Unintended pregnancies are associated with less likelihood of prolonged breast-feeding: an analysis of 18 Demographic and Health Surveys

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Abstract

Objective: To examine the relationship between unintended pregnancies and prolonged breast-feeding among 18 countries on an individual and aggregated level.

Design and setting: Regional multivariate logistic regression analyses were conducted to examine this association based on 18 Demographic and Health Surveys conducted between 1995 and 2000.

Subjects: Women who had a live child between 13 and 36 months old were included in these analyses ($n = 41\,353$).

Results: Regression models were adjusted for 10 covariates including child age, maternal age, pregnancy status of mother at the time of interview and parity. In 11 out of the 18 countries the odds ratio (OR) of the association between unintended pregnancies and prolonged breast-feeding was < 1.0, reaching statistical significance in three countries. Pooled analyses of all 18 countries detected a significant association between unintended pregnancies and less likelihood of prolonged breast-feeding (OR = 0.90, 95% confidence interval = 0.85–0.96).

Conclusions: Prospective studies are needed to further understand if and how pregnancy intentions influence breast-feeding outcomes in different settings.

With over one-third of pregnancies worldwide as unintended[1] (either mistimed or unwanted), recent studies have focused on maternal pregnancy intentions as a predictor of breast-feeding initiation and duration. Several studies in the USA and developing countries have linked unintended pregnancies to lower initiation rates and shorter durations of breast-feeding. Two separate US-based studies, analysing secondary datasets from national surveys, found that women with unwanted pregnancies were less likely to breast-feed than women who planned their pregnancies[2,3]. One of those studies also found that women with unintended pregnancies who initiated breast-feeding were more likely to stop breast-feeding sooner than their counterparts with planned pregnancies[3]. Similarly, a 1995–1996 study in a central New York hospital showed that women who did not intend to become pregnant (either mistimed or unwanted) were less likely to plan to breast-feed their child after hospital discharge than those women who planned their pregnancy[4].

Studies in developing countries have focused on pregnancy intentions as a predictor of breast-feeding duration into the second and third year of life[5,6]. Two studies to date based on Demographic and Health Survey (DHS) data from Peru and Ghana found that women with unintended pregnancies (mistimed and unwanted combined) were more likely to breast-feed for shorter periods of time than those women with intended pregnancies[5,6]. Peruvian mothers were also more likely to initiate breast-feeding if they had planned their pregnancy[5]. The study from Ghana found a statistical interaction between parity and pregnancy intentions on the likelihood of breast-feeding. The authors showed that primiparous women with unintended pregnancies breast-fed for shorter periods of time (median duration 18.5 months) compared with those with planned pregnancies (median duration 21.1 months)[6].

To our knowledge, no studies have investigated whether the relationship between pregnancy intentions and prolonged breast-feeding is global or if it is country-specific. Thus, the objective of this secondary data analysis was to determine if there is an association between unintended pregnancy and breast-feeding beyond the first year of life based on a pooled sample of 18 DHS surveys.

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Methods

Selection of datasets

Forty-six DHS III surveys were conducted in 40 different countries between 1995 and 2000[7]. Over 30 surveys conducted within those 5 years had complete, accessible DHS III survey data by 31 December 2000[7]. The countries with eligible surveys were grouped into six regions: Africa, Americas, Central Asia/Former Soviet Republics, North Africa/Mediterranean, Southeast Asia and Western Pacific. Within each region, the country with the largest sample size was automatically selected for analyses to maximise statistical power. Of the remaining eligible countries, 50% within each region were randomly selected using the Statistical Package for the Social Sciences (SPSS). For those regions that had an odd number of countries listed, slightly over 50% of the countries were randomly chosen to avoid under-representing the region.

In total, 18 countries were selected for the final analyses (Table 1). Of those countries selected, eight were from Africa, four were from the Americas, two were from Central Asia/Former Soviet Republics, one was from North Africa/Mediterranean, two were from Southeast Asia, and one from the Western Pacific. The number of women aged 15–49 years surveyed for the DHS III varied among the 18 countries. Kazakhstan and Uzbekistan, in the Central Asia/Former Soviet Republics region, had the smallest

Table 1 Demographic and Health Survey (DHS) countries included in the study

Region/country	Year of data collection	Number of women aged 15–49 years surveyed in DHS III†
Africa		
Benin	1996	5491
Burkina Faso	1998–99	6445
Cameroon	1998	5501
Chad	1996–97	7454
Madagascar	1997	7060
Mali	1995–96	9704
Niger	1998	7577
Togo	1998	8964
Americas		
Bolivia	1998	11 187
Guatemala	1995	12 403
Nicaragua	1997–98	13 634
Peru	1996	28 951
Central Asia/Former Soviet Republics		
Kazakhstan	1995	3771
Uzbekistan	1996	4415
North Africa/Mediterranean		
Egypt	1995	14 779
Southeast Asia		
Bangladesh	1996–97	9127
Indonesia	1997	28 810
Western Pacific		
Philippines	1998	13 983

† Reflects the whole population of women sampled in the DHS survey. From this population we determined the sub-sample used in the analyses presented.

sample sizes of the 18 countries with 3771 and 4415 women surveyed, respectively. In contrast, Indonesia and Peru, in Southeast Asia and the Americas regions, respectively, both had the largest sample sizes, each reaching almost 29 000 women surveyed.

Sub-sample selection

The sub-sample included in the analyses to determine the likelihood of prolonged breast-feeding as a function of pregnancy intention was based on women whose last-born child was alive and between 13 and 36 months of age. Preliminary analyses on children ≤ 36 months of age showed that the great majority of women (88% on average) were breast-feeding up to 12 months of age. Therefore, the analyses reported in this paper focused on children between 13 and 36 months of age. Additionally, women without children, and mothers whose last-born child was not alive at the time of the survey and died between 13 and 36 months of age, were excluded from these analyses because they were categorised in the DHS III survey as not breast-feeding.

Variables

Dependent variable

Women in the DHS III surveys were asked whether they were currently breast-feeding. In our analyses, this dichotomous variable indicated whether the index child was breast-feeding or not at the time of the survey (with or without complementary feeding). For this study, the dependent variable, prolonged breast-feeding, was defined as breast-feeding between 13 and 36 months of age.

Independent variables

The main independent variable included in these analyses was pregnancy intentions. Women reported retrospectively if their last pregnancy (corresponding to the index child) was wanted then (planned), wanted later (mistimed) or not wanted at all (unwanted). Pregnancy intentions were classified as a dichotomous variable in two ways: (1) using unintended pregnancy and planned pregnancy categories, and (2) using unwanted pregnancy and wanted pregnancy categories. Women who reported that their most recent pregnancy was wanted later or not wanted at all were categorised as unintended pregnancies and planned if they reported otherwise. Women who reported that their most recent pregnancy as wanted then or wanted later were categorised as wanted pregnancies and unwanted if they reported the pregnancy was not wanted at all.

Covariates entered in the individual country analyses were: child's age (months), the square of the child's age (months²), child's gender (male or female), place of residence (urban or rural), maternal employment (yes or no), parity (primiparous or multiparous), maternal age,

pregnancy status of the respondent at the time of the interview (no/unsure or yes), maternal education (none, primary, secondary, higher) and marital status (partner or no partner). For all African countries as well as Guatemala and Bangladesh, secondary and higher education categories within the covariate of maternal education were merged due to low statistical power in the latter category. Primary and secondary education categories were merged for the countries Kazakhstan and Uzbekistan due to low statistical power in the former category.

The covariates of child's age (months) and the square of the child's age (months^2) were entered to properly model the likelihood of breast-feeding across time. The square of the child's age term allows for the proper mathematical modelling of breast-feeding secular trends across countries that have different rates of breast-feeding declines during the first year of life.

Two covariates included in the individual country analyses were excluded from the final model. Indonesia did not have employment data; thus this variable was not included in this country's analysis or in the final pooled model. Maternal education was also excluded from the final model because of the high collinearity with country, a variable included in the analyses to account for unmeasured country differences.

Statistical analyses

All analyses were conducted using SPSS for Windows, version 11.0 (SPSS Inc., Chicago, IL, USA). Individual country analyses presented in this paper document the association between unintended pregnancy intentions and the likelihood of prolonged breast-feeding among primiparous and multiparous women combined. Additional analyses were conducted by parity status but did not justify presenting separate regression results for primiparous and multiparous women. Additional analyses were also conducted to examine the association between unwanted pregnancy (vs. mistimed and wanted) and the likelihood of prolonged breast-feeding. These analyses were run with parity as a main effect or interacting with pregnancy intentions. For many countries the sample sizes for the category of unwanted pregnancy intentions were small, particularly among primiparous women, yielding inconclusive results. Thus, these results are not presented here.

Countries' sample weights were applied to descriptive statistics generated for both the whole sample of women surveyed as well as the sub-sample used in these analyses. Multivariate logistic regression analyses were run using breast-feeding status between 13 and 36 months of age as the dependent variable. The independent variable of pregnancy intentions (categorised as unintended and planned) and the 10 covariates previously listed were included in the analyses. Results are presented as odds ratios (OR) and their respective 95% confidence intervals (95% CI). Independent variable and covariates were

considered to be significantly associated with the likelihood of prolonged breast-feeding if the 95% CI excluded the value of 1.0.

All eighteen countries were pooled together to maximise statistical power and to find out if there is an association between pregnancy intentions and the likelihood of prolonged breast-feeding among children 13–36 months of age on a global level. A weight proportional to the sample size of each country was applied to the pooled analyses to adjust for differences in sample sizes. Thus, the equation $1/[18 \times (n_C/n_T)]$ was used, where n_C is the sample size for each country and n_T is the sample size for the pooled data. The goodness-of-fit of the model was tested with the Hosmer–Lemeshow test. The population-attributable risk percentage (PAR%) for not practising prolonged breast-feeding was estimated for each risk factor identified in the pooled analysis using the formula $PAR\% = ([Pe \times (RR - 1)]/\{1 + [Pe \times (RR - 1)]\}) \times 100$, where Pe is the proportion exposed to the risk factor and RR is the relative risk (or odds ratio).

Results

Descriptive information

Sample surveyed for DHS III

Women surveyed in all 18 countries were, on average, in their late twenties or early thirties, with Egypt and Indonesia having the highest mean of 33 years. Women had an average of two to four children, with the average age of their last-born child ranging from 37.8 months in Niger to 95.9 months in Kazakhstan. The percentage of women with formal education varied among countries. Fourteen per cent of women in Burkina Faso had some level of formal schooling as compared with 99.9% in Kazakhstan and Uzbekistan. The majority of women in the African countries, Guatemala, Uzbekistan, Egypt and Southeast Asian countries resided in rural areas. Less than half of the women in Chad, Guatemala, Nicaragua, Uzbekistan, Egypt, Bangladesh and the Philippines were working at the time of the survey. Only a small percentage of women surveyed were currently pregnant, ranging from 4% in Kazakhstan to 14% in Chad, Mali and Niger. Finally, between 58% of women in Peru and 93% in Indonesia reported having a partner either by marriage or cohabiting.

Sub-sample

Women in the sub-sample with last-born child alive and aged 13–36 months had similar characteristics to the whole sample of women surveyed for DHS III. Women in the sub-sample for each country were of similar age, parity and education level as those in the country's whole sample. Similar to the whole sample, the majority of the sub-sample of women in each country resided in rural areas. The majority of women in the African and Americas

Table 2 Sociodemographic characteristics by country for the sub-sample of women analysed†

Region/country	Maternal age (years), mean ± SD (n)	Parity, mean ± SD (n)	Maternal education, % without school (n)	Rural residence, % (n)	Currently working, % (n)	Currently pregnant, % (n)	Marital status, % with partner (n)	Gender of child, % male (n)	Pregnancy intentions, % unintended (n)
Africa									
Benin	29.3 ± 7.0 (1423)	4.1 ± 2.6 (1423)	78 (1110)	67 (959)	92 (1307)	17 (237)	96 (1363)	51 (719)	23 (332)
Burkina Faso	29.0 ± 7.1 (1765)	4.2 ± 2.6 (1765)	90 (1591)	89 (1566)	69 (1224)	14 (241)	97 (1717)	49 (893)	23 (398)
Cameroon	27.8 ± 7.0 (1183)	3.9 ± 2.6 (1183)	32 (378)	72 (852)	79 (936)	17 (198)	85 (1002)	50 (591)	28 (329)
Chad	27.8 ± 6.9 (1952)	4.2 ± 2.6 (1952)	78 (1522)	79 (1542)	45 (874)	22 (436)	95 (1850)	50 (975)	9 (169)
Madagascar	28.2 ± 7.1 (1747)	4.1 ± 3.0 (1747)	23 (402)	78 (1364)	82 (1422)	22 (376)	80 (1389)	50 (873)	24 (417)
Mali	29.0 ± 7.1 (2611)	4.7 ± 2.8 (2611)	84 (2198)	73 (1903)	54 (1421)	23 (589)	96 (2504)	50 (1296)	21 (548)
Niger	28.4 ± 7.3 (2171)	4.7 ± 2.9 (2171)	88 (1908)	83 (1794)	55 (1191)	23 (498)	96 (2094)	52 (1134)	10 (227)
Togo	29.8 ± 6.9 (2014)	4.0 ± 2.5 (2014)	62 (1238)	77 (1540)	87 (1754)	16 (316)	94 (1886)	50 (1002)	41 (823)
Americas									
Bolivia	29.4 ± 6.9 (1962)	3.6 ± 2.6 (1962)	10 (197)	40 (791)	53 (1029)	14 (282)	89 (1754)	50 (987)	52 (1017)
Guatemala	28.6 ± 7.1 (2476)	3.9 ± 2.7 (2476)	37 (910)	65 (1618)	26 (637)	20 (498)	92 (2268)	50 (1239)	30 (746)
Nicaragua	27.3 ± 6.9 (2355)	3.4 ± 2.6 (2355)	20 (466)	46 (1074)	36 (841)	11 (247)	81 (1900)	50 (1180)	33 (785)
Peru	29.1 ± 7.0 (4783)	3.3 ± 2.5 (4783)	9 (425)	38 (1803)	52 (2467)	10 (487)	88 (4223)	50 (2378)	60 (2861)
Central Asia/Former Soviet Republics									
Kazakhstan	27.6 ± 5.7 (423)	2.3 ± 1.5 (423)	0 (0)	56 (235)	30 (125)	10 (40)	93 (392)	48 (202)	16 (66)
Uzbekistan	27.4 ± 5.4 (747)	2.7 ± 1.6 (747)	0 (0)	68 (511)	37 (275)	10 (77)	98 (732)	50 (377)	5 (34)
North Africa/Mediterranean									
Egypt	28.8 ± 6.2 (3316)	3.5 ± 2.3 (3316)	42 (1386)	60 (1994)	17 (561)	18 (581)	99 (3268)	53 (1752)	34 (1139)
Southeast Asia									
Bangladesh	25.3 ± 6.1 (1973)	3.0 ± 2.0 (1973)	56 (1111)	91 (1798)	34 (669)	9 (184)	98 (1941)	51 (970)	32 (629)
Indonesia	28.6 ± 6.4 (5425)	2.7 ± 1.9 (5425)	9 (482)	72 (3864)	‡	6 (299)	97 (5282)	49 (2684)	17 (927)
Western Pacific									
Philippines	30.2 ± 6.3 (2118)	3.5 ± 2.4 (2118)	2 (37)	52 (1110)	43 (912)	16 (339)	96 (2038)	53 (1120)	48 (1011)

SD – standard deviation.
† The sub-sample comprises women 15–49 years of age whose last-born child is alive and between 13 and 36 months old. Survey sampling weight applied; weighted sample sizes and weighted estimates are reported.
‡ Data unavailable.

regions reported working, with the exception of Chad, Bolivia and Peru. Only a small percentage of women in the sub-sample surveyed were currently pregnant, and at least 80% of women in each country had a partner either by marriage or cohabiting (Table 2).

Pregnancy intentions and breast-feeding

Descriptive information

Among the whole sample of women who were asked about pregnancy intentions towards their last-born child, responses varied within and across regions. Within Africa, the percentage of women with unintended pregnancies remained under 30% for most countries with the range spanning from 9% in Chad to 42% in Togo. The Americas region had slightly higher percentages of women reporting unintended pregnancies. The lowest percentage of women reporting unintended pregnancies was in Guatemala (32%) and the highest (60%) in Peru. Women within the Central Asia/Former Soviet Republics region were less likely to have an unintended pregnancy with the index child, ranging from 5% in Uzbekistan to 17% in Kazakhstan. In Egypt, within the North Africa/Mediterranean region, 36% of all women surveyed reported that their last pregnancy was unintended. Women in Bangladesh and Indonesia in Southeast Asia reported that 32% and 17% of pregnancies were unintended, respectively. Finally, women in the Philippines, within the Western Pacific region, reported 48% of their pregnancies as being unintended.

Within the sub-sample of women included in this analysis, the results are almost identical to those found above (Table 2). The percentage of women in the sub-sample with unintended pregnancies remained the same as that in the whole sample for six of the 18 countries: Cameroon, Chad, Peru, Uzbekistan, Bangladesh and Indonesia. For 11 countries, the percentage of women in the sub-sample with unintended pregnancies decreased by 1% to 3%. Only in one country, Burkina Faso, did the percentage of women with unintended pregnancies increase from 22% in the whole sample to 23% in the sub-sample.

Across all regions in both the entire sample and the analytical sub-sample, unintended pregnancies were the highest in the Americas. Women in Peru reported the highest percentage of unintended pregnancies (60% in both the whole sample and sub-sample) followed by Bolivia (54% and 52%, respectively).

Within-country analyses

Almost two-thirds (11) of the countries analysed by multivariate regression analyses had an OR < 1.0 for the association between unintended pregnancies and the likelihood of prolonged breast-feeding (Fig. 1). In three countries, Benin, Guatemala and Kazakhstan, this association was statistically significant. The remaining seven countries showed a slight but non-significant increase in the likelihood of prolonged breast-feeding among women with unintended pregnancies.

Pooled analyses

The weighted pooled multivariate regression analyses showed a significant inverse association between unintended pregnancies and prolonged breast-feeding (Table 3). The observed median values for the sub-sample
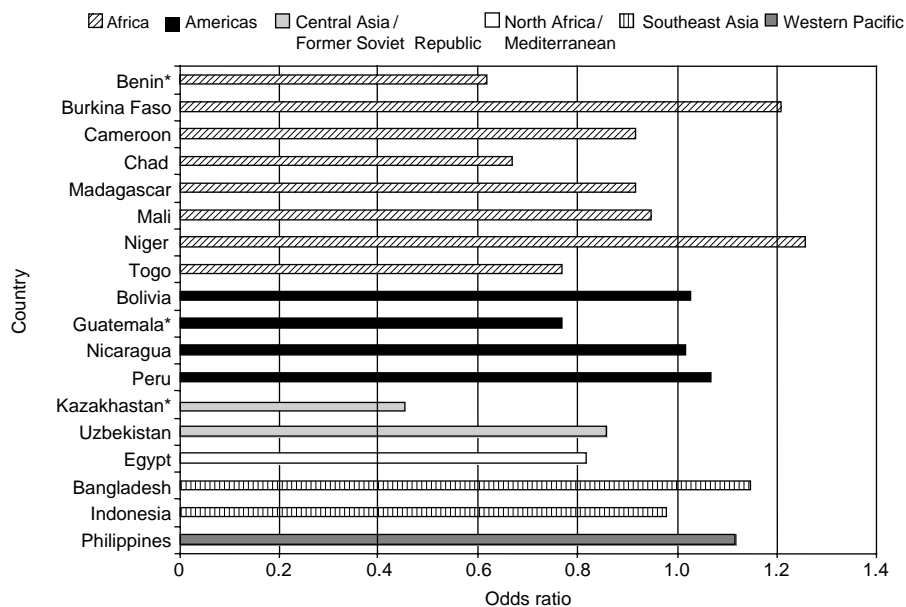

Fig. 1 Adjusted odds ratio per country showing the likelihood of women with unintended pregnancies continuing to breast-feed their last-born child 13–36 months of age. Ten covariates were adjusted for in the model: child age, square of child age, child gender, residence, maternal education, employment, parity, maternal age, current pregnancy and marital status. Data analyses were performed using unweighted samples. *Results are significant at $P \leq 0.05$

reflected this relationship. After adjusting for nine covariates, women with unintended pregnancies were less likely to continue breast-feeding their child beyond the first year of life than women whose pregnancies were intended (OR = 0.90; 95% CI = 0.85–0.96, n = 12 896). The PAR% for not practising prolonged breast-feeding associated with unintended pregnancies was 3.2%. PAR% ranged from 1.9% for being a single mother to 64.9% for being currently pregnant.

Women whose last pregnancy was unintended had an observed median duration of breast-feeding 1.3 months less than women with planned pregnancies (21.7 months vs. 23 months, respectively). The adjusted median duration of breast-feeding predicted for women with unintended pregnancies remained lower than among

those whose pregnancies were planned but the magnitude of the difference diminished (20.8 months vs. 21.3 months, respectively) (Fig. 2).

Additional risk factors for shorter durations of prolonged breast-feeding emerged from the multivariate logistic regression analysis. Women who lived in urban areas or who did not have a partner were significantly less likely to continue breast-feeding their child beyond the first year of life. A male child was also less likely to be breast-fed beyond 12 months than a female child. Women were most likely to breast-feed beyond the first year of life if they were multiparous or not currently pregnant.

Discussion

Pooled findings from this study support evidence provided by other studies that women with unintended pregnancies are less likely to breast-feed their child beyond the first year of life[6]. Although the pooled analysis supports this conclusion, the heterogeneity of the relationship between unintended pregnancies and prolonged breast-feeding across individual countries needs to be taken into account. Therefore, it is not sufficient to say that this relationship between unintended pregnancies and prolonged breast-feeding is global only based on the pooled results. Although our study showed that this trend does exist within two-thirds of the countries analysed, this relationship was statistically significant in only three of the 18 countries examined. Future longitudinal research is needed to understand if and how the nature of the relationship between pregnancy intentions and breast-feeding outcomes varies across countries. In addition, social sciences research is needed to find out if the large variability across

Table 3 Adjusted odds for prolonged breast-feeding calculated by multiple logistic regression; results are presented by independent variable for children 13–36 months of age of pooled data for all 18 countries†

	n‡	OR (95% CI)
Child's age (months)	41 353	0.688 (0.66–0.71)*
Square of child's age (months²)	41 353	1.004 (1.003–1.004)*
Gender of child		
Male	20 944	0.93 (0.88–0.98)*
ref: Female	20 409	1.0
Pregnancy intention		
Unintended	12 896	0.90 (0.85–0.96)*
ref: Planned	28 457	1.0
Residence		
Urban	14 325	0.46 (0.43–0.48)*
ref: Rural	27 028	1.0
Primiparous		
No	32 252	1.39 (1.29–1.49)*
ref: Yes	9101	1.0
Maternal age (years)	41 353	1.019 (1.01–1.02)*
Currently pregnant		
No or unsure	35 190	13.41 (12.20–14.74)*
ref: Yes	6163	1.0
Marital status		
No partner	2953	0.74 (0.67–0.82)*
ref: Partner	38 400	1.0
Country	§	§

OR – odds ratio; CI – confidence interval; ref – reference category.

* Results significant at $P \le 0.05$ (Hosmer–Lemeshow test for goodness-of-fit). Some 95% CI of significant associations may include 1.0 due to rounding.

† Analyses based on pooled data of women who had a living child 13–36 months of age. Pooled data analyses were performed using weighted samples. The population-attributable risk percentage (PAR%) for not practising prolonged breast-feeding was estimated for each risk factor identified in the pooled analysis using the formula PAR% = ([Pe × (RR − 1)]/{1 + [Pe × (RR − 1)]}) × 100, where Pe is the proportion exposed to the risk factor and RR is the relative risk (or odds ratio). PAR%: male child (3.6%), unintended pregnancy (3.2%), urban residence (23%), primiparity (7.9%), currently pregnant (64.9%), single mother (1.9%).

‡ Sample size.

§ Applies to pooled analyses. OR, 95% CI (n) with Uzbekistan as reference country (675) – Bangladesh: 25.78, 21.65–30.70 (1951); Benin: 3.50, 3.01–4.08 (1416); Bolivia: 1.34, 1.15–1.55 (2040), Burkina Faso: 7.35, 6.29–8.60 (1698); Cameroon: 0.86, 0.74–1.00 (1081); Chad: 3.21, 2.76–3.73 (1909); Egypt: 1.24, 1.07–1.43 (3465); Guatemala: 3.31, 2.85–3.85 (2677); Indonesia: 2.98, 2.58–3.45 (5751); Kazakhstan: 0.38, 0.33–0.44 (427); Madagascar: 2.44, 2.10–2.83 (1607); Mali: 3.69, 3.17–4.30 (2547); Nicaragua: 0.79, 0.68–0.92 (2474); Niger: 2.31, 2.02–2.72 (2061); Peru: 1.84, 1.58–2.13 (5287); Philippines: 0.70, 0.60–0.81 (2243); Togo: 4.90, 4.20–5.70 (2044).
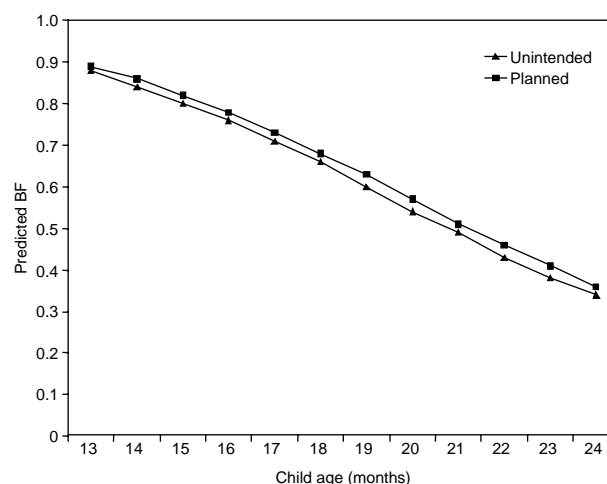

Fig. 2 Predicted probability of prolonged breast-feeding (BF) for children 13–24 months among women with unintended and planned pregnancies. Results are based on logistic regression for weighted pooled analysis (18 countries) for children 13–36 months of age, adjusting for nine covariates: child age, square of child age, child gender, residence, parity, maternal age, current pregnancy, marital status and country

countries in pregnancy intentions is factual or related to differences in cultural perceptions and social pressures that may influence how women in different cultures respond to sensitive survey questions about pregnancy intentions.

While the pooled results of this study support the *a priori* directionality of the association between pregnancy intentions and likelihood of prolonged breast-feeding, they do leave open the argument for reverse causality. For example, the pooled results of this study found that women who were not currently pregnant were significantly more likely to practise prolonged breast-feeding than their counterparts. Risk analyses indicated this was the most predictive factor for prolonged breast-feeding. Reverse causality would argue that women who breast-feed are less likely to get pregnant. Therefore, this could affect the woman's ability to control when to get pregnant, ultimately impacting on whether the pregnancy was intended or unintended. The current model tested in this study did not address the possibility of reverse causality as this can only be achieved through prospective studies. This study as well as previous studies in this area have been based on cross-sectional/retrospective data. Thus, further prospective studies are needed to strengthen the causal inferences that can be drawn.

The exclusion of women whose last-born child had died introduced a possible bias. It is possible that these women were different from the sub-sample included in this study with regard to the key variables of interest (i.e. pregnancy intentions and breast-feeding behaviours). This introduces a possible 'subject exclusion' bias because perhaps these children may have died because their mothers may have been more likely not to plan their pregnancies and weaned them earlier from the breast.

Studies suggest that breast-feeding beyond the first year of life benefits children in developing countries[8,9]. Breast milk has been shown to offer protection against gut damage and infection once complementary foods have been introduced[10]. Prolonged breast-feeding has been shown to have a positive influence on child growth in some developing countries[9]. After controlling for confounders, a prospective study conducted in Kenya of children aged 11–18 months at enrolment showed that those who lived in poorer sanitary conditions but were breast-fed for 2 months longer gained more in length than their counterparts[9]. The adjusted median duration of prolonged breast-feeding in our study differed by 0.5 months between women with unintended pregnancies and those with intended pregnancies. The public health impact of this difference in prolonged breast-feeding duration remains to be elucidated.

In conclusion, studies in developing countries have shown that there are several infant factors such as height, appetite and nutritional status that contribute to the mother's decision to wean her infant from the breast[11–13]. Based on the pooled findings of this study, it is likely that maternal attitude towards her pregnancy is another

significant predictor of prolonged breast-feeding behaviours. Future studies in this area should follow longitudinal designs to better understand the links of pregnancy intentions with prenatal care behaviours and subsequent pregnancy outcomes, child feeding, morbidity and mortality[2,14,15].

Acknowledgements

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