

## Duration of breastfeeding and its determinants in Bangladesh

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### ABSTRACT

The purpose of this study is to assess the duration of breastfeeding and the factors influencing the duration of breastfeeding in Bangladesh. A total of 4023 mother-child pairs were selected in the study from Bangladesh Demographic and Health Survey (BDHS) 2004. Survival analysis technique (Kaplan Meier, Life table and Cox proportional Hazards model) was employed to investigate the duration and predictor of breastfeeding. The observed mean and median durations of breast-feeding were 30.41 and 35.00 months respectively. Independent effects each of the study variables on duration of breastfeeding were estimated by using Cox's regression model which reveals that the duration of breastfeeding was positively associated with Place of residence, religion of mother and was negatively associated with age at marriage, delivery status, wealth index and maternal education. Younger mothers, mothers from Chittagong and Sylhet division, mothers and having husbands with secondary and higher education, urban mothers, caesarean-section births and Muslim mother were associated with lower duration of breastfeeding. Mothers should be informed about the maternal health benefit of breastfeeding including lactational amenorrhoea, which increases birth interval and maintains good health of the mothers.

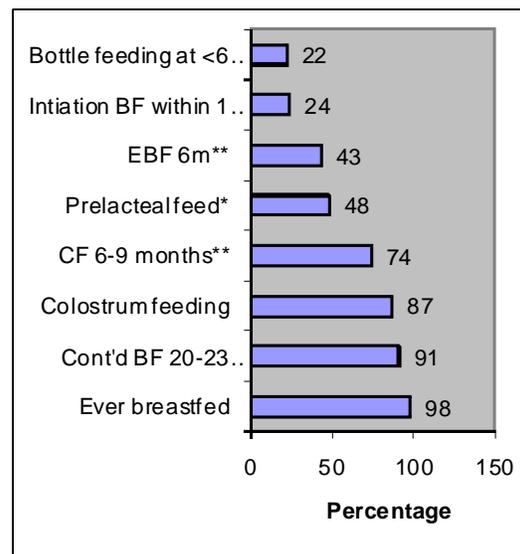
**Key words:** Breastfeeding, Cox's regression, socio-demographic, duration, Bangladesh.

### INTRODUCTION

Breastfeeding is a cost effective way of feeding an infant, providing nourishment for a child at a small cost to the mother. Frequent and exclusive breastfeeding can delay the return of fertility through lactational amenorrhoea, though breastfeeding is an imperfect means of birth control. During breastfeeding beneficial hormones are released into the mother's body <sup>[1]</sup> and the maternal bond can be strengthened <sup>[2]</sup>.

Breastfeeding is the feeding of an infant or young child with breast milk directly from female human breasts (i.e., via lactation) rather than from a baby bottle or other container. Babies have a sucking reflex that enables them to suck and swallow milk <sup>[3]</sup>. Bangladesh has a strong breastfeeding culture. Almost all children are breastfed and continue to be breastfed until they are at least 2 years old. However, sub-optimal practices such as delayed initiation of breastfeeding, prelacteal feeding, non-exclusive breastfeeding, and bottle-feeding are common. Exclusive breastfeeding rates showed little change from 1994 to 2007, ranging between 42 and 46 percent. During this time, some feeding practices improved. e.g. Initiation of breastfeeding within one hour of birth increased from 9 to 24 percent and timely feeding of complementary foods to infants aged 6-9 months rose dramatically, from 28 to 74 percent <sup>[4]</sup>. Figure 1 shows the gaps in exclusive breastfeeding in the first six months and feeding practices at different ages.

Fig 1. Infant and Young Child Feeding (IYCF) Breastfeeding practices in Bangladesh, BDHS 2004, BBF 2005\*, BDHS 2007\*\*



Source: UNICEF 2009.

The present study was undertaken to assess the duration of breast-feeding using survival analysis to identify the cultural, socio-economic and demographic factors influencing the duration of breast-feeding.

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## MATERIALS AND METHODS

Data for the study were drawn from the Bangladesh Demographic and Health Survey (BDHS) 2004. Information was collected on education, age, reproductive behavior, availability of family-planning supplies and services, breastfeeding, child

viewed. In total, 4023 mothers provided information on the duration of breastfeeding for their last-born child at the time of interview. Breastfeeding recorded in the survey was 60 months but the study included the duration of breastfeeding up to 36 months and ignored the remaining months as outlier.

Table 1: Mean and medium duration of breastfeeding (in months) by Kaplan Meier & Life-table method by socio-economic and demographic characteristic, Bangladesh, 2004.

Characteristics	Number	Percentage	Mean (in months)	Median (in months)
Age (years) of mothers				
10-19	852	21.2	30.77	35.00
20-29	2329	57.9	30.46	35.00
30 and above	842	20.9	30.07	35.00
Age (years) at first marriage of mothers				
10-14	1967	48.9	31.07	35.00
15-19	1764	43.8	30.16	35.00
20-24	252	6.3	27.99	35.00
25 and above	40	1.0	23.24	
Delivery status				
Normal	3810	94.7	30.57	35.00
Caesarian	213	5.3	26.93	34.00
Region of Residence				
Barisal	425	10.6	31.31	35.00
Chittagong	897	22.3	27.98	29.34
Dhaka	866	21.5	30.38	35.00
Khulna	525	13.0	31.99	35.00
Rajshahi	745	18.5	31.52	35.00
Sylhet	565	14.0	30.26	35.00
Place of Residence				
Urban	1197	29.8	29.62	35.00
Rural	2826	70.2	30.78	35.00
Religion of respondent				
Muslim	3681	91.5	30.27	35.00
Non Muslim	342	8.5	31.99	35.00
Wealth Index				
Poor	1670	41.5	30.96	35.00
Middle	787	19.6	30.72	35.00
Rich	1566	38.9	29.69	35.00
Education of fathers				
No education	1501	37.3	31.04	35.00
Primary	1060	26.3	30.94	35.00
Secondary	1018	25.3	29.64	35.00
Higher	444	11.0	28.69	35.00
Education of mothers				
No education	1354	33.7	30.52	35.00
Primary	1249	31.0	31.33	35.00
Secondary	1154	28.7	29.97	35.00
Higher	266	6.6	27.37	30.36
Total	4023	100	30.41	35.00

Estimation is limited to the largest survival time if it is censored.

health, and maternal status. The survey considered ever-married women of reproductive age as eligible for interview. A sample of 10,500 households was selected from which 11,440 women were inter-

viewed. In total, 4023 mothers provided information on the duration of breastfeeding for their last-born child at the time of interview. Breastfeeding recorded in the survey was 60 months but the study included the duration of breastfeeding up to 36 months and ignored the remaining months as outlier.

Table 2: Cox's proportional hazard model estimates of relative risk of duration of breastfeeding by socio-economic and demographic characteristics, Bangladesh, 2004.

Characteristics	Coefficient	P value	Hazards Ratio	95% CI for Hazard Ratio	
				Lower	Upper
Age (years) of mothers					
10-19	0.033	0.830	1.034	0.762	1.403
20-29	-0.066	0.550	0.936	0.753	1.163
30 and above	-	-	1.000	-	-
Age (years) at first marriage of mothers					
10-14	-1.035	0.004	0.355	0.175	0.720
15-19	-0.951	0.007	0.386	0.194	0.768
20-24	-0.627	0.081	0.534	0.264	1.081
25 and above	-	-	1.000	-	-
Delivery status					
Normal	-0.290	0.117	0.748	0.520	1.075
Caesarian	-	-	1.000	-	-
Region of Residence					
Barisal	-0.370	0.066	0.690	0.465	1.025
Chittagong	0.302	0.041	1.352	1.012	1.806
Dhaka	-0.196	0.213	0.822	0.604	1.119
Khulna	-0.648	0.001	0.523	0.356	0.769
Rajshahi	-0.443	0.011	0.642	0.456	0.905
Sylhet	-	-	1.000	-	-
Place of Resident					
Urban	0.119	0.250	1.127	0.919	1.381
Rural	-	-	1.000	-	-
Religion of respondent					
Muslim	0.680	0.001	1.973	1.329	2.930
Non Muslim	-	-	1.000	-	-
Wealth Index					
Poor	-0.049	0.712	0.953	0.736	1.233
Middle	-0.012	0.930	0.988	0.751	1.298
Rich	-	-	1.000	-	-
Education of fathers					
No education	-0.107	0.611	0.898	0.594	1.359
Primary	-0.106	0.604	0.899	0.602	1.343
Secondary	0.132	0.458	1.142	0.805	1.620
Higher	-	-	1.000	-	-
Education of women					
No education	-0.201	0.416	0.818	0.504	1.328
Primary	-0.466	0.049	0.628	0.394	0.999
Secondary	-0.216	0.296	0.806	0.538	1.207
Higher	-	-	1.000	-	-

Independent variables: The independent variables, all measured at the survey date, were grouped into three categories: demographic, socio-economic and cultural variables. The demographic variables included age of mother, age-at-marriage and delivery status.

The socioeconomic variables included region of residence/administrative division, place of residence, wealth index, the highest level of education of the mother and the father. Religion was included as a cultural variable. Information regarding the household items (*i.e.*, television, radio or car) and dwelling characteristics such as main floor materials,

main roof material and sources of drinking water were assigned a weight or factor score generated through principle component analysis (score is not shown here). The resulting scores were distributed normally with mean zero and standard deviation one. Each household was assigned a standard score for each asset. Standard household scores were added up for each household, and each woman was assigned the total household asset score for her household. Women were ranked according to their total scores and divided into five quintiles (Q<sub>1</sub>, Q<sub>2</sub>, Q<sub>3</sub>, Q<sub>4</sub> and Q<sub>5</sub>) to understand the health inequality. Among the five quintiles Q<sub>1</sub> and Q<sub>2</sub> were considered as poor group, Q<sub>3</sub> as middle and Q<sub>4</sub>, Q<sub>5</sub> the rich group.

The association of the duration of breastfeeding with all the explanatory variables included in this study was first checked by the Chi-square statistic. Chi-square statistic has also been used to test the goodness of fit of the model as well as to test the significance of the explanatory variables.

Both univariate and multivariate proportional hazards model analysis were used to study the duration of breastfeeding. The univariate proportional hazard model analysis was used to give a measure of the effect of each variable on the duration-specific probabilities of the duration of breastfeeding (hazard function) in the absence of the control for other variables. A multivariate proportional hazard model analysis was then undertaken to measure the effect of each category of each variable on the hazard function while controlling the effects of the other variables (and their categories) included in the model. A relative risk of 1.00 was considered to indicate baseline category or reference for each variable. A relative risk greater than 1.00 was taken to indicate higher risks of occurrence of the event than the reference category or vice-versa. Confidence interval (95%) of relative risk indicated the level of significance.

Bivariate and multivariate statistical techniques were used for studying the predictor variable—duration of breastfeeding—in relation to the explanatory variables. Survival (Life-table and Kaplan Meier) analysis provides a good understanding of breastfeeding behavior over time. The factors affecting the duration of breastfeeding were investigated in a regression using Cox's proportional hazard model<sup>[5]</sup>. This model was used for determining the covariates that were significantly associated with the duration of breastfeeding. The hazard ratio (odds ratio) for breastfeeding and its 95% confidence interval (CI) were calculated for the sociodemographic and cultural factors associated with breastfeeding. The data obtained were analyzed using the SPSS software (version 13.0) and M S Excel.

### Duration of breastfeeding

Breast milk can make the difference between healthy growth and malnutrition, between life and death. When it comes to nutrition, the best first food for babies is breast milk. It has been found that babies given cow's milk or formula by bottle and no breast-milk have over 60% more risk of being malnourished. Almost 5 million babies each year are at risk of poor nutrition because of inadequate breastfeeding practices in rural areas<sup>[6]</sup>. In our study majority (70%) lived in rural area and only 30% lived in urban areas. Maximum (82%) women got married at adolescent age (10-19 years). More over 91% were Muslim and only 9% were non-Muslim (Hindu, Christian and Buddhist).

In this study mean and median duration of breastfeeding of Bangladeshi women under study was 30.4 and 35.0 months respectively (Table 1).

The mean and medium duration of breastfeeding was 28.8 and 32.4 months respectively<sup>[7]</sup>. The mean duration of breastfeeding<sup>[8]</sup> was found about 26.4 months for the last child.

Mothers who were married at an early age had a longer duration of breastfeeding than those who were married in older age. The average duration of breastfeeding was 30.57 months for mothers who gave birth normally (vaginally) compared to 26.93 months for those who were delivered by caesarian. The mean duration of breastfeeding was almost same in all administrative area except Chittagong (27.98 months) division.

The urban mothers breastfed their children for a relatively shorter duration (29.62 months) than the rural mothers (30.78 months). The non-Muslim mothers breastfed for a longer duration (31.99 months) than the Muslim mothers (30.27 months). In this study, the mean duration of breastfeeding was 30.96, 30.72 and 29.69 months for poor, middle and rich income group women respectively.

Table 2 shows the results (Odds Ratio) of the proportional hazards model for the duration of breastfeeding. Women who got married at an early age ( $\leq 14$  years) had a lower risk of stopping breastfeeding compared to women who were married at an older age (25 years and over). Normal delivery was associated with a 25% less likelihood of terminating breastfeeding compared to birth by caesarean section. The mothers of Chittagong and Sylhet divisions were more likely to terminate breastfeeding early compared to the mothers in other divisions.

Mothers who lived in urban area were 1.13 times more likely to terminate breast-feeding than the mothers who lived in rural area. The odds of stopping breastfeeding for Muslim mothers were higher (OR 1.97) than the Non-Muslim counterparts. Hazard ratio shows the risk of terminating breastfeeding was lower among mothers with no formal, primary or secondary education than the mothers who had higher education. Risk of terminating breastfeeding was higher among mothers whose husbands had secondary and higher education than those with primary and No education

## RESULTS AND DISCUSSION

The study estimated mean and median duration of breastfeeding of Bangladeshi women are estimated to be 30.4 and 35.0 months respectively. Past studies in Bangladesh obtained average duration of breastfeeding are 28.2, 31.3 and 31.9 months<sup>[9-12]</sup> respectively for surviving children, which was close to our study. Compared to South Asian countries e.g, India, Pakistan and Sri Lanka where the average durations of breast-feeding were 18.4, 21.8 and 23.2 months<sup>[13-15]</sup> respectively, where the breast-feeding duration is relatively higher in Bangladesh Age of marriage of women  $\leq 14$  years, 15-19 years and 20-24 years were less likely to terminate breastfeeding

than women who were married at 25 and above years. Mothers from Chittagong and Sylhet were more likely to terminate breastfeeding earlier than those from Barisal, Dhaka, Khulna and Rajshahi division. Muslim mothers had higher risk of terminating of breastfeeding than non-Muslim mothers (Hindu, Christian and Buddhist). The previous study reported non-Muslim mothers breastfeed longer than Muslim mothers in the country<sup>[8,9,12,16]</sup>.

Mothers from rich families had shorter duration of breast-feeding. The reasons might be that economically affluent families could afford to buy powder milk, other baby formulae, wet nurses *etc.* Figure consciousness among the mothers of higher educated and high-income group also could be a reason for shorter breast-feeding duration.

Mothers should be informed about the value of colostrums and the need for breastfeeding the neonates on demand with special emphasis on the direct positive relationship of higher frequency of suckling and increase in breast milk flow. Also should inform the adverse effects of bottle-feeding and use of tinned milk and milk from sources other than breast milk. Mothers should be informed about the maternal health benefit of breastfeeding including lactational amenorrhoea and its contraceptive effect, which increases birth interval and maintains good health of the mothers.

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