

Original Paper

A Survey of Feeding Practice in Infants Between 6 and 12 Month of Age among The PHC Visitors in Kerbala Governorate in 2018

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Abstract

Background: The World Health Organization (WHO) has stressed that adequate nutrition is essential for the children development and health. These international policies stress exclusive breastfeeding during the first six months of life to decrease neonatal mortality, strengthening early initiation of breastfeeding within first hour after birth. Complementary feeding (CF) are usually started at six months when, the micronutrient deficiencies, infectious illnesses in developing countries and growth faltering. For this reason, in this vulnerable period; an effective interventions in a high priority should be done to reduce malnutrition.

Aim of the study: This study aimed to find the prevalence of breastfeeding in infants between 6 and 12 month of age, the age of initiating the complementary feeding and the main problems related to complementary feeding.

Subjects and methods: A descriptive cross sectional study was conducted between 1st January and 31st Augusts 2018, among visitors of primary health care centers in Kerbala city in Iraq. The mothers were interviewed through closed and open questions to determine the type of feeding practice in infants and main related problems.

Results: The result shows a significant statistical relation between the occupation of the mother and the father, the type of delivery, the mother educational level and age, and the income with the type of feeding (breast, bottle, or mixed) and the complementary feeding.

Conclusions: breastfeeding is the corner stone for good health and proper way for achieving the best mental and physical children's development, and the right time to start with the complementary feeding at the age of 6 months also play a major role children's well-being.

Key word: Kerbala city, feeding, children's age from 6 to 12 month.

Introduction

Exclusive breastfeeding (EBF) has been defined by the World Health Organization (WHO) as the situation where 'the infant has received only breast milk from his/her mother or a wet nurse, or expressed breast milk and no other solids, or liquids, with the exception of syrups or drops consisting of minerals supplements, medicines or vitamins ⁽¹⁾. The United Nations Children's Fund (UNICEF) and the (WHO) encourage that the mothers need to put their newborn to the breast within first hour of delivery ⁽²⁾.

The WHO stipulates an age interval of 4–6 month, whereas the American Academy of Pediatrics and the (UNICEF) have used the wording "at about 6 month" (UNICEF 1999, American Academy of Pediatrics 1997) ⁽³⁾.

The main contributor to child deaths worldwide is an unhygienic and unhealthy environment, while in these resource poor settings the good protective is EBF ⁽⁴⁾. A cost-effective intervention in saving children's lives in the first six months of an infant's life is EBF. There is about 13 to 15% deaths of children under 5 years in

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middle and low income countries could be averted with 90% coverage of EBF ⁽⁵⁾. Exclusive breastfeeding is the most suitable feeding for all infants including sick newborns and premature; the human milk have been stated by the American academy of pediatrics ⁽⁶⁾.

Breast feeding benefits are not limited to physical gains, the frequently studied and reported associations between cognitive development and breast feeding and the intimate mother-infant emotional and physical contact ⁽⁷⁾. At a global level, the Sustainable Development Goals (SDG) which were approved after MDG, need to be a key element for enabling framework for nutrition ⁽⁸⁾.

The Baby-Friendly Hospital Initiative (BFHI) is implemented through Ten Steps to have a infallible Breast Feeding promotion ⁽⁹⁾.

The period of Complementary Feeding (CF), which is a vulnerable and critical time in the development and growth of children, is defined as the time when any nutrient-containing liquids or foods, in addition to breast milk, are offered to young children ⁽¹⁰⁾. The time of peak incidence of micronutrient deficiencies, growth faltering and health problems and infectious illnesses in the developing countries, which is mostly involved in the period of CF interventions that targeted at the range 6–24 months of age ⁽¹¹⁾.

According to the WHO, the CF should be appropriate, timely, and adequate. ‘Appropriate’ meaning that foods should be variant, of appropriate texture and given in sufficient quantity ; ‘Timely’ meaning that all the infants should starting to receive foods in addition to breast milk from 6 months onwards; and ‘adequate’ meaning that the nutritional value of complementary foods should fulfill all the needs of the children to rapidly grow ⁽¹²⁾.

The risk of nutrient imbalances and infectious diseases can be caused by early introduction of beverages, foods, and non-breast-milk ⁽¹³⁾.The CF will provide nutrients and additional energy when

breastfeeding alone is inadequate to meet nutritional needs ⁽¹⁴⁾. Improving the quality of complementary foods is one of the most cost-effective strategies for reducing mortality and morbidity and improving health in young children ⁽¹⁵⁾.

Babies are ready to be moved on to a mixed diet at around 6 months, to start first, by introducing cereal mixed with milk(formula or breast milk), fruits, or vegetables, and when the baby became used to those first foods the mothers can continue with chicken, fish, meat , pasta, rice, pulses, full-fat dairy, and lentils, which have been stated by UK as advice on CF ⁽¹⁶⁾. The mothers continue to nurse their children for at least two years ⁽¹⁷⁾. This study aimed to determine the pattern of feeding in children's between 6 and 12 month of age; and explore mother's perception and attitude toward breast feeding and its benefits. In addition, it aimed to determine the timing and main obstacles that affect the complementary feeding of the children's and detecting the factors that may affect infant feeding pattern.

Subjects and Method

Ethical approval was obtained from the research ethical committee in the college of medicine in Kerbala University and from the research ethical committee in Kerbala health directorate. Oral consent was taken from each participant prior to the interview after brief explanation on the study and its objectives. This study represents a descriptive cross sectional study at the primary health centers in Kerbala governorate in 2018. It interviewed mothers of infant between 6 and 12 month of age about the type of feeding of their infants. A specially designed questionnaire; based on WHO questionnaire, including the socio-demographic part of the mother and father, including age ,gender ,marital status ,occupation, educational level, income, residence and family history. A pilot study among 19 mothers was done two weeks

prior to the definitive study and minor changes were undertaken.

Data collected between 10th of March 2018 and 15th of June 2018. Convenience sampling procedures was followed to include a sample size depending on the prevalence of the breast fed infants in Iraq, which was about 17% in 2016. The estimated sample was 454 participants. Excel, Word, Endnote, and the Statistical package for social science (SPSS) version 20 were used in analysis at a significance level of ≤ 0.05 .

Results

A total-454 participant mothers were enrolled in the present study. More than one half (57.7%) of study participants gave breast milk to their infants, while only 5.3%

were bottle fed and the others (37.0%) were mixed fed (figure 2).

There was a significant positive association between the number of the residents in the house and the type of feeding ($p=0.049$). About three quarters (70.2%) of the participants reporting mixed feeding were living with 5-10 residents, and almost a similar proportion (67.6%) of those using breast feeding reported living with the same number of residents (table 1).

There was also significant association between the mother occupation and type of feeding. It was found that about 88.9% those who breast fed their children were housewives, while the proportion was lower among other job categories (table 2). Additionally, there was a significant association between the father occupation and breast feeding ($p= 0.022$).

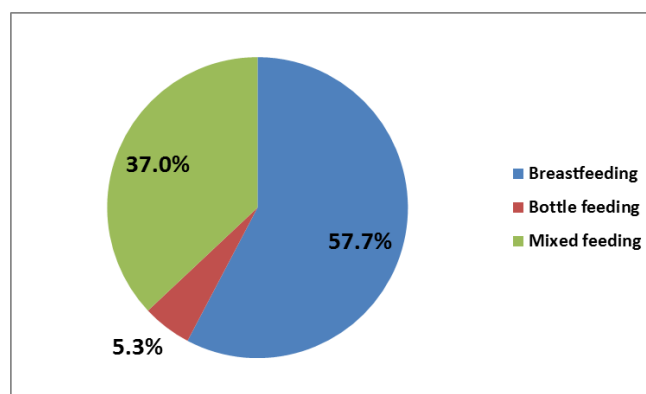


Figure 2. The distribution of study participants according to type of food during first six month (n=454)

Table 1. The distribution of the socioeconomic characteristics and delivery type by type of feeding in Kerbala governorate in 2018 (n=454)

Variables	Type of feeding during first six month			Significance
	Breast	Bottle	Mixed	
Number of the resident in the house				
Below 5	34 (13.0)	3 (12.5)	28 (16.7)	0.049
5-10	177 (67.6)	12 (50.0)	118 (70.2)	
10-15	37 (14.1)	5 (20.8)	18 (10.7)	
More than 15	14 (5.3)	4 (16.7)	4 (2.4)	
Family income				
Enough or more	40 (15.3)	6 (25.0)	22 (13.1)	0.022
Enough	178 (67.9)	13 (54.2)	97 (57.7)	
Not enough	44 (16.8)	5 (20.8)	49 (29.2)	
Type of delivery				0.001
Normal vaginal delivery	204(44.9)	9(1.9)	119(26.2)	
cesarean section	41(9.0)	32(7.0)	49(10.7)	

The majority of the participants (65.9%, 299 mother) thought that complementary food for infants should be started at age of six months, but about one half (54.0%, 245 mother) had actually started giving additional foods before six month. Multiple reasons were reported for this early feeding as more than one cause have been given by about one half (45.8%, 208 mother) of the participants. There was a significant positive association between the level of education of the mother and the time of complementary feeding introduction. The illiterate mothers found to introduce the complementary food before six months in

more than one half of the participants (59.0%, 24 mother), while the college graduate mothers introduced the complementary food after six months in 78.6% (44 mother, table 3).

Discussion

How to feed the infant is an easy decision, for every mother, to make. However, various psychological, social, emotional, and environmental factors impact whether an infant is breastfed, bottle fed or mixed fed.

Table 2. The distribution of mother occupation by the type of feeding in Kerbala governorate in 2018 (n=454)

Mother occupation	Type of feeding during first six month			χ^2	Significance
	Breast	Bottle	Mixed		
Housewife	233 (88.9)	18 (75.0)	137 (81.5)	6.724	0.035
Other occupations	29 (11.1)	6 (25.0)	31 (18.5)		

Table 3. The distribution of the mother characteristics and the type of infant feeding and the time of complementary food introduction in Kerbala governorate in 2018 (n=454)

Variable	Complementary feeding introduction				Total		Significance
	Birth -< six month		≥ six month				
Education level of mother							
Illiterate	24	59.0%	16	41.0%	40	100.0%	0.002
Read and write	35	48.6%	37	51.4%	72	100.0%	
Primary school	41	32.5%	83	67.5%	123	100.0%	
Intermediate school	41	37.3%	70	62.7%	111	100.0%	
Secondary school	18	34.6%	34	65.4%	53	100.0%	
Collage or more	12	21.4%	44	78.6%	56	100.0%	
Total	170	37.4%	284	62.6%	454	100.0%	
Type of feeding							
Breast feeding	69	26.4%	192	73.6%	261	100.0%	0.001
Bottle feeding	6	25.0%	18	75.0%	24	100.0%	
Mixed feeding	95	56.3%	74	43.7%	169	100.0%	
Total	170	37.4%	284	62.6%	454	100.0%	
Mother age (year)							
< 30	77	30.9%	171	69.1%	248	100.0%	0.001
30-39	63	39.4%	97	60.6%	160	100.0%	
>40	30	65.2%	16	34.8%	46	100.0%	
Total	170	37.4%	284	62.6%	454	100.0%	
Income							
Enough and more	22	32.4%	46	67.6%	68	100.0%	0.001
Enough	94	32.8%	194	67.2%	288	100.0%	
Not enough	54	54.6%	44	45.4%	98	100.0%	
Total	170	37.4%	284	62.6%	454	100.0%	

In the present study, the prevalence of breast feeding was 57.7%, which was higher than other study in Kerbala ^(18, 19), and in Iraq ⁽²⁰⁾, but lower than other studies in Iraq Al Mousawi A (2006)⁽²¹⁾, and in Abu Dhabi, United Arab Emirates ⁽²²⁾, the result of different epidemiological studies may show different rates due to difference in methodology and trends change or sometimes due to the continuous educational campaigns that have been done by kerbala PHCs, pediatric hospital and the college of medicine.

Regarding mother's occupation, more than one half of employed mothers (49 % had a mixed feeding as a choice of feeding and 9 %bottle), this finding is consistent with other studies that explained the work status was one of barriers to breastfeeding ⁽²³⁾, that being employed full-time decreases breastfeeding initiation and duration, mother working outside the home as one of the greatest hindrances to exclusive breast feeding . Other studies by Amin and his colleagues in Saudi Arabia in 2011 ⁽²⁴⁾, and Khassawneh and his colleagues in Jordan in 2006 ⁽²⁵⁾, reported that mother's job, residence, and crowding index play a role in determined the economic status of the family and have an effective influence on the type of feeding.

In the present study, the type of delivery had significant association with type of feeding, therefore mothers who had delivered their babies through normal vaginal delivery (56.9%)are more likely to breastfeed (61%, $p<0.001$), unfortunately among women who delivered their babies by cesarean section (C/S), 32 (26 %) chose bottle feeding and49 (39.8%) chose mixed ,these finding going with other similar studies done by Al Mousawi ⁽¹⁹⁾, in 2006, Imhonde and Shaibu and their colleagues in 2012; and Carlander, Edman, and their colleagues in 2009; and Li, Zhang and his colleagues in 2004 ⁽²⁶⁻²⁸⁾. This is because of pain on Caesarian section and the need of the mother for rest after her operation, the newborns (Caesarian section) are often taken to a nursery. Urinary catheterization

or Intra-venous line are a mother barriers for initiation breastfeeding leading to increase the possibility formula feeding of the infant ⁽²⁹⁾. Moreover, the delayed onset of lactation was due to having Caesarian section delivery ⁽³⁰⁾.

One major cause of infant formula feeding in the current study was related to mothers' concern that their milk was not sufficient (46.8%). Studies throughout the world have identified that concern about milk supply is the most common reason women give for stopping breastfeeding ^(18, 31, 32). Education for women regarding time needed for colostrum to change to transitional milk and education regarding ways of successful breastfeeding can be valuable in decreasing concern about milk supply.

In a previous study in the Middle Eastern about complementary feeding context, the main reasons for introducing complementary feeding to their infants prior to reaching 17 weeks of age: that their baby was hungry, and the mother's belief that their child was old enough to be given solid foods ⁽³³⁾. Further, in a study in Australia, a developed country, the main reasons mothers put forward for introducing complementary feeding prior to 17 weeks were that breast milk is "nutritionally insufficient" by itself to feed an infant at three or four months old, and simply that "the child is old enough" ⁽³⁴⁾ .

The present study revealed that started complementary breastfeeding in170 (37.4%) less than six months, 284 (62.6 %) at six months or more and these results was accepted as compared to other regions globally ⁽³⁵⁾.

Higher rates of early introduction of complementary feeding have also been found in various previous studies in the Middle East context; for example, 65% of infants were reported to have received complementary feeding at the age of 3 months in the United Arab Emirates ⁽²²⁾; 41.6% of infants received solid foods by the age of 4 months in Lebanon ⁽³⁶⁾; 35% of infants received complementary feeding by

the age of 5 months in Turkey⁽²²⁾; and 30.4% of infants received complementary feeding by the age of 17 weeks in Kuwait⁽³⁷⁾.

The lower education and maternal age has been associated with the early initiation of the complementary feeding^(38, 39), and these result going with the present study, while many other study show the positive associated results as later introduction of CF due to longer duration breastfeeding⁽⁴⁰⁾, higher education level and maternal age^(41, 42).

Conclusions

Breastfeeding is the universally accepted means of infant feeding with proven benefits to the infant, mother and the economy of the country.

Early complementary feeding before four months of age should be discouraged. In very poor families with high illiteracy, innovative ways should be used to optimize infant feeding practices.

Ideally, all women who intend to exclusively breastfeed should be supported to achieve their goals. Increased implementation of Baby-

Friendly hospital practices (BFH), especially giving only breast milk in the hospital, may help more mothers achieve their exclusive breastfeeding intentions.

Limitation

Data collections depended on information of retrospective nature based on maternal report which can result in recall bias (the participants over- or under-estimating the complementary feeding practices they have implemented in the past); either because the mothers inaccurately remembered certain practices, or because they were unaware of feeding practices occurring when their infant was not with them. This study involved mothers presenting at government PHCCs, which means that mothers attending other health centers (such as privately clinics) were unavailable for inclusion in the sample. Since a

convenience sampling method was used, the study population may not be representative of women attending the primary health centers in kabala governorate.

Recommendations

We must acknowledge the need to provide adequate social and nutritional support to lactating women. Thus, an intervention study is recommended to answer this important question. Interventions that seek to increase exclusive breastfeeding should be more focused on women who are at most risk of early discontinuation of breast feeding.

Accelerated and concerted actions are required to deliver and scale up nutrition education and Complementary Feeding provision interventions that are cost-effective, effective and feasible in improving the nutritional status of children.

Reference

1. Alemayehu T, Haidar J, Habte D. Determinants of exclusive breastfeeding practices in Ethiopia. *Ethiopian Journal of Health Development*. 2009;23.
2. Cai X, Wardlaw T, Brown DW. Global trends in exclusive breastfeeding. *International breastfeeding journal*. 2012;7:12.
3. Dewey KG, Cohen RJ, Brown KH, Rivera LL. Effects of exclusive breastfeeding for four versus six months on maternal nutritional status and infant motor development: results of two randomized trials in Honduras. *The Journal of nutrition*. 2001;131:262-7.
4. Engebretsen IMS, Wamani H, Karamagi C, Semiyaga N, Tumwine J, Tylleskär T. Low adherence to exclusive breastfeeding in Eastern Uganda: a community-based cross-sectional study comparing dietary recall since birth with 24-hour recall. *BMC pediatrics*. 2007;7:10.
5. Nkala TE, Msuya SE. Prevalence and predictors of exclusive breastfeeding among women in Kigoma region, Western Tanzania: a community based cross-sectional study. *International breastfeeding journal*. 2011;6:17.
6. Li R, Darling N, Maurice E, Barker L, Grummer-Strawn LM. Breastfeeding rates in the United States by characteristics of the child, mother, or family: the 2002 National

- Immunization Survey. Pediatrics. 2005;115:e31-e7.
7. Kramer MS, Fombonne E, Igumnov S, Vanilovich I, Matush L, Mironova E, et al. Effects of prolonged and exclusive breastfeeding on child behavior and maternal adjustment: evidence from a large, randomized trial. *Pediatrics*. 2008;121:e435-e40.
 8. Hawkes C, Haddad L, Udomkesmalee E. The Global Nutrition Report 2015: what we need to do to advance progress in addressing malnutrition in all its forms. *Public health nutrition*. 2015;18:3067-9.
 9. Braun MLG, Giugliani ER, Soares MEM, Giugliani C, de Oliveira AP, Danelon CMM. Evaluation of the impact of the baby-friendly hospital initiative on rates of breastfeeding. *American Journal of Public Health*. 2003;93:1277-9.
 10. Hotz C, Gibson R. Complementary feeding practices and dietary intakes from complementary foods amongst weanlings in rural Malawi. *European Journal of Clinical Nutrition*. 2001;55:841.
 11. Dewey KG, Adu-Afaruwah S. Systematic review of the efficacy and effectiveness of complementary feeding interventions in developing countries. *Maternal & child nutrition*. 2008;4:24-85.
 12. Imdad A, Yakoob MY, Bhutta ZA. Impact of maternal education about complementary feeding and provision of complementary foods on child growth in developing countries. *BMC public health*. 2011;11:S25.
 13. Gross R, Giay T, Sastroamidjojo S, Schultink W, Lang NT. Premature complementary feeding is associated with poorer growth of Vietnamese children. *The Journal of nutrition*. 2000;130:2683-90.
 14. Briend A, Darmon N, Ferguson E, Erhardt JG. Linear programming: a mathematical tool for analyzing and optimizing children's diets during the complementary feeding period. *Journal of pediatric gastroenterology and nutrition*. 2003;36:12-22.
 15. Krebs NF, Hambidge KM. Complementary feeding: clinically relevant factors affecting timing and composition-. *The American journal of clinical nutrition*. 2007;85:639S-45S.
 16. Pearce J, Langley-Evans S. The types of food introduced during complementary feeding and risk of childhood obesity: a systematic review. *International journal of obesity*. 2013;37:477.
 17. Radwan H. Patterns and determinants of breastfeeding and complementary feeding practices of Emirati Mothers in the United Arab Emirates. *BMC public health*. 2013;13:171.
 18. Jamil NF, SA-R. Feeding practices of Children under Two Years of Age in Karbalaa. *IRAQI JOURNAL OF COMMUNITY MEDICINE*. 2008;21:183-8.
 19. Al Mousawi A. Al Mousawi, A Feeding patterns of Infants in Kerbala [Arabic]. *Journal of the University of Kerbala*. 2006;1:28-44.
 20. M. SZ. Feeding patterns in children under two years of age in Mosul. *Annals of the college of Medicine*, 2001, 27: 60-64.
 21. Al-musawie AM. Breast feeding pattern in Kerbala Governorate. 2006.
 22. Gardner H, Green K, Gardner A. Infant Feeding Practices of Emirati Women in the Rapidly Developing City of Abu Dhabi, United Arab Emirates. *Int J Environ Res Public Health*. 2015;12:10923-40.
 23. Al-Mutairi NF, Al-Omran YA, Parameswari PJ. Breastfeeding practice and knowledge among women attending primary health-care centers in Riyadh 2016. *Journal of family medicine and primary care*. 2017;6:392-8.
 24. Amin T, Hablas H, Al Qader AA. Determinants of initiation and exclusivity of breastfeeding in Al Hassa, Saudi Arabia. *Breastfeeding medicine : the official journal of the Academy of Breastfeeding Medicine*. 2011;6:59-68.
 25. Khassawneh M, Khader Y, Amarin Z, Alkafajei A. Knowledge, attitude and practice of breastfeeding in the north of Jordan: a cross-sectional study. *Int Breastfeed J*. 2006;1:17.
 26. Li L, Zhang M, Scott JA, Binns CW. Factors associated with the initiation and duration of breastfeeding by Chinese mothers in Perth, Western Australia. *Journal of human lactation*. 2004;20:188-95.
 27. Imhonde H, Shaibu H, Imhonde J, Handayani L. Type of Birth, Depression and Anxiety as determinates of Breastfeeding Attitude among Nursing Mothers. *International Journal of Public Health Science (IJPHS)*. 2012;1:49-54.
 28. Carlander A-KK, Edman G, Christensson K, Andolf E, Wiklund I. Contact between mother, child and partner and attitudes towards breastfeeding in relation to mode of delivery. *Sexual & Reproductive Healthcare*. 2010;1:27-34.
 29. Dashti M SJ, Edwards CA, Al-Sughayer M. (2010). Determinants of breastfeeding initiation among mothers in Kuwait. *International Breastfeeding Journal*, 5, 7.
 30. Qiu L, Zhao Y, Binns CW, Lee AH, Xie X. Initiation of breastfeeding and prevalence of exclusive breastfeeding at hospital discharge in urban, suburban and rural areas of Zhejiang China. *International Breastfeeding Journal*. 2009;4:1-.
 31. Xu F, Qiu L, Binns CW, Liu X. Breastfeeding in China: a review. *International Breastfeeding Journal*. 2009;4:6.

32. Majeed MN. Factors Influencing Breast Feeding Patterns In Thi- Qar Governorate. Thi-Qar Medical Journal 2009;3:25-32.
33. Nasreddine L, Zeidan MN, Naja F, Hwalla N. Complementary feeding in the MENA region: practices and challenges. Nutrition, metabolism, and cardiovascular diseases : NMCD. 2012;22:793-8.
34. Scott JA, Binns CW, Graham KI, Oddy WH. Predictors of the early introduction of solid foods in infants: results of a cohort study. BMC pediatrics. 2009;9:60.
35. UNICEFs Report. From the First Hour of Life MtcfiaycfeAfhdurorf.
36. Batal M, Boulghourjian C, Akik C. Complementary feeding patterns in a developing country: a cross-sectional study across Lebanon. Eastern Mediterranean health journal = La revue de sante de la Mediterranee orientale = al-Majallah al-sihhiyah li-sharq al-mutawassit. 2010;16:180-6.
37. Yonas Deressa Guracho MAA. Knowledge, Attitude and Practice of Breast and Complementary Infant Feeding Among Mothers in Shinasha Culture: The Case of Bullen Woreda, Benishangul Gumuz Region,2014. World Journal of Public Health 2017; 2: 18-27.
38. Robinson S, Marriott L, Poole J, Crozier S, Borland S, Lawrence W, et al. Dietary patterns in infancy: the importance of maternal and family influences on feeding practice. The British journal of nutrition. 2007;98:1029-37.
39. Schack-Nielsen L, Sorensen T, Mortensen EL, Michaelsen KF. Late introduction of complementary feeding, rather than duration of breastfeeding, may protect against adult overweight. The American journal of clinical nutrition. 2010;91:619-27.
40. Van Rossum CMT BF, Hoekstra J. Quantification of health effects of breastfeeding : Review of the literature and model simulation. RIVM report 350040001/2005. [Accessed July 6, 2012]. 2006. Available at <http://www.rivm.nl/bibliotheek/rapporten/350040001.pdf>.
41. Thulier D, Mercer J. Variables associated with breastfeeding duration. Journal of obstetric, gynecologic, and neonatal nursing : JOGNN. 2009;38:259-68.
42. Kristiansen AL, Lande B, Overby NC, Andersen LF. Factors associated with exclusive breast-feeding and breast-feeding in Norway. Public health nutrition. 2010;13:2087-96.