Sociodemographic factors associated with uptake of exclusive breastfeeding practice in Brunei Darussalam.

MM Alhaji [1], R Sharbawi [2], A Majeed [3], NAA Tuah [1,3]
[1] Pengiran Anak Puteri Ra'asidah Saadatul Bolkiah (PAPRSB) Institute of Health Sciences (IHS), Universiti Brunei Darussalam, Brunei Darussalam
[2] Maternal and Child Health Services, Ministry of Health, Brunei Darussalam
[3] Primary Care & Public Health Department, Imperial College London, United Kingdom

ABSTRACT

Introduction: Exclusive breastfeeding is the practice of exclusively breastfeeding the newborn from the early hours of life to six months. This practice is encouraged to improve health of baby and also bonding. However, how widely practiced is exclusive breastfeeding in our local setting is unknown. This study aimed to establish the prevalence and socio-demographic factors affecting the uptake of exclusive breastfeeding practice among working and non-working (full-time housewives) mothers in Brunei Darussalam. **Materials and Methods**: This is a retrospective review of secondary longitudinal data from 5,484 child health records, aged from one to six months, obtained from 22 Maternal and Child Health clinics in Brunei Darussalam in 2010. The study population represents 85.5% of the total live births in Brunei Darussalam for the year 2010. **Results**: Exclusive breastfeeding steadily declined from 71% at the first month after birth to 29% by six months. Exclusive breastfeeding practice at six months was higher in non-working mothers (36.7%) compared to working mothers (17.9% private, and 24.9% government workers) (p<0.001). Parity, maternal race, and maternal employment status were significantly associated with exclusive breastfeeding practice; but no relationship was found between exclusive breastfeeding practice and geographical area of residence of the mother, or sex of the child. Multivariate analyses showed working mothers (private sector, adjusted Odds Ratio, AOR=0.40, p<0.001; and government sector, AOR=0.55, p<0.001) were less likely to practice exclusive breastfeeding for six months than non-working mothers. Primiparous mothers were also less likely to practice exclusive breastfeeding for six months (AOR=0.74, p<0.001) compared to multiparous mothers. **Conclusion**: The prevalence of exclusive breastfeeding progressively declines from first month to only 29% at six months in Brunei Darussalam in 2010. Non-working mothers were more likely to continue exclusive breastfeeding at six months. These findings have important implications for future studies, policies and programmes on maternal and child health in the country.

Keywords: Breastfeeding, Maternal, Child Health and Nutrition, Early Life

INTRODUCTION

Exclusive breastfeeding (EBF) is the practice of exclusively breastfeeding the newborn from the early hours of life to six months, with the exception of prescribed medication such as vitamins, rehydration therapy and other medicines. [1] EBF had been found to be of immense benefit (short and long term) to both mother and child. For mothers, it has been associated with rapid weight loss after birth and delayed ovulation, postpartum; while in infants, it has been shown to reduce

Correspondence author: Mohammed M. Alhaji
PAPRSB Institute of Health Sciences,
Universiti Brunei Darussalam, Gadong, BE1410,
Brunei Darussalam.
E mail: mohalhaj20@yahoo.com.sg;
16h0220@ubd.edu.bn

with the exception of prescribed medication such as vitamins, rehydration therapy and other medicines. [1] EBF had been found to be of immense benefit (short and long term) to both mother and child. For mothers, it has been associated with rapid weight loss after birth and delayed ovulation, postpartum; while in infants, it has been shown to reduce risk of childhood-related morbidity and mortality especially from gastrointestinal diseases. [2] A review of existing literatures also suggested that breastfeeding practices possibly could possibly reduce the risk of breast cancer in mothers. [3]

Studies have confirmed the association of continued EBF at six months with decreased risks of several childhood related diseases and illnesses such as asthma, obesity, and early years of hospitalisation due to respiratory tract infections, and with improved cognitive function and health in general. [4–6] EBF also makes economic sense; a recent pediatric cost-analysis report in United States of America calculated a possible cost saving annually of up to US$13 billion spent on childhood illnesses and formula feeding—and prevent nearly 1,000 infant deaths— if 90% US mothers could practice EBF as recommended by the World Health Organisation. [7]

In Brunei Darussalam, the prevalence of EBF at six months was reported to be 26.7% in 2009 according to the 2nd national health and nutritional status survey, NHANSS. [8] While the prevalence of EBF was low, the top three reasons why mothers gave up practicing EBF were stress, (perceived) insufficient breast-milk, and need to resume working for employed mothers. [8] Maternal employment has been previously reported as a significant negative factor for the uptake of EBF. [9, 10] It was for this reason that the International Labor Organisation (ILO) advocated for a minimum of 14 weeks paid and protected maternity leave for employed new mothers. However, in its recent statistics on 185 countries, only 98 countries had adhered to its recommendations. [11] Other barriers apart from maternal employment hindering the practice of EBF by mothers include short periods between pregnancies, [12] maternal residence location,[13] higher maternal socioeconomic status and education. [14]

This study provides a national prevalence of EBF as well as associated factors for EBF among new mothers in Brunei in 2010. Considering that the duration of maternity leave in Brunei Darussalam was increased from eight weeks to 15 weeks in the following year, 2011, [15] the results reported in this study would serve as a baseline data upon which future EBF practice (post-maternity leave extension) and studies on EBF could use to measure change in pattern or practice of breastfeeding in Brunei Darussalam. Therefore, this study has important implication for post-policy evaluation with regards to EBF practices and maternal and child health related legislations.

MATERIALS AND METHODS

This retrospective study was conducted using secondary longitudinal health (breastfeeding) records obtained from all the 22 government MCH Clinics in Brunei Darussalam to determine the cross-sectional distribution of EBF in the country for the year 2010. The study protocol was approved by the Medical and Health Research Ethics Committee (MHREC), Ministry of Health, Brunei Darussalam.

The eligible criteria for inclusion in this study was availability of complete EBF status record for 1-6 months and child age. Records for adopted children and incomplete records were excluded. Mothers were asked their exclusive breastfeeding status monthly (1-6 months) at the MCH clinics as part of the mandatory child developmental check-up. Maternal reasons for giving up EBF were also recorded. 5,484 records (representing 85.5% of total live birth [6,412] were retrieved from

the Birth and Registrations section, Immigration Department for the year 2010, which forms the dataset for analysis in this study.

The Statistical Package for the Social Sciences (SPSS) version 15.0 was used to analyze the data. The frequency distribution of EBF was determined using descriptive statistics. Chi-square test was used to assess the level of statistical difference between comparable groups, and multivariate analysis was done on variables that showed statistical significance at univariate analyses to determine adjusted odds of covariates for the likelihood of practicing EBF at six months. All difference at $p<0.05$ were considered statistical significant.

RESULTS

Overall, 89.3% of the study participants were Bruneians; 70.1% were multiparous mother; and 85.9% were Malay. The full demographic profile of the study population is shown in Table 1.

Table 1: Demographic profile of the study participants (N=5,484).

Variable		n (%)
Mother's citizenship		
	Bruneian	4,899 (89.3)
	non-Bruneian	585 (10.7)
Parity		
	Primiparous	1,641 (29.9)
	Multiparous	3,843 (70.1)
Infant Sex		
	Male	2,804 (51.1)
	Female	2,680 (48.9)
Maternal Employment sector		
	Government	2,066 (37.7)
	Private	1,056 (19.3)
	Non-working	2,362 (43.0)
Mother's race/ethnicity		
	Malay	4,710 (85.9)
	Chinese	337 (6.1)
	*Others	437 (8.0)
District of residence		
	Brunei-Muara	3,947 (72.0)
	Tutong	648 (11.8)
	Kuala Belait	749 (13.7)
	Temburong	140 (2.6)

*all other race/ethnicity apart from the other two listed

The prevalence of EBF practice in the study population was highest during the period from birth to one month at 71%. This steadily decline with each passing month and dropped to as low as 29% at 6th months (Table 2).

In comparing the prevalence of EBF among working mothers (in government and and private sectors) and non-working mothers, EBF practice was consistently higher from one to six months of infant age among non-working mothers than in the working mothers, which was statistically significant between the three groups at each month (Table 2: $p=0.003$ at first month; $p<0.001$ at every other months). The prevalence of successful EBF practice at six months among private, government workers, and non-working mothers was 17.9%, 24.9% and 36.7% respectively. Non-working mothers also had the highest prevalence followed by mothers in the govern-

Table 2: EBF Practice among from 1–6 months infant age in 2010 (N=5,484).

	Maternal Employment Status, *n (%)*			
Infant age (in months)	**Government (n=2,066)**	**Private (n=1,056)**	**Non-working**	***p* value[a]**
1	1,488 (72.0)	708 (67.0)	1,713 (72.5)	0.003
2	1,060 (51.3)	443 (42.0)	1,308 (55.4)	<0.001
3	811 (39.3)	318 (30.1)	1,116 (47.2)	<0.001
4	644 (31.2)	253 (24.0)	980 (41.5)	<0.001
5	543 (24.9)	216 (20.5)	905 (38.3)	<0.001
6	514 (24.9)	189 (17.9)	868 (36.7)	<0.001

ment sector compared to those in the private sectors (Table 2).

There was no significant association between the mother's district of residence (*P*=0.063), gender of the infant with EBF practice at six months, even though more female infants were breastfed slightly more than their male counterparts (Table 3: 29.2% vs. 28.1%; *p*=0.394). More multiparous mothers exclusively breastfed their infants (at six months) than primiparous mothers (Table 3: 30.7% vs. 23.9%; *p*<0.001). Malay Mothers (29.5%) practiced EBF at 6 months more than Chinese mothers (19.0%) and mothers of combined other ethnic groups (27.2%), and the difference was significantly different (Table 3: *p*<0.001).

The results from multivariate analyses in predicting the likelihood of EBF at 6 months are also shown in Table 4. Both maternal parity and maternal employment status were significant independent predictors for EBF at 6 months. Primiparous mothers (Table 4: AOR 0.74, 95% CI: 0.64, 0.84) were 26% less likely practicing EBF than multiparous mothers (*p*<0.001). The practice of EBF at 6 months was also less likely among working mothers (Table 4: private sector: AOR 0.40, 95% CI: 0.33, 0.47; Government sector: AOR 0.56, 95% CI: 0.49, 0.64) than non-working mothers (*p*<0.001). Meanwhile, although mother's race played a role in the multiple logistic regression model (*p*=0.003), the odds of Malay mothers (Table 4: AOR 1.17, 95% CI: 0.94, 1.47) practicing EBF at 6 months was not statistically significant from mothers of 'other' ethnic group (Table 4: *p*=0.167), just as the difference in odds between Chinese mothers and mothers of other ethnic group was also not significantly differ-

Table 3: EBF at 6 months according to demographic variables.

Variable		N	n (%)	*p* value[a]
Parity				
	Primiparous	1,641	393 (23.9)	<0.001
	Multiparous	3,843	1,178 (30.7)	
Infant's gender				
	Male	2,804	789 (28.1)	0.394
	Female	2,680	782 (29.2)	
Mother's ethnicity				
	Malay	4,710	1,388 (29.5)	
	Chinese	337	64 (19.0)	<0.001
	Others	437	119 (27.2)	
District of residence				
	Brunei Muara	3,947	1,093 (27.7)	
	Tutong	648	210 (32.4)	
	Kuala Belait	749	227 (30.4)	0.063
	Temburong	140	41 (29.3)	

[a]Chi square test of independence

Table 4: Multiple Logistic Regression of factors associated with EBF practice at six months (N=5,484).

Variable		N	Adjusted Odd Ratio (AOR)	(95% Confidence Interval; CI)	*p* value[b]
Parity					
	Primiparous	1641	0.74	(0.64, 0.84)	<0.001
	Multiparous	3843	1.00	-	-
Mother's ethnicity					0.003
	Malay	4710	1.17	(0.94, 1.47)	0.167[c]
	Chinese	337	0.73	(0.33, 0.47)	0.082[c]
	Others	437	1.00	-	-
Maternal Employment Sector					<0.001
	Government	2066	0.55	(0.48, 0.63)	<0.001[c]
	Private	1056	0.40	(0.33, 0.47)	<0.001[c]
	Non-working	2362	1.00	-	-

[b] Likelihood ratio test [c] Wald test Nagelkarke R^2=0.048

ent (Table 4: p=0.082). The three variables—parity, employment sector and mother's race/ethnicity—only explained for about 5% factors associated with EBF in multiple logistic model (Table 4).

DISCUSSION

This study showed a decline in EBF practice among mothers as infant aged; from 71% EBF at one month to 29% at six months infant age. The prevalence of EBF at six months in Brunei is less than the reported global average (39%) for the year 2010. [16] However, similar trends of decline in EBF practice as infant age were reported in previous studies conducted in different countries such as Bangladesh, Timor Leste, the United States, and others like Ethiopia. [9, 13, 14, 17, 18] For example, in Timor Leste, EBF practice decline from 68% at infant aged less than one month to 24.9% at infant aged five months in a longitudinal study on 975 infants. [13]

A systematic review of clinical trials and observational studies comparing child/maternal health outcomes with EBF for 6 months versus EBF for 3-4 months concluded that children exclusively breastfed in their first 6 months of life were less likely to experience infection-related morbidity compared to those who were partially- and mix-fed for 3-4 months. [2] The United Nations Children's Fund (UNICEF) highlighted that despite the many benefits associated with EBF practice, only about 40% of infants were being exclusively breastfed in their first six months of life. [19]

Studies have identified numerous barriers hindering the uptake of EBF by mothers such as perceived-insufficient breast milk; maternal employment and short maternity leave; short period between pregnancies; lack of antenatal counseling; higher maternal socioeconomic status and education; mode of delivery, caesarean delivery affects EBF practice; tiredness and fatigue; and many others. [8-10, 12-14, 20-22]

The 29% EBF practice at 6 months in 2010 in Brunei Darussalam (as reported in this study) although considered suboptimal by WHO standards was slightly higher than that reported in 2009 by the NHANSS study and also more than what was reported in several other countries. [7, 8] In Australia, a cohort study on 991 mother-infant pair from 5 different health clinics in three South East Queensland health service districts reported 9.5% EBF at five months. [23]

A cross-sectional study on a convenient sample of 593 Emirati mothers in the United Arab Emirate reported a suboptimal feeding of 25% EBF at six months. [24] A demographic health survey (DHS) conducted on 975 mothers in Timor-Leste reported that only 24.9% were still exclusively breastfeeding at five months. [13] Another study found a 16.8% EBF practice at six months in the United States from their cross-sectional survey on secondary data of nationally representative sample of 19,012 mothers recruited from the 2007 National Survey of Children's Health. [25] A study on a convenient-sampled 572 pairs of postpartum mother-infant from three government hospitals and three private hospitals in Jordan reported an even lower rate of EBF practice at six months of only 1%. [12]

Nevertheless, our finding was lower than the EBF (at six months) reported in some studies conducted in Bangladesh (42.5%); Ethiopia (up to 70%-age appropriate EBF); Kenya (50.3%); and Tanzania (41-58%), although another study in Tanzania reported 24.1% EBF at six months. [14, 18, 26-28] Indeed, as reported in a review, that although the prevalence of EBF practice remained low across the globe, the highest rates of EBF practice and improvements were in developing countries. [16] The global average increased from 33% in 1995 to 39% in 2010. [16]

Our findings are also in consonance with other studies that found non-working mothers to practice EBF more than the working mothers. More non-working mothers (36.7%) in our study exclusively breastfed their infants at six months than either government-employed (24.9%) or private-employed mothers (17.9%). This is similar to an analysis of secondary data (on 3,697 infants) from the Longitudinal Study of the Australian Children (LSAC) in 2004 which reported that more non-employed mothers (56%) were still breastfeeding their infants than employed (full-time) mothers (39%) at 6 months. [10] Another study carried out among 1000 professional working mothers in Ghana reported that 520 (52%) could not practice EBF; and 91% (473 of the 520) attributed their failure to practice EBF to resumption to work. [29] Similarly, a population-based study on 2098 mothers conducted in Hong Kong reported that 29.6% working mothers also attributed their failure to practice EBF to resumption to work. [22] Indeed, maternal employment, among other factors such as breast problems, tiredness, stress, area of residence, family income, race, marital status, baby refusal, mother's perception, have been shown to impede breastfeeding. [30]

This study also found a preponderance among multiparous mothers to have a higher uptake of EBF at six months compared to primiparous mothers, similar to what other studies have reported. [6, 24] In this study, the prevalence of EBF at six months was the highest among Malay mothers, and Chinese mothers had the lowest EBF practice. However, a study conducted on 2,098 mothers in Singapore reported that Chinese mothers (odds ratio, OR: 1.00) practiced EBF more than Malay mothers (OR: 0.56) but less than Indian mothers (OR: 1.33). [31] This confirms the influence of race, culture and ethnicity and environment on the practice of EBF. [14, 32]

Unlike the findings of a study carried in India which reported that girls were breastfed for a shorter duration compared to their male counterparts, our study found otherwise, although the difference was not statistically significant. [32] The authors hypothesized several possible reasons among which the need for male child due to cultural pressure is likely the reason for shorter breastfeeding span of breastfeeding for girls in India, in a bid to conceive again. [32]

Finally, the difference in EBF practice between the four districts were not statistically significant, but mothers residing in Brunei-Muara and Kuala Belait had the two lowest EBF prevalence. Both these districts are highly urbanized. In comparison, mothers in the rural districts of Tutong and Temburong had the two highest EBF prevalence. The findings of higher prevalence of EBF in rural areas as compared with urban areas are also reflected in other studies, where rural mothers tended to practice EBF more than urban mothers.[14,33]

The strength of this study lies in its national representable sample (85.5% of total live births in 2010). It gives a true reflection of EBF practice in Brunei Darussalam for the year 2010. Also the monthly recollection by the breastfeeding mothers from 1-6 months infant age makes this finding robust.

It is however important to note that some studies cited in this sections assessed the practice of EBF differently which may have influence on the direct comparison we highlighted. Some studies used the 'WHO 24-hour maternal recall' of EBF for infant aged between one and six months, which has been criticized for its tendency to overestimate EBF practice. [34, 35] Many other studies reviewed secondary data, just like this study. However, a review of 11 studies conducted between 1966 to 2003 noted that maternal recall of breastfeeding practices are valid and reliable after a period of not more than three years. [36]

In conclusion, the prevalence of EBF in Brunei for the year 2010 was lower than the global average but comparable—even better than—prevalence of EBF reported in some countries. Our study found that maternal employment has a significant negative impact on uptake of EBF, with non-working mothers more likely to practice EBF than working mothers. There is need for global advocacy and actions toward encouraging the EBF practice particularly among working mothers and also the need for improved maternity and child health coverage. For practice, health care professionals may be able to offer effective health education on breastfeeding to targeted groups such as first time mothers and working mothers who were less likely to practice EBF. In 2011, the duration of maternity leave in Brunei Darussalam was increased from 8 weeks to the recommended 15 weeks paid leave, which may have a major impact on the prevalence of EBF among working mothers. Future researches on EBF practice may seek to evaluate the impact of this legislation on working mothers and other inhibiting factors as well as further ways, including policy adjustments, of promoting the practice for reference to policy makers and health programme planners.

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