Determinants of Early Initiation of Breastfeeding Practices of Newborns in Bangladesh: Evidence From Bangladesh Demographic and Health Survey

Md. Saifullah Sakib[1] (ID), Abu Sayed Md. Ripon Rouf[1] and Tahmina Ferdous Tanny[2]

[1]Department of Statistics, Jagannath University, Dhaka, Bangladesh. [2]Department of Public Administration, Jagannath University, Dhaka, Bangladesh.

ABSTRACT

PURPOSE: Early initiation of breastfeeding is essential for newborns after birth to reduce mortality and morbidity. Early initiation of breastfeeding awareness/activities may be a vital role in Bangladesh to minimize the infant deaths. The aim of this study is to identify factors associated with the early initiation of breastfeeding practices.

METHODS: In this study, Bangladesh Demographic and Health Survey (BDHS) 2017 to 2018 data was used that will be the first analysis for early initiation of breastfeeding practices in this data set in Bangladesh. Considering the importance of early breastfeeding practices, the dependent variable was divided into 3 categories (immediately: breastfeeding for less than 20 minutes, within an hour, and after 1 hour) to find a significant association with early breastfeeding practices in Bangladesh. Bivariate analysis is used to examine the differentials to early initiation of breastfeeding according to the selected number of background variables. Multinomial logistic regression is used to determine predictive independent factors associated with the dependent variable.

RESULTS: Using BDHS 2017 to 2018 data on 4950 observations, this study revealed that 24.6% of mothers breastfed their babies immediately after birth and 36.2% of mothers breastfed their babies within an hour. The rate of mothers who breastfeed their babies immediately after birth is lowest at the age of 20 to 25, mothers with a higher level of education, richer class, Khulna division, the first child born, Islam, and private/NGO. With a multivariate analysis of breastfeeding within an hour compared to immediate breastfeeding: richest (OR = 0.71), Barisal division (OR = 0.72), and Buddhism (*OR* = 0.52) are less likely to breastfeed newborns compared to the reference category. On the other hand, primary, secondary, and higher educated mothers are more likely to breastfeed newborns compared to no educated mothers. Besides, breastfeeding newborns after 1 hour compared to immediate after birth: mothers aged 20 to 25 (OR = 1.40), richer (OR = 1.46), higher secondary (OR = 2.06), Khulna division (OR = 1.81), and private/NGO (OR = 2.51) are more likely breastfeed newborn.

CONCLUSION: Mother's education, wealth index, region, birth order, religion, and place of delivery have a significant impact on the early initiation of breastfeeding practices, but the rate of immediate breastfeeding is relatively lower than others. Ultimately, this information will help planners and other professionals plan strategies and interventions to provide good quality health services.

KEYWORDS: Breastfeed, initial, newborn, immediately, BDHS, regression

Introduction

Early initiation of breastfeeding within the first hour after birth is critical for infant survival and the establishment of long-term breastfeeding. When breastfeeding is delayed after birth, the consequences can be life-threatening, and the longer an infant is expected, the greater the risk of a newborn after birth.[1] Feeding practices play a pivotal role in determining the optimal growth and development of an infant. Poor breastfeeding and infant feeding practices have adverse consequences for the health and nutritional status of children. Initiating breastfeeding is also part of newborns' care. An important distinguishing feature of mammals is that offspring have mothers (beginning of human mammary glands), whose function of which is to secrete milk to nourish infants. Breastfeeding for the first time after birth is an integral part of a safe delivery[2] and is extensively avowed as a beneficial practice. A series of neonatal survival analyzes identified breastfeeding as a possible intervention that could reduce all-cause infant mortality and morbidity by 55% to 87%.[3] Several studies have shown that breastfeeding reduces the risk of infant mortality, especially from infections[4] such as diarrhea,[5] neonatal sepsis,[6] pneumonia, and meningitis.[7] Another study has shown that late breastfeeding increases the risk of infant mortality.[8] Initiating breastfeeding compared with infants within the first hour of life, neonatal mortality between enrollment and 28 days was higher in infants initiating at 2 to 23 hours after birth.[9] Early initiation of breastfeeding within 1 hour of birth can also inhibit up to 22% of all newborn deaths[10] and the recent Lancet Every Newborn series mentions that reducing mortality can reach up to 44%.[10,11] Therefore, the World
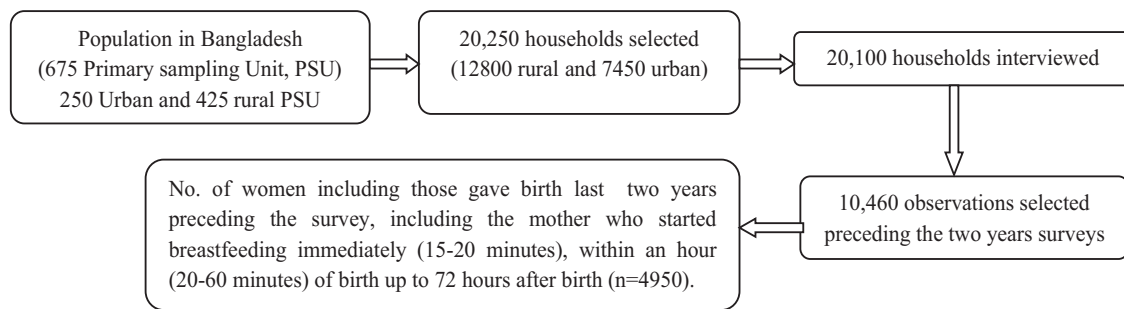
Figure 1. Flow chart shows the selection of respondents (Source: 1 BDHS 2017-18 data).

Health Organization (WHO) recommends starting breast-feeding immediately and preferably within 1 hour of birth.[12] In recent years, many efforts have been made by domestic and international stakeholders to encourage mothers to breastfeed early.[13] Nevertheless, only 45% of newborns worldwide and 42% of newborns in South Asia are breastfed within an hour of birth.[14] Breast milk is the best source of nutrition for newborn babies, specially formulated to meet all the nutritional needs of infants during the first 6 months of life.[15] Bangladesh is a developing country. Most women in Bangladesh are not aware of the importance of early initiation of breastfeeding. The most recent demographic health surveillance report in Bangladesh showed that 60% of mothers started breastfeeding immediately and within an hour of giving birth (BDHS 2017-18). Interestingly, trends in early breastfeeding, identified over the past decade from similar surveys, show that mothers are less likely to practice giving birth in health facilities than at home (BDHS 2007-2014). According to BDHS data, the rate of immediately feeding breasts was the lowest in the year 2007 at 19.4% followed by a sharp increase of over 10% for the next 4 years which is 31.2% in 2011. It then almost leveled off with a slight rise (32.4%) in 2014, followed by a significant drop at 24.6% in 2017. Regarding breastfeeding within 1 hour of birth, it was 23.7% in 2007 while it fell to 17.2% in 2014, eventually, the rate shot up remarkably at 36.2% in the year 2017. At the same time as the increase in the birth rate in health facilities across the country,[16] it is urgent for health to identify the factors affecting the early initiation of breastfeeding in health facilities to improve this life-saving practice. To recognize the importance of early initiation of breastfeeding practices, this study focused on some essential factors and determinants of newborns in Bangladesh.

Data, Variables, and Methods

The sample for the 2017 to 2018 BDHS is nationally representative and covers the entire population living in non-institutional dwelling units within the country. The survey used an inventory of enumeration areas (EAs) from the 2011 Population and Housing Census of the People's Republic of Bangladesh, provided by the Bangladesh Bureau of Statistics (BBS), as a sampling frame (BBS 2011).[17] The primary sampling unit (PSU) of the survey is an EA with a medium of about 120

households (BDHS 2017-18). The study is based on a 2-stage stratified test of family units. Within the to begin with organizing, 675 EAs (250 in urban zones and 425 in rural zones) were chosen with a likelihood corresponding to EA estimate. Based on this plan, 20 250 residential households were chosen. Completed interviews were expected from approximately 20 100 ever-married women aged 15 to 49. In this study, 4950 samples were selected from 10 460 observations among last-born children who were born in the 2 years preceding the survey (explained it in Figure 1).

Early initiation of breastfeeding was considered the outcome variable in this study. The BDHS 2017 to 2018[18] data asked the following question of the mothers: how long after birth did you put to the breast? Outcome variables based on last-born children born in the 2 years preceding the survey, including the children who started breastfeeding immediately, within an hour (after 20 minutes) of birth, and children are given something other than breast milk during the first 3 days of life. Early initiation of breastfeeding shows to have positive effects when done within the first hour after delivery. Among healthy term infants, feeding cues from the infant may be apparent within the first 15 to 20 minutes after birth.[1] Based on these outcome variables has 3 categories such as breastfeeding immediately (as soon as possible/less than 20 minutes), within an hour (20-60 minutes), and after 1 hour (according to BDHS 2017-18 data set). Besides dependent variables, we also considered a mother's aged first birth, place of residence, region, religion, wealth index, mother's education, birth order, gender, and place of delivery as potential factors for early initiation of breastfeeding practices in Bangladesh.

For the statistical analysis, a Chi-square test was performed to evaluate the association between demographic and socio-demographic variables and early initiation of breastfeeding. For the multiple analysis, a multinomial logistic regression (MLR) was performed, since in this study the outcome variables were divided into 3 categories. Although ordinal logistic regression is a reasonable approach to use in our data because the variables will be treated as ordered categories, it violates the proportional advantage assumption. Therefore, MLR is the method of analysis here. In the analysis, statistical software SPSS was used for bivariate analysis, and STATA was used for multivariate analysis.

Results

Information on the background characteristics of the study population is essential for the interpretation of the study findings. From Table 1, it can be seen that a large number of respondents for mothers age who are in age at 15 to 20. Besides, secondary educated mothers, poor household income, rural areas, 2 to 3 birth orders are higher numbers compared to other categories. In the case of religion, the majority are belonging to Islam and most of the mothers delivered their babies at the home. Although breastfeeding practices are common in Bangladesh, the rate of immediate feeding of newborns is increasing. For bivariate analysis, Table 1 contains many important demographic and socio-demographic variables. Except for the gender of the child and the place of residence of the respondent, most variables have a significant impact on the onset of breastfeeding. For the variable mother's age at the first birth percentage of early initiation of breastfeeding immediately age below 15 is 26.1 which is higher for other age categories, within an hour this percentage is little change, and most newborns are breastfed an hour later. The majority number (3193) of mothers' ages at first birth is 15 to 20 and the proportion of mothers aged 20 to 25 who breastfed their babies 1 hour after birth is higher. The education of the mother is very important for the infants. In the case of mothers who have passed higher education, the rate of breastfeeding after 1 hour was higher. In addition, for no educated mothers, the rate of rapid breastfeeding is higher. Despite being a developing country, women living below the poverty line are more likely to breastfeed immediately after birth. While the percentage of the poorest mothers breastfeeding within an hour is 43.2% while this rate of the richest group is 30.1%. In contrast, the rate of breastfeeding after 1 hour is higher among the richest class where their percentage is 45.6. Looking at the region now, Dhaka Division is slightly ahead in terms of immediately breastfeeding rate, Mymensingh Division within an hour and Khulna Division has the highest percentage of breastfeeding after 1 hour. In a comparative review of religion, Buddhism is at the forefront of immediately breastfeeding. On the other hand, to consider the percentage of Christianity is higher in case of breastfeeding within 1 hour and the percentage is closer after 1 hour for Islam and Hinduism. Although birth order had a significant impact on the early initiation of breastfeeding, breastfeeding rates immediately after the third child were highest and lowest for the first child and the opposite result occurred after 1 hour of breastfeeding. For the place of delivery, the immediate breastfeeding rate of mothers giving birth at respondent's home was 28.0%, the highest. Mothers giving birth to private/NGO/others have a breastfeeding rate of 52.7% after 1 hour and a minimum of 27.2% within an hour. And in all 3 of these cases, the percentage of government facilities differs from home facilities and others.

Prior to performing the multinomial logistic regression model, the bivariate analysis showed a significant association with demographic and sociodemographic variables. All the significant variables in the bivariate analysis were included in the model. Table 2 clearly shows that for "mother's age at first birth" mothers aged 15 to 20, age 20 to 25, and above 25 will be compared breastfeeding with mothers age below 15. In the case of breastfeeding "within an hour" compared to "immediately," mothers age below 15 compared to immediately breastfeeding are more likely to other age groups for breastfeeding newborns within an hour. On the other hand, in the case of breastfeeding "after 1 hour" compared to "immediately" mother's aged 15 to 20, 20 to 25, and above 25 compared to age below are more likely to breastfeeding after 1 hour, given the other variables in the model are held constant. It was observed that the tendency of breastfeeding after 1 hour is higher among those who are aged 20 to 25 and above 25 years of age. For mother's education primary, secondary, and higher secondary, the comparison will be compared to no educated mother. In the case of breastfed newborns, breastfeeding "within an hour" compared to "immediately," primary, secondary, and higher educated mothers compared to no educated mothers are more likely to breastfeed within an hour. As with breastfed newborns, breastfeeding "after 1 hour" versus "immediately," primary, secondary, and higher educated mothers compared to no educated mothers are more likely to breastfeeding after 1 hour, given the other variables in the model are held constant. For the wealth index, breastfeeding "within an hour" versus "immediately" poorer, middle, richer, and richest compared to poorest are less likely and "after 1 hour" compared to "immediately" are more likely of the middle, richer, and richest accordingly of breastfeeding after 1 hour compared to the poorest class. For the region, early initiation of breastfeeding after births of newborns "within 1 hour" and "after 1 hour" compared to "immediately" Barisal is less likely and Chittagong is more likely compared to Dhaka. Also, for a variable place at delivery government facilities, private/NGO/Others compared to respondents' home are less likely to breastfeeding newborns "within 1 hour," and more likely for government facilities (OR = 1.61, CI(1.30, 1.99)) and private/NGO/Others (OR = 2.51, CI(2.14, 2.95)) of after 1 hour compared to immediate breastfeeding, given the other variables in the model were kept constant.

Discussion

The first hour after is called the starting hour and all mothers should support the early initiation of breastfeeding as soon as possible after birth, within the first hour after birth during this time. The immediate arrangement of mother's breast milk to infants within the first hour of life was proposed as a way to reduce the mortality rate.[19] Growth that begins with breastfeeding will fully progress toward achieving MDG 4 through reduced neonatal mortality;[4,8,20,21] through improved infant nutrition with associations reported with abated moderate wasting and stunting prevalence.[10] The findings of this study suggest that achieving more outstretched practice of early breastfeeding initiation relies on multi-sector interventions.

Table 1. Distribution of early initiation of breastfeeding of demographic and socio-demographic characteristics.

VARIABLES	CATEGORIES	IMMEDIATELY	WITHIN AN HOUR	AFTER 1 HOUR	*P*-VALUE	NUMBER OF BIRTHS (N)
Mother's age at first birth	Age below 15	26.1	37.4	36.5		690
	Age 15-20	24.8	37.2	38.0	.009	3193
	Age 20-25	22.7	32.8	44.5		863
	Age above 25	24.5	31.4	44.1		204
Mother's education	No education	32.4	32.0	35.6		309
	Primary	25.7	39.4	35.0	.000	1367
	Secondary	24.3	36.8	38.9		2376
	Higher Secondary	21.0	31.3	47.7		898
Wealth index	Poorest	24.6	43.2	32.2		1067
	Poorer	27.4	38.9	33.7	.000	1004
	Middle	23.8	34.6	41.6		895
	Richer	22.8	33.5	43.7		975
	Richest	24.3	30.1	45.6		1009
Sex of child	Male	24.6	36.0	39.4	.947	2596
	Female	24.6	36.4	39.0		2354
Region	Dhaka	29.5	33.5	37.0		728
	Chittagong	24.6	38.4	36.9		824
	Barisal	22.6	32.4	45.0		528
	Khulna	18.2	32.5	49.3	.000	517
	Mymensingh	23.2	40.9	35.9		599
	Rajshahi	24.6	35.0	40.4		520
	Rangpur	26.8	38.2	35.1		553
	Sylhet	26.0	40.1	33.9		681
Place of residence	Urban	24.6	34.8	40.6	.233	1700
	Rural	24.6	37.0	38.4		3250
Birth order	1	21.8	35.0	43.2		1890
	2-3	25.8	36.3	37.9	.000	2467
	3+	28.3	40.0	31.7		593
Religion	Islam	24.3	36.5	39.2		4537
	Hinduism	27.5	31.6	40.9		386
	Buddhism	50.0	38.9	11.1	.009	18
	Christianity	-	66.7	33.3		9
Place at delivery	Respondent's home	28.0	42.7	29.3		2433
	Government	23.8	362	40.0	.000	743
	Facilities	20.1	27.2	52.7		1752
	Private/NGO/others					
Total		24.6	36.2	39.2		4950

Table 2. Factors associated with early initiation of breastfeeding practices from multinomial logistic regression.

BACKGROUND CHARACTERISTICS	WITHIN AN HOUR		AFTER 1 HOUR	
	ODDS RATIO	95% CI	ODDS RATIO	95% CI
Mother's age at first birth				
Age below 15 (ref)				
Age 15-20	1.05	0.85-1.29	1.10	0.89-1.35
Age 20-25	1.01	0.77-1.31	1.40**	1.08-1.81
Age above 25	0.89	0.59-1.35	1.29*	0.87-1.91
Mother's education				
No education (ref)				
Primary	1.55***	1.14-2.11	1.24	0.91-1.68
Secondary	1.53***	1.14-2.06	1.46**	1.09-1.95
Higher Secondary	1.50***	1.08-2.10	2.06***	1.49-2.84
Wealth index				
Poorest (ref)				
Poorer	0.81	0.65-1.00	0.94	0.75-1.17
Middle	0.83	0.66-1.04	1.33*	1.05-1.68
Richer	0.84	0.67-1.05	1.46**	1.16-1.84
Richest	0.71**	0.56-0.88	1.43**	1.14-1.79
Region				
Dhaka (ref)				
Chittagong	0.91	0.69-1.23	1.33**	1.00-1.77
Barisal	0.72**	0.55-0.97	0.83	0.63-1.11
Khulna	1.14	0.82-1.60	1.81***	1.31-2.50
Mymensingh	1.12	0.83-1.53	1.03	0.76-1.40
Rajshahi	0.91	0.66-1.25	1.09	0.80-1.49
Rangpur	0.91	0.67-1.24	0.87	0.64-1.19
Sylhet	0.98	0.74-1.32	0.87	0.65-1.17
Birth order				
1(ref)				
2-3	0.88	0.75-1.03	0.74**	0.63-0.86
3+	0.88	0.70-1.11	0.59***	0.44-0.72
Religion				
Islam (ref)				
Hinduism	0.76*	0.58-1.00	0.92	0.71-1.20
Buddhism	0.52***	0.19-1.39	0.14	0.03-0.64
Christianity	-		-	
Place at delivery				
Respondent's home (ref)				
Government facilities	0.98	0.81-1.23	1.61**	1.30-1.99
Private/NGO/Others	0.89	0.75-1.05	2.51***	2.14-2.95

Reference category: Immediately breastfeeding.
*P < .10. **P < .05. ***P < .01.

For instance, universal access to primary education[22] and income expenditure will help combat the negative impact of lack of education. The same is true for South Asia where lack of education has been a factor in the early initiation of breastfeeding in Nigeria (Waheed 2013),[23] Ethiopia,[24] Tanzania,[25] and Malawi.[26] In addition, regional disparities and household income and expenditures and the promotion of gender equality and women empowerment,[22] the lack of decision-making power of mothers is a barrier to early initiation of breastfeeding, which is consistent with findings in Tanzania[25] and our study had to find out the significant impact on education for infants feeding. In the case of, lower and middle-income countries have lower rates of breastfeeding for newborns after birth.[27] In the case of religion, our results differed from the early initiation of breastfeeding practices (Karim et al. 2018).[28] This is relevant especially in South Asia, where more than half of deliveries in several South Asian countries occur outside health facilities[26] and also similar findings in this study. The study observed the ratio of this practice among the home deliveries is much higher than the reported average among all facility deliveries in Bangladesh (40%) which differs from some other south-east Asian countries: Pakistan (17%), India (33%), and Nepal (55%) as stated in their demographic health surveillance (DHS) reports.[30-32] The practice of early initiation of breastfeeding was positively indicated to correlate with lower neonatal deaths up to 3 times from all causes compared with babies who did not receive breast milk early after birth.[33] There is a significant association between home delivery and delayed breastfeeding initiation is consistent with reports from Nigeria (Waheed 2013), Tanzania,[25] Ethiopia,[24] and Malawi[26] that resembling our study. Limited prenatal screening is also an observed barrier in Vietnam,[34] Turkey,[35] Malawi,[26] and Nigeria (Waheed 2013).[23] Evidence from many countries, mother's common position in the household's decision-making situations explains the low number of early initiations of breastfeeding.[36] From other studies in Nepal, the practice was even lower in uneducated mothers due to lower home rules in decision-making to breastfeed the children.[37] This increasingly low coverage of early breastfeeding initiation in health care facilities is cause for concern as promoting institutional delivery is a priority intervention to achieve the goals of the Sustainable Development Goals (SDG) on reducing maternal and child mortality by 2030.[38] In addition, no country has more than 80% of breastfeeding within an hour of birth. It is estimated globally that 42% of all newborns are breastfed within the first hour of life (WHO 2015).[39] This consensus affirms that promoting and facilitating the use of maternal health services must be a priority to achieve progress in early initiation of breastfeeding. Based on the discussion of this study, several policy implications, comments, and recommendations have been proposed that will help the government to take initiative to promote early initiation of breastfeeding practices in Bangladesh.

Conclusion

There are several reasons that emphasize the importance of breastfeeding immediately after birth. Although Bangladesh is a developing country, awareness of breastfeeding immediately and within an hour of giving is even lower. However, this study found that relatively less educated and poorer mothers are more prone to rapid breastfeeding. In addition, there is a significant influence on region, religion, and parity of birth order. Since our research shows that mothers who give birth at home breastfeed quickly. Breastfeeding after giving birth is very important. Therefore, appropriate measures should be taken to ensure that infants are breastfed immediately after birth. The importance of breastfeeding in awareness-raising activities carried out by the government, as well as various NGOs and social workers, can be conveyed to individual households in Bangladesh.

Author Contributions

SS had the original idea for this study. SS and TFT drafted the manuscript. All authors participated the statistical analysis. All authors reviewed and contributed to the writing of the manuscript.

Ethical Approval and Consent to Take Part

The BDHS 2017–18 were used for this study with permission from the DHS Program website: https://www.dhsprogram.com/data/dataset/Bangladesh_Standard-DHS_2017.cfm?flag=0. Informed consent got from National Institute of Population Research and Training (NIPORT).

ORCID iD

Md. Saifullah Sakib https://orcid.org/0000-0002-6360-4544

REFERENCES

1. UNICEF. *Capture the Moment – Early Initiation of Breastfeeding: The Best Start for Every Newborn World Health Organization*. UNICEF; 2018.
2. World Health Organization. *Integrated Management of Pregnancy and Childbirth: WHO Recommended Interventions for Improving Maternal and Newborn Health*. World Health Organization; 2009.
3. Darmstadt GL, Bhutta ZA, Cousens S, Adam T, Walker N, de Bernis L. Evidence-based, cost effective interventions: how many newborn babies can we save? *Lancet*. 2005;365:977-988.
4. Edmond KM, Kirkwood BR, Amenga-Etego S, Owusu-Agyei S, Hurt LS. Effect of early infant feeding practices on infection-specific neonatal mortality: an investigation of the causal links with observational data from rural Ghana. *Am J Clin Nutr*. 2007;86:1126-1131.
5. Lamberti LM, Walker CLF, Noiman A, Victora C, Black RE. Breastfeeding and the risk for diarrhea morbidity and mortality. *BMC Public Health*. 2011;11:S15.
6. Ashraf RN, Jalil F, Zaman S, et al. Breast feeding and protection against neonatal sepsis in a high risk population. *Arch Dis Child*. 1991;66:488-490.
7. Victora CG. Infection and disease: the impact of early weaning. *Food Nutr Bull*. 1996;17:1-8.

8. Mullany LC, Katz J, Li YM, et al. Breast-feeding patterns, time to initiation, and mortality risk among newborns in southern Nepal. *J Nutr*. 2008;138: 599-603.

9. NEOVITA Study Group. Timing of initiation, patterns of breastfeeding, and infant survival: prospective analysis of pooled data from three randomised trials. *Lancet Glob Health*. 2016;4:e266-e275.

10. Debes AK, Kohli A, Walker N, Edmond K, Mullany LC. Time to initiation of breastfeeding and neonatal mortality and morbidity: a systematic review. *BMC Public Health*. 2013;13:S19.

11. Bhutta ZA, Das JK, Bahl R, et al. Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cost? *Lancet*. 2014;384:347-370.

12. World Health Organization. *Indicators for Assessing Infant and Young Child Feeding Practices: Part 1: Definitions: Conclusions of a Consensus Meeting Held 6–8 November 2007 in Washington, DC, USA*. World Health Organization; 2008.

13. Taqi I. Global breastfeeding advocacy initiative. *Breastfeed Med*. 2014;9:355-357.

14. UNICEF. *From the First Hour of Life: Making the Case for Improved Infant and Young Child Feeding Everywhere*. UNICEF; 2016.

15. Gartner LM, Morton J, Lawrence RA, Naylor AJ, O'Hare D, Schanler RJ. Breastfeeding and the use of human milk. *Pediatrics*. 2005;115(2):496-506.

16. National Institute of Population Research and Training (NIPORT), Mitra and Associates, Macro International. *Bangladesh Demographic and Health Survey (BDHS) 2014*. NIPORT, Mitra and Associates, and Macro International; 2014.

17. Bangladesh Bureau of Statistics (BBS) 2011. Bangladesh Population and Housing Census 2011. http://catalog.ihsn.org/index.php/catalog/4376.

18. National Institute of Population Research and Training (NIPORT)., Mitra and Associates., Macro International. *Bangladesh Demographic and Health Survey (BDHS) 2017–18*. NIPORT, Mitra and Associates, and Macro International; 2017–18.

19. World Health Organization. *Early Initiation of Breastfeeding to Promote Exclusive Breastfeeding*. WHO; 2019.

20. Khan J, Vesel L, Bahl R, Martines JC. Timing of breastfeeding initiation and exclusivity of breastfeeding during the first month of life: effects on neonatal mortality and Morbidity—a systematic review and meta-analysis. *Matern Child Nutr*. 2015;19:468-479.

21. Tawiah-Agyemang C, Kirkwood BR, Edmond K, Bazzano A, Hill Z. Early initiation of breast-feeding in Ghana: barriers and facilitators. *J Perinatol*. 2008;28: S46-S52.

22. Lomazzi M, Borisch B, Laaser U. The millennium development goals: experiences, achievements and what's next. *Glob Health Action*. 2014;7:23695-23699.

23. Waheed BY, Samson BA. Modeling the trend and determinants of breastfeeding initiation in Nigeria. *Child Develop Res*. 2013; 2013:530396.

24. Setegn T, Gerbaba M, Belachew T. Determinants of timely initiation of breastfeeding among mothers in Goba Woreda, South East Ethiopia: a cross-sectional study. *BMC Public Health*. 2011;11:217.

25. Victor R, Baines SK, Agho KE, Dibley MJ. Determinants of breastfeeding indicators among children less than 24 months of age in Tanzania: a secondary analysis of the 2010 Tanzania demographic and health survey. *BMJ Open*. 2013;3:e001529.

26. Kazembe L. Spatial modeling of initiation and duration of breastfeeding: analysis of breastfeeding behaviour in Malawi – I. *World Health Popul*. 2008;10:47-64.

27. Takahashi K, Ganchimeg T, Ota E, et al. Prevalence of early initiation of breastfeeding and determinants of delayed initiation of breastfeeding: secondary analysis of the WHO global survey. *Sci Rep*. 2017;7:44868.

28. Karim F, Billah SM, Chowdhury MAK, Zaka N, Manu A, Arifeen SE. Initiation of breastfeeding within one hour of birth and its determinants among normal vaginal deliveries at primary and secondary health facilities in Bangladesh: A case-observation study. *PLoS ONE*. 12018:13(8):e0202508.

29. Tey N-P, Lai S-L. Correlates of and barriers to the utilization of health services for delivery in South Asia and Sub-Saharan Africa. *Sci World J*. 2013; 2013:423403.

30. Ministry of Health and Population (MOHP), New ERA, ICF International. *Nepal Demographic and Health Survey 2011*. Ministry of Health and Population, New ERA, ICF International; 2012.

31. International Institute for Population Sciences (IIPS), Macro International. *National Family Health Survey (NFHS-3), 2005–06: India: Volume I*. International Institute for Population Sciences (IIPS); 2007.

32. National Institute for Population Studies (NIPS), ICF International. *Pakistan Demographic and Health Survey 2012–13*. National Institute for Population Studies (NIPS) and ICF International; 2013.

33. Phukan D, Ranjan M, Dwivedi LK. Impact of timing of breastfeeding initiation on neonatal mortality in India. *Int Breastfeed J*. 2018;13:27.

34. Nguyen PH, Keithly SC, Nguyen NT, Nguyen TT, Tran LM, Hajeebhoy N. Prelacteal feeding practices in Vietnam: challenges and associated factors. *BMC Public Health*. 2013;13:932.

35. Orun E, Yalcin SS, Madendag Y, Ustunyurt-Eras Z, Kutluk S, Yurdakok K. Factors associated with breastfeeding initiation time in a Baby-Friendly Hospital. *Turk J Pediatr*. 2010;52:10-16.

36. Benedict RK, Craig HC, Torlesse H, Stoltzfus RJ. Trends and predictors of optimal breastfeeding among children 0–23 months, South Asia: analysis of national survey data. *Matern Child Nutr*. 2018;14:e12698.

37. Acharya P, Khanal V. The effect of mother's educational status on early initiation of breastfeeding: further analysis of three consecutive Nepal demographic and health surveys. *BMC Public Health*. 2015;15:1069.

38. Campbell OM, Graham WJ. Strategies for reducing maternal mortality: getting on with what works. *Lancet*. 2006;368:1284-1299.

39. World Health Organization. Health (WHO) in 2015: from MDGs, Millennium Development Goals to SDGs, *Sustainable Development Goals*. 2015. https://www.who.int/gho/publications/mdgs-sdgs/en/.