Factors Associated with Duration of Breastfeeding in Bangladesh: Evidence from Bangladesh Demographic and Health Survey 2014

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Abstract

Background: Breastfeeding is one of the most effective ways for reducing infant mortality and confirming optimal growth and development of children. The aim of this study was to find the effect of socio-demographic determinants on duration of breastfeeding among Bangladeshi mothers.

Methods: The data was extracted from the Bangladesh Demographic and Health Survey (BDHS)-2014. A total of 3541 married non–pregnant Bangladeshi mothers in reproductive age who had at least one child aged 6-36 months were included. Independent sample t-test and ANOVA were used to find the significance deference in duration of breastfeeding between two and more than two groups respectively. Multiple linear regression model was utilized to determine the effect of some quantitative variables on duration of breastfeeding among Bangladeshi mothers.

Results: This study raveled that the mean duration of breastfeeding among Bangladeshi mothers was 18.91±7.98 (95% CI: 18.65-19.17) and median was 19.00 month. Independent sample t-test provided that short duration of breastfeeding was observed among; (i) mothers received antenatal care facilities during their pregnancy period, (ii) Muslim and (iii) delivered their last child by caesarean section. ANOVA showed that duration of breastfeeding significantly influenced by (i) parents' education, (ii) geographical location and (iii) household wealth quintile. Multiple regression analysis demonstrated that mothers' age, mothers' body mass index, total number of children and mothers' mothers' age at first birth were important predictors of duration of breastfeeding.

Conclusion: Health care providers and decision makers can consider these findings to make plan for counseling of mothers and family members to promote optimal duration of breastfeeding practice in first three years of baby's life.

Background

Over the last decade, scientific evidence supporting the integral role of breastfeeding in the survival, growth and development of a child, as well as in the health and wellbeing of mothers, has brought to light. The world health organization (WHO) and UNICEF recommend that optimal early breastfeeding particularly within one hour after birth should be encouraged by the health care professionals in health facilities [1]. According to WHO, only breast milk can ensure a complete nutritional requirements that a baby needs for growth, health and development in first six months of life [2]. Infants should be exclusively breastfeed to achieve optimal growth, development and health [2]. Furthermore, it is safe and contains antibodies that help to protect infants and boost immunity. Consequently, breastfeeding contributes to reduce infant morbidity and mortality due to diarrhea, respiratory or ear infections and other infectious diseases [3]. One of the study clearly mentioned that suboptimum breastfeeding increase the risk of mortality in first two or more years of life [4]. In addition, breast feeding is inexpensive, easily available, clean and at the right temperature which help in eliminating family cost and undue sufferings. Breastfeeding also delays the return of fertility and reduces the risk of developing breast and ovarian

cancers [5]. Thereafter, infants should receive nutritionally adequate and safe complementary foods, while continuing to breastfeed for up to two years [6, 7]. However, knowledge and attitudes of duration of breastfeeding among mothers are influenced by multiple factors, including sociocultural, demographical and physiological factors [8–14].

This study was designed to work towards the health related issues under the Sustainable Development Goals (SDGs). Statistics indicates that optimal breastfeeding practices are still sub-optimal in Bangladesh and this presents a challenge to meet the SDGs by 2030. Subsequently, the benefits of breastfeeding are only taken advantage to the full when it continues for at least two years with complementary feeding [15]. To the best of our knowledge, duration of breastfeeding practices has rarely been studied in the context of Bangladesh by using BDHS-1999-2000 [16] and BDHS-2004 dataset [17]. None of these studies considered mothers' BMI as a factor associated with duration of breastfeeding although some studies showed that BMI was significantly associated with breastfeeding status [18, 19]. Within this overlong time, there has been a notable change in socio-economic status of Bangladeshi people [20]. However, there was no study available for investigating the associated factor of duration of breastfeeding using BDHS-2014 dataset.

The aim of the current study was to determine the effect of socio-economic and demographic variables on the duration of breastfeeding among Bangladeshi mothers.

The Study Was Based On The Following Hypotheses:

H_{01}: Socio-economic factors are significantly associated with duration of breastfeeding.

H_{02}: Demographic factors have impact on the duration of breastfeeding.

H_{03}: Duration of breastfeeding is associated with anthropometric measurements.

Methods

Study design and population: Bangladesh Demographic and Health Survey (BDHS)-2014 collected socio-demographic, health, anthropometric and lifestyle information from 17,863 Bangladeshi married women aged 15 to 49 years. The data utilized in the existing study was extracted from the large scale of dataset collected by the recent data series BDHS-2014. The data was collected from March 24, 2014 to August 11, 2014. BDHS-2014 had taken information on duration of breastfeeding among their children born in the three years preceding the survey. This was a nationally representative survey which covered all administrative regions (divisions) of Bangladesh. All information regarding study design, study population, data collection technique, instruments, data reliability, questionnaire etc. have been described elsewhere [21]. It was mentionable that the last survey of BDHS was done in 2014, the latest nationally representative data was used in this study.

Sampling: BDHS-2014 used two stage stratified random sampling for selecting sample from urban and rural areas from each administrative division such as Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur and Sylhet. Bangladesh Bureau of Statistics (BBS) divided Bangladesh into many small areas called enumeration areas (EA) for population and housing census. BDHS-2014 considered EA as the primary sampling unit (PSU) for their survey. In the first stage, BDHS-2014 randomly selected 600 EAs, with 207 EAs in urban and 393 in rural areas. In the second stage, they selected on average 30 households from each EA using systematic sampling. BDHS-2014 interview was successfully completed in 17,300 (99%) households. A total of 18,245 ever-married women in reproductive age were identified in these households and 17,863 were interviewed. From the preliminary sample, the mothers were excluded for the present study who had no children. The mothers who had children aged less than 6 months were also excluded from the present study. Besides these, some incomplete information and missing samples were also excluded from the data, 3541 samples were considered for the final analysis.

Dependent variable: The duration of breastfeeding among Bangladeshi mothers who had at least one child aged 6–36 months was the dependent variable for this study.

Independent variables: The quantitative variables for this study were: mothers' age, mothers' body mass index (BMI), total number of ever born children and mothers' age at first birth. The qualitative variables were: antenatal care (ANC) visits during pregnancy, mothers' education level, fathers' education level, geographic location (division), religion, sex of children, place of residence, mode of delivery and household wealth quintile ((wealth index (WI)). The categories and codes of qualitative variables were given in Table 1 (Table 1).

Table 1
Qualitative variables with their categories and codes

Variables	Category (Code)
ANC visits (at least one time) during pregnancy	No (0), Yes (1)
Mother's education level	Uneducation (0), Primary (1), Secondary (2), Higher (3)
Father's education level	Uneducation (0), Primary (1), Secondary (2), Higher (3)
Geographical location (Division)	Barisal (1), Chittagong (2), Dhaka (3), Khulna (4), Rajshahi (5), Rangpur (6), Sylhet (7)
Religion	Muslim (1), Non-Muslim (2)
Sex of children	Male (1), Female (2)
Place of residence	Urban (1), Rural (2)
Mode of delivery	Vaginal (0), *C*esarean (1)
Household wealth index	Poor(1), Middle (2), Rich(3)

Statistical analysis: Independent sample t-test and one-way analysis of variance (ANOVA) were used to find the significant difference in duration of breastfeeding between two and more than two groups respectively. Data was checked for the standard assumptions of independent sample t-test and ANOVA. Multiple linear regression analysis was used to find the average relationship between the duration of breastfeeding and predictor variables. Variation inflation factor (VIF) was used to check for the multicollinearity problem among the predictor variables in multiple linear regression analysis. According to Chatterjee and Hadi, if the value of VIF lies between 0 to less than 5, there is no evidence of multicollinearity problem; if this value lies between 5 to less than 10, there is a moderate multicollinearity problem and if this value is greater than or equal to 10, there is a serious multicollinearity problem of variables [22]. It was informed that the variation in duration of breastfeeding among clusters (EAs) was not significant, no need to apply multilevel model for removing cluster effect. We selected STATA (version 11) and SPSS software (version IBM 22) for statistical analyses, and statistical significance was accepted at $p < 0.05$.

Results

A total of 3541 mothers having children aged 6–36 months were included in the study to investigate the socio-demographic determinants on duration of breastfeeding in Bangladesh. The mean duration of breastfeeding among Bangladeshi mothers was 18.91 ± 7.98 month (95% CI: 18.65–19.17) and median was 19.00 month. Kolmogorov-Smirnov and Levene tests were used to check the normality and group homogeneity of our dependent variable respectively, these tests showed that there was no serious problem regarding normality and homogeneity. It was found, more than 78% mothers received ANC services during their pregnancy period, and independent sample t-test demonstrated that the duration of breastfeeding was significantly ($p < 0.01$) shorter (18.63 ± 7.99 month) among the mother who received ANC than mothers those did not receive (18.63 ± 7.99 month). Muslim mothers had practice to provide their breast milk to their children in shorter duration (18.82 ± 7.88 month) than Non-Muslim mothers (20.10 ± 9.11 month) ($p < 0.05$). The duration of breastfeeding was longer (19.10 ± 7.97 month) among vaginal delivered mothers compared with caesarean delivered mothers (18.27 ± 7.98 month) ($p < 0.01$). It was noted that the duration of breastfeeding among mothers decreased with increasing their education level, and ANOVA showed that the variation of duration of breastfeeding among mothers' education level was significant ($p < 0.05$). Almost same pattern of breastfeeding was observed among fathers' education level ($p < 0.01$). Highest mean value of duration of breastfeeding was found among mothers living in Rangpur division (20.00 ± 8.27 month) followed by Khulna (19.38 ± 8.37 month), Barisal (19.17 ± 8.11 month), Sylhet (19.16 ± 7.66 month), Rajshahi (18.97 ± 8.31 month), Chittagong (18.33 ± 7.31 month) and Dhaka (17.99 ± 8.01 month). The variation of breastfeeding among divisions was statistically significant ($p < 0.01$). It was found that the mean value of duration of breastfeeding decreased with increasing the household quintile index, and the variation was significant ($p < 0.05$). We did not find the significant difference in duration of breastfeeding between urban and rural mothers ($p > 0.05$), and male and female children ($p > 0.05$) (Table 2).

Table 2
Duration of breastfeeding among mothers by socio-demographic factors

Socio-demographic factors	Group	N (%)	Mean (in Months)	SD	Value of t-statistic	Value of F-statistic
ANC	Yes	2768 (78.2)	18.63	7.99	3.89 **	
	No	773 (21.8)	19.89	8.00		
Religion	Muslim	3250 (91.8)	18.82	7.88	-1.88*	
	Non-Muslim	291 (8.2)	20.10	9.11		
Place of residence	Urban	1143 (32.3)	18.71	8.11	-1.00	
	Rural	2398 (67.7)	19.00	7.92		
Sex of child	Male	1807 (51)	18.79	8.06	-0.90	
	Female	1734 (49)	19.03	7.89		
Mode of delivery	Caesarean	831 (23.5)	18.27	7.98	2.64**	
	Vaginal	2710 (76.5)	19.10	7.97		
Mothers' educational level	Uneducated	471 (13.3)	19.80	7.96		3.61*
	Primary	975 (27.5)	19.15	8.13		
	Secondary	1705 (48.20)	18.66	7.90		
	Higher	390 (11.00)	18.27	7.85		
Fathers' educational level	Uneducated	828 (23.4)	19.99	8.02		7.10**
	Primary	1059 (29.9)	18.78	7.95		

*denotes 5% level of significance; ** denotes 1% level of significance

Socio-demographic factors	Group	N (%)	Mean (in Months)	SD	Value of t-statistic	Value of F-statistic
	Secondary	1109 (31.3)	18.40	7.89		
	Higher	545 (15.4)	18.52	7.98		
Division	Barisal	415 (11.7)	19.17	8.11		3.78**
	Chittagong	674 (19.0)	18.33	7.31		
	Dhaka	626 (17.7)	17.99	8.01		
	Khulna	422 (11.9)	19.38	8.37		
	Rajshahi	436 (12.3)	18.97	8.31		
	Rangpur	446 (12.6)	20.00	8.27		
	Sylhet	522 (14.7)	19.16	7.66		
Wealth index	Poor	1410 (39.8)	19.29	8.04		3.619*
	Middle	677 (19.1)	18.98	7.95		
	Rich	1454 (41.1)	18.50	7.90		

*denotes 5% level of significance; ** denotes 1% level of significance

In Table 3, we observed that VIF values of all predictors lies between 0 and 5; there was no evidence of multicollinearity problem among the predictors. Multiple linear regression model showed that the mothers' age had significant ($p < 0.05$) positive effect on duration of breastfeeding. BMI of mothers had significant ($p < 0.05$) positive effect on duration of breastfeeding. However, total number of children ever born and mothers' age at first birth had a significant ($p < 0.05$) negative effect on duration of breastfeeding (Table 3).

Table 3
Effect of socio-demographic factors on duration of breastfeeding

Predictors	Coefficients	SE	95% CI		VIF
			Lower	Upper	
Mothers' age	0.638**	0.045	0.542	0.721	4.058
Mothers' BMI	0.091**	0.034	-0.061	0.073	1.025
Total children ever born	-1.735 **	0.177	-2.081	-1.386	3.782
Mothers' age at first birth	-0.633**	0.058	-0.519	0.493	2.028
*denotes 5% level of significance; ** denotes 1% level of significance					

Discussion

In the present study, we investigated the socio-economic and demographic factors associated with the duration of breastfeeding among Bangladeshi mothers. It was found that duration of breastfeeding was shorter among the mother who received ANC than who did not. Our results did not coincide with other study [23]. They found that duration of breastfeeding was longer among the mothers who visited ANC. This dissimilarity has happened due to urban mothers received more antenatal service (ANC) than rural mothers in Bangladesh [24, 25] and urban mothers breastfed their children for shorter period than rural mothers. It was also observed that younger mothers breastfed their children for shorter period than older mothers. Similar results were also found in Brazil [26, 27], China [28] and Kuwait [29, 30]. This may be due to lack of experience and knowledge of younger mother regarding breastfeeding. In addition, they may receive less counseling on benefits of breastfeeding. Our results indicated no significant difference in duration of breastfeeding between male and female children. This finding was supported to a previous study [29]. In the present study, it was detected that educated mothers breastfed their children for shorter period than comparatively low educated mothers. Our result coincided with other studies in Nigeria [23] and Kuwait [29, 30]. The higher educated women have more opportunities in the workforce and tend to choose their career over fertility-related matters [31]. Higher educated and working mothers might not provide breastfed their children for long time due to demand of occupation [32, 33]. Educational status was one of the most important factors that influence breastfeeding practices which concords with the study conducted in Malaysia [34]. In this study, short duration of breastfeeding was noticed among caesarian mothers. Similar findings were also observed in China [35] and in Vietnam [36]. Thus mode of delivery can be stated as an important indicator for the breastfeeding duration. It was found that the mothers who delivered a large number of children had negative effect on duration of breastfeeding in Bangladesh. In 2018, Al-Kandari also found the same results among Kuwaiti mothers [30]. The fathers' educational level was also an important factor for duration of breastfeeding discovered by the present study. This result supported by other studies [30, 37]. It was observed that mothers who lived in Dhaka division breastfed for shorter period than other divisions in Bangladesh. Women living in Dhaka division, the Capital city of Bangladesh are comparatively in average more educated than women living in other

divisions [38]. Our findings suggested that women who had completed at least primary education, breastfeed their children for shorter period than illiterate women. Thus geographic factor can be mentioned as an important determinant for the duration of breastfeeding.

Strength and limitations of the study

Some studies have been done in initial and exclusive breastfeeding among Bangladeshi mothers extracting data from nationally representative dataset BDHS-2014. Perhaps this was the first time we attempt to do research in duration of breastfeeding among Bangladeshi mothers using BDHS-2014 dataset, which was the major strength of this study. However, there were some limitations of this study. This study was conducted using secondary data and it was bounded by the limitations of those data. Because of being a cross-sectional study, it was difficult to set up a causal relationship between socio-demographic, demographic and anthropometric factors and duration of breastfeeding among mothers in Bangladesh. Last night self-recall method was used for assessing breastfeeding duration whereas longitudinal study was more effective. A large number of subjects dropped out of this study, probably due to its limited duration. From the literature review, we observed that some independent variables were very important predictor for breastfeeding but we could not include those variables such as ethnicity, birth order, gestational age etc. [39]. Though we used the latest nationally representative data but it was already passed six years. Cleary more research is required with duration of breastfeeding among Bangladeshi mothers using new nationally representative data.

Conclusions

In the present study, we tried to determine the factors which were related to duration of breastfeeding among mothers in Bangladesh using nationally representative data collected by BDHS-2014. Our selected statistical technique/models provided that ANC, religion, mode of delivery, parents' education, geographic location (division), mothers' age, mothers' BMI, total ever born children, mothers' age at first birth and household wealth quintile were associated factors of duration of breastfeeding among Bangladeshi mothers. The socio-demographic factors related to overall duration of breastfeeding can be a valuable appliance when planning local actions and policies aimed at improving breastfeeding rates. The present study indicated that the breastfeeding-promotion programme in Bangladesh should address our findings. Government should take proper care and more attention to adolescent mothers to provide guidance, encouragement and support for breastfeeding and also try to reduce the frequency of adolescent pregnancy.

Abbreviations

ANOVA: Analysis of variance; BBS: Bangladesh Bureau of Statistics; BDHS: Bangladesh Demographic and Health Survey; BMI: Body Mass Index, CI: Confidence Interval; EA: Enumeration area; NIPORT: National Institute of Population Research and Training; PSU: Primary SamplingUunit; SDGs: *Sustainable Development Goals;* SE: Standard error; SPSS: Statistical Package For Social Sciences; UNICEF: United

Nations International Children's Emergency Fund; VIF: Variance inflation factor; WHO: World Health Organization.

Declarations

Competing interests: The authors have no conflict of interests.

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Authors Contributions: UA and MGH conceptualized and designed the research; UA and ASMAM analyzed the data; UA drafted the original manuscript; MGH, ASMAM and MAS critically reviewed and edited the manuscript. All the authors read, discussed and approved the final version of the manuscript for publication.

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