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The Onset Lactation, Early Initiation Breastfeeding, and Frequency of Antenatal Care as Determinants of Successful Exclusive Breastfeeding in Primipara Mothers

Onset *Laktasi, Inisiasi Menyusui Dini, dan Frekuensi* Antenatal Care *sebagai Penentu Keberhasilan Pemberian ASI Eksklusif pada Ibu Primipara*

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ABSTRACT

Background: Since 2016 the City of Surabaya has provided assistance and mentoring for pregnant mothers and infants during the first 1000 days of life. This initiative aims have been to alleviate stunting on children and increase exclusive breastfeeding coverage on breastfeeding mothers. However, the target for exclusive breastfeeding coverage has yet been achieved, and the level of coverage remains low despite these efforts.
Objectives: The aim of this study was to determine the effect of the onset of lactation, early initiation breastfeeding frequency of antenatal care on exclusive breastfeeding in primipara mothers.
Methods: The research design was cross-sectional; the samples were 130 of 378 primipara mothers and lactating pregnant women who were selected by cluster random sampling. The data were analyzed using both Chi-Square and Logistic Regression analysis α=0.05. data was collected in April 2021.
Results: The results showed that there was a significant relationship between ANC, EIB, and onset of lactation with EB (x^2=3.145; p-value=0.008, x^2=18.745; p-value<0.001, and x^2=47.147; p-value<0.001).
Conclusions: ANC, EIB, and onset of lactation are determining the success of EB.

INTRODUCTION

Maternal and child health is a determinant of human resources quality[1]. The period of initial one thousand days, from conception to two years old, is an important period of infants growth and development[2]. The first 1000 days of life is deemed the "golden window of opportunity"[3]. To ensure an optimal growth and development in infants aged 0-6 months, exclusive breastfeeding is highly recommended[4]. Exclusive breastfeeding plays a crucial role in improving infant health outcomes, particularly by reducing the risk of infections. A comprehensive review revealed that exclusive breastfeeding significantly minimizes the risk of gastrointestinal infections and acute respiratory infections in infants. Research shows that if optimal breastfeeding is practiced, it could save approximately 800,000 children's lives annually, particularly in low-income settings where infection rates are high. Despite this, only about 37% of infants globally are exclusively breastfed for the first six months[5,6].

Moreover, exclusive breastfeeding has been linked to better cognitive and social-emotional development in children. A study conducted by the American Academy of Pediatrics' found that exclusive breastfeeding for at least six months was associated with improved cognitive development, better physical growth,

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and reduced rates of stunting by age three. The research suggests that the maternal-infant bonding facilitated through breastfeeding, alongside the nutritional benefits, play a pivotal role in these developmental outcomes[7].

In addition to cognitive benefits, the protective role of exclusive breastfeeding against childhood morbidity is well-documented. Another study reviewed over 70 research articles and confirmed the consistent link between breastfeeding and reduced incidences of infections such as diarrhea and respiratory illnesses. It emphasizes the need for clearer definitions and better monitoring of breastfeeding practices globally to ensure consistent data collection and support for Exclusive Breastfeeding initiatives[6].

In practice and supported by the research, it is evident that several factors impact the implementation of Early Initiation Breastfeeding (EIB). These include maternal age, parity, education, occupation, knowledge, attitude, place of delivery, type of birth attendant, as well as support from healthcare providers, family, and the husband. The research carried out by Ulfa demonstrated that younger mothers, particularly those aged 17-25 (52.94%), had less knowledge compared to those mothers in the pregnancy ideal age range (26-35). Despite the healthcare visits from prenatal care to delivery, the older respondents were hardly capable of comprehending any conveyed information or acting upon it during these visits[8].

The World Health Organization targets 50% of newly-born babies to receive exclusive breastfeeding. According to the Basic Health Research 2018, East Java, only 38% of newly-born babies received exclusive breastfeeding[9]. In the report on assistance in the West Surabaya and North Surabaya areas in 2021, only 40% of babies were exclusively breastfed. Exclusive breastfeeding coverage has yet met the expectations. Another study in Europe found that many mothers discontinued exclusive breastfeeding earlier than planned due to concerns about insufficient milk production and inadequate infant weight gain. Up to 40% of mothers also reported issues such as nipple pain and mastitis, contributing to early cessation. These physical and emotional challenges illustrate the need for better postnatal support[10]. In addition to the factors already discussed, global studies consistently highlight various contributors to the low rates of exclusive breastfeeding. In India, for instance, 57% of mothers experienced delayed initiation of breastfeeding due to numerous key factors including caesarean sections, lower maternal education, and non-institutional births. Furthermore, non-exclusive breastfeeding rates were significantly higher among mothers in urban settings and those who experienced premature delivery[11,12]. The failures of exclusive breastfeeding are commonly caused by the delay in onset of lactation or the delay in the release of breast milk for the first time[13,14]. The timing of lactation onset determines the success of breastfeeding. In Indonesia, there are 42% of mothers experiencing delayed onset of lactation, while in Malaysia , 34.7% of mothers are reported to experience similar issues[15], and 47.1% of mothers perform exclusive breastfeed.

Early initiation breastfeeding is essential to maintain the baby's life, early initiation of breastfeeding has proven to successfully alleviate the incidence of hypothermia[16,17]. A systematic review reported that initiation of breastfeeding within 24 hours of birth was significantly associated with a reduction in “all-cause neonatal mortality”[18]. A meta-analysis across countries such as China and the U.S. revealed that delayed onset of lactation affected 30-34% of mothers. Socioeconomic factors, maternal age, and access to antenatal care were identified as major contributors to this issue. Addressing these challenges could significantly improve global breastfeeding outcomes[11]. Early initiation of breastfeeding is associated with exclusive breastfeeding[19,20].

Delayed onset of lactation is a key factor which triggers failures of Exclusive Breastfeeding (EB). In addition, timely initiation breastfeeding is crucial for neonatal health, as delayed onset can contribute to neonatal mortality and morbidity. In a study across 58 low- and middle-income countries, over half of the mothers (53.8%) experienced delayed initiation of breastfeeding, which was particularly prevalent after caesarean section births. Caesarean sections were linked to delayed lactation due to physiological and recovery factors, leading to an increased risk of neonatal mortality[21,22]. Another study highlighted that delayed initiation breastfeeding more frequently occur in low-resource settings, especially when birth takes place at home. Women giving birth at health facilities are generally less likely to delay breastfeeding than those who experience labor at home. This emphasizes the role of healthcare supports during childbirth in improving breastfeeding practices[22]. Breastfeeding within the first hour of life is associated with a significantly lower risk of neonatal mortality. Infants who started breastfeeding longer than 24 hours after birth were 2.19 times expected to experience neonatal death compared to those who initiated breastfeeding within the first hour[21]. Thus, both timely onset of lactation and early initiation breastfeeding critical for reducing mortality and improving neonatal health outcomes globally.

The World Health Organization (WHO) recommends at least eight ANC visits during pregnancy[23]. Similarly, the Government of the Republic of Indonesia advises at least six ANC visits[24]. Timely and appropriate evidence-based ANC practices have been exhibited to produce a substantial impact on maternal and infant health outcomes. ANC provides crucial opportunities for healthcare providers to educate mothers for breastfeeding practices, including the benefits of early initiation and EB. Studies have shown that frequent ANC visits are associated with higher rates of exclusive breastfeeding, as mothers presumably receive guidance, support, and resources for breastfeeding during these visits. However, despite the recommendations, only 74.1% of pregnant women in Indonesia attended at least four ANC visits, as reported in the 2018 Basic Health Research Report[25]. The objective of this study was to explore the influence of ANC frequency, onset of lactation, and early initiation of breastfeeding on exclusive breastfeeding rates. The objective of this study was to determine the effect of the onset of lactation, early initiation breastfeeding, frequency of Antenatal Care on exclusive breastfeeding.

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Antenatal care plays a key role in preventing delayed onset of lactation by providing mothers with the knowledge and support needed for successful breastfeeding. The WHO recommends at least eight ANC visits during pregnancy[23]. The Government of the Republic of Indonesia recommends at least six ANC visits during pregnancy[24]. It has been established that by implementing timely and appropriate evidence-based practices, ANC can save lives[23]. Based on the 2018 Basic Health Research Report, only 74.1% of pregnant women in Indonesia performed ANC up to 4 times[25].

In light of the high of prevalence of delayed lactation and suboptimal breastfeeding practices. The objective of this study was to determine the effect of the onset of lactation, early initiation breastfeeding, frequency of Antenatal Care on exclusive breastfeeding outcomes. Understanding the relationship is critical for developing strategies to enhance maternal care and breastfeeding support.

METHODS

The research design employed was a cross-sectional study, with observations conducted at a single point in time. Observations regarding mentoring conditions took place in April 2021. The study population consisted of all pregnant women and breastfeeding mothers participating in the mentoring program for the first 1,000 days of life in Surabaya. A total of 105 pregnant and 273 lactating mothers were distributed across various the Community Health Centers. The sampling method used was cluster random sampling, which began by selecting clusters based on the geographic area of responsibility: North Surabaya, South Surabaya, West Surabaya, East Surabaya, and Central Surabaya. The chosen clusters for this study were West Surabaya and North Surabaya. From these areas, breastfeeding mothers whose babies were at least 7 months old were randomly selected. The inclusion criteria samples were 1) Their participants must be a minimum age of 19 years old. 2) They were residents in 3) Resident of the administrative area of Surabaya. 4) They had undergone prenatal check-ups and planned births in the city area of Surabaya. The exclusion criteria samples were included 1) Suffering from infectious diseases (Hepatitis, Tuberculosis Hepatitis, Tuberculosis, HIV/AIDS). 2) Obesity. 3) Having a nonmarital pregnancy (pregnancy that occurs outside of a wedlock). The sample size consisted of 130 breastfeeding mothers, selected through random sampling from those whose babies were at least 7 months old.

Independent variables in the study included: early initiation of breastfeeding, this refers to breastfeeding the baby in the first hour after birth. The indicator is the time the baby first starts breastfeeding after birth, measured in minutes/hours, family income, a family's monthly income is measured within a specific range, based on the regional minimum wage or other applicable standards. Maternity job is the mother's employment status after giving birth including whether the mothers are full-time or part-time workers or unemployed, onset lactation, the time indicator when a mother starts producing breast milk after giving birth. It is measured based on maternal reports and is rated as "on time" if it occurs less than the first 72 hours after birth, and "delayed" if it is more than 72 hours. frequency of antenatal care, the number of visits made by pregnant women to health facilities for pregnancy check-ups, measured based on the number of visits in accordance with health service standards Dependent variable: exclusive breastfeeding. Exclusive Breastfeeding to babies without additional food or other drinks during the first six months of life, in accordance with WHO recommendations. The indicator is whether the baby receives breast milk merely for the first six months. Bivariate analysis was carried out using the Chi-Square test (α=0.05) to determine the effect of early initiation of breastfeeding on exclusive breastfeeding, the effect of onset of lactation on exclusive breastfeeding and the effect of frequency of antenatal care visits on exclusive breastfeeding. Multivariate analysis with logistic regression (α=0.05) to determine the effect of the independent variables together on the dependent variable. The statistical analyses were conducted using IBM SPSS Statistics, version 26.0 (IBM Corp., Armonk, NY).

Informed consent was obtained from all individual participants included in the study. Participants were provided with detailed information about the study's purpose, procedures, potential risk, and benefits. All data collected were kept confidential and used solely for the purposes of this research. This study was granted by ethical clearance number 372/HRECC.FODM/VII/2021 from research ethical clearance Universitas Airlangga.

RESULTS AND DISCUSSIONS

The result in Table 1 shows that most breastfeeding mothers are employed at 73.1% respectively. Also, most families earning an income less than or equal to IDR 4,000,000 and greater than IDR 4,000,000 were at the same percentage. Similarly, mothers who started breastfeeding early, released breast milk three days after delivery and had more than six ANC visits were of 64.9 %, 77.9 %, and 79.4 %, respectively. Lastly, the respondent's ages ranged from 21 to 34 years old, with the majority of them were married at 30 years old.

Table 1. Characteristics of Breastfeeding Mothers in the Mentoring Program for the first 1000 days of life in Surabaya, Indonesia in 2021

Variable	n (%)
Family Income	
≤IDR 4,000,000	65 (50.0)
>IDR 4,000,000	65 (50.0)
Mother's Job	
Employee	35 (73.1)

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Variable	n (%)
Housewives	95 (26.9)
Early Initiation Breastfeeding	
Yes	72 (55.4)
No	58 (44.6)
Exclusive Breastfeeding	
Yes	54 (41.5)
No	76 (58.5)
Onset of Lactation	
On-time (≤3 days)	80 (61.5)
Delay (>3 days)	50 (38.5)
ANC Frequency	
≤6x	92 (29.2)
>6x	38 (70.8)

%=Percentage of Respondents

Several factors influence the success of EB in Indonesia, including maternal education, socioeconomic status, and the support provided during ANC. Research shows that higher maternal education is associated with a greater likelihood of exclusive breastfeeding, as mothers with higher education levels tend to have better knowledge about breastfeeding benefits and techniques[26]. Furthermore, women who made more than six ANC visits reported higher rates of EB, as frequent consultations provide mothers with essential information and guidance on breastfeeding[27].

Employment also plays a significant role in EB success. Employed mothers often face challenges in balancing work and breastfeeding; consequently, they contribute to lower EB rates compared to unemployed mothers. In a study conducted in Ethiopia, a significant number of employed mothers ($p<0.0001$) were unable to exclusively breastfeed, with time constraints and lack of workplace support cited as major factors[28] with time constraints and lack of workplace support cited as major factors[29]. Workplace policies that provide adequate maternity leave and breastfeeding-friendly environments can significantly impact the success of EB.

At last, family income also affects EB. A study conducted in Qatar identified that only 29.9% of high-income mothers were unable to exclusively breastfeed before 12 months[30]. Families with higher incomes tend to have a better access to healthcare and breastfeeding resources; thus, they ensure successful EB practices. However, in low-income settings, mothers may face economic pressures that disrupt breastfeeding, such as the need to return to work early[26]. Economic support programs and community health education are crucial in bridging these gaps and promoting EB across socioeconomic strata.

The income of the respondents ranged from IDR 1.5 million to IDR 13.0 million, with an average of IDR 5.4 million. In the City of Surabaya, the minimum wage in 2020 was of IDR 4.2 million per month, as established and declared by the Governor of East Java in 2019. Family income is closely linked to food supplies, which in turn affects the nutritional status of breastfeeding mothers[31]. The Indonesian government recommends that antenatal care (ANC) inspections occur at least six times during pregnancy: twice in the first trimester, once in the second trimester, and three times in the third trimester[24]. As a result, most pregnant women participating in Surabaya's mentoring program for the first 1,000 days of life had more than six ANC inspections throughout their pregnancy[32,33].

The importance of exclusive breastfeeding for infants aged 0-6 months is well-documented in numerous studies. A survey based on the 2017 Indonesia Demographic Health Survey stated that mothers who had received four or more antenatal care visits were most likely to initiate early breastfeeding and exclusively breastfeed their babies. The study also found that factors like skin-to-skin contact after delivery increased the likelihood of successful early initiation of breastfeeding, which is a critical component for EB success[34,35].

In addition, a study conducted in Indonesia identified that one of the main reasons why mothers decide to quit breastfeeding early is the mother's Perception of Insufficient Milk supply (PIM). This perspective is often illogical. Yet, it brings up considerable influences over the decision to introduce supplemental feeding. The study found that mothers who did not receive proper breastfeeding counselling during ANC were 19.7 times more likely to experience PIM. This emphasizes the role of healthcare workers in providing lactation education during ANC visits to improve EB rates[34].

Lastly, research published in the Journal of Public Health and Preventive Medicine revealed socioeconomic factors influencing EB practices in Indonesia. Mothers from wealthier families and higher educational levels were more likely to exclusively breastfeed. The study highlighted that rural and urban settings were alike, access to quality maternal health services, including ANC, was critical for promoting EB. The availability of healthcare facilities and trained professionals was a major determinant of whether mothers adhered to EB recommendations[35].

To support the findings regarding ANC, a study explained that pregnant women who received six or more ANC visits had a significantly lower risk of pregnancy complications and adverse birth outcomes, such as preterm birth or low birth weight[36]. The study found that 78.6% of women who attended regular ANC visits delivered full-term babies with normal birth weights. This

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demonstrates the critical role of regular ANC visits in monitoring maternal and fetal health, allowing for early detection of potential issues, and providing timely interventions to ensure a safe delivery and healthy infant.

In relation to family income and its impact on maternal nutrition, a study highlighted that families with a monthly income above IDR 4 million could possibly afford a nutritious diet for breastfeeding mothers, compared to lower-income households. The study reported that 65% of breastfeeding mothers in high-income families had access to a balanced diet rich in essential nutrients like protein, vitamins, and minerals which are crucial for maintaining milk production and overall health. In contrast, only 42% of mothers from lower-income families reported similar access to nutritious food, leading to potential nutrient deficiencies and lower milk quality. This underscores the direct relationship between family income, food security, and maternal health outcomes[37].

Furthermore, a study examined the economic challenges faced by breastfeeding mothers in urban areas like Surabaya. The study found that 74.3% of mothers with incomes below the minimum wage experienced difficulties in maintaining an adequate diet due to high living costs, especially for food and healthcare[38]. These mothers would most possibly rely on cheaper, less nutritious food options which negatively affected their nutritional status and breastfeeding outcomes. This highlights the need for targeted nutritional support programs for low-income families, especially for breastfeeding mothers, to ensure both maternal and infant health are safeguarded despite financial constraints.

In 2014, the Indonesian government set a goal for 50% of babies born in 2019 to be breastfed early and exclusively[39]. In Surabaya, the implementation of mentoring programs for the first 1,000 days of life has surpassed the targets established by the Indonesian Ministry of Health, achieving early breastfeeding rates of 64.9% and exclusive breastfeeding rates of 54%. These figures are significantly higher than the national rates for exclusive breastfeeding in Indonesia and East Java, which stand at 37.3% and 38%[25], respectively. Consequently, early initiation of breastfeeding (EIB) has a notable positive impact on the success of exclusive breastfeeding (EB)[40].Exclusive breastfeeding (EB) in Indonesia has shown an improvement in recent years, yet challenges remain. According to a study based on the 2017 Indonesian Demographic Health Survey, 51.6% of mothers practiced EB, with the highest rates in the Nusa Tenggara region (72.3%) and the lowest in Kalimantan (37.5%). These disparities are attributed to regional socioeconomic differences and access to healthcare services, which play a vital role in breastfeeding success[41]. The initiation of breastfeeding within the first hour, known as EIB, has also been recognized as a key factor in EB success. A 2022 study pinpointed that EIB helps establish lactation and increases the likelihood of mothers exclusive breastfeeding for the recommended six months[42]. However, the rate of EIB in Indonesia varies significantly across regions, correlating with healthcare access and maternal education. Research also indicates that family and community supports are vital in promoting and sustaining exclusive breastfeeding. A 2023 study found that family involvement, particularly managed by husbands, substantially contributes to higher EB rates. Mothers who received consistent family supports probably continue breastfeeding despite external pressures to introduce formula[43]. Another study found that workplace policies also influenced breastfeeding practices. In areas where workplace support for breastfeeding mothers is lacking, EB rates are lower[44]. The government has fostered breastfeeding-friendly environments although further improvements are required to meet the national targets. The public health education remains crucial in promoting EB. Studies suggest that once healthcare providers offer continuous breastfeeding education and supports during antenatal care to pregnant women; consequently, they tend to be successful in practicing exclusive breastfeeding[45].

The bivariate analysis results in Table 2, performed using Chi-Square (α=0.05), depict significant effort on exclusive breastfeeding success for several variables. Maternal job status has a p-value of 0.010, family income is highly significant with p=0.000, and the frequency of antenatal care visits is significant at p=0.008. Additionally, early initiation of breastfeeding and onset of lactation both exhibit high significant results, each with p-value<0.001.

Table 2. Results of Chi-Square bivariate analysis

Variable	Exclusive Breastfeeding		x^2	p-value
	Yes	No		
	n	n		
Maternal Job				
Employee	33	62	6.772	0.010
Housewives	21	14		
Family Income				
≤4,000,000	16	49	15.331	<0.001
>4,000,000	38	27		
Frequency ANC				
≤6x	45	47	3.145	0.008
>6x	9	29		
Early Initiation of Breastfeeding				
Yes	42	30	18.745	<0.001

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Variable	Exclusive Breastfeeding		x^2	p-value
	Yes	No		
	n	n		
No	12	46		
Onset of Lactation				
On-time (≤3 days)	52	28	47.147	<0.001
Delay (>3 days)	2	48		

n=Total of Respondents, x^2=The Difference between Observed and Expected Frequencies of Outcomes, p-value=Probability Value

Plenty ANC visits are undesirable since they hardly affect EB. In practice, pregnant women can turn to healthcare workers for seeking advice about mothers' self-care and baby care. Therefore, healthcare workers are vital in ensuring that EB messages are delivered intensively during ANC by the midwives or doctors who treat them. They will produce an outstanding impact on the success of EB. Moreover, midwives are usually more successful than other healthcare workers in educating pregnant women for the success of EB[46].

Researches illustrate that ANC visits play a crucial role in improving EB rates. A study found that mothers who got a counseling concentrated on breastfeeding during ANC had higher chances of initiating EB within the first hour after delivery. Healthcare workers, especially midwives, were considered pivotal in providing this education[47]. Midwives are often more effective in educating mothers on breastfeeding techniques than other healthcare workers due to their regular interaction and specialized training in maternal care.

Moreover, a study highlights that the quality of antenatal education directly influences maternal breastfeeding confidence. Pregnant women who received personalized breastfeeding education from healthcare workers showed considerably improved EB practices, underscoring the importance of skilled healthcare interventions[48]. Moreover, a study highlights that the quality of antenatal education directly influences maternal breastfeeding confidence. Pregnant women who received personalized breastfeeding education from health workers showed significantly improved EB practices, underscoring the importance of skilled healthcare interventions[48]. Community health workers (CHWs) have also been proven to be instrumental in enhancing EB outcomes, particularly in low-income settings. CHWs offer continuous support during ANC and postnatal care, increasing breastfeeding initiation and duration rates, according to a systematic review from the Maternal and Child Health Journal[47].

Early breastfeeding initiation has a significant effect on the implementation of EB. Similarly, implementing early breastfeeding initiation in the first hour after delivery give the mother confidence and provide comfort to the baby. This will stimulate the hormones prolactin and oxytocin to produce breast milk and to stimulate the letdown reflex, respectively, allowing breast milk to be given. Therefore, the success of EB is determined by the mother's self-confidence and family support[49,50].

Researches demonstrate that healthcare workers play a critical role in promoting EB, particularly during ANC visits. A study found that pregnant women who received frequent and intensive counseling from midwives were 2.5 times more likely to successfully implement EB compared to those who did not receive such guidance[51]. Midwives are often the primary source of information on breastfeeding, and their ability to provide hands-on education, answers for their worries, and emotional supports has proven to increase the likelihood of EB initiation. In short, consistent breastfeeding education delivered by midwives during ANC visits can significantly enhance a mother's confidence and ability to breastfeed exclusively[52].

Additionally, Early Initiation Breastfeeding (EIB) has indicated a profound effect on the continuation of EB. A study revealed that mothers who initiated breastfeeding within the first hour of delivery were 3.1 times more likely to continue breastfeeding exclusively for six months, thanks to EIB which facilitates early bonding between mother and child, which triggers hormonal responses necessary for milk production and the letdown reflex[42]. This study is in line with the result (Table 2.) that showed a significant between EIB and EB (*p<0.001*). The study also emphasized that mothers who experience a successful early breastfeeding gain more confidence in producing enough milk, reducing anxiety and increasing the likelihood of adhering to EB recommendations.

Family support, particularly contributed by the pregnant women's spouses, also plays a significant role in the success of EB. A study demonstrated that 78% of mothers who received considerable supports from their husbands and immediate family members successfully practiced EB for six months. Emotional encouragement, practical help, and a supportive environment should grow a mother's confidence and reduce her stress, which can directly establish the breastfeeding success[53]. The study highlights that family members who understand the importance of breastfeeding and offer continuous support can greatly enhance a mother's ability to continue breastfeeding exclusively despite unexpected challenges.

The onset of lactation is the first release of milk shortly after the baby's birth. However, when it occurs after 72 hours, it is referred to as delayed onset of lactation[14,54]. The onset of lactation gives the mother confidence to breastfeed her child; thus, it ensures the success of EB. Conversely, delayed release of breast milk after delivery can cause maternal anxiety and uncertainty about the quality of her milk[55,56]. According to the research of Anna Ismiyana conducted in Indonesia, 42% of mothers experience delayed onset of lactation[57]. Whereas in China, 30.3% of mothers experience delayed onset of lactation[54]. According to Kathryn G. Dewey research in 2003, 22% of those who faced delayed onset of lactation were prim parous mothers[58]. Furthermore,

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the delay onset of lactation will be longer in the case of a Caesarean Section delivery, which begins four days later following the delivery[14].

Exclusive Breastfeeding (EB) relies heavily on the onset of lactation. A study by Brown and Jordan found that delayed onset of lactation often leads to the introduction of formula supplementation as mothers perceive their milk supply as insufficient. This early supplementation negatively affects EB rates, reducing baby chances to get the recommended exclusive breastfeeding that should be maintained for six months[59]. Further research conducted by Christian emphasized that early skin-to-skin contact and breastfeeding initiation applied immediately in postpartum stage can improve EB success, even in cases of delayed lactation. These practices increase the likelihood of exclusive breastfeeding during the early days of postpartum recovery[60]. Additionally, a review published in the *Journal of Perinatology* suggested that infants who were breastfed within the first hour after birth had significantly higher rates of EB. Early initiation breastfeeding is linked to lower risks of neonatal morbidity and mortality, further emphasizing the critical window for establishing EB and minimizing formula use[61,61].

The table presents the results of a logistic regression analysis conducted to assess the impact of independent variables on the dependent variable, which is exclusive breastfeeding (EB) success. Table 3 indicates that family income significantly influences EB success, with p-values of 0.006 and 0.05. Additionally, early initiation of breastfeeding also demonstrates a notable impact on EB success, with p-values of 0.002 and 0.05. The onset of lactation shows a strong effect on EB success as well, with p-value<0.001 and 0.05. Furthermore, the frequency of antenatal care (ANC) visits is another variable that significantly affects EB success, with p-values of 0.010 and 0.05. In contrast, the other variables analyzed do not show a remarkable effect on EB. Based on these results, the following regression equation is proposed:

$$\text{Probability} = \frac{\exp(1.848+1.072\ Onset\ of\ Lactation+0.966\ EIB)}{1+\exp(1.848+1.072\ Onset\ of\ Lactation+0.966\ EIB)}$$

Considering the value of Exp(B), it can be concluded that deliveries with early initiation of breastfeeding (EIB) have a 2.628 to 3 times greater chance of successful exclusive breastfeeding (EB) compared to deliveries without EIB. Additionally, when comparing timely onset of lactation to delayed onset, timely initiation offers a 2.921 to 3 times greater likelihood of achieving successful EB.

Table 3. Logistic regression analysis with α=0.05

Variable	p-value	OR	95% CI	
			Lower Scale	Upper Scale
Maternal Job	0.316	0.435	0.085	2.214
Family Income	0.006	0.126	0.029	0.552
Early Initiation of Breastfeeding	0.002	0.189	0.065	0.551
Onset of Lactation	<0.001	69.823	12.289	396.702
ANC Frequency	0.010	3.085	1.316	7.235

p-value=Probability Value, OR=Odd Ratio, 95% CI=95% Confident Interval

CONCLUSIONS

The study indicates that antenatal care, the onset of lactation and EIB are critical factors that significantly impact the success of EB. Regular ANC is important for monitoring maternal and fetal health, studies reveal that the frequency of ANC visits unlikely has a direct impact on EB success. Mothers who receive frequent and high-quality ANC, particularly focusing on breastfeeding education and support, are easier to initiate and sustain EB. Furthermore, mothers, upon practicing EIB within the first hour of birth, are three times more successful in carrying out exclusive breastfeeding compared to those who postpone early initiation breastfeeding. Similarly, mothers who experience timely onset of lactation, typically within 72 hours post-delivery, tend to be three times more successful in sustaining EB compared to those who encounter delayed lactation. This highlights the importance of immediate breastfeeding support after delivery to enhance maternal confidence and ensure lactation success.

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CONFLICT OF INTEREST AND FUNDING DISCLOSURE

The authors declare no potential conflict of interests with any part.

AUTHOR CONTRIBUTIONS

DS: principal investigator, conceptualized and designed the study, prepared the draft of the manuscript, and reviewed the manuscript; SS: advised on the data analysis and interpretation and reviewed the manuscript; AS: reviewed the manuscript review; BS: reviewed the manuscript; RAR: editing and reviewed the manuscript.

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