

Exclusive Breastfeeding Survival And Factors Related to Early Breastfeeding Cessation in Indonesia

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Abstract — Give only breast milk for the first six months is recommended for optimizing the infant's growth and development. In fact, the rate of exclusive breastfeeding in Indonesia is relatively low. This study was aimed to assess the survival probability of exclusive breastfeeding and identify the factors related to early breastfeeding cessation. This study used cross sectional design with sample of 1088 mothers of infants aged 6-12 months. Data were obtained from The Indonesian Family Life Survey (IFLS) wave 5 that conducted in 2014-2015 and analyzed using survival analysis. The Life Table showed that half of exclusive breastfeeding cessation occurred in the first month of infant age, while the exclusive breastfeeding survival probability was 21.3%. The median duration of breastfeeding in Indonesia was 2.03 months. Cox Regression revealed that mother's education and place of delivery were associated with early breastfeeding cessation ($p < 0.05$). The promotion programs of exclusive breastfeeding should be increase since the duration of breastfeeding among Indonesian mothers was relatively short.

Keywords—exclusive breastfeeding, cessation, IFLS, survival analysis

I. INTRODUCTION

Breast milk has been scientifically proven as the best source of nutrition for infants. Breast milk not only contains required nutrients for child's growth and development, but also bioactive factors that contribute to strengthen the immune system [1]. Considering the well-establish advantages of breast milk, World Health Organization (WHO) has stated recommendation that in the first six months of life, infants should be exclusively breastfed. Exclusive breastfeeding means giving only breast milk for 6 months, not permitted to give other liquids (include water) or solid foods, except vitamins, minerals, and medicines [2].

Exclusive breastfeeding could give great impact on saving child's life. It has potential affect to prevent the death of 823,000 children under five per year in developing countries [3]. Some studies have been carried out the association between exclusive breastfeeding practice and infant mortality [3,4,5,6,7]. Exclusive breastfeeding contributes in reducing the risk of getting infection disease among infants, i.e. diarrhea, respiratory infection. Long-term effects of exclusive breastfeeding on protecting children from chronic diseases in adulthood and increasing the intelligence score have been documented [8,9, 10,11,12]. Beside strengthen the emotional

bonding between mother and child, exclusive breastfeeding could fasten the recovery postpartum and gives protective effects on maternal health outcomes, i.e. breast cancer, ovarian cancer [8,13]. Not giving exclusive breastfeeding also causes enormous economic consequences. Low rates of breastfeeding could cause economic loss more than \$302 billion annually [12].

Generally, the breastfeeding rates in the worldwide are quite low. Based on a report of *Global Breastfeeding Scorecard* which evaluated breastfeeding data from 194 countries, the percentage of babies under six months who are breastfed exclusively (given only breast milk) is 40%. Only 23 countries have exclusive breastfeeding rate above 60% [14]. The cohort study which conducted in Brazil found that cumulative survival probability of exclusive breastfeeding in the first six months of life was gradually declined. Up to the end of the first month, the rate of exclusive breastfeeding was 89.6% and only 11.3% at the end of six months. Median duration of exclusive breastfeeding was 89 days [15]. The survival rate of exclusive breastfeeding in Belgium has similar result with those in Brazil. In the end of six months, the percentages of exclusive breastfeeding fallen to 12.6% and the median duration of exclusive breastfeeding was 3 months [16].

Various studies show that mother's age, socioeconomic status, number of parities, psychosocial factors, and maternity-leave duration are the predictors of breastfeeding duration. Exclusive breastfeeding are also independently associated with perceived inadequate breast milk, cesarean section delivery, and feeding counseling during postnatal care [15,16,17].

Indonesia is one of the countries that have regulation in supporting exclusive breastfeeding practice. However, the rate of exclusive breastfeeding in this country was low. According to the 2012 Indonesia Demographic and Health Survey, only 42% of children under six months of age were exclusively breastfed [18]. But, there is limited evidence about the cumulative survival probability during the period time of exclusive breastfeeding and the factors affecting exclusive breastfeeding duration in Indonesia. Therefore, this study was conducted to estimate the cumulative survival probability of exclusive breastfeeding and identify the predictors of breastfeeding cessation.

II. METHOD

We conducted a cross sectional study using data from the fifth wave of the Indonesian Family Life Survey (IFLS-5). The IFLS-5 was fielded between late October 2014 and the end of April 2015. Women in the reproductive age group (15-49 years) who have 6-12 months old children when interviewed (born between 2013 and April 2014) were the population of this study. Participants who had missing data at time when child first fed water, other foods, or child’s age when first weaned, were excluded. The eligible population of this study was 1088 mother-child pairs and all of them will be the study participants.

Exclusive breastfeeding duration was obtained from the date of child’s birth to time when he/she consumption other foods other than breast milk, including water. The survival time of exclusive breastfeeding was recorded in months. Mothers who had reported feeding her baby water, other foods, or weaned before six months were considered as events and those who only breastfed for six months were right censored data. The other potential predictors of time of exclusive breastfeeding cessation, such as mother’s age, mother’s education level, mother’s working status, knowledge of exclusive breastfeeding, number of children, place of delivery, attendant of delivery, antenatal care follow up, and post natal care follow up, were evaluated in this study.

Descriptive statistics were used to describe the feature of the data, like frequencies, proportions, mean, and median. The exclusive breastfeeding survival was analyzed using life table approach, resulting the survival curve and hazard function graph. The effect of potential predictors on exclusive breastfeeding duration was assessed using Cox regression (Proportional Hazard). Variables with p value < 0.25 in bivariate Cox regression were further entered to multivariate Cox regression model. Variables were identified as the determinant factors associated with exclusive breastfeeding cessation if the p value < 0.05 with 95% Confidence Interval (CI).

III. RESULT AND DISCUSSION

The number of participants who enrolled in this study was 1088 mothers. Most of them (78.8%) were in the 21-35 years old, had completed secondary education (66.4%), and married woman (98.2%). One-half (51.5%) of the mothers were employed and had known the definition/meaning of exclusive breastfeeding (52.8%). Mothers who gave birth in health facilities accounted for 82% of the sample. Almost all the mothers were attended by health professional (94.2%). The proportion of mothers who attended at least four antenatal care visits was 86.4% and only 485 mothers (44.6%) received postnatal care service. The distribution of baseline characteristics of study subjects could be seen at Table 1.

TABLE I. DISTRIBUTION OF RESPONDENT’S CHARACTERISTICS AND STATUS OF EXCLUSIVE BREASTFEEDING

Variables	n	%
Mother’s age (years)		
< 20	141	13.0
21 – 35	857	78.8
> 35	90	8.3
Mother’s education		
Primary	184	16.9
Secondary	722	66.4
Tertiary	182	16.7
Marital status		
Separated/divorced/widowed	20	1.8
Married	1068	98.2
Mother’s occupation		
No	528	48.5
Yes	560	51.5
Mother’s knowledge		
Poor	514	47.2
Good	574	52.8
Place of delivery		
Health facilities	892	82.0
Others	196	18.0
Attendant of delivery		
Health professionals	1025	94.2
Others	63	5.8
Antenatal care		
< four visits	148	14.6
Four visits	940	86.4
Postnatal care		
No	603	55.4
Yes	485	44.6
Exclusive breastfeeding		
No	856	78.7
Yes	232	21.3

Figure 1 shows the cumulative survival probability of exclusive breastfeeding. There were 21.3% mothers who survive to give their babies only breast milk for six months. The median duration of exclusive breastfeeding was 2.03 months and most of breastfeeding cessation events were observed at the first month. The failure of giving exclusive breastfeeding gradually increased over a period of time.

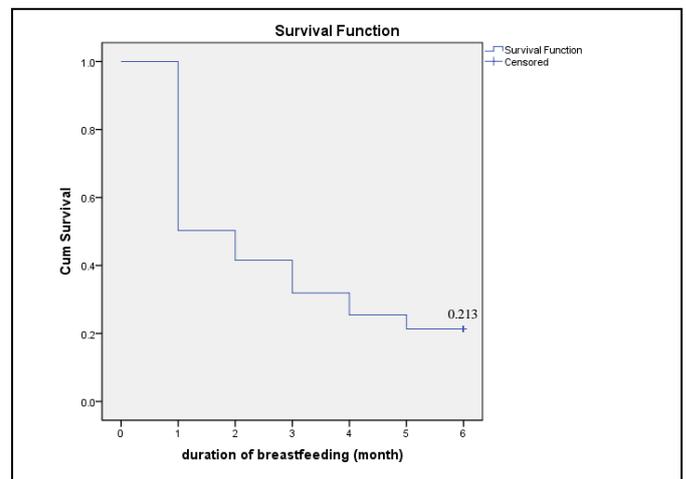


Fig. 1. Cumulative survival probability of exclusive breastfeeding

Based on bivariate analysis, the cumulative survival probability of exclusive breastfeeding was found significantly different based on mother’s age, mother’s education, marital

Variables	n	%
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status, place of delivery, and antenatal care ($p < 0.05$). Older mother had longer breastfeeding duration than younger mother. The survival rate of exclusive breastfeeding among mother who are over 35 years old was 26% and median time to stay on exclusive breastfeeding was 2.57 months. Higher education of mother, married woman, delivered in health facilities, and visited antenatal care also increased the rates of exclusive breastfeeding (Table 2).

Table 3 shows the results of Multivariate Cox Proportional Hazard Regression analysis. This analysis revealed that educational level of mother and place of delivery were associated with exclusive breastfeeding cessation. Mothers with primary (AHR = 1.289; 95% CI 1.059-1.570) and secondary (AHR = 1.352; 95% CI 1.057-1.729) level education were more likely to failure in giving exclusive breastfeeding than mothers who had graduated from college degree. Mothers who gave birth in non-health facilities (AHR = 1.246; 95% CI 1.042-1.490) were more likely to stop exclusive breastfeeding as compared to mothers who deliver in health facilities.

TABLE II. BIVARIATE ANALYSIS OF EXCLUSIVE BREASTFEEDING CUMULATIVE SURVIVAL PROBABILITY

Variables	Survival (%)	Median survival time (month)	Wilcoxon	Sig.
Mother's age (years)				
< 20	13.0	1.88	7.069	0.029*
21 – 35	22.0	2.11		
> 35	26.0	2.57		
Mother's education			13.073	0.001*
Primary	15.0	1.88		
Secondary	20.0	1.99		
	35.0	3.00		
Mother's occupation			0.001	0.974
No	22.0	2.00		
Yes	21.0	2.07		
Mother's knowledge			2.283	0.131
Poor	18.0	1.97		
Good	24.0	2.21		
Marital status			5.536	0.019*
Divorced/widowed	15.0	1.63		
Married	21.0	2.10		
Place of delivery			19.063	0.000*
Health facilities	23.0	2.39		
Others	14.0	1.78		
Attendant of delivery			3.549	0.060
Health professionals	22.0	2.10		
Others	13.0	1.83		
Antenatal care			5.144	0.023*
< four visits	16.0	1.84		
Four visits	22.0	2.22		
Postnatal care			0.290	0.590
No	21.0	1.99		
Yes	22.0	2.16		

TABLE III. FINAL MODEL OF FACTORS RELATED TO BREASTFEEDING CESSATION

Variables	B	Wald	Sig.	AHR	95% CI AHR
Mother's education					
Tertiary	0.301	7.308	0.026	ref	
Secondary	0.254	5.775	0.016	1.352	1.057 – 1.729
Primary	0.220	6.391	0.011	1.289	1.059 – 1.570
Place of delivery		5.796	0.016	1.246	1.042 – 1.490

The cumulative survival probability of exclusive breastfeeding showed that in the end of six months, 21.3% mothers remained exclusively breastfed her babies. This rate was higher than the findings of Viera et al., Robert et al., and Akodu et al., but lower than the findings of Kasahun et al., Thakur et al., and Ishaya & Dikko [15,16,17,19,20,23]. This study also found that the median duration of exclusive breastfeeding practice was two months. It was shorter than duration of exclusive breastfeeding practice in Brazil, Belgium, Nigeria, Ethiopia, and India [15,16,17,19,20]. The median duration of exclusive breastfeeding in those countries ranged from three months to six months. This difference could be influenced by the difference of subject's characteristics, i.e. a lack of knowledge, sociocultural, economic and personal reasons. Differences in measuring the duration of exclusive breastfeeding may cause different findings across studies.

Based on the survival curve, most of breastfeeding cessation events in the current study were observed at the end of first month. It indicated that the mothers had early introduced other foods to their babies. Mothers had given their babies other liquids, i.e. water, formula milk and also solid foods prematurely. Early introduction to other foods may lead early exclusive breastfeeding cessation or shorten the duration of breastfeeding. It can cause infections when babies consume microbial contaminated foods. Their gastrointestinal systems are not fully developed [21,22].

This study revealed mother's education as the predictor of exclusive breastfeeding duration. Mothers with lower level of education had higher risk to cease breastfeeding practice than mothers who have graduated from college. This finding was similar to the study which conducted by Lenggogeni and Brown et al. [24,25]. Mothers with high education level tend to have better knowledge and attitude towards exclusive breastfeeding practice. They may have better access to health information, so they have good understanding about the important of exclusive breastfeeding for their infant's health. Even though mothers who have higher education are more likely have employed status, the Indonesia's government regulation has granted the working mothers to breastfeed during working hours. The work places have to provide facilities for mothers to breastfeed. This finding was contrast with studies from South Ethiopia, Northern Ethiopia, and United Arab Emirates [17,26,27]. These studies found that mothers with lower education level were associated with longer duration of breastfeeding practice.

Place of delivery was significantly associated with duration of exclusive breastfeeding. Mothers who gave birth in health facilities have longer duration in breastfeeding practice compared as mothers who gave birth in other places, i.e. home. This study was consistent with the findings of Biks et al. and Seid et al. [28,29]. Health facilities have to provide immediate support to initiate and establish breastfeeding after delivery, such as counseling about exclusive breastfeeding, the right position and attachment. This condition can increase the motivation of mothers to exclusively breastfed.

IV. CONCLUSION

The probability of completing exclusive breastfeeding among mothers in Indonesia was low. Mother's education and place of delivery had role to predict the continuity of exclusive breastfeeding practice. Breastfeeding duration among mothers with higher educational level was longer than lower education group. The same thing was occurred among mothers who gave birth at health facilities. They didn't tend to cease breastfeeding early. The promotion programs of exclusive breastfeeding could be focused among low education group. Health professionals also could be trained in order to provide breastfeeding support and valid information about exclusive breastfeeding for mothers who gave birth at health facilities.

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