

Exclusive breastfeeding rate and factors associated with infant feeding practices in Indonesia

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Abstract

Background Breast milk is the ideal food for infants. According to the 2007 Indonesian National Household Health Survey, only 23% of mothers exclusively breastfeed for six months.

Objectives To determine the rate of exclusive breastfeeding in Indonesia, to evaluate factors associated with infant feeding practices, and to compare the nutritional and developmental status between exclusively-breastfed and formula-fed infants.

Methods A survey was conducted in hospitals located in 17 provinces in Indonesia. The rate of exclusive breastfeeding was calculated. Many variables were investigated as potential predictors for exclusive breastfeeding using a multivariable logistic regression analysis. Further analysis was performed to compare the nutritional and developmental status between exclusively breastfed and formula-fed infants at the time of survey.

Results From 1,804 infant subjects, the overall rate of exclusive breastfeeding was 46.3%, ranging from 10.5% in East Java to 66.9% in Jambi. Predominant breastfeeding, complementary feeding, and formula feeding rates were 14.3%, 8.6%, and 30.7%, respectively. Maternal unemployment was associated with a longer duration of breastfeeding ($P=0.000$). There were significantly more formula-fed infants who were undernourished compared to exclusively-breastfed infants (14% vs. 8%, $P=0.001$). There were also significantly more infants in the formula-fed group who had abnormal head circumference compared to those in the exclusively-breastfed group (9% vs. 6%, $P=0.031$). Child development, as assessed by the Pre-screening Developmental Questionnaire, was similar between the two groups ($P=0.996$).

Conclusion The overall rate of exclusive breastfeeding in Indonesia is 46.3%. Maternal unemployment is associated with longer duration of breastfeeding. Exclusive breastfed infants have significant better growth and head circumference compared to

formula fed infants, while the development is similar between the two groups. [Paediatr Indones. 2016;56:24-31.].

Keywords: exclusive breastfeeding, rate, growth, development, Indonesia

Breast milk is the ideal food for infants because it contains the complete range of nutrients needed for optimal growth and development. Exclusive breastfeeding is recommended for the first six months of life.¹ In the United States, 76.9% of mothers breastfeed, but only 16.3% of mothers continue breastfeeding for a full six months.¹ According to the 2007 Indonesian National Household Health Survey, the practice of exclusive breastfeeding in infants aged 1-3 months was 61.7%, but dropped to only 23% by the age of six months.² This data indicates that mothers may lack knowledge on the benefits of exclusive breastfeeding. For the past four years, the Indonesian government

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has endorsed a campaign promoting six months of exclusive breastfeeding, followed by supplementation with appropriate complementary foods up to two years and beyond.

Several factors affect the practice of six months of exclusive breastfeeding, including maternal knowledge about breastfeeding, family support, and health care providers educating mothers on breastfeeding.³ A study reported that antenatal education might increase the practice of six months of exclusive breastfeeding with a relative risk of 2.16 (95%CI 1.05 to 4.43), while postnatal education might increase the practice with a relative risk of 2.12 (95%CI 1.03 to 4.37).³

The Indonesian Pediatrics Society performed a survey to evaluate breastfeeding practices in Indonesia. We aimed to determine the exclusive breastfeeding rate and factors associated with infant feeding practices in Indonesia, as well as to compare the nutritional and developmental status between exclusively-breastfed and formula-fed infants.

Methods

This study was based on results from a survey conducted by the Indonesian Pediatrics Society. It was approved by the Ethics Review Board at the University of Indonesia Medical School, Jakarta. The study population was selected from women who lived in the 17 selected provinces, comprising mothers with infants aged 0-11 months who gave birth in private hospitals, public hospitals, or by midwife assistance. We excluded infants who were adopted, severely ill (hospitalized in intensive care units), or who had medical indications to receive breast milk substitutes, such as maternal HIV infection, drug abuse, chemotherapy, maternal consumption of anticonvulsant drugs (phenobarbital or topiramate), or maternal radiotherapy, as well as infants with galactosemia or phenylketonuria.

Exclusive breastfeeding rate was defined as the proportion of infants who received only breast milk and no other liquids (including formula milk, water, or juice) or solids except for vitamins, mineral supplements, or medicines for the first six months of life, or at the time of study for infants <6 months of age. Predominant breastfeeding rate was defined as the proportion of infants who received breast milk and liquids, such as juice or honey, but not formula milk,

from birth to 6 months, or at the time of the survey for infants less than 6 months of age. Complementary feeding rate was defined as the proportion of infants who received breast milk and solids. Formula-fed rate was defined as the proportion of infants who did not receive breast milk at all or received breast milk for a time, but received only formula milk by 6 months of age or at the time of the survey for infants less than 6 months of age. Infant feeding practices were also described in this study.

A wide range of variables was investigated as potential predictors of exclusive breastfeeding including infant gender, twin siblings, gestational age, mode of delivery, location of birth (home, primary health care provider, midwife practice, private or public hospital), as well as maternal age, education, background, occupation, and socioeconomic status. Socioeconomic status was determined by the families' monthly expenses.

For univariable analysis, differences in the proportion of exclusive breastfeeding were assessed among the different levels of each factor using normalized weights. Chi-square test and odds ratio (OR) using 95% confidence interval (95%CI) were performed for categorical variables. We also performed a multivariable logistic regression analysis to assess factors possibly associated with exclusive breastfeeding with potential factors as independent variables and exclusive breastfeeding as the dependent variable. Adjusted OR and 95%CI were reported for the final model. Further analysis was performed to compare the nutritional and developmental status at the time of the survey between exclusively-breastfed and formula-fed infants. Nutritional status was determined by the *World Health Organization* (WHO) chart of weight-for-length (z-score).⁴ Nutritional status was classified as overweight (above +2 SD growth curve), well-nourished (between -2 SD and +2 SD growth curve), or malnourished (below -2 SD growth curve). Head circumference was also determined by WHO chart of head circumference for age.⁴ Head circumference was classified as normal (within the curve) or abnormal (below or above the curve). Developmental status was assessed by the Pre-screening Developmental Questionnaire.⁵ Developmental status was classified as normal, for the ability to perform 9-10 activities according to his/her age group; undetermined, for the ability to perform 7-8 activities according to his/her

age group; or abnormal, for the ability to perform ≤ 6 activities according to his/her age group.

Results

Data for the rate of exclusive breastfeeding in Indonesia were obtained from 17 provinces: Aceh, West Sumatra, Jambi, South Sumatra, Lampung, Banten, Jakarta, West Java, Central Java, Yogyakarta, East Java, Bali, West Kalimantan, South Kalimantan, East Kalimantan, South Sulawesi, and North Sulawesi. From 1,804 subjects, the overall rate of exclusive

breastfeeding was 46.3%, ranging from 10.5% in East Java to 66.9% in the Jambi Province. Predominant breastfeeding was given to 14.3% subjects, while complementary feeding was given to 8.6% subjects, aged 0-6 months. As many as 30.7% of subjects did not receive breast milk at all or received breast milk for a time, but only formula milk by 6 months of age. The rate of the various types of feeding, overall and by province, are shown in **Table 1**.

Further analysis was performed to assess for differences between infants who received exclusive breastfeeding and those who were formula-fed, in terms of growth and development at the time of the study.

Table 1. Rates of exclusive breastfeeding, predominant breastfeeding, complementary feeding, and formula feeding

Area	Exclusive breastfeeding n (%)	Types of feeding		
		Predominant breastfeeding n(%)	Complementary feeding n (%)	Formula feeding n (%)
Aceh (n=40)	26 (65)	10 (25.0)	3 (7.5)	1 (2.5)
West Sumatra (n=66)	37 (56.1)	1 (1.5)	11 (16.7)	17 (25.8)
Jambi (n=127)	85 (66.9)	40 (31.5)	-	2 (1.6)
South Sumatra (n=150)	52 (34.7)	12 (8.0)	44 (29.3)	42 (28.0)
Lampung (n=51)	23 (45.1)	9 (17.6)	2 (3.9)	17 (33.3)
Banten (n=150)	34 (22.7)	12 (8.0)	7 (4.7)	97 (64.7)
Jakarta (n=195)	104 (53.3)	30 (15.4)	4 (2.1)	57 (29.2)
West Java (n=120)	78 (65)	6 (5)	12 (10)	24 (20)
Yogyakarta (n=150)	95 (63.3)	8 (5.3)	3 (2.0)	44 (29.3)
Central Java (n=59)	17 (28.8)	16 (27.1)	14 (23.7)	12 (20.3)
East Java (n=38)	4 (10.5)	11 (28.9)	2 (5.3)	21 (55.3)
Bali (n=100)	32 (32)	27 (27)	19 (19)	22 (22)
West Kalimantan (n=57)	19 (33.3)	8 (14.0)	3 (5.3)	27 (47.4)
South Kalimantan (n=72)	33 (40.2)	17 (20.7)	4 (4.9)	18 (22.0)
East Kalimantan (n=150)	55 (36.7)	40 (26.7)	18 (12)	37 (24.6)
South Sulawesi (n=129)	71 (55)	10 (7.8)	6 (4.7)	42 (32.6)
North Sulawesi (n=150)	71 (47.3)	1 (0.7)	4 (2.7)	74 (49.3)
Overall (n=1,804)	836 (46.3)	258 (14.3)	156 (8.6)	554 (30.7)

Table 2. Nutritional, growth, and development status of infants based on feeding type

Variables	Exclusively breastfed	Formula fed	P value
Nutritional status (N=1275)			
Overweight, n(%)	48 (6)	34 (7)	0.001
Well-nourished, n(%)	649 (86)	408 (79)	
Under-nourished, n(%)	61 (8)	75 (14)	
Head circumference (N=1275)			
Normal, n(%)	715 (94)	468 (91)	0.031
Abnormal, n(%)	45 (6)	47 (9)	
Developmental status (N=819)			
Normal, n(%)	425 (91)	302 (86)	0.996
Undetermined, n(%)	32 (7)	35 (10)	
Abnormal, n(%)	11 (2)	14 (4)	

Table 3. Characteristics of subjects from 10 selected provinces

Characteristics	Exclusive breastfeeding (n=391)	Predominant breastfeeding (n=174)	Complementary feeding (n=81)	Formula feeding (n=236)	Total (n=882)
Infant age, n (%)					
1-3 months	181 (53)	85 (25)	4 (1)	70 (21)	340
4-6 months	117 (42)	53 (19)	30 (11)	80 (29)	280
7-9 months	46 (34)	21 (15)	30 (22)	40 (29)	137
10-12 months	47 (38)	15 (12)	17 (14)	46 (37)	125
Infant gender, n (%)					
Male	192 (42)	93 (21)	38 (8)	132 (29)	455
Female	199 (47)	81 (19)	43 (10)	104 (24)	427
Birth order, n (%)					
1 st child	175 (43)	83 (20)	30 (7)	117 (29)	405
2 nd child	149 (50)	48 (16)	32 (10)	71 (24)	300
3 rd child	53 (44)	25 (21)	11 (9)	32 (26)	121
4 th or 5 th child	14 (25)	18 (32)	8 (14)	16 (29)	56
Twin siblings, n (%)					
Yes	16 (38)	8 (19)	5 (12)	13 (31)	42
No	375 (45)	166 (20)	76 (9)	223 (26)	840
Gestational age, n (%)					
Full term	366 (45)	159 (20)	80 (10)	205 (25)	810
Preterm	25 (35)	15 (21)	1 (1)	31 (43)	72
Mode of delivery, n (%)					
Vaginal	282 (46)	115 (19)	73 (12)	143 (23)	613
C-section	109 (41)	59 (22)	8 (3)	93 (34)	269
Birth location, n (%)					
Home	14 (39)	9 (25)	7 (19)	6 (17)	36
Primary health care provider	12 (36)	7 (21)	5 (15)	9 (27)	33
Midwife practice	83 (41)	36 (18)	35 (17)	47 (23)	201
Private hospital	184 (46)	71 (18)	21 (5)	123 (31)	399
Public hospital	98 (46)	51 (24)	13 (6)	51 (24)	213
Maternal age, n (%)					
≤24 years	83 (41)	42 (21)	26 (13)	51 (25)	202
25-34 years	271 (48)	107 (19)	43 (7)	147 (26)	568
≥35 years	37 (33)	25 (22)	12 (11)	38 (34)	112
Socioeconomic level, n (%)					
1 (lowest)	92 (52)	23 (13)	7 (4)	54 (31)	176
2	52 (40)	28 (22)	11 (8)	39 (30)	130
3	27 (38)	20 (28)	8 (11)	16 (23)	71
4	93 (38)	56 (23)	23 (9)	72 (30)	244
5 (highest)	127 (49)	47 (18)	32 (12)	55 (21)	261
Maternal education, n (%)					
No formal /primary school	25 (32)	13 (17)	15 (20)	24 (31)	77
Junior high	64 (44)	34 (23)	19 (13)	30 (20)	147
Senior high	174 (44)	79 (20)	36 (9)	108 (27)	397
Diploma/Univ	112 (46)	46 (19)	11 (5)	72 (30)	241
Postgraduate	16 (80)	2 (10)	-	2 (10)	20
Paternal education, n (%)					
No formal /primary school	21 (39)	7 (13)	14 (26)	12 (22)	54
Junior high	38 (36)	23 (22)	10 (10)	33 (32)	104
Senior high	197 (43)	99 (22)	42 (9)	118 (26)	456
Diploma/Univ	113 (47)	41 (17)	14 (6)	70 (30)	238
Postgraduate	22 (74)	4 (13)	1 (3)	3 (10)	30
Maternal occupation, n (%)					
Full-time work	63 (34)	32 (18)	14 (8)	74 (40)	183
Part-time work	14 (30)	15 (33)	3 (7)	14 (30)	46
Entrepreneur	22 (41)	8 (15)	4 (8)	19 (36)	53
Unemployed	292 (49)	119 (20)	60 (10)	129 (21)	600
Paternal occupation, n (%)					
Full-time work	241 (44)	110 (20)	49 (9)	146 (27)	546
Part-time work	63 (40)	34 (21)	21 (13)	42 (26)	160
Entrepreneur	76 (47)	28 (18)	8 (5)	48 (30)	160
Unemployed	11 (69)	2 (12)	3 (19)	-	16

From 1,390 subjects who were exclusively breastfed and formula fed, 1,275 infants had nutritional status and head circumference data available, but only 819 infants had developmental status data available. There were significantly more formula-fed infants who were undernourished compared to exclusively-breastfed infants (14% vs. 8%, $P=0.001$). There were also significantly more infants in the formula-fed group who had abnormal head circumference compared to those in the exclusively-breastfed group (9% vs. 6%, $P=0.031$). Child development, as assessed by the Pre-screening Developmental Questionnaire, was similar between the two groups ($P=0.996$) (Table 2).

We performed more in-depth interviews on subjects from 10 of the 17 provinces: Aceh, Lampung, Jakarta, West Java, Central Java, East Java, Bali, West Kalimantan, South Kalimantan, and East Kalimantan ($n=882$). The characteristics of these subjects are shown in Table 3.

We also elaborated on the feeding practices among mothers. For breastfeeding infants, 25.9% of them received expressed breast milk when the mother was away; 63.3% did not receive expressed breast milk; and there was no data for 10.8% of subjects. Of those who received expressed breast milk ($n=228$), 17.5% were fed by spoons or cups; while 78.1% of the infants used bottles; and 4.4% did not mention the medium used for expressed breast milk.

Regarding the timing of breastfeeding, 62.2% of infants were fed anytime needed (on demand); 16.9% were fed only when the baby cried; and 12.9% infants were fed every 2 hours on a schedule. For location of breastfeeding, 69.2% of mothers breastfed anywhere, including during travel and out of the home. Another 14.4% of mothers breastfed at home and out of home, but not during travel; 11.9% of mothers breastfed only at home; and 4.5% of mothers did not mention the places they breastfed. For working mothers, formula was given to 50.4% of the infants, expressed breast milk to 28% of infants, and formula with expressed breast milk to 3.2% of infants, while the mother was working. The remaining subjects (18.4%) did not mention their feeding practices.

We evaluated the practice of giving formula at the location of delivery, including the hospital, primary health care center, or midwives' practice. We found that in infants who were given formula, 89% started while in the hospital, primary health care center, or

midwife practice, while 4.8% of infants started while not in delivery locations (i.e., at home). No answer was given by 6.2% of the respondents with regards to this question. For infants who received formula, the decision to give formula was made by the mother herself (29.5%), by the nurse but with permission from the mother (41.1%), or by the nurse without permission from the mother (23.3%). Again, no answer was obtained for 6.1% of the respondents.

Univariable analysis revealed no correlation between the practice of six months of exclusive breastfeeding with singletons or twins ($P=0.397$), gestational age ($P=0.089$), mode of delivery ($P=0.131$), location of birth ($P=0.105$), or paternal occupation ($P=0.410$). However, significant correlations were observed between the practice of six months of exclusive breastfeeding and birth order of the child ($P=0.004$), maternal age ($P=0.01$), maternal education ($P=0.004$), paternal education ($P=0.005$), maternal occupation ($P=0.001$), and socioeconomic status of the family ($P=0.013$).

Multivariable analysis using logistic regression revealed a significant correlation only between the practice of exclusive breastfeeding and maternal occupation of being unemployed ($P=0.000$). More unemployed mothers engaged in exclusive breastfeeding than part-time working mothers (2.4 times; $P=0.012$), and full-time working mothers (2.4 times; $P=0.000$). However, there was no significant difference in maternal unemployment and mothers who were entrepreneurs, as the rate of exclusive breastfeeding was only 1.2 times more often in unemployed mothers ($P=0.564$).

Discussion

The *World Health Organization* recommends exclusive breastfeeding until infants are six months of age. Breast milk is the best food for optimal growth and development of infants.^{6,7} Although the benefits of breastfeeding are numerous, rates for six months of exclusive breastfeeding remain unsatisfactory. In our study, the rate of exclusive breastfeeding varied from 10.5% in East Java to 66.9% in the Jambi Province, with an overall rate of 46.3%. In developed countries, rates for six months of exclusive breastfeeding were found to be low: 16.3% in the United States,¹ 13.8% in

Canada,⁹ 13.4% in Hong Kong,¹⁰ 10.1% in Sweden,¹¹ and 7% in Norway.¹² In developing countries, the rates were more favorable. As many as 49% of mothers exclusively breastfed in Ethiopia,¹³ 46.4% in India,¹⁴ and 27.7% in Iran.¹⁵ A study conducted in peninsular Malaysia reported a rate of 14.5%.¹⁶

Several factors consistently had positive associations with breastfeeding duration. Such maternal and social factors included maternal intention to breastfeed, earlier timing of the decision to breastfeed, increased maternal age, higher maternal education, maternal non-smoking or occasional smoking, and being married or having a partner.¹⁷⁻²² Several other factors inconsistently showed positive associations with breastfeeding duration: having a previous child or children, positive previous breastfeeding experience, breastfeeding confidence, higher social class, higher income, higher socioeconomic status, maternal attitude towards infant feeding, having been breastfed oneself, attendance at childbirth education classes, partner's perceived preference for breastfeeding, and breastfeeding knowledge.¹⁷⁻²² In hospital practice and obstetrics, there were other factors which inconsistently had positive associations such as earlier breastfeeding initiation, rooming-in, early skin-to-skin contact, and encouragement to breastfeed by a health professional. Other potential influences included mastitis and infant birth weight > 2,500 grams.¹⁷⁻²²

A maternal factor found to consistently have a negative or no association with breastfeeding duration was higher maternal body mass index. Hospital practices and obstetric factors that consistently had negative associations with breastfeeding duration were early postnatal discharge, giving commercial discharge packs, introduction of solids with continued breastfeeding, and introduction of formula. Other factors that inconsistently had negative associations with breastfeeding duration were previous infant feeding methods, breastfeeding confidence, lower income, a view that the feeding method made no difference to the baby's health, more positive attitude to bottle feeding, employment plans, returning to work, parity, perception of lack of support for breastfeeding, Caesarean section, birth type, early infant-to-breast contact, use of formula during the postnatal hospital stay, breastfeeding problems such as sore and cracked nipples, early breastfeeding problems,

inverted nipples, lower infant birth weight, male infant, admission to special care nursery, and use of dummies or pacifiers.¹⁷⁻²²

In our study, we found no association between longer breastfeeding duration and increased maternal age or higher maternal education. However, these two factors consistently had positive associations with breastfeeding duration in previous studies.¹⁸⁻²² Some studies found a negative association between employment plans/returning to work and breastfeeding duration.^{20,23-24} In our study, we found that more unemployed mothers exclusively breastfed than working mothers. The government may help to increase these rates by mandating extended maternity leave, for example, of up to 6 months for full-time working mothers.

The WHO recommends that exclusive breastfeeding be given until the baby is six months old, because the nutritional needs of infants can be fulfilled by breast milk alone.⁵ Studies in Italy,²⁵ Israel,²⁶ and Croatia²⁷ found that growth patterns of breastfed and formula-fed children were different. Breastfeeding may have a preventive impact on development of obesity. A meta-analysis in 2012 also found that at 12 months, fat mass was higher in formula-fed infants than in breastfed infants.²⁸ In our study, significantly more formula-fed infants who were undernourished compared to exclusively-breastfed infants.

We found significantly more infants in the formula-fed group who had abnormal head circumference than in the exclusively-breastfed group ($P=0.031$). A previous study also found that infants who were exclusively breastfed had larger head circumference-for-age values than those who were formula-fed or mixed-fed,²⁹ while another study found that head circumference did not differ by feeding mode.³⁰

A meta-analysis indicated that breastfeeding was associated with significantly higher scores for cognitive development.³¹ Kramer *et al.* in a large randomized trial, also found that breastfeeding improved children's cognitive development.³² In our study, developmental status was similar between exclusively-breastfed and formula-fed infants. This observation may be due the use of different tools to evaluate development, as we only used the Pre-screening Developmental Questionnaire.

The overall rate of exclusive breastfeeding in Indonesia was found to be 46.3%. Maternal

unemployment was associated with longer duration of breastfeeding. Significantly more formula-fed infants had malnourishment and abnormal head circumference than those who were exclusively breastfed. However, child development was similar between the two groups.

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References

1. Centers for Disease Control and Prevention (CDC). 2012 Breastfeeding Report Card, United States. [cited 15 July 2012]. Available from: <http://www.cdc.gov/breastfeeding/pdf/2012BreastfeedingReportCard.pdf>.
2. Statistics Indonesia (Badan Pusat Statistik—BPS) and Macro International. Indonesia Demographic and Health Survey 2007. Calverton : BPS and Macro International; 2008. Page 169-73.
3. Su LL, Chong YS, Chan YH, Chan YS, Fok D, Tun KT, et al. Antenatal education and postnatal support strategies for improving rates of exclusive breast feeding: randomised controlled trial. *BMJ*. 2007;335:596-602.
4. World Health Organization. The WHO Child Growth Standards. Geneva: world Health Organization (WHO). [cited 15 July 2012]. Available from: <http://www.who.int/childgrowth/standards/en/>.
5. Frakenburg WK, Fandal AW, Thornton SM. Revision of Denver Prescreening Developmental Questionnaire. *J Pediatr*. 1987; 110:653-7.
6. Kramer MS, Kakuma R. The optimal duration of exclusive breastfeeding: a systematic review. *Adv Exp Med Biol*. 2004;554:63-77.
7. Butte NF, Lopez-Alarcon MG, Cutberto G. Nutrient adequacy of exclusive breastfeeding for the term infant during the first six months of life. Geneva: World Health Organization (WHO). 2002. [cited 15 July 2012]. Available from: <http://whqlibdoc.who.int/publications/9241562110.pdf>.
8. Fewtrell MS, Morgan JB, Duggan C, Gunnlaugsson G, Hibberd PL, Lucas A, et al. Optimal duration of exclusive breastfeeding: what is the evidence to support current recommendations? *Am J Clin Nutr*. 2007;85:635S-8S.
9. Al-Sahab B, Lanes A, Feldman M, Tamim H. Prevalence and predictors of 6-month exclusive breastfeeding among Canadian women: a national survey. *BMC Pediatr*. 2010;10:20.
10. Leung EY, Au KY, Cheng SS, Kok SY, Lui HK, Wong WC. Practice of breastfeeding and factors that affect breastfeeding in Hong Kong. *Hong Kong Med J*. 2006;12:432-6.
11. Brekke HK, Ludvigsson JF, van Odijk J, Ludvigsson J. Breastfeeding and introduction of solid foods in Swedish infants: the All babies in Southeast Sweden study. *Br J Nutr*. 2005;94:377-82.
12. Lande B, Andersen LF, Baerug A, Trygg KU, Lund-Larsen K, Veierod MB, et al. Infant feeding practices and associated factors in the first six months of life: the Norwegian infant nutrition survey. *Acta Paediatr*. 2003;92:152-61.
13. Alemayehu T, Haidar J, Habte D. Determinants of exclusive breastfeeding practices in Ethiopia. *Ethiop J Health Dev*. 2009;23:12-8.
14. Patel A, Badhoniya N, Khadse S, Senarath U, Agho KE, Dibley MJ, et al. Infant and young child feeding indicators and determinants of poor feeding practices in India: secondary data analysis of National Family Health Survey 2005-06. *Food Nutr Bull*. 2010;31:314-33.
15. Olang B, Farivar K, Heidarzadeh A, Strandvik B, Yngve A. Breastfeeding in Iran: prevalence, duration and current recommendations. *Int Breastfeed J*. 2009;4:8.
16. Tan KL. Factors associated with exclusive breastfeeding among infants under six months of age in peninsular Malaysia. *Int Breastfeed J*. 2011;6:2.
17. Forster DA, McLachlan HL, Lumley J. Factors associated with breastfeeding at six months postpartum in a group of Australian women. *Int Breastfeed J*. 2006;1:18.
18. Blyth RJ, Creedy DK, Dennis CL, Moyle W, Pratt J, De Vries SM, et al. Breastfeeding duration in an Australian population: the influence of modifiable antenatal factors. *J Hum Lact*. 2004;20:30-8.
19. Grossman LK, Fitzsimmons SM, Larsen-Alexander JB, Sachs

- L, Harter C. The infant feeding decision in low and upper income women. *Clin Pediatr (Phila)*. 1990;29:30-7.
20. Avery M, Duckett L, Dodgson J, Savik K, Henly SJ. Factors associated with very early weaning among primiparas intending to breastfeed. *Matern Child Health J*. 1998;2:167-79.
 21. Scott JA, Landers MC, Hughes RM, Binns CW. Factors associated with breastfeeding at discharge and duration of breastfeeding. *J Paediatr Child Health*. 2001;37:254-61.
 22. Li L, Li S, Ali M, Ushijima H. Feeding practice of infants and their correlates in urban areas of Beijing, China. *Pediatr Int*. 2003;45:400-6.
 23. Mandal B, Roe BE, Fein SB. The differential effects of full-time and part-time work status on breastfeeding. *Health Policy*. 2010;97:79-86.
 24. Ogbuanu C, Glover S, Probst J, Liu J, Hussey J. The effect of maternity leave length and time of return to work on breastfeeding. *Pediatrics*. 2011;127:e1414-27.
 25. Agostoni C, Grandi F, Gianni ML, Silano M, Torcoletti M, Giovannini M, *et al.* Growth patterns of breast fed and formula fed infants in the first 12 months of life: an Italian study. *Arch Dis Child*. 1999;81:395-9.
 26. Zadik Z, Borondukov E, Zung A, Reifen R. Adult height and weight of breast-fed and bottle-fed Israeli infants. *J Pediatr Gastroenterol Nutr*. 2003;37:462-7.
 27. Mandic Z, Piricki AP, Kenjeric D, Hanicar B, Tanasic I. Breast vs. bottle: differences in the growth of Croatian infants. *Matern Child Nutr*. 2011;7:389-96.
 28. Gale C, Logan KM, Santhakumaran S, Parkinson JR, Hyde MJ, Modi N. Effect of breastfeeding compared with formula feeding on infant body composition: a systematic review and meta-analysis. *Am J Clin Nutr*. 2012;95:656-69.
 29. Donma MM, Donma O. The influence of feeding patterns on head circumference among Turkish infants during the first 6 months of life. *Brain Dev*. 1997;19:393-7.
 30. Dewey KG. Growth characteristics of breast-fed compared to formula-fed infants. *Biol Neonate*. 1998;74:94-105.
 31. Anderson JW, Johnstone BM, Remley DT. Breastfeeding and cognitive development: a meta-analysis. *Am J Clin Nutr*. 1999;70:525-35.
 32. Kramer MS, Aboud F, Mironova E, Vanilovich I, Platt RW, Matush L, *et al.* Breastfeeding and child cognitive development: new evidence from a large randomized trial. *Arch Gen Psychiatry*. 2008;65:578-84.