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Encouraging Healthcare Childbirth to Increase Exclusive Breastfeeding: Evidence from Madurese, Indonesia

Mendorong Persalinan di Pelayanan Kesehatan untuk Meningkatkan Pemberian ASI Eksklusif: Bukti dari Masyarakat Madura, Indonesia

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ABSTRACT

Background: Exclusive breastfeeding (EBF) is critical to starting life in its earliest phases. Breast milk alone provides adequate nutrition for infants from delivery until six months. The EBF achievement in Madura in 2022 was only 37.9%, far from the target set by the World Health Organization of 50% in 2025.
Objectives: The study examined the role of birthplace on EBF in Madura Island in Indonesia.
Methods: A cross-sectional study of 990 Madurese children was conducted. The researcher looked at 11 control variables, including regency, residence, mother age, marital status, education, occupation, wealth, antenatal care (ANC), early initiation breastfeeding (EIBF), child's age, and sex, and EBF activity as the outcome variable and childbirth as the exposure variable. As the last step, the author performed a binary logistic regression test.
Results: Madura Island had a 37.9% EBF proportion. Meanwhile, 90.1% of births take place in healthcare facilities. According to the birthplace, mothers who gave birth in healthcare facilities were 1.939 times more likely to perform EBF than those who gave birth in non-healthcare facilities (AOR 1.939; 95% CI 1.854-2.037). Moreover, the study also found eleven control variables related to EBF among Madurese.
Conclusions: Birthplace was related to EBF among Madurese. To achieve EBF, childbirth in healthcare facilities was almost twice that of childbirth in non-healthcare facilities. The study recommends only giving birth in a health facility. On the other hand, increasing the intensity of contact with health services during pregnancy and childbirth is necessary.

INTRODUCTION

Exclusive Breastfeeding (EBF) is one of the most essential needs for the development and growth of children. WHO recommends that EBF be given to children for six months, but in practice, but in practice, less than half of babies receive EBF for this duration[1]. There are still many mothers who have not practiced EBF for six months, even though there are many benefits obtained not only for the baby but also for the mother herself. The content of essential nutrients in breast milk affects children's development and growth, prevents the risk of disease and infection, and improves children's psychomotor[2,3].

Over the previous decade, there has been a 10%-point increase in the global rates of EBF during the first six months of life. As of 2023, the rate stands at 48%, close to the aim set by the World Health Assembly of reaching 50% by 2025. Meanwhile, just 37% of infants below six months of age in low- and middle-income nations are solely nourished through breastfeeding[4]. Cultural and health system constraints hinder EBF in low-middle-income countries. Concurrently, health practitioners' knowledge and counselling skills need to be improved. Furthermore, it is imperative to implement essential measures to endorse legislation and regulations about the promotion and sale of breast milk replacements and to give working women in low- and

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middle-income countries compensated maternity leave and pauses for breastfeeding[5].

A study in Somalia showed that the prevalence of EBF is lower compared to other practices in infants and young children[6]. This condition is similar to the condition in Indonesia. EBF in Indonesia has been widely socialized to mothers during *Posyandu* (Integrated Service Post), but it is still not fully practiced. The Indonesian Basic Health Research results in 2018 showed that the rate of EBF in Indonesia was at a relatively low level of 37.3%[7]. The proportion of EBF in East Java in 2017 was 74.3%, with the lowest achievement being in Bangkalan and Sampang Districts on Madura Island[8]. The rate of EBF in Madura has yet to reach the target, where the national target is 80%. Sampang Regency has an EBF percentage of 46.8%, and Sreseh Regency has 42.4%[9]. Furthermore, the latest Indonesian Health Survey results in 2023 inform that the national EBF in Indonesia is around 44.8%[10].

Various factors cause EBF. Social determinants such as residence type, maternal education, economic level, maternal employment, and health services utilization are influences in EBF[11–13]. Culture is also among the most influential factors [14]. Support from around also dramatically affects how EBF behavior in children. One of the most essential supports is support from health workers in healthcare facilities[15,16]. Studies in Ghana show that health workers in healthcare facilities play a necessary role as critical facilitators in improving EBF behavior[17].

The Government of Indonesia's efforts in increasing childbirth coverage in healthcare facilities are reflected in Ministry of Health Regulation No. 21 of 2021 concerning the Implementation of Health Services Before Pregnancy, Pregnancy, Childbirth, and Postpartum Period, as well as Contraception and Sexual Health Services[18]. These rules are essential for controlling the standards, criteria, and mechanisms of reproductive health services in various health facilities nationwide, focusing on maternity. With this regulation, the government aims to ensure that childbirth services in health facilities meet high standards, are safe, and abide by applicable medical protocols. In addition, this regulation also covers other important aspects, such as health services before pregnancy, during pregnancy, and after childbirth, as well as harmonizing contraception and sexual health services.

In addition, the Government of Indonesia also issued a strategic policy in the form of Presidential Instruction Number 5 of 2022 concerning Increasing Access to Health Services for Pregnant, Maternity, Postpartum, and Newborn Women through the Maternity Insurance Program[18]. This policy aims to provide optimal health protection for pregnant, maternity, postpartum, and newborn women in poor community groups not covered by other health insurance. The *Jampersal* (*Jaminan Persalinan*/Childbirth Assurance) program is one of the solutions offered to improve the welfare of vulnerable community groups by providing access to quality maternity services without being burdened by high health costs. Besides offering financial aid, this program strongly encourages expectant mothers to give birth at medical institutions with high service standards. Additionally, this scheme has been modified to reflect the advantages of the National Health Insurance (NHI) program[19,20].

Madura Island is one of the regions in East Java province, with an area of about 5,379 km^2 and a population of more than 4 million people. The island is famous for its distinctive culture, traditions, and arts, such as cow caravan, *keris, batik,* and *saronen* music[21–23]. However, behind its cultural richness, the island also faces various problems and challenges in the health sector. Several studies show that several factors contribute to health disparities in Madura Island, namely, the quality and accessibility of health services in Madura are still not optimal due to low resources, lack of coordination between various stakeholders in health services, and everyday social and economic conditions of the community[23,24]. In addition, other factors contribute to the high health problems on Madura Island, namely lack of education and health awareness and a culture that does not encourage health[25,26]. For instance, a society that believes breast milk is insufficient to meet a newborn's nutritional needs. Some people in Madura still believe babies should get additional foods, such as coconut water, honey, or coconut sugar, to strengthen endurance and increase energy[27]. Many areas on Madura Island are still challenging to reach by public transportation, especially in rural areas and small islands[28]. People with the illness find it difficult to obtain proper medical care, particularly regarding necessary medical services and health insurance[29]. According to the narration, the study examined the role of birthplace on EBF in Madura Island in Indonesia. The study's primary focus on how a mother's birthplace on Madura Island affects EBF is a specific angle that has not been thoroughly explored.

METHODS

Study Design and Data Source

The 2022 Indonesian National Nutritional Status Survey provided data for the secondary analysis. The Indonesian Ministry of Health conducted the cross-sectional survey at the national level, providing the authors with the data. Information was gathered using two types of questionnaires: Household and Individual Questionnaires. All children under two (0–23 months) living in Madura Island, East Java Province, Indonesia, were included in the study population. The inclusion criteria were children aged 0-23 months who lived on Madura Island with a known place of birth status. The children were the analysis unit in this study, and the mothers were the respondents. The survey used a multi-stage cluster random sampling approach to generate a weighted sample of 990 Madurese youngsters.

Setting

The researcher studied on Madura Island. The island is part of the Indonesian province of East Java. The Madura Island comprises four regencies: Bangkalan, Sampang, Pamekasan, and Sumenep.

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Outcome Variable

The study used the EBF habits of mothers with children under two years old. The author categorized the EBF as Yes = 1 or No = 0. "Yes = 1" was provided to mothers who reported that until the child was six months old, they had only given them breast milk, while "No = 0" was given to women who reported that they had given their child any food other than breast milk[30].

Exposure Variables

The author used birthplace as an exposure variable. The study divided birthplace into non-healthcare and healthcare. Healthcare consists of hospitals and primary care; outside of that, it is categorized as non-healthcare.

Control Variables

Regency, type of housing, mother's education, age, employment status, marital status, financial status, antenatal care (ANC), early initiation of breastfeeding (EIBF), child's age, and sex were the 11 control variables included in the study. There are two categories of housing: rural and urban. The mothers' ages categories were 20, 20–24, 25–29, 30-34, 35–39, 40–44, and >44[31]. The marital statuses are married and divorced/widowed. We divided maternal education into five levels: no education, primary school, junior high school, senior high school, and college. Maternal employment status also encompasses mothers who are employed and those who are not.

The study used the wealth quintile of a household's belongings to calculate its wealth level. The quantity and variety of items in a family's home determined how they were ranked in the survey. The poll also included information about the residents' features and various items, including bicycles, cars, and televisions, to measure wealth. The primary floor construction materials, sources of potable water, and restroom facilities were all considered during the inspection. The survey employed principal component analysis to obtain the score. The national wealth quintiles, divided into the same five groups and accounting for 20% of the population, were calculated using the household score of each member in the pool. Five categories are used in the poll to classify wealth: poorest, poorer, middle, richer, and richest[32].

The author classified ANC as Yes or No in the study. Early Initiation of Breastfeeding (EIBF) was to guarantee that the baby gets colostrum; moms start breastfeeding within the first hour of the baby's birth[33]. The author made up EIBF of Yes and No. The child is between 0 and 11 and 12 and 23 months. The child has both boys' and girls' gender.

Data Analysis

The study performed the Chi-Square analysis in the first stage to select the variable for the following analysis. In the second stage, the co-linearity test demonstrated no meaningful association between the independent variables. The last stage involved applying a binary logistic regression test (entry procedure). The author used a p-value of 0.05 and a 95% confidence interval (CI) to assess statistical significance. The statistical computations for the analysis were carried out using IBM SPSS Statistics 26.

Ethics Approval and Consent Participant

The 2022 Indonesian National Nutritional Status Survey provided data for the research. The National Ethics Commission has accepted the study. The Indonesian Ministry of Health gathered the information for the poll with signed informed consent. Participants filled out an informed consent form to highlight the voluntary and private character of the data-gathering process. Through the Internet, the Indonesian Ministry of Health provided scholars with the following information: https://layanandata.kemkes.go.id/. The authors have been mandated to use the data for this study.

RESULTS AND DISCUSSIONS

Based on the findings of the analysis, Madura Island has a 37.9% EBF proportion. In the meantime, 90.1% of births take place in healthcare facilities. Moreover, Table 1 presents the descriptive statistics of EBF in Madurese, Indonesia. Madurese mothers who perform childbirth in healthcare have a higher EBF ratio than those who serve childbirth in non-healthcare facilities. Regarding regency, Pamekasan Regency has the highest EBF proportion. Moreover, based on the residence type, mothers in rural areas have a higher ratio of EBF.

Table 1. Bivariate analysis of exclusive breastfeeding and maternal and child characteristics in Madura Island, Indonesia

Mothers' Characteristics	Exclusive Breastfeeding		p-value
	No (n=607)	Yes (n=383)	
Birthplace			
Non-healthcare	76 (75.0%)	21 (25.0%)	<0.001**
Healthcare	531 (60.7%)	362 (39.3%)	
Regency			
Bangkalan	233 (86.7%)	37 (13.3%)	
Sampang	136 (55.2%)	105 (44.8%)	<0.001**
Pamekasan	91 (38.3%)	151 (61.7%)	
Sumenep	147 (60.7%)	90 (39.3%)	
Residence type			
Urban	286 (64.3%)	190 (35.7%)	
Rural	321 (61.3%)	193 (38.7%)	
Maternal age (in years)			<0.001**

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Mothers' Characteristics	Exclusive Breastfeeding		p-value
	No (n=607)	Yes (n=383)	
≤19	16 (77.9%)	6 (22.1%)	
20-24	98 (61.2%)	58 (38.8%)	
25-29	187 (60.2%)	122 (39.8%)	
30-34	151 (61.9%)	92 (38.1%)	
35-39	89 (64.2%)	60 (35.8%)	
40-44	40 (56.1%)	35 (43.9%)	
≥45	26 (75.1%)	10 (24.9%)	
Maternal Marital Status			
Married	602 (62.2%)	381 (37.8%)	<0.001**
Divorced/Widowed	5 (52.2%)	2 (47.8%)	
Maternal Education			
No formal education	48 (73.0%)	21 (27.0%)	
Primary school	310 (64.0%)	175 (36.0%)	<0.001**
Junior high school	104 (59.5%)	70 (40.5%)	
Senior high school	88 (55.9%)	77 (44.1%)	
College	57 (58.8%)	40 (41.2%)	
Maternal Employment Status			
Unemployed	382 (61.2%)	245 (38.8%)	<0.001**
Employed	225 (63.8%)	138 (36.2%)	
Wealth status			
Poorest	165 (63.5%)	105 (36.5%)	
Poorer	189 (60.8%)	120 (39.2%)	<0.001**
Middle	128 (66.3%)	73 (33.7%)	
Richer	75 (55.5%)	55 (44.5%)	
Richest	50 (61.2%)	30 (38.8%)	
Antenatal care			
No	64 (76.6%)	19 (23.4%)	<0.001**
Yes	543 (60.7%)	364 (39.3%)	
Early initiation of breastfeeding			
No	195 (79.4%)	48 (20.6%)	<0.001**
Yes	412 (56.2%)	335 (43.8%)	
Under two's age (in months)			
0-11	380 (74.8%)	125 (25.2%)	<0.001**
12-23	227 (49.9%)	258 (50.1%)	
Under two's sex			
Boy	312 (62.6%)	189 (37.4%)	0.002*
Girl	295 (61.7%)	194 (38.3%)	

Note: Chi-square test, significant if p-value<0.05; *p-value<0.010; **p-value<0.001

Regarding maternal age, Table 1 shows that mothers aged 40-44 have the highest proportion of EBF. Divorced/widowed mothers have a higher EBF ratio than married mothers. Meanwhile, mothers with senior high school education have the highest EBF proportion regarding maternal education. On the other hand, unemployed mothers have a higher EBF ratio than employed mothers. Furthermore, regarding wealth status, mothers with the more prosperous status have the highest proportion of EBF.

Table 1 presents that mothers with ANC have a higher EBF ratio than those without. Regarding EIBF, mothers with EIBF have more than twice the EBF proportion than those without. Meanwhile, according to the kid's age, 12-23 months have twice the ratio of EBF than 0-11. Moreover, based on children's sex, girls have a slightly higher EBF ratio than boys.

The following study used co-linearity testing. The variance inflation factor (VIF) value for each variable is more excellent than 10.00, and the tolerance values for each variable are, on average, more significant than 0.10. The study concluded that there are no signs of a strong relationship between two or more independent variables in the regression model after using co-linearity tests to analyze the data, and no evidence of collinearity between the independent variables was found.

Table 2 displays the findings of EBF binary logistic regression. The result informs that birthplaces are associated with EBF among Madurese. According to the birthplace, mothers who childbirth in healthcare are more likely by 1.939 times to achieve EBF than those who childbirth in non-healthcare facilities (AOR 1.939; 95% CI 1.854-2.037). The likelihood of EIBF and EBF was related to the birthplace, which could be categorized as home and healthcare facilities. The birthplace associated with the EIBF and EBF could be due to the opportunity for mothers to receive counseling and assistance from health professionals and their commitment and support to breastfeeding practice[34]. Other research among mothers in agricultural areas also stated that birthplace is related to the EBF practice because the policy associated with EBF in birthplace proved to support EBF practice for

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mothers significantly. Birthplaces with policies and standard operating procedures about EBF could increase the likelihood of EIBF and EBF among mothers[35].

Moreover, mothers who childbirth in healthcare were more likely to perform EBF than those who childbirth in non-healthcare facilities. Mothers delivering babies in healthcare facilities have supporting knowledge to practice EBF. In addition, mothers are encouraged to practice breastfeeding through Early Initiation of Breastfeeding (EIBF), which healthcare providers perform. As a result, mothers with EIBF are more likely by 2.16 times to achieve EBF[36]. In Haiti, 41.22% of mothers having EIBF also breastfeed exclusively, which means there is a correlation between EIBF and EBF[37]. Furthermore, a study in Bondowoso, Indonesia, also shows similar results. 33% of mothers participate in EIBF practice EBF. It has a higher percentage than those who are not participating, which is 26.1%[38].

Table 2. EBF binary logistic regression in Madura Island, Indonesia

Predictors	Exclusive Breastfeeding			
	p-value	Adjusted Odds Ratio	95% Confidence Interval	
			Lower Bound	Upper Bound
Birthplace: Non-healthcare (ref.)	-	-	-	-
Birthplace: Healthcare	<0.001**	1.939	1.854	2.027
Regency: Bangkalan (ref.)	-	-	-	-
Regency: Sampang	<0.001**	5.293	5.090	5.504
Regency: Pamekasan	<0.001**	10.507	10.076	10.956
Regency: Sumenep	<0.001**	4.227	4.060	4.402
Residence: Urban (ref.)	-	-	-	-
Residence: Rural	<0.001**	1.141	1.111	1.172
Maternal age: ≤19 (ref.)	-	-	-	-
Maternal age: 20-24	<0.001**	2.238	2.038	2.458
Maternal age: 25-29	<0.001**	2.333	2.130	2.555
Maternal age: 30-34	<0.001**	2.166	1.976	2.374
Maternal age: 35-39	<0.001**	1.966	1.789	2.160
Maternal age: 40-44	<0.001**	2.760	2.499	3.048
Maternal age: ≥45	0.006*	1.167	1.044	1.303
Maternal Marital: Married	<0.001**	0.664	0.590	0.746
Maternal Marital: Divorced/Widowed (ref.)	-	-	-	-
Maternal Education: No formal education (ref.)	-	-	-	-
Maternal Education: Primary school	<0.001**	1.525	1.445	1.608
Maternal Education: Junior high school	<0.001**	1.844	1.740	1.955
Maternal Education: Senior high school	<0.001**	2.141	2.019	2.271
Maternal Education: College	<0.001**	1.900	1.779	2.029
Maternal employment: Unemployed	<0.001**	1.116	1.088	1.144
Maternal employment: Employed (ref.)	-	-	-	-
Wealth: Poorest (ref.)	-	-	-	-
Wealth: Poorer	<0.001**	1.123	1.089	1.158
Wealth: Middle	<0.001**	0.885	0.854	0.917
Wealth: Richer	<0.001**	1.395	1.339	1.454
Wealth: Richest	<0.001**	1.102	1.048	1.159
Antenatal care: No (ref.)	-	-	-	-
Antenatal care: Yes	<0.001**	2.119	2.020	2.224
Early initiation of breastfeeding: No (ref.)	-	-	-	-
Early initiation of breastfeeding: Yes	<0.001**	3.002	2.909	3.099
Age of under two: 0-11 months(ref.)	-	-	-	-
Age of under two: 12-23 months	<0.001**	2.976	2.902	3.052
Sex of under two: Boy (ref.)	-	-	-	-
Sex of under two: Girl	0.002*	1.039	1.014	1.064

Note: Binary Logistic Regression test, significant if p-value<0.05; *p-value<0.010; **p-value<0.001

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Besides, mothers delivering babies in healthcare also have a chance to do Skin to Skin Contact (SSC). This contact enables mother-baby bonding, which may increase the mother's comfort, infant warmth, breast attachment, and emotional bonding. Around 72% of mothers who get SSC are more likely to perform EBF[39]. SSC served approximately 10 minutes, which may increase EBF practice[40]. Moreover, a 60-minute SSC regimen may increase mothers' breastfeeding efficacy immediately after giving birth[41]. Since EIBF and SSC are given when mothers give birth in healthcare facilities, mothers perform EBF better than in other facilities.

Additionally, the study discovered that every control variable was associated with EBF among Madurese. Regarding places, Table 2 indicates that all regencies are more likely than Bangkalan Regency to achieve EBF, and mothers in rural areas are 1.141 times more likely than those in urban areas to execute EBF (AOR 1.141; 95% CI 1.111-1.172). Research in Ethiopia also proved that mothers who reside in the metropolis region were less likely to EBF. The situation could be related to the mother's employment status. Mothers in urban areas probably have more formally employed women, which could hinder them from providing EBF[42].

Furthermore, the results also found five maternal characteristics associated with EBF among Madurese: age, marital, education, employment, and wealth status. A similar study also shows that sociodemographic aspects affect EBF practice among mothers. Age is related to how someone thinks, acts, or makes decisions. Adolescent mothers are associated with powerlessness when it comes to decisions, sometimes lack nutritional status, and have less knowledge about taking care of kids[43,44]On the contrary, adult mothers are better motivated to EBF and make sound decisions. This means that age affects the way mothers breastfeed.

Furthermore, marital status involves a father-mother relationship that may enhance mothers' nursing efficacy. The father or spouse has a superior status that may lead to the mother's stress. The high hierarchy of husbands in marriage creates a lack of support for mothers[45]. On the other hand, the father's presence may support the mother emotionally and enable a mother to discuss certain things about taking care of babies, including EBF[46]. Moreover, mothers need proper knowledge to practice EBF. Higher education has an essential role in increasing people's understanding. It also increases people's self-awareness because education facilitates gaining skills and knowledge on general health[47]. In Indonesia, basic information about breastfeeding is given during school. So, education level may correlate to EBF practice. Other sociodemographic aspects that may influence EBF are employment and wealth status. These aspects are related to mothers' ability to live a healthy life[48]. Mothers need to consume highly nutritious food, perform ANC, and prepare for newborn needs besides fulfilling household needs. Financial support is necessary to fulfill the needs. By being employed and having economic stability, mothers may breastfeed effectively. Previous studies show that household wealth status significantly correlates with EBF practice[43,49]. In conclusion, sociodemographic statuses such as age, marital status, education, employment, and wealth status are needed to support mothers in practicing EBF.

Table 2 shows that, according to ANC, mothers with ANC are more likely by 2.119 times to execute EBF than those without (AOR 2.119; 95% CI 2.020-2.224). An Ethiopian finding shows that around 54,5% of mothers visiting ANC at least once practiced EBF for approximately six months[43]. ANC calls correlate significantly to EBF practice since mothers can receive lactation counseling during visitation[50]. WHO standardized counseling, which contains the importance of breastfeeding, increasing breastmilk, breast care, and breastfeeding techniques, results in better breastfeeding practice. Counseling was given during the third semester, the day of birth, and the post-natal period[51]. In Indonesia, lactation counseling may improve mothers' breastfeeding knowledge, attitude, and practice. In this way, the counseling should be done once a month for five months to reach that outcome[52]. Furthermore, the Regulation of the Indonesian Ministry of Health states that the standard of ANC includes lactation counseling[53]. So, ANC enables mothers to get breastfeeding information, positively affecting their knowledge of breastfeeding practice.

Meanwhile, mothers who perform EIBF are 3.002 times more likely to execute EBF than those without EIBF (AOR 3.002; 95% CI 2.909-3.099). Meanwhile, mothers who perform EIBF were likelier to achieve EBF than those without EIBF. EIBF was positively associated with EBF and was a significant determinant of EBF within the first six months[54]. Research among mothers in agricultural areas stated that 100% of mothers who perform EIBF also achieve the EBF for six months. EIBF stimulates breast milk production and prevents the baby from getting formula milk during the few days after birth[35]. Therefore, to support EBF, it is essential to promote the practice of EIBF.

Moreover, the study found two children's characteristics related to EBF among Madurese. The two are age and sex. Furthermore, the study found two children's characteristics associated with EBF among Madurese. The two are age and sex. Children aged 12-23 months have twice the ratio of EBF than 0-11. Research in Indonesia also proved that children aged 6-17 months have a reduced chance of being breastfed than kids aged 18-23[55].

Furthermore, based on children's sex, girls have a slightly higher EBF ratio than boys. Research in Vietnam also showed that the proportion of EBF among girls is somewhat higher than among boys. However, for EIBF, the boys showed a higher proportion than girls[56]. Although other research revealed the opposite, most girls were less likely to be EBF because their mothers may give more attention to boys than girls because having a boy made her feel prouder of the family[57].

Strength and Limitation

Extensive data processing is needed to obtain research results at the Madura Island level. As a data source for this study, researchers used SSGI 2022; for that reason, this study only analyzed variables included in the survey. The study's conclusions did not consider several

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other factors associated with exclusive breastfeeding in previous studies, including birth order, total number of children born, child grades, child fever experience, and child diarrhea experience[30,57–60].

CONCLUSIONS

According to the findings, the research concluded that birthplace was associated with EBF among Madurese. Childbirth in healthcare facilities was almost twice that of childbirth in non-healthcare facilities to achieve EBF. The results of this study further emphasize the importance of encouraging delivery only in healthcare facilities. On the other hand, information about the strong relationship between ANC and EIBF with EBF indicates that contact with health services during pregnancy and delivery can increase EBF coverage in Madurese.

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CONFLICT OF INTEREST AND FUNDING DISCLOSURE

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AUTHOR CONTRIBUTIONS

MY: conceptualization, investigation, methodology, supervision, writing–review and editing; ADL: conceptualization, investigation, methodology, supervision, writing–review and editing; SRD: methodology, writing–original draft; NL: methodology, writing–original draft; IN: methodology; formal analysis, writing–original draft; NN: formal analysis, resources; NHW: writing–original draft, writing–review and editing.

REFERENCES

1. WHO. Breatsfeeding. https://www.who.int/health-topics/breastfeeding (2024).
2. Couto, G., Dias, V. & Oliveira, I. Benefits of exclusive breastfeeding: An integrative review. *Nurs. Pract. Today* **7**, 245–254 (2020). DOI 10.18502/npt.v7i4.4034.
3. Laksono, A. D., Wulandari, R. D., Ibad, M. & Kusrini, I. The effects of mother ' s education on achieving exclusive breastfeeding in Indonesia. 1–6 (2021). DOI 10.1186/s12889-020-10018-7.
4. Unicef & World Health Organization. *Global Breastfeeding Scorecard 2023*. https://www.unicef.org/media/150586/file#:~:text=Figure 1.-,Trends in the global prevalence of exclusive,0–5 months of age.&text=Globally rates of exclusive breastfeeding,target of 50%25 by 2025. (2023).
5. Kavle, J., LaCroix, E., Dau, H. & Engmann, C. Addressing barriers to exclusive breast-feeding in low- and middle-income countries: a systematic review and programmatic implications. *Public Health Nutr.* **20**, 1–15 (2017). DOI 10.1017/S1368980017002531.
6. Jama, A. *et al.* Exclusive breastfeeding for the first six months of life and its associated factors among children age 6-24 months in Burao district, Somaliland. *Int. Breastfeed. J.* **15**, 1–8 (2020). DOI 10.1186/s13006-020-0252-7.
7. Saputri, N. S. *et al.* Progress towards reducing sociodemographic disparities in breastfeeding outcomes in Indonesia: a trend analysis from 2002 to 2017. *BMC Public Health* **20**, 1–15 (2020). DOI 10.1186/s12889-020-09194-3.
8. Yoto, M., Megatsari, H., Ridwanah, A. A. & Laksono, A. D. Factors Related to Exclusive Breastfeeding in East Java - Indonesia. *Indian J. Forensic Med. Toxicol.* **16**, 800–806 (2022). DOI 10.37506/ijfmt.v16i1.17595.
9. Yunitasari, E., Andriani, R. W. & Wahyuni, S. D. Exclusive Breastfeeding Based on The Health Promotion Model in Madura Island. *Int. J. Pharm. Res.* **12**, 2212 (2020). DOI 10.31838/ijpr/2020.12.02.298.
10. Indonesian Ministry of Health. *Indonesian Health Survey in Numbers (Survei Kesehatan Indonesia dalam Angka)*. (2024).
11. Abegunde, D. *et al.* Socioeconomic inequality in exclusive breastfeeding behavior and ideation factors for social behavioral change in three north-western Nigerian states: a cross-sectional study. *Int. J. Equity Health* **20**, 1–14 (2021). DOI 10.1186/s12939-021-01504-4.
12. Kusrini, I., Ipa, M., Laksono, A. D., Fuada, N. & Supadmi, S. The Determinant of Exclusive Breastfeeding among Female Worker in Indonesia. *Syst. Rev. Pharm.* **11**, 1102–1106 (2020). DOI 10.31838/srp.2020.11.157.
13. Wulandari, R. D. & Laksono, A. D. Does the Place of Residence Affect the Achievement of Exclusive Breastfeeding? A Study in Eastern Indonesia. *Syst. Rev. Pharm.* **11**, 872–876 (2020). DOI 10.31838/srp.2020.9.126.
14. Fu, C. Y. *et al.* Exclusive breastfeeding rate and related factors among mothers within maternal health WeChat groups in Jiaxing, Zhejiang province, China: a cross-sectional survey. *Int. Breastfeed. J.* **17**, 4–11 (2022). DOI 10.1186/s13006-022-00521-5.
15. Rujumba, J. *et al.* 'If I have money, I cannot allow my baby to breastfeed only …' barriers and facilitators to scale-up of peer counselling for exclusive breastfeeding in Uganda. *Int. Breastfeed. J.* **15**, 43 (2020). DOI 10.1186/s13006-020-00287-8.
16. Perdani, F. P., Laksono, A. D. & Chalidyanto, D.

How to cite: *Yoto, M., Laksono, A. D., Devy, S. R., Luthviatin, N., Nafikadini, I., Nandini, N., & Widyaningtyas, N. H. (2025). Encouraging Healthcare Childbirth to Increase Exclusive Breastfeeding: Evidence from Madurese, Indonesia: Mendorong Persalinan di Pelayanan Kesehatan untuk Meningkatkan Pemberian ASI Eksklusif: Bukti dari Masyarakat Madura, Indonesia. Amerta Nutrition, 9(1), 45–54.*

The Undernutrition Prevalence of Under-Two-Years Infant in Indonesia: Do breastfeeding Practices Ecologically Matter? *Indian J. Forensic Med. Toxicol.* **15**, 1113–1119 (2021). DOI 10.37506/ijfmt.v15i4.16855.

17. Agyekum, M. W., Codjoe, S. N. A., Dake, F. A. A. & Abu, M. Enablers and inhibitors of exclusive breastfeeding: perspectives from mothers and health workers in Accra, Ghana. *Int. Breastfeed. J.* **17**, 1–15 (2022). DOI 10.1186/s13006-022-00462-z.
18. The Ministry of Health of The Republic of Indonesia. *Regulation of the Minister of Health Number 21 of 2021 concerning Health Services for Pre-Pregnancy, Pregnancy, Childbirth, and Postpartum Period, Implementation of Contraceptive Services, and Sexual Health Services*. 1–40 (2021).
19. Laksono, A. D., Nantabah, Z. K., Wulandari, R. D., Khoiri, A. & Tahangnacca, M. Barriers to Expanding the National Health Insurance Membership in Indonesia: Who Should the Target? *J. Prim. Care Community Heal.* **13**, 1–7 (2022). DOI 10.1177/21501319221111112.
20. Putri, N. K., Laksono, A. D. & Rohmah, N. Predictors of national health insurance membership among the poor with different education levels in Indonesia. *BMC Public Health* **23**, Article number 373 (2023). DOI 10.1186/s12889-023-15292-9.
21. Izzah, L., Sulistiyono, S. T. & Rochwulaningsih, Y. Commodifying culture in a frontier area: The utilization of madurese culture for developing tourism in the eastern tip of Java Island, Indonesia. *J. Mar. Isl. Cult.* **10**, 118–137 (2021). DOI 10.21463/JMIC.2021.10.1.07.
22. Laksono, A. D., Wulandari, R. D. & Kusrini, I. Regional Disparities of Stunted Toddler in Madura Island, Indonesia. *J. Crit. Rev.* **7**, 6115–6121 (2020). DOI 10.31838/jcr.07.19.708.
23. Laksono, A. D. & Wulandari, R. D. Determinant of the Puskesmas Utilization in Madura Island. *Indian J. Public Heal. Res. Dev.* **10**, 576–581 (2019). DOI 10.5958/0976-5506.2019.03802.6.
24. Andayani, Q., Koesbardiati, T. & Purnomo, W. Implementation Program of child Under 5 Years' Growth and Development Problems in Bangkalan, Madura. *Indian J. Public Heal. Res. Dev.* **10**, 1257 (2019). DOI 10.5958/0976-5506.2019.02617.2.
25. Yunitasari, E., Umayro, A. H. & Pratiwi, I. N. Community Empowerment in the Madura Tribe with Exclusive Breastfeeding in the Working Area of Community Health Center Sreseh Sampang Madura. *Indian J. Public Heal. Res. Dev.* **10**, 2600 (2019). DOI 10.5958/0976-5506.2019.02260.5.
26. Wiliyanarti, P. F., Wulandari, Y. & Nasrullah, D. Behavior in fulfilling nutritional needs for Indonesian children with stunting: Related culture, family support, and mother's knowledge. *J. Public health Res.* **11**, (2022). DOI 10.1177/22799036221139938.
27. Oktarina, O. & Wardhani, Y. F. Nutritional Fulfillment Behavior of Breastfeeding Mothers in Several Ethnicities in Indonesia (Perilaku Pemenuhan Gizi pada Ibu Menyusui di Beberapa Etnik di Indonesia). *Bul. Penelit. Sist. Kesehat.* **22**, 236–244 (2020). DOI 10.22435/hsr.v22i4.1550.
28. Nurif, M. & Hermanto, H. The Development Study of Madura Area (An Area Marketing Approach). *IPTEK J. Proc. Ser.* **0**, 16 (2019). DOI 10.12962/j23546026.y2019i6.6320.
29. Ridwanah, A. A., Nugraheni, E. & Laksono, A. D. The Role of Education Level in the Utilization of Community Health Centers on Madura Island, East Java, Indonesia. *J. Keperawatan Indones. Timur* **2**, 8–17 (2022). DOI 10.32695/JKIT.V2I1.278.
30. Terefe, B. & Shitu, K. Exploring the determinants of exclusive breastfeeding among infants under six months in the Gambia using gambian demographic and health survey data of 2019- 20. *BMC Pregnancy Childbirth* **23**, 220 (2023). DOI 10.1186/s12884-023-05544-2.
31. Syahri, I. M. *et al.* Exclusive breastfeeding among Indonesian working mothers: does early initiation of breastfeeding matter? *BMC Public Health* **24**, 1225 (2024). DOI 10.1186/s12889-024-18619-2.
32. Wulandari, R. D., Laksono, A. D., Prasetyo, Y. B. & Nandini, N. Socioeconomic Disparities in Hospital Utilization Among Female Workers in Indonesia: A Cross-Sectional Study. *J. Prim. Care Community Health* **I3**, 1–7 (2022). DOI 10.1177/21501319211072679.
33. UNICEF & WHO. Capture the Moment–Early initiation of breastfeeding: The best start for every newborn. https://data.unicef.org/topic/nutrition/ infant-and-young-child-feeding (2018).
34. Admasu, J., Egata, G., Bassore, D. G. & Feleke, F. W. Effect of maternal nutrition education on early initiation and exclusive breast-feeding practices in south Ethiopia: a cluster randomised control trial. *J. Nutr. Sci.* **11**, e37 (2022). DOI 10.1017/jns.2022.36.
35. Pusporini, A. D., Pangestuti, D. R. & Rahfiludin, M. Z. Faktor-Faktor yang Berhubungan dengan Praktik ASI Eksklusif di Daerah Pertanian Kabupaten Semarang(Studi pada Ibu yang Memiliki Bayi Usia 0−6 Bulan). *Media Kesehat.*

How to cite: *Yoto, M., Laksono, A. D., Devy, S. R., Luthviatin, N., Nafikadini, I., Nandini, N., & Widyaningtyas, N. H. (2025). Encouraging Healthcare Childbirth to Increase Exclusive Breastfeeding: Evidence from Madurese, Indonesia: Mendorong Persalinan di Pelayanan Kesehatan untuk Meningkatkan Pemberian ASI Eksklusif: Bukti dari Masyarakat Madura, Indonesia. Amerta Nutrition, 9(1), 45–54.*

Masy. Indones. **20**, (2021). DOI 10.14710/mkmi.20.2.83-90 .

36. Iffah Zahrotin Nisa, T., Benya Adriani, R. & Murti, B. Effect of Early Initiation of Breastfeeding on Exclusive Breastfeeding and Stunting: A Meta-Analysis. *J. Matern. Child Heal.* **7**, 685–698 (2022). DOI 10.26911/thejmch.2022.07.06.07.
37. Walsh, S. M., Cordes, L., McCreary, L. & Norr, K. F. Effects of Early Initiation of Breastfeeding on Exclusive Breastfeeding Practices of Mothers in Rural Haiti. *J. Pediatr. Heal. Care* **33**, 561–567 (2019). DOI 10.1016/j.pedhc.2019.02.010.
38. Susilowati, S. & Wicaksi, D. Effect of Early Initiation on Exclusive Breastfeeding in Blindungan Village Blindungan District Bondowoso. *D'Nursing Heal. J.* **2**, 23–27 (2021). DOI 10.36835/dnursing.v2i1.137.
39. Sharma, A. Efficacy of early skin-to-skin contact on the rate of exclusive breastfeeding in term neonates: A randomized controlled trial. *Afr. Health Sci.* **16**, 790 (2016). DOI 10.4314/ahs.v16i3.20.
40. Moore, E. R., Bergman, N., Anderson, G. C. & Medley, N. Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database Syst. Rev.* **2016**, (2016). DOI 10.1002/14651858.CD003519.pub4.
41. Huang, J.-Z. *et al.* Evaluation of the Effects of Skin-to-Skin Contact on Newborn Sucking, and Breastfeeding Abilities: A Quasi-Experimental Study Design. *Nutrients* **14**, 1846 (2022). DOI 10.3390/nu14091846.
42. Ahmed, K. Y., Page, A., Arora, A. & Ogbo, F. A. Trends and determinants of early initiation of breastfeeding and exclusive breastfeeding in Ethiopia from 2000 to 2016. *Int. Breastfeed. J.* **14**, 40 (2019). DOI 10.1186/s13006-019-0234-9.
43. Tariku, A. *et al.* Mothers' education and ANC visit improved exclusive breastfeeding in Dabat Health and Demographic Surveillance System Site, northwest Ethiopia. *PLoS One* **12**, e0179056 (2017). DOI 10.1371/journal.pone.0179056.
44. Agrawal, J., Chakole, S. & Sachdev, C. The Role of Fathers in Promoting Exclusive Breastfeeding. *Cureus* **14**, (2022). DOI 10.7759/cureus.30363.
45. Budiati, T., Setyowati, S., Adjie, S. & Gunawijaya, J. Fathers' Role in Sustainability of Exclusive Breastfeeding Practice in Post-Cesarean-Section Mothers. *J. Public health Res.* **11**, jphr.2021.2744 (2022). DOI 10.4081/jphr.2021.2744.
46. Raghupathi, V. & Raghupathi, W. The influence of education on health: An empirical assessment of OECD countries for the period 1995-2015. *Arch. Public Heal.* **78**, 1–18 (2020). DOI 10.1186/s13690-020-00402-5.
47. Supadmi, S. *et al.* Factor related to stunting of children under two years with working mothers in Indonesia. *Clin. Epidemiol. Glob. Heal.* **26**, 101538 (2024). DOI 10.1016/j.cegh.2024.101538.
48. Laksono, A. D., Wulandari, R. D., Susianti, N., Samsudin, M. & Musoddaq, M. A. Stunting Among Wealthy Indonesian Families: A Cross-Sectional Study of Children Under the Age of Two. *J. Popul. Soc. Stud.* **32**, 384–398 (2024). DOI 10.25133/JPSSv322024.023.
49. Nurhayati, E. & Fikawati, S. Counseling of exclusive breastfeeding during antenatal care (ANC) and perceptions of insufficient milk supply. *J. Gizi dan Diet. Indones. (Indonesian J. Nutr. Diet.* **7**, 65 (2019). DOI 10.21927/ijnd.2019.7(2).65-73.
50. Thomas, S., Mohanty, N. & Dasila, P. K. Effect of Antenatal Lactation Counselling on Knowledge and Breastfeeding Practices among Mothers. *Int. J. Heal. Sci. Res.* **8**, (2018).
51. Suryani, D. *et al.* The Effect Of Counseling On Knowledge, Attitudes, And Practices Of Mothers breastfeeding In The Work Area Of Sawah Lebar Community Health Center, Bengkulu 2017. in *Proceedings of the 1st International Conference on Inter-professional Health Collaboration (ICIHC 2018)* (Atlantis Press, 2019). doi:10.2991/icihc-18.2019.43. DOI 10.2991/icihc-18.2019.43.
52. Kementerian Kesehatan Republik Indonesia. *Peraturan Menteri Kesehatan Nomor 21 tahun 2021 Tentang Penyelenggaraan Pelayanan Kesehatan Masa Sebelum Hamil, Masa Hamil, Persalinan, dan Masa Sesudah Melahirkan, Pelayanan Kontrasepsi, dan Pelayanan Kesehatan Seksual*. (Kemenkes RI, 2021).
53. Zhou, Q. & Feng, X. L. Breastfeeding practices in Northeast China in 2008 and 2018: cross-sectional surveys to explore determinants over a decade. *Int. Breastfeed. J.* **18**, 25 (2023). DOI 10.1186/s13006-023-00562-4.
54. Sebayang, S. K. *et al.* Determinants of age-appropriate breastfeeding, dietary diversity, and consumption of animal source foods among Indonesian children. *Matern. Child Nutr.* **16**, 19 (2020). DOI 10.1111/mcn.12889.
55. My, D. T. T. *et al.* Associated factors of breastfeeding practices among mothers in rural Vietnam: A community-based study. *J. Pediatr. Nurs.* **67**, e85–e91 (2022). 10.1016/j.pedn.2022.09.005.
56. Tello, B. *et al.* Breastfeeding, feeding practices and stunting in indigenous Ecuadorians under 2 years of age. *Int. Breastfeed. J.* **17**, 19 (2022). DOI 10.1186/s13006-022-00461-0.
57. Kusrini, I., Ipa, M. & Laksono, A. D. "Is It true that the child is king?": Qualitative Study of Factors

How to cite: *Yoto, M., Laksono, A. D., Devy, S. R., Luthviatin, N., Nafikadini, I., Nandini, N., & Widyaningtyas, N. H. (2025). Encouraging Healthcare Childbirth to Increase Exclusive Breastfeeding: Evidence from Madurese, Indonesia: Mendorong Persalinan di Pelayanan Kesehatan untuk Meningkatkan Pemberian ASI Eksklusif: Bukti dari Masyarakat Madura, Indonesia. Amerta Nutrition, 9(1), 45–54.*

Related to Nutritional Status of Children in West Lombok, Indonesia. *Indian J. Public Heal. Res. Dev.* **10**, 1729–1733 (2019). DOI 10.37506/v10/i12/2019/ijphrd/192113.

58. Pratita, I. & Laksono, A. D. 'If this child eats, whatever she/he is asked ...': Exploration of Value of Children and Parenting Patterns in Javanese in the Besowo village, Kediri, East Java. *Amerta Nutr.* **4**, 147 (2020). DOI 10.20473/amnt.v4i2.2020.147-154.

59. Laksono, A. D. & Wulandari, R. D. The Food Taboo of the Muyu Tribe in Papua (Pantangan Makanan pada Suku Muyu di Papua). *Amerta Nutr.* **5**, 251 (2021). DOI 10.20473/amnt.v5i3.2021.251-259.

60. Laksono, A. D. & Wulandari, R. D. 'Children are Assets': Meta Synthesis of Child Values in the Lani and Acehnese ("Anak adalah Aset": Meta Sintesis Nilai Anak pada Suku Lani dan Suku Aceh). *J. Kesehat. Reproduksi* **10**, 11–20 (2019). DOI 10.22435/kespro.v10i1.933.11-20.

How to cite: *Yoto, M., Laksono, A. D., Devy, S. R., Luthviatin, N., Nafikadini, I., Nandini, N., & Widyaningtyas, N. H. (2025). Encouraging Healthcare Childbirth to Increase Exclusive Breastfeeding: Evidence from Madurese, Indonesia: Mendorong Persalinan di Pelayanan Kesehatan untuk Meningkatkan Pemberian ASI Eksklusif: Bukti dari Masyarakat Madura, Indonesia. Amerta Nutrition, 9(1), 45–54.*