's factors (age, knowledge, and parity) and premature birth and EIB (p>0.05).

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