

## Early initiation of breast feeding but not bottle feeding increase exclusive breastfeeding practice among less than six months infant in Indonesia

Suparmi, Ika Saptarini

National Institute of Health Research and Development, Ministry of Health of Indonesia

Corresponding address: Suparmi  
e-mail: suparmi@litbang.depkes.go.id

Received: February 28, 2016; Revised: May 05, 2016; Accepted: May 22, 2016.

### Abstrak

**Latar belakang:** Pemberian asi eksklusif merupakan salah satu upaya dalam menurunkan kematian bayi dan neonatal. Namun, prevalensi asi eksklusif di Indonesia masih rendah. Penelitian ini bertujuan untuk menilai hubungan inisiasi menyusui dini dan penggunaan botol/dot dengan praktek asi eksklusif pada bayi di bawah usia 6 bulan di Indonesia.

**Metode:** Penelitian ini menggunakan data Riset Kesehatan Dasar (Riskesdas) tahun 2013. Sub-sampel adalah bayi dibawah usia 6 bulan. Dari 7226 bayi dibawah usia 6 bulan, 6397 memiliki data yang lengkap untuk dilakukan analisis. Analisis dilakukan dengan regresi Cox.

**Hasil:** Dari 6397 responden, 44% mendapatkan asi eksklusif. Inisiasi menyusui dini, penggunaan botol, pelayanan kesehatan pasca persalinan, tempat tinggal dan status sosial ekonomi berhubungan dengan praktek pemberian asi eksklusif. Anak yang mendapat inisiasi menyusui dini 66% lebih besar kemungkinan untuk memperoleh asi eksklusif bila dibandingkan dengan anak yang tidak memperoleh inisiasi menyusui dini [risiko relatif suaian (RRa) = 1,66; 95% interval kepercayaan (CI): 1,45 – 1,90]. Anak yang menggunakan dot/kempeng memiliki kemungkinan 71% lebih rendah untuk asi eksklusif bila dibandingkan dengan anak yang tidak menggunakan dot/kempeng (RRa = 0,29; 95% CI: 0,25 – 0,34).

**Kesimpulan:** Inisiasi menyusui dini dapat meningkatkan pemberian asi eksklusif, sedangkan penggunaan dot dapat menurunkan praktek pemberian asi eksklusif. (*Health Science Journal of Indonesia 2016;7:44-8*)

**Kata kunci:** asi eksklusif, inisiasi menyusui dini, dot

### Abstract

**Background:** Exclusive breastfeeding is a intervention to reduce neonatal and infant mortality. However, the prevalence of exclusive breastfeeding in Indonesia remains low. The aim of the study was identify the association of early initiation and bottle-feeding with exclusive breastfeeding practice among infant less than six month in Indonesia.

**Methods:** This study was a part of Basic Health Research (RISKESDAS) 2013 data. The sub-sample study was infants under six months. Out of 7226 infant aged less than 6 months, 6397 infant had complete data for the analysis. The Cox regression was used for analysis.

**Results:** Out of 6397 infant, 44% had exclusively breastfeed. Early initiation, bottle-feeding, postnatal care, residence and socio-economic status were associated to exclusive breastfeeding practices. Infant who had early initiation had 66% more exclusively breastfeed compared to delayed initiation [adjusted relative risk (RRa) = 1.66; 95% confidence interval (CI): 1.45 – 1.90]. Infant who had bottle-feeding or using pacifiers had 71% less to be exclusively breastfeed compared to infant who did not have use bottle-feeding/pacifiers (RRa = 0.29; 95% CI: 0.25 – 0.34).

**Conclusion:** Early initiation within one hour of birth increased exclusive breastfeeding practice, however, bottle-feeding decreased exclusive breastfeeding practice. (*Health Science Journal of Indonesia 2016;7:44-8*)

**Keywords:** exclusive breastfeeding, early initiation, bottle-feeding

The World Health Organization (WHO) recommends mothers to sustain exclusive breastfeeding up to six months.<sup>1</sup> Several studies showed the benefits of exclusive breastfeeding for both, mother and infants. Breast milk during first six months provides essential nutrients for child growth and cognitive development. In addition, exclusive breastfed infant are healthier compared to formula-fed.<sup>2</sup> Studies also shows the infant who had exclusive breastfeed for six months are more to be protected from gastrointestinal infections, respiratory illness, morbidity, and death.<sup>3,4</sup> Exclusive breastfeeding is estimated to reduce 10% of child death<sup>4</sup> and nearly 45% reduction of infection-related neonatal mortality.<sup>5</sup>

Breastfeeding seems nearly universal in Indonesia. The Demographic and Health Survey (DHS) 2012 revealed about 96% of infant less than two years were ever breastfed. Unfortunately, only 42% infant are exclusively breastfed.<sup>6</sup> Basic Health Research 2013 also showed similar results, which were 93% ever breastfed and 30.2% infant exclusively breastfed up to six months.<sup>7</sup>

Several studies indicate that early initiation of breastfeeding may increase exclusive breastfeeding rates.<sup>8,9</sup> There are also several factors associated with exclusive breastfeeding including bottle-feeding practice, age of mothers, maternal education, place of residence, socio-economic status and history of antenatal and postnatal care.<sup>4,5</sup>

In order to assess more specific risk factors related to exclusive breastfeeding practice in Indonesia, therefore, we assessed the association of early initiation, bottle-feeding and other risk factors with exclusive breastfeeding practice among infant less than six month.

## METHODS

We analyzed a part of nationally representative health survey, Basic Health Research (RISKESDAS) 2013 conducted by the National Institute of Health Research and Development (NIHRD) Indonesia. The sampling frame of Riskesdas 2013 consisted of 12000 census blocks (cluster) which selected from master sample area from the 2010 population census. In each selected cluster, 25 household were selected from a complete list of households. There were 294959 households interviewed from a total of 300000 selected households from the sample, obtained a response rate of 98.3%. The samples were representative from 33 provinces (497 districts/cities) in Indonesia.<sup>7</sup>

A total of 1027763 household members were interviewed using structured questionnaire and data were collected through interviews by trained enumerators.<sup>7</sup> In this study, we restricted our analysis to infant aged less than 6 months (n=7226). For the analysis 829 respondents were excluded because of incomplete data, leaving 6397 infant who had complete data on exclusive breastfeeding, early initiation, bottle-feeding as well as others demographic factors.

The outcome variable, exclusive breastfeeding status was defined as infant aged 6 months or less who received only breast milk and did not other liquids or solids except for drops or syrups consisting of vitamins, minerals supplements or medicines.<sup>1</sup> The exclusive breastfeeding practice was a dichotomous variable (yes/no).<sup>1</sup>

Potential independent variables including early initiation of breastfeeding, bottle-feeding, history of antenatal and postnatal care, age of mothers, maternal education, place of residence and socio-economic status in order to determine factors associated with exclusive breastfeeding practice. Early initiation of breastfeeding and bottle-feeding practice were dichotomous (yes/no). Early initiation of breastfeeding was defined as mother's who gave breast milk to infants within 1 hour of birth. Bottle-feeding practice was defined as infant who experience of using bottle-feeding before six months of age.

Antenatal care refers to mothers who had experience of pregnancy examination at least 1 times in first trimester, at least 1 times in second trimester and at least 2 times in third trimester. Postnatal care refers to infant who had visit to health care at least 1 times in first 2 days. Mother's education was divided into 3 groups (no education, primary and secondary or higher). Residence was divided into 2 subgroups (urban/rural).

Socio-economic status was an index constructed from household ownership information, using polychoric correlation analysis (PCA). Variables forming the index were: 1) the primary source of drinking water, 2) cooking fuel, 3) defecation facilities ownership, 4) type of toilet, 5) final feces disposal, 6) illumination source, 7) motorcycles, 8) television, 9) water heater, 10) gas cylinder 12 kg, 11) refrigerator, and 12) cars. Furthermore, socio-economic status was divided into 5 subgroups based on wealth quintile.<sup>7</sup> The lowest 20% of the households was designated as the poorest households and the highest 20% as the richest households.

STATA version 12.0 was used for statistical analysis. The Relative Risk was calculated by Cox regression and sample weighting factors. Age of infant was used as time variable to indicate time of not exclusively breastfed. Variables in bivariate analysis with p-value less than 0.25 were included into multivariate analysis. The adjusted Relative Risk with 95% confidence intervals was calculated in order to assess the strength of association, and those with  $p < 0.05$  were remained in the final model.<sup>10</sup>

The author had received official permission from NIHRD to use the dataset for breastfeeding related analysis.

## RESULTS

Out of 7226 infant aged less than 6 months, 6397 included in the analysis. The prevalence of infant who were exclusive breastfeed was 44.0%. Almost 54% of the infant lived in rural areas and distributed almost equally between male and female. Nearly 54% of mothers had complete secondary or higher level of education. About 59.9% of mothers had

have at least one antenatal care in first trimester, one antenatal care in second trimester, and two antenatal cares in third trimester of pregnancy. The proportion of postnatal care in first two days was 72.9%.

Table 1 shows percentage of infant aged less than 6 months who were exclusively breastfed by socio-demographic and health service characteristics. Exclusive and non exclusive breastfeeding subjects similarly distributed in terms of antenatal care, age of mother, mother's education and sex of infant.

Table 2, our final model shows the strength of association between socio-demographic and health service characteristics with exclusive breastfeeding. The infant who had early initiation within one hour were 66% more likely to exclusively breastfeed compared to non-early initiation [adjusted relative risk (RRa) = 1.66; 95% confidence interval (CI): 1.45 – 1.90]. On the other hand, infant who had bottle-feeding or using pacifiers were less likely to be exclusive breastfed compared to infant who had not bottle-feeding/pacifiers (adjusted relative risk(RRa)= 0.29; 95% confidence interval(CI): 0.25 – 0.34).

Table 1. Socio-demographic and health services related to exclusive breastfeeding (EBF) practice among less than six months infant in Indonesia

Characteristics	Non EBF (n=3561)		EBF (n=2836)		Crude relative risk	95% Confidence Interval	p-value
		%		%			
Antenatal care							
No	1,390	56.6	1,066	43.4	1.00	Reference	
Yes	2,171	55.1	1,770	44.9	1.04	0.96 - 1.13	0.357
Postnatal care							
No	960	56.6	736	43.4	1.00	Reference	
Yes	2,601	55.3	2,100	44.7	1.12	0.99 - 1.27	0.064
Age of mother (year)							
13 - 19	84	53.2	74	46.8	1.00	Reference	
20 - 34	1,979	53.9	1,694	46.1	0.97	0.67 - 1.39	0.863
35 - 87	1,498	58.4	1,068	41.6	0.86	0.60 - 1.25	0.433
Mother's education							
No education	147	56.8	112	43.2	1.00	Reference	
Primary	1,466	54.6	1,220	45.4	1.09	0.84 - 1.42	0.514
Secondary and above	1,948	56.4	1,504	43.6	1.06	0.82 - 1.37	0.664
Sex							
Male	1,842	56.7	1,408	43.3	1.00	Reference	
Female	1,719	54.6	1,428	45.4	1.06	0.95 - 1.18	0.301
Residence							
Urban	1,748	59.0	1,216	41.0	1.00	Reference	
Rural	1,813	52.8	1,620	47.2	1.23	1.10 - 1.37	0.000
Socio-economic status							
Quintile 1	612	49.0	636	51.0	1.00	Reference	
Quintile 2	634	53.8	544	46.2	0.95	0.82 - 1.11	0.542
Quintile 3	694	56.6	533	43.4	0.84	0.72 - 0.99	0.044
Quintile 4	823	59.6	558	40.4	0.65	0.55 - 0.77	0.000
Quintile 5	798	58.5	565	41.5	0.83	0.71 - 0.97	0.018

Table 2. Association of early initiation, bottle-feeding and exclusive breastfeeding (EBF) practice among less than six months infants in Indonesia

Characteristics	Non EBF (n=3561)		EBF (n=2836)		Adjusted relative risk*	95% Confidence Interval	p-value
		%		%			
Early initiation							
No	1,561	72.2	602	27.8	1.00	Reference	
Yes	2,000	47.2	2,234	52.8	1.66	1.45 - 1.90	0.000
Bottle-feeding or using pacifier							
No	1,630	39.7	2479	60.3	1.00	Reference	
Yes	1,931	84.4	357	15.6	0.29	0.25 - 0.34	0.000

\*Adjusted each other between variables listed on this Table, postnatal care, residence and socio-economic status

## DISCUSSION

The study had nationally representative sample, comprehensive data on standard infant feeding indicators, appropriate adjustment for sampling design, including sampling weight and a very high response rate (98.3%) to the survey interview. However, findings of the study should be interpreted in the light of the following limitations. First, the overall prevalence of exclusive breastfeeding based on the 24 hour recall methodology. The validity of data on exclusive breastfeeding based on 24 hour periods has been questioned.<sup>11</sup> Studies reported a wide discrepancy on the prevalence of exclusive breastfeeding between current status based on a 24-hour recording and exclusive breastfeeding since birth.<sup>12</sup> Second, the cross-sectional nature of this study prevents drawing causal inferences from the association between the determinant factors and exclusive breastfeeding.

Adequate nutrition for early childhood in first two years is important to support the rapid growth and brain development.<sup>13</sup> In order to achieve optimal growth and development, children should be exclusively breastfed for the first six months of age.<sup>1</sup> Inadequate nutrition in this period marked by growth faltering, micronutrient deficiencies and common childhood illnesses such as diarrhea diseases.<sup>13</sup>

Our study revealed that early initiation increased exclusive breastfeeding practice. Children who had early initiation within one hour were 1.66 times more likely to exclusively breastfeed compared to delayed initiation. The first hour of birth is the best time to initiate breastfeeding to the infant. World Health Organization recommends skin to skin contact for at least 30 minutes and early initiate breastfeeding for normal vaginal deliveries mothers.<sup>1</sup> Early skin-to-skin contact will increase the opportunity of the infants to

suckle. Studies show that immediate skin-to-skin and suckling contact prolonged exclusive breastfeeding duration.<sup>14,15</sup> Previous studies also suggested that early touch of the nipple and areola after birth may increase mother and infant relationships, furthermore increase in breastfeeding rates up to 3 months.<sup>16</sup>

However, another study shows that high early initiation of breastfeeding rates in Congo is not resulted in high exclusive breastfeeding prevalence. The study highlight that WHO materials more designated to promote early initiation of breastfeeding rather than addressing difficulties breastfed babies in upcoming weeks and months.<sup>17</sup>

This study identified children who had bottle-feeding or pacifiers were less likely to be exclusively breastfed compared to children who had not bottled feeding/pacifiers. The WHO suggests that infants should not use bottle or pacifiers and as an alternative method for feeding infants who cannot breastfeed is by cup. Studies showed that infant with cup feeding are more likely to be exclusively breastfed compared to bottle-feeding.<sup>18</sup> Another study also suggests using spoon-feeding as an alternative method for feeding infant who cannot full breastfeeding.<sup>19</sup> It was found that spoon-feeding infant had shorter time to switch to full breastfeeding compared to infant who were fed using bottle.

Bottles with artificial teats may be considered as an alternative feeding method when infants cannot be fed directly from the breast. However, it can be harmful for carrying infection were hygienic care of bottles is difficult. Bottle-feeding also reduce time spent suckling at the breast and thereby interfering with demand feeding.<sup>20</sup> Therefore, both cup and spoon feeding are recommended particularly for infants who are expected to breastfeed later.<sup>18,19,20</sup>

The main finding of this study is that early initiation may increase exclusive breastfeeding practice, yet bottle-feeding negatively associated with exclusive breastfeeding practice. There is an urgent need to develop interventions to improve early initiation within one hour of birth and reduce bottle-feeding practice among less than six months children. Mothers should be more informed that cup-feeder/glass or spoon as substitute alternative of bottle-feeding if the infant separated from their mother.

## REFERENCES

1. United Nations Children's Fund (UNICEF). *Programming Guide: Infant and Young Child Feeding*. New York: 2011.
2. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS, Bellagio Child Survival Study G. How many child deaths can we prevent this year? *Lancet*. 2003;362(9377):65-71.
3. Heinig MJ, Dewey KG. Health advantages of breast feeding for infants: a critical review. *Nutrition research reviews*. 1996;9:89-110.
4. Khanal V, Sauer K, Zhao Y. Exclusive breastfeeding practices in relation to social and health determinants: a comparison of the 2006 and 2011 Nepal Demographic and Health Surveys. *BMC public health*. 2013;13:958.
5. Biks GA, Tariku A, Tessema GA. Effects of antenatal care and institutional delivery on exclusive breastfeeding practice in northwest Ethiopia: a nested case-control study. *International Breastfeeding J*. 2015;10:30.
6. Statistics Indonesia (Badan Pusat Statistik—BPS), BKKBN, and Kementerian Kesehatan (Kemenkes—MOH), and ICF International. *Indonesia Demographic and Health Survey 2012*. Jakarta: BPS, BKKBN, Kemenkes, and ICF International, 2013.
7. National Institute of Health Research and Development. *Basic Health Research 2013 Report*. Jakarta: The Institute. 2013.
8. Hunter T, Cattelona G. Breastfeeding initiation and duration in first-time mothers: exploring the impact of father involvement in the early post-partum period. *Health promotion perspectives*. 2014;4:132-6.
9. White AL, Carrara VI, Paw MK, et al. High initiation and long duration of breastfeeding despite absence of early skin-to-skin contact in Karen refugees on the Thai-Myanmar border: a mixed methods study. *International Breastfeeding J*. 2012;7:19.
10. Hosmer DW LS. *Applied Logistic Regression 2nd Edition*. New York: Wiley; 2000.
11. Piwoz EG, Creed de Kanashiro H, Lopez de Romana G, et al. Potential for misclassification of infants' usual feeding practices using 24-hour dietary assessment methods. *The Journal of nutrition*. 1995;125:57-65.
12. Aarts C, Kylberg E, Hornell A, et al. How exclusive is exclusive breastfeeding? A comparison of data since birth with current status data. *International journal of epidemiology*. 2000;29:1041-6.
13. Tan KL. Factors associated with exclusive breastfeeding among infants under six months of age in Ppeninsular Malaysia. *International Breastfeeding J*. 2011;6:2.
14. Aghdas K, Talat K, Sepideh B. Effect of immediate and continuous mother-infant skin-to-skin contact on breastfeeding self-efficacy of primiparous women: a randomised control trial. *Women and birth : journal of the Australian College of Midwives*. 2014;27:37-40.
15. Chiou ST, Chen LC, Yeh H, et al. Early skin-to-skin contact, rooming-in, and breastfeeding: a comparison of the 2004 and 2011 National Surveys in Taiwan. *Birth*. 2014;41:33-8.
16. Ekstrom A, Abrahamsson H, Eriksson RM, et al. Women's use of nipple shields-Their influence on breastfeeding duration after a process-oriented education for health professionals. *Breastfeeding medicine : the official journal of the Academy of Breastfeeding Medicine*. 2014;9:458-66.
17. Yotebieng M, Labbok M, Soeters HM, et al. Ten steps to successful breastfeeding programme to promote early initiation and exclusive breastfeeding in DR Congo: a cluster-randomised controlled trial. *The Lancet Global Health*. 2015;3:e546-55.
18. Yilmaz G, Caylan N, Karacan CD, et al. Effect of cup feeding and bottle feeding on breastfeeding in late preterm infants: a randomized controlled study. *Journal of human lactation : official journal of International Lactation Consultant Association*. 2014;30:174-9.
19. Aytakin A, Albayrak EB, Kucukoglu S, et al. The effect of feeding with spoon and bottle on the time of switching to full breastfeeding and sucking success in preterm babies. *Turk pediatri arsivi*. 2014;49:307-13.
20. Kramer MS. Exclusive bottle feeding of either formula or breast milk is associated with greater infant weight gain than exclusive breastfeeding, but findings may not reflect a causal effect of bottle feeding. *Evidence-based Medicine*. 2013;18:114-5.
21. Huang YY, Gau ML, Huang CM, et al. Supplementation with cup-feeding as a substitute for bottle-feeding to promote breastfeeding. *Chang Gung Medical J*. 2009;32:423-31.