



# Impact of Routine Counseling on Breastfeeding Status in Hospitalized Infants Below 6 Months: Observation From a Large Diarrheal Disease Hospital in Bangladesh

Global Pediatric Health  
Volume 6: 1–6  
© The Author(s) 2019  
Article reuse guidelines:  
sagepub.com/journals-permissions  
DOI: 10.1177/2333794X19854942  
journals.sagepub.com/home/gph  


Sharika Nuzhat, MBBS, DCH<sup>1\*</sup>, Rafiqul Islam, MBBS, MPH<sup>1\*</sup>,  
Tahmeed Ahmed, MBBS, PhD<sup>1</sup>, Shafiqul Alam Sarker, MBBS, MD, PhD<sup>1</sup>,  
Azharul Islam Khan, MBBS, PhD<sup>1</sup>, Sutopa Purkayastha, MBBS<sup>1</sup>,  
and Mohammad Jobayer Chisti, MBBS, MMed, PhD<sup>1</sup> 

## Abstract

**Background.** Breastfeeding counseling (BFC) plays a crucial role in improving infant and young child feeding practices. To evaluate the impact of activities of BFC unit (BFCU) on breastfeeding practices of infants who were hospitalized for diarrheal illness through their regular counseling, assistance and support, and motivation. **Methods.** In this retrospective chart analysis conducted at Dhaka Hospital of icddr,b using an electronic database, data were collected from mothers of infants younger than 6 months of age who visited the BFCU from 2011 to 2015. **Results.** Among a total of 3420 infants enrolled during study period, 429 (12.5%) were predominantly breastfed, 2457 (71.8%) partially breastfed, 531 (15.5%) non-breastfed, and 3 (0.1%) exclusively breastfed (EBF) at home. Through counseling of BFCU (following 24-hour recall technique), 2212 (65%) infants became EBF and 1186 (35%) failed to be EBF during discharge. Logistic regression analysis after adjusting for potential covariates, such as maternal age <18 years and receiving breast milk with other liquid at home, revealed that infants having severe underweight, maternal perception of “baby does not suck,” and “there is not enough milk” were less likely to be associated with EBF during discharge. Among 531 non-breastfed infants, 455 (85.7%) became partial breastfeeding and only 23 (4.3%) became EBF. **Conclusion.** Counseling of mothers even during acute illness of infants in the hospital can help promote breastfeeding. Therefore, there is great importance of robust counseling on breastfeeding practices and may help establish re-lactation of acutely ill babies.

## Keywords

exclusive breastfeeding, EBF, predominant breastfeeding, partial breastfeeding, breastfeeding counseling, diarrhea in infancy

Received March 14, 2019. Received revised May 7, 2019. Accepted for publication May 10, 2019.

## Introduction

Breast milk is the first food of a baby. In 2012, the World Health Assembly targeted to increase the global rate of exclusive breastfeeding in the first 6 months of life from a baseline of 37% to 50% by 2025.<sup>1,2</sup> Breast milk alone is the ideal nourishment during the first 6 months of age. It provides all of the nutrients, including vitamins and minerals, an infant needs, which means no other liquid or food is required.<sup>3</sup> Breastfeeding provides significant protection against many infectious diseases in infancy.<sup>4</sup> The protective effect of breastfeeding against diarrhea is

well established.<sup>5,6</sup> The impact of breastfeeding in reducing the duration as well as episodes of diarrheal illness is also reported.<sup>7,8</sup> Exclusive breastfeeding is one

<sup>1</sup>Nutrition and Clinical Services Division (NCSD), International Centre for Diarrhoeal Disease Research Bangladesh (icddr,b), Dhaka, Bangladesh

\*These authors contributed equally to this work.

### Corresponding Author:

Mohammad Jobayer Chisti, NCSD, icddr,b, Dhaka Hospital, 68 Shahed Tajuddin Ahmed Sarani, Mohakhali, Dhaka 1212, Bangladesh. Email: chisti@icddr.org



of the key survival interventions among infants <6 months of age.<sup>6</sup>

In Bangladesh, the trend of exclusive breastfeeding among nursing mothers mostly remained unchanged for a long time.<sup>9</sup> A recent study conducted in a rural sub-district in Bangladesh showed lower prevalence of exclusively breastfed (EBF; 36%)<sup>10</sup> compared with national prevalence (55%).<sup>11</sup>

The role of breastfeeding counseling (BFC) has already been documented in the antenatal period and just after birth, which is a crucial period for initiation of breastfeeding.<sup>12</sup> Lactation counselors commonly provide antenatal education and support in the postnatal period. Their primary focus is counseling, encouragement, and to help continue the breastfeeding in crisis.<sup>13</sup> An intervention trial on diarrheal children focused the necessity of BFC in acutely ill children 20 years ago in International Centre for Diarrheal Disease Research, Bangladesh (icddr,b).<sup>14</sup> However, since then, we do not have any data on the status of BFC and its impact on feeding status of infants <6 months of age hospitalized for diarrhea. Thus, the purpose of this study was to evaluate the status and impact of activities of BFC for mothers of infants younger than 6 months of age who were hospitalized for diarrheal illness.

## Materials and Methods

### Ethics Approval

In this retrospective chart analysis, data were de-identified before analysis and hence no parental consent was required. Institutional review board (Research Review Committee and Ethical Review Committee) of the icddr,b approved this study. The institutional review board approval number is not needed as it went for an expedited review process.

### Study Site

The data were abstracted from the electronic database in Dhaka Hospital of icddr,b, which is used for research.<sup>15,16</sup> Dhaka Hospital treats more than 140 000 diarrheal patients in a year. A great majority of patients are below 5 years of age. The numbers of infants below 6 months of age are around 4500 per year. Majority (50%) of the patients attending are admitted to the short stay unit for correction of dehydration (~20 hours stay). Forty percent remain at the outpatient department for children with no dehydration needing observation for 4 hours and another 10% with complication or comorbidities are admitted to the longer stay unit or intensive care unit (ICU). Among different service wings, there is a BFC unit (BFCU). BFCU was established in 1989 under

Clinical Science Division of icddr,b. The unit is run by 2 counselors and operates 7 days a week free of cost.

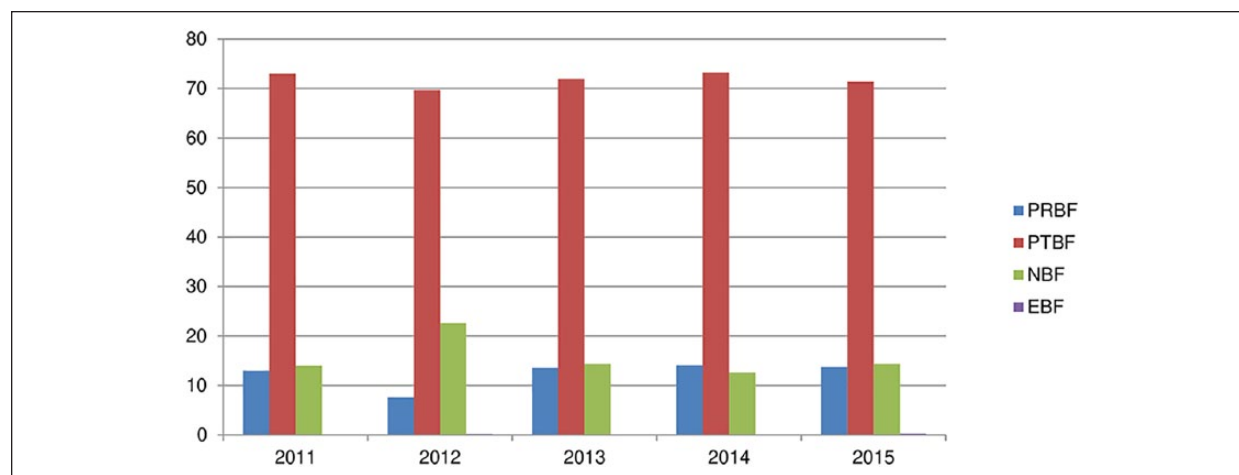
When infants with diarrhea are admitted to icddr,b Dhaka Hospital, their mothers are routinely referred for free counseling at BFCU. The BFCU offers both one-on-one sessions as well as group counseling for all mothers irrespective of the hospital stay except outpatient department and critically ill babies requiring ICU admission. ICU-admitted babies were usually counseled after transferring to the general ward (longer stay unit) when they had improved from their critical condition. Usually EBF babies did not require referring to BFCU unless otherwise indicated. During individual sessions, mother is motivated with counseling describing the benefits of breastfeeding for herself and for the baby. In addition to individual sessions, during the group counseling family members are also counseled to support and to provide extra care to the mother. During hospital stay, counselors visit the mother 2 to 3 times a day to monitor and to help the mothers in their breastfeeding practice. Breastfeeding counselors also collect data from parents of infants below 6 months of age and record them in a form in digital format. Notably, this BFCU also provides mental support to mothers for building up their confidence level on breastfeeding practice and care of their infants.

### Study Design

This was a retrospective study from a chart review conducted at Dhaka Hospital of icddr,b. We collected data of infants below 6 months of age who were admitted during 2011 through 2015 and visited the BFCU of the hospital. To evaluate the impact of BFC, we compared the infants who became EBF and were discharged from the hospital also having EBF with those who failed (to have EBF). EBF status was declared by 24-hour recall technique as followed by the Bangladesh Demographic Health Survey.<sup>17</sup>

### Measurements

For relevant data acquisition, we collected the digital formatted clinical report form that was used by breastfeeding counselors for collecting detailed history on breastfeeding. Characteristics analyzed included demographic information (age, sex, and socioeconomic status), feeding status before 6 months of age, and nutritional status (expressed by age- and sex-specific “z” score and classified as per the World Health Organization classification system).<sup>18,19</sup> Exclusive breastfeeding was defined by 24-hour recall technique (that means other than breast milk, baby did not take plain water or liquid food or solid food) and partial breastfeeding defined by taking breast milk along with formula milk or other food; predominant breastfeeding is defined as receiving



**Figure 1.** Home feeding status of infants younger than 6 months visited in breastfeeding counseling unit (2011-2015).

**Table 1.** Comparison of Maternal and Infants' Characteristics Between the EBF Group and Non-EBF Group on Discharge.

Characteristics	EBF Group	Non-EBF Group
Mean age of infant (in days)	79.3	74.6
Mean hospital stay (in days)	2.2	2.8
Mean age when other milk started (in days)	24.4	15.6
Mean maternal age (in years)	23.7	23.7
Mother's education in years (mean)	6.6	6.5

Abbreviation: EBF, exclusively breastfed.

breast milk and only plain water or non-milk liquids such as juice, clear broth, and other liquids.<sup>20</sup> During discharge, the feeding status was checked from mothers by 24-hour recall prior to discharge. The World Health Organization has acknowledged this indicating the potential overestimation of the prevalence of EBF.<sup>21</sup>

### Analysis

All data were entered into SPSS for Windows (version 20.0; SPSS Inc, Chicago, IL) and Epi-Info (version 7.0, USD, Stone Mountain, GA). Differences in proportion were compared by the  $\chi^2$  test. A probability of less than .05 was considered statistically significant. Strength of association was determined by calculating odds ratio and their 95% confidence intervals. Independent characteristics associated with EBF status during discharge were identified using logistic regression after controlling potential covariates.

### Results

A total of 3420 diarrheal infants below 6 months of age visited BFCU during the study period. Among them,

429 (12.5%) were predominantly breastfed, 2457 (71.8%) partially breastfed (PTBF), 531 (15.5%) non-breastfed (NBF), and 3 (0.1%) EBF at home (Figure 1). After regular BFC of mothers (which is provided by BFCU as routine practice) following 24-hour recall technique, 2212 (65%) infants became EBF on discharge and 1186 (35%) failed to be EBF during discharge. The characteristics of mother and infants were comparable in both EBF and non-EBF groups (Table 1). EBF infants were mainly receiving breast milk and other liquid at home (18.0% vs 0.4%,  $P < .01$ ), had <18-year-old mothers (10% vs 14%,  $P < .01$ ), were less likely with severe underweight (24% vs 43%,  $P < .01$ ) compared with non-EBF infants (Table 1). Mothers of EBF infants more often had the perception that "the baby does not suck" (4% vs 24%,  $P < .01$ ) and "there is not enough milk" (1.5% vs 29%,  $P < .01$ ) compared with mothers of non-EBF infants (Table 2). Logistic regression analysis after adjusting for potential covariates such as maternal age <18 years and receiving breast milk and other liquid at home, we found that infants having severe underweight, the maternal perception of "the baby does not suck," and "there is not enough milk" were less likely associated with EBF during discharge (Table 3).

**Table 2.** Sociodemographic Characteristics of Infants With Exclusive Breastfeeding and Non-Exclusive Breastfeeding on Discharge (Received Lactation Counseling).

Variables	EBF Group (N = 2212), n (%) <sup>a</sup>	Non-EBF Group (N = 1186), n (%) <sup>a</sup>	OR	95% CI	P
Severe underweight (W/A z score $\leq -3$ )	505 (24)	495 (43)	0.4	0.36-0.49	<.01
Maternal age < 18 years	225 (10)	162 (14)	0.7	0.58-0.89	<.01
Male sex	1349 (61)	769 (65)	0.9	0.73-0.98	.03
Breast milk with juice/water at home	405 (18.3)	5 (0.4)	30.8	12.68-74.64	<.01
Cause of starting other milk—baby did not suck	93 (4.2)	282 (23.8)	0.2	0.14-0.23	<.01
Practical help taken by mother	2169 (98)	1167 (98.4)	0.7	0.35-1.31	.31
Maternal perception on their breast milk—not enough milk	34 (1.5)	344 (29)	0.0	0.03-0.05	<.01
Correct position seeking mother	2182 (99)	1159 (98)	1.7	1.00-2.86	.06
Housewife—mother	1954 (88.3)	1040 (87.7)	1.1	0.85-1.31	.67

Abbreviations: EBF, exclusively breastfed; OR, odds ratio; CI, confidence interval.

<sup>a</sup>% denotes percentage of EBF group and non-EBF group until mentioned otherwise.

**Table 3.** Logistic Regression Analysis to Find Out Independent Feature Associated With EBF on Discharge Group.

Characteristic	OR	95% CI	P
Severe underweight (W/A z score $\leq -3$ )	0.6	0.46-0.74	<.01
Maternal age < 18 years	1.0	0.64-1.30	.62
Breast milk with juice/water at home	0.8	0.07-8.39	.84
Cause of starting other milk—baby did not suck	0.5	0.29-0.68	<.01
Maternal perception on their breast milk—not enough milk	0.0	0.02-0.03	<.01

Abbreviations: EBF, exclusively breastfed; OR, odds ratio; CI, confidence interval.

Through regular counseling of 531 NBF infants, 455 (85.7%) became PTBF and only 23 (4.3%) became EBF (Figure 2).

## Discussion

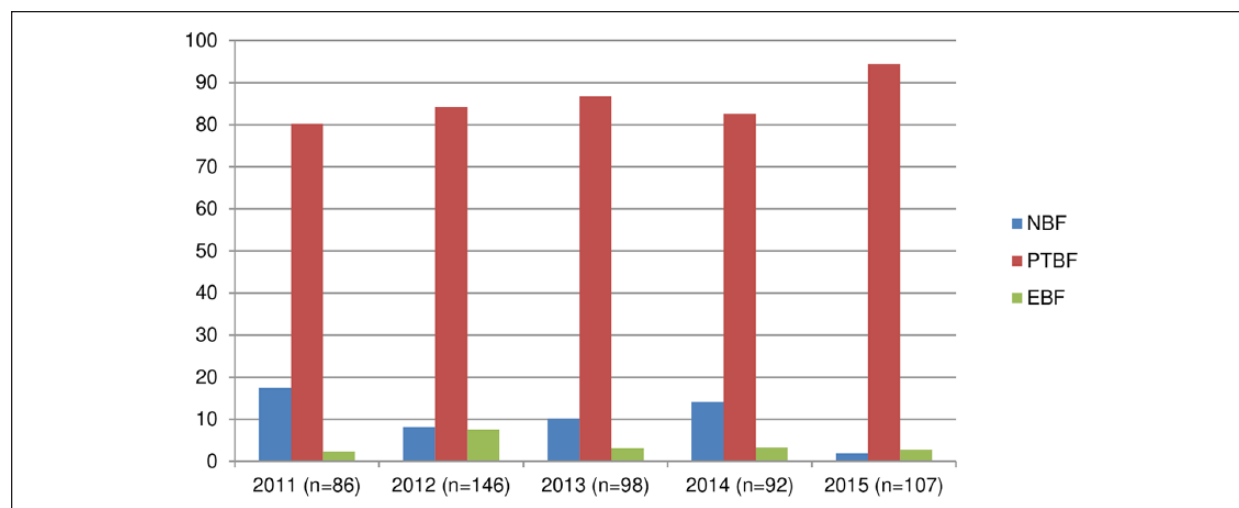
This study was carried out to find out the role of BFC to mother of diarrheal infants below 6 months of age in promoting breastfeeding status. There are evidences of increased EBF practices in response to support and counseling to the mothers.<sup>22</sup> A study conducted in Bangladesh with individual demonstration of lactation counseling by a counselor had a strong influence on mothers to have EBF during hospitalization.<sup>14</sup> They compared the intervention group having BFC with control group having routine health education.<sup>14</sup> Our study differs from that because our study did not have a control group, and we solely evaluated the ongoing counseling system of the hospital.

We have observed that those with PTBF were more motivated to be EBF. Both our individual and group counseling might have had an impact on the motivation process. Pooled analysis from systematic review also supports our observation.<sup>23</sup>

Severe underweight was observed to be more marked in non-EBF infants, and the finding indicates that the mothers of severe underweight infants might not have been motivated enough to be EBF. There are also evidences that NBF children are more often associated with severe malnutrition compared with EBF.<sup>24</sup>

A prospective cohort study conducted in Australia reported that compared with a 20-year-old mother, a 30-year-old mother was one and half times more likely to be breastfeeding at discharge from delivery center and 50% as likely to stop breastfeeding at any time up to 6 months.<sup>25</sup>

We observed that lower maternal age was more marked in non-EBF infants. The finding is really alarming and warrants attention by policy planners. Most of the mothers have perception that “there is not enough milk” and “the baby did not suck” and those mothers could not be motivated enough for EBF. These observations corroborated well with earlier findings.<sup>26,27</sup> This observation also reported in a study conducted in Canada where mothers self-reported that concerns about milk supply were one of the causes of discontinuing breastfeeding early.<sup>28</sup> Breastfeeding counselors also documented potential causes of starting other milk stated by



**Figure 2.** Impact of counseling on breastfeeding status at discharge during 2011 through 2015 among non-breastfed infants (“n” indicating total number of non-breastfed infants in each year).

mothers, which included maternal sickness (6.8%) and sickness of infants (4.4%).

The other notable findings of the study are that 85.7% NBF infants became PTBF and only 4.3% became EBF (Figure 2). This was an important observation. Most of the admitted infants were discharged from hospital early as per our patient management and counselors got less time to counseling the mother, so PTBF is more than EBF.

The main limitation of the study was its retrospective nature that may limit a number of variables of interest to be associated with EBF. Another important limitation was that we did not follow-up the mothers to evaluate whether EBF status was sustained at home, although breastfeeding counselors had repeated visits to mothers during hospitalization and the counseling was not blind to the mothers’ status. This might have an observer bias as well as Hawthorne effect for the outcome of the study. The fourth limitation of the study was that staff related to counseling was not blind to the mothers’ status.

## Conclusions

Counseling of mothers even during acute illness of their infants may help reestablish breastfeeding in most of the infants irrespective of the feeding status at home. Regular counseling in hospital may improve breastfeeding status of children <6 months of age. However, a future prospective study having the probation of monitoring of post discharge breastfeeding practice is a sine qua non to consolidate or refute our observation.

## Acknowledgments

We gratefully acknowledge the donors for their support and commitment to icddr,b’s research effort. We are acknowledging uninterrupted support of our 2 breastfeeding counselors, Ms Shajeda Khatun Parveen and Ms Shammi Akhter Bithika.

## Author Contributions

SN, TA, SAS, and MJC conceived and designed the study; SN collected, merged, and cleaned the data; SN, RI, TA, SAS, AIK, SP, and MJC analyzed and interpreted the data; SN, TA, SAS, and MJC gave technical support and conceptual advice; SN wrote the first draft of the manuscript and all the authors reviewed the manuscript; MJC as a senior author finally approved the manuscript. All authors read and approved the final manuscript.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research study was funded by core donors which provide unrestricted support to icddr,b for its operations and research. Current donors providing unrestricted support include: Government of the People’s Republic of Bangladesh; the Department of Foreign Affairs, Trade and Development (DFATD), Canada; Swedish International Development Cooperation Agency (Sida) and the Department for International Development (UK Aid). The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the article.

## ORCID iD

Mohammad Jobayer Chisti  <https://orcid.org/0000-0002-6062-4072>

## References

- World Health Organization. Global Nutrition Targets 2025: policy brief series. [https://apps.who.int/iris/bitstream/handle/10665/149018/WHO\\_NMH\\_NHD\\_14.2\\_eng.pdf?ua=1](https://apps.who.int/iris/bitstream/handle/10665/149018/WHO_NMH_NHD_14.2_eng.pdf?ua=1). Accessed May 29, 2019.
- Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS; Bellagio Child Survival Study Group. How many child deaths can we prevent this year? *Lancet*. 2003;362:65-71.
- Butte NF, Lopez-Alarcon MG, Garza C. Nutrient adequacy of exclusive breastfeeding for the term infant during the first six months of life. <https://apps.who.int/iris/bitstream/handle/10665/42519/9241562110.pdf?sequence=1&isAllowed=y>. Accessed May 29, 2019.
- Bhatia J. Human milk and the premature infant. *Ann Nutr Metab*. 2013;62(suppl 3):8-14.
- Turin CG, Ochoa TJ. The role of maternal breast milk in preventing infantile diarrhea in the developing world. *Curr Trop Med Rep*. 2014;1:97-105.
- Lamberti LM, Walker CLF, Noiman A, Victora C, Black RE. Breastfeeding and the risk for diarrhea morbidity and mortality. *BMC Public Health*. 2011;11(suppl 3):S15.
- Brown KH, Black RE, de Romaña GL, de Kanashiro HC. Infant-feeding practices and their relationship with diarrheal and other diseases in Huascar (Lima), Peru. *Pediatrics*. 1989;83:31-40.
- Lopez-Alarcon M, Villalpando S, Fajardo A. Breastfeeding lowers the frequency and duration of acute respiratory infection and diarrhea in infants under six months of age. *J Nutr*. 1997;127:436-443.
- Hossain M, Islam A, Kamarul T, Hossain G. Exclusive breastfeeding practice during first six months of an infant's life in Bangladesh: a country based cross-sectional study. *BMC Pediatr*. 2018;18:93.
- Joshi PC, Angdembe MR, Das SK, Ahmed S, Faruque ASG, Ahmed T. Prevalence of exclusive breastfeeding and associated factors among mothers in rural Bangladesh: a cross-sectional study. *Int Breastfeed J*. 2014;9:7.
- National Institute of Population Research and Training; ICF International. Bangladesh Demographic and Health Survey 2014. <https://dhsprogram.com/pubs/pdf/FR311/FR311.pdf>. Accessed May 29, 2019.
- Patel S, Patel S. The effectiveness of lactation consultants and lactation counselors on breastfeeding outcomes. *J Hum Lact*. 2016;32:530-541.
- Shealy KR, Li R, Benton-Davis S, Grummer-Strawn LM. The CDC guide to breastfeeding interventions. [https://www.cdc.gov/breastfeeding/pdf/breastfeeding\\_interventions.pdf](https://www.cdc.gov/breastfeeding/pdf/breastfeeding_interventions.pdf). Accessed May 29, 2019.
- Haider R, Islam A, Hamadani J, et al. Breast-feeding counselling in a diarrhoeal disease hospital. *Bull World Health Organ*. 1996;74:173-179.
- Akhter S, Ahmed T, Sarker SA, et al. Factors associated with *Klebsiella* bacteremia and its outcome in under-five children admitted with diarrhea. *Int J Pediatr*. 2016;2016:4760610.
- Shahunja KM, Ahmed T, Faruque ASG, et al. Experience with nosocomial infection in children under 5 treated in an urban diarrheal treatment center in Bangladesh. *Glob Pediatr Health*. 2016;3:2333794X16634267.
- National Institute of Population Research and Training. Bangladesh: Demographic and Health Survey 2007. [https://dhsprogram.com/pubs/pdf/FR207/FR207\[April-10-2009\].pdf](https://dhsprogram.com/pubs/pdf/FR207/FR207[April-10-2009].pdf). Accessed May 29, 2019.
- Chisti MJ, Tebruegge M, La Vincente S, Graham SM, Duke T. Pneumonia in severely malnourished children in developing countries—mortality risk, aetiology and validity of WHO clinical signs: a systematic review. *Trop Med Int Health*. 2009;14:1173-1189.
- World Health Organization. WHO child growth standards: length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: methods and development. <https://apps.who.int/iris/handle/10665/43413>. Accessed May 29, 2019.
- US Agency International Development. MEASURE DHS: Demographic and health Surveys: quality information to plan, monitor and improve population, health, and nutrition programs. [https://dhsprogram.com/Who-We-Are/upload/MEASURE\\_DHS\\_Brochure.pdf](https://dhsprogram.com/Who-We-Are/upload/MEASURE_DHS_Brochure.pdf). Accessed May 29, 2019.
- World Health Organization. Indicators for assessing breast-feeding practices: report of an informal meeting, 11-12 June 1991, Geneva, Switzerland. <https://apps.who.int/iris/handle/10665/62134>. Accessed May 29, 2019.
- Valdés V, Pérez A, Labbok M, Pugin E, Zambrano I, Catalan S. The impact of a hospital and clinic-based breastfeeding promotion programme in a middle class urban environment. *J Trop Pediatr*. 1993;39:142-151.
- Haroon S, Das JK, Salam RA, Imdad A, Bhutta ZA. Breastfeeding promotion interventions and breastfeeding practices: a systematic review. *BMC Public Health*. 2013;13(suppl 3):S20.
- Teka T, Faruque AS, Fuchs GJ. Risk factors for deaths in under-age-five children attending a diarrhoea treatment centre. *Acta Paediatr*. 1996;85:1070-1075.
- Scott JA, Landers MC, Hughes RM, Binns CW. Factors associated with breastfeeding at discharge and duration of breastfeeding. *J Paediatr Child Health*. 2001;37:254-261.
- Aarts C, Kylberg E, Hörnell A, Hofvander Y, Gebre-Medhin M, Greiner T. How exclusive is exclusive breastfeeding? A comparison of data since birth with current status data. *Int J Epidemiol*. 2000;29:1041-1046.
- Blyth R, Creedy DK, Dennis CL, Moyle W, Pratt J, De Vries SM. Effect of maternal confidence on breastfeeding duration: an application of breastfeeding self-efficacy theory. *Birth*. 2002;29:278-284.
- Brown CR, Dodds L, Legge A, Bryanton J, Semenic S. Factors influencing the reasons why mothers stop breastfeeding. *Can J Public Health*. 2014;105:e179-e185.