Factors associated with exclusive breastfeeding practices in western Bhutan

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ABSTRACT

Introduction: Breastfeeding is widely accepted in Bhutan but there are wide range of practices, some of which are not in accordance with the recommendations of WHO. In 2015 the prevalence of exclusive breastfeeding under six months of age, in western region was only 33.8% while the national rate was 51.4%. This study aimed to identify the factors associated with exclusive breastfeeding practices in western Bhutan. **Methods:** A cross-sectional study was conducted involving 220 mothers with children 6-12 months of age attending the Maternal and Child Health clinics of three hospitals in western Bhutan. Data collection was done by a face-to-face interview in April 2017. Chi-square test was used to assess the association and all the significant variables were included in the multivariate model adjusting for potential confounders. **Results:** The prevalence of exclusive breastfeeding at six months was 35.9%. Multivariate logistic regression detected significant association of exclusive breastfeeding with parity ($OR_{adjusted}$ 2.80; 95% CI 1.36-5.78), knowledge ($OR_{adjusted}$ 2.09; 95% CI 1.09-4.00), family income ($OR_{adjusted}$ 2.26; 95% CI 1.10-4.65), early initiation of breastfeeding ($OR_{adjusted}$ 6.28; 95% CI 1.90-20.70), and care giver ($OR_{adjusted}$ 3.56; 95% CI 1.19-10.59). Mothers' perception that the child feels thirsty was the most important reason to stop exclusive breastfeeding. **Conclusions:** The study identified breastfeeding education as a definite measure to improve the rates of exclusive breastfeeding in western Bhutan. The study recommends to educate mothers that water is not required for the baby until six months of age and to include fathers in breastfeeding education sessions. The study also recommends to strengthen lactation management clinic.

Keywords: Exclusive breastfeeding; Maternal and Child Health Clinics; Western Bhutan.

INTRODUCTION

Exclusive breastfeeding (EBF) means that the child receives only breast milk or expressed breast milk and no other liquid or solid foods and not even water with exceptions to oral rehydration solutions and medicines until six months of age. Adequate nutrition during the early days of life is necessary to ensure that the growth and development of the child is achieved[1]. Exclusive breastfeeding is the most important determinant of child survival[2]. Colostrum, the yellowish breastmilk secreted during the first few days after delivery, provides immunity to the infant as the infant gets exposed to the environment for the first time[1]. It is rich in white cells and antibodies, proteins, minerals and fat-soluble vitamins[1]. Breastfeeding confers both short term and long term benefits. The short term benefits mainly include protection against morbidity and mortality from infectious diseases, while the long term benefits include lower risks of hypertension, obesity, diabetes and better cognitive performance[2]. Breastfeeding confers great deal of protection against hospital admission. Children who have not been breastfeed were more likely to suffer from acute otitis media, non-specific gastroenteritis, obesity, type I and II diabetes, childhood leukemia and sudden infant death syndrome[3]. The World Health Organization (WHO) estimates that optimal breastfeeding can save 0.8 million lives of children under the age of five annually[4]. WHO recommends early initiation of breastfeeding, preferably within an hour of birth, breastfeeding on demand, as many times as the infant wants, exclusive breastfeeding for the first six months, and to avoid bottle feeding[4]. Reviews from high income countries show that women in high income group and women with better education are more likely to breastfed[3].

The National Nutrition Survey of Bhutan 2015 reported that national rates of exclusive breastfeeding among children 0-6 months were 51.4%[5]. The study used WHO Infant and Young Child Feeding indicators to determine the rates of exclusive breastfeeding[5]. The exclusive breastfeeding rates varied greatly among the three regions, the highest in the eastern region (77.7%) followed by central region (48.8%) and lowest being at the western region (33.8%)[5]. Similar trends were observed in prevalence of wasting and underweight among children 0 to 59 months and anemia among children 6 to 59 months[5]. A study identified pre-lacteal feeding, breastfeeding, antenatal care and complementary feeding as independent variables associated with severe wasting of children in Bhutan[6]. A study conducted in 2008 reported that exclusive breastfeeding for six months was difficult for working mothers as maternity leave was only three months in the public sector while workers in the private sectors had only two months[7]. To overcome this challenge, the paid maternity leave for mothers in the public sector has been extended from three months to six months since March 2016[8].

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However, the females in civil service comprise only 1.26 % of the Bhutanese population[9,10]. The rates of exclusive breastfeeding has remained almost stagnant with marginal growth from 48.7 % in 2010[11] to 51.4% in 2015[5]. The Food and Nutrition Security Policy of Bhutan 2014 states that there are multiple cultural and traditional barriers which need to be addressed to promote optimal breastfeeding[12]. The World Health Assembly in 2012 endorsed six global nutrition targets for 2025. The fifth target is to increase the rate of exclusive breastfeeding to at-least 50%[13]. Although we have met the national target, there are huge regional variations which merits urgent investigation. However, very few studies have been conducted in Bhutan on exclusive breastfeeding which highlights the importance of this study.

METHODS

A cross-sectional study was conducted at the Maternal and Child Health (MCH) clinics of Jigme Dorji Wangchuck National Referral Hospital, Thimphu, Paro General Hospital, Paro and Phuentsholing General Hospital, Phuentsholing in western Bhutan. These three hospitals were purposively selected as these hospitals are located in major urban hubs of three different districts in western Bhutan where the rate of exclusive breastfeeding is low compared to the national rate. Finite population proportional to size sampling method was used as the three districts have a huge difference in population size. The number of Bacillus Calmette-Guerin (BCG) vaccine used by the respective health facility in the year 2015 was used to estimate the finite population. The research instrument was developed by the researchers and piloted in three different hospitals in the same region. Internal reliability test of the questionnaire showed that Cronbach's alpha coefficient was 0.7. Knowledge was measured by 14 questions and classified as 'good', 'moderate' and 'poor' using Benjamin Bloom criteria while maternal perception towards exclusive breastfeeding was assessed using 12 negative statements and scored using 3 point Likert scale and classified as positive and negative perception based on the median. Data were collected from 220 mothers with infant 6-12 months of age visiting the MCH clinics of the specified hospitals. Convenience sampling was done at the respective hospitals till the desired sample size was achieved.

Data collection was done in April 2017 using structured questionnaire by a face-to-face interview at the immunization clinics after the respondents availed their desired services. Data analysis was done with SPSS 18. Descriptive statistics were presented as frequency, percent, mean, median and standard deviation. Chi-square test was done to assess the associations between the independent and dependent variable and *p*-value less than 0.05 was considered significant. All the significant variables were included in the univariate and multivariate model and were analyzed adjusting for potential confounders. Odds ratio and 95% confidence intervals were calculated. Ethical clearance was granted by the Ethical Review Committee for Human Research, Faculty of Public Health, Mahidol University, Thailand (MUPH-2017-065) and Research Ethics Board of Health, Ministry of Health, Bhutan (REBH/ Approval/2017/016). Data collection was done only after obtaining the written consent.

Table 1: General Characteristics (*n*= 220)

Characteristics	Number	Percent
Age of the Mother		
<25	87	39.5
26 – 35	120	54.5
≥36	13	5.9
Mean 27.37, SD 4.48, Minimum 18, Maximum 42,		
Education		
No Education	61	27.8
Primary School	37	6.8
High School	93	2.3
Certificate/Diploma/University	29	13.2
Occupation		
Housewife	153	69.5
Business women	27	12.3
Private	16	7.3
Government	14	6.4
Corporation/NGO/INGO	6	2.8
Farmer	4	1.8
Type of family		
Nuclear	157	71.4
Extended	63	28.6

Education of the husband		
No Education	31	14.1
Primary School	42	19.1
High School	86	39.1
Higher Education	57	25.9
Monastic School	4	1.8
Monthly family income		
Low income (<18000 Ngultrums)	134	60.9
Middle (18001 – 36000 Ngultrums)	61	27.7
High income (>30001 Ngultrums)	25	11.4
Mean 19766, SD 15598, Minimum 3000, maximum 150000 median income 15000		
Number of Children		
One child	115	52.3
Two children	74	33.6
Three and above	31	14.1
Age of the child		
6 months	43	19.5
7 months	35	15.9
8 months	36	16.4
9 months	37	16.8
10 months	24	10.9
11 months	26	11.8
12 months	19	8.6
Illness of the child(0-6 months)		
Yes	90	41.0
No	130	59.0
Working mothers (n=40)		
Travel time		
< 15 Minutes	24	60.0
15-30 Minutes	14	35.0
> 30 Minutes	2	5.0
Total working hours per day		
≤ 8 hours	32	80.0
≥ 9 hours	8	20.0
Flexi feeding hours		
Yes	31	81.6
No	9	18.4
Breastfeeding during lunch time		
Always	25	62.5
Sometimes	8	20.0
Rare/Never	7	17.5
Breastfeeding room		
Yes	3	7.5
No	37	92.5
Paid maternity leave		
No leave	4	10.0
1 month	1	2.5
2 months	6	15.0
3 months	11	27.5
6 months	18	45.0

RESULTS

Socio-demographic characteristics have been presented in Table 1. More than half of the mothers (54.5%) were between the age group 26-35 years. Nearly half of the mothers (42.3%) had high school education. Two-thirds (69.5%) of the mothers were housewives followed by 12.3% as business women. Over two-thirds of the mothers lived in nuclear family and over half of them were from low income family. Over one-third of the husbands had high school education while around 14% of them had no education. A total of 40 working mothers were encountered during the study. It was found that 60% of the mothers took less than 15 minutes to commute between home and office. 81.6% of the mothers reported that their office provided flexi feeding hours for breastfeeding.

Maternal and child care history is presented in Table 2. Majority of the mothers did not have breast or nipple deformity and were free from chronic diseases. Majority of the mothers identified that their husband is the most important secondary care giver for the child. The most important reason to stop exclusive breastfeeding was mother's perception that the child will feel thirsty.

Table 2. Maternal and child care

Characteristics	Number	Percent
Place of Delivery		
Hospital	216	98.2
Home	4	1.8
Type/Method of Delivery		
Normal	171	77.7
Caesarean	46	20.9
Instrumental	3	1.4
Maternal Health Status		
No Disease	196	89.1
Hypertension	12	5.5
Diabetes	5	2.3
Others	7	3.2
(2 Chronic kidney disease, 1kidney stone, 1 gastritis, 1 TB, 1Hepatitis, 1 Arthritis)		
Most important care giver secondary care giver		
Husband	188	85.5
Family members	32	14.5
Consultation for breastfeeding		
Health professionals	100	45.45
Family and Friends	50	22.73
No Consultation	70	31.82
Trusted source of information on breastfeeding		
Health professionals	187	85.0
Family	18	8.2
TV	11	5.0
Internet	4	1.8
First ANC visit		
First month	35	15.9
Second month	53	24.1
Third month	86	39.1
Fourth month	30	13.6
Fifth to seventh month	16	7.3
Total number of ANC visits		
1-4 visits	14	6.4
5-8 visits	163	74.1
9-12	43	19.5

Family members/husband accompanied for ANC		
Yes	190	86.4
No	30	13.6
Counselling of breastfeeding		
Yes	192	87.3
No	28	12.7
Counselling on positioning and attachment		
Yes	193	87.7
No	27	12.3
Initiation of breastfeeding		
Within an hour	181	82.3
Within a day	22	10.0
After a day	17	7.7
Reason to stop exclusive breastfeeding (n=141)		
Child feels thirsty	54	38.3
Unable to initiate	21	14.9
Insufficient breastmilk	17	12.1
Family advice/Pressure	15	10.6
Health advice	14	9.9
Child feels hungry	13	9.2
Resume work	4	2.8
Nipple deformity	3	2.1

Table 3. Knowledge, perception and prevalence of exclusive breastfeeding

Characteristic	Number	Percent
Level of knowledge		
Good (12-14scores)	99	45.0
Moderate (9-11scores)	89	40.5
Poor (0-8 scores)	32	14.5
Mean 10.89, SD 2.11, Median 11, Minimum 5, Maximum 14		
Maternal Perception on exclusive breastfeeding		
Positive Perception	123	55.9
Negative Perception	97	44.1
Mean 30.35, SD 3.61, Median score 31, Minimum score16, Maximum score 36		
Prevalence of exclusive breastfeeding		
Exclusive	79	35.9
Non-exclusive	141	64.1

Maternal knowledge and perception and prevalence of exclusive breastfeeding

The study found that only 45% of the mothers had good level of knowledge and 55.9% had positive perception towards breastfeeding. The prevalence of exclusive breastfeeding at six months was 35.9% (Table 3).

Table 4 presents the declining prevalence of exclusive breastfeeding from birth till six months. It was observed that 6.4% mothers introduced water even before the child reached the age of one month and around 17% of the mothers practiced mixed feeding (breastmilk, water and complementary foods).

Table 4. Prevalence of feeding methods from birth till six months

	Exclusive breastfeeding		Breast milk and water		Mixed feeding	
Age	Number	Percent	Number	Percent	Number	Percent
0 month	168	76.4	14	6.4	38	17.2
1 month	159	72.3	17	7.7	44	20.0
2 months	151	68.6	23	10.5	46	20.9
3 months	131	59.6	39	17.7	50	22.7
4 months	115	52.3	53	24.1	52	23.6
5 months	98	44.6	53	24.1	69	31.3
6 months	79	35.9	56	25.5	85	38.6

Multivariate regression analysis

All the significant variables from the Chi-square test were included in the univariate analysis and the multivariate model. Potential confounders such as maternal age, occupation, nipple deformity status, perception and whether they were accompanied by their husband/ family members during ANC visits were included for adjustment. The analysis showed that breastfeeding initiation time had the greatest influence on exclusive breastfeeding. Mothers who initiated breastfeeding within an hour of birth were six times more likely to practice exclusive breastfeeding ($_{adjusted}$ OR :6.28; 95% CI: 1.90-20.70). Women who identified their husband as their child's secondary care giver were three times more likely ($_{adjusted}$ OR 3.56; 95% CI 1.19-10.59) to have exclusively breastfed to 6 months, compared to those who identified another family member as being their child's secondary care giver. All the variables remained significant even after adjustment (Table 5).

DISCUSSION

The study found out that only 35.9% of the mother's in western Bhutan practiced exclusive breastfeeding at six months. Mothers perception that the infant will feel thirsty was the most important reason to stop exclusive breastfeeding. Around 10% of the mothers reported that they stopped exclusive breastfeeding because of family advice and pressure. Similar findings were reported by a qualitative study conducted in Myanmar and the study highlights the importance of educating family members on the importance of exclusive breastfeeding[14]. Another 10% stopped exclusive breastfeeding because of communication gap between health professionals and mothers. The staff explained that the complementary foods should be introduced at the completion of six months but the mothers understood it as beginning of six months. This could be because of inadequate staff and infrastructure and the MCH clinics are usually crowded. An analysis of the data from several low income countries reported that shortage of resources were barriers in implementing health products[15].

The study found that the prevalence of exclusive breastfeeding at six months of age was 25.2% and 47.6% in primiparous and multiparous mothers respectively and it was found to be statistically significant. Multiparous mothers were 2.8 times more likely to practice exclusive breastfeeding. This can be attributed to better skills, knowledge, experience and confidence the multiparous mothers gathered during the previous child. Primiparous mothers reported that they did not know how to breastfeed and handle the child. Better breastfeeding outcomes in multiparous mothers have been reported by several studies[16-19]. Mothers who initiated breastfeeding within an hour of birth were 6 times more likely to have exclusively breastfed to six months compared to those who initiated breastfeeding after an hour. This is because the newborns, whose mothers did not initiate had to be put on formula feeding. A study conducted in Bangladesh reported that women who practiced pre-lacteal feeding had a substantial delay (mean delay of 30.6 hours) in initiation of breastfeeding[20]. A systematic review concluded that pre-lacteal feeding is a major barrier to exclusive breastfeeding in South Asia[21].

The study found that mothers with good level knowledge were two times more likely to practice exclusive breastfeeding. This could be because mothers who have good level of knowledge are able to make independent decisions are not easily influenced family advices. Similar observations were reported by studies conducted in other countries[22,23]. However only 45% of the mothers had a good level of knowledge in this study. Therefore, educating mothers on the importance of exclusive breastfeeding is undoubtedly an important means to improve the rates of exclusive breastfeeding. This study aimed to explore the relationship between breastfeeding patterns and the child's most important secondary care giver. The prevalence of exclusive breastfeeding was higher when husbands were the most important care giver for the child compared to family members. Statistical association was observed between care giver and

Table 5. Multivariate analysis of significant variables adjusted for potential confounders

Variables	EBF		Non-EBF		Unadjusted		Adjusted	
	n	%	n	%	OR	95% CI	OR	95% CI
Age								
18-30	59	33.5	117	66.5	1	-	1	-
31-42	20	45.5	24	54.5	1.65	0.85 - 3.23	0.64	0.29 - 1.51
Education								
No Education	24	39.2	37	60.7	1	-	1	-
Educated	55	34.6	104	65.4	0.82	0.44 - 0.50	0.62	0.27 - 1.30
Occupation								
Unemployed	51	33.3	102	66.7	1	-	1	-
Employed	28	41.8	39	58.2	0.7	0.39 - 1.26	0.68	0.34 - 1.36
Nipple Deformity								
Yes	6	26.1	17	73.9	1	-	1	-
No	73	37.1	124	62.9	1.69	0.63 - 4.42	1.43	0.46 - 4.43
Parity								
Primiparous	29	25.2	86	74.8	1	-	1	-
Multiparous	50	47.6	55	52.4	2.7	1.53 - 4.77*	2.8	1.36 - 5.78*
Knowledge								
Poor - Moderate	34	28.1	87	71.9	1	-	1	-
Good	45	45.5	54	54.5	2.13	1.22 - 3.70*	2.09	1.09 - 4.00*
Perception								
Negative	29	29.9	68	70.1	1	-	1	-
Positive	50	40.7	73	59.3	1.61	0.91 - 2.82	1.4	0.73 - 2.69
Family Income								
Low	39	29.1	95	70.9	1	-	1	-
Moderate - High	40	46.5	46	53.5	2.12	1.23 - 3.72*	2.26	1.1 - 4.65*
Secondary care giver								
Family members	5	15.6	27	84.4	1	-	1	-
Husband	74	39.4	114	60.6	3.51	1.29 - 9.51*	3.56	1.19 - 10.59*
Accompanied for ANC								
No	7	23.3	23	76.7	1	-	1	-
Yes	72	39.7	118	62.1	2	0.82 - 4.91	1.49	0.54 - 4.11
Initiation of breastfeeding								
More than an hour	4	10.3	35	89.7	1	-	1	-
Within an hour	75	41.4	106	58.6	6.19	2.11 - 18.17*	6.28	1.90 - 20.70*
Number of ANC Visits								
7 – 12	37	27.4	98	76.2	1	-	1	-
1 - 6	42	49.4	43	50.6	2.52	1.15 – 5.56*	2.59	1.46 – 4.57*

*EBF: Exclusive breastfeeding, Non-EBF: Non-exclusive breastfeeding, * significant*

Adjusted for age, education, occupation, nipple deformity status, perception, and whether they were accompanied for ANC

exclusive breastfeeding. Mothers who identified their husband as their child's secondary care giver were 3.5 times more likely to have exclusively breastfed to six months compared to those who identified another family member as being their child's secondary care giver. This may be because of spouses having higher education compared to the family members. In this study around 65% of the fathers had at-least high school education and this could be the probable reason for the observed association. The study also saw that around 10% of the mothers stopped exclusive breastfeeding because of family advice and pressure. A systematic review of 13 studies from different countries and different study designs concluded that grandmothers were highly influential in breastfeeding decisions. A negative opinion had the likelihood to reduce breastfeeding by 70% while a positive opinion had the potential to increase breastfeeding by 13%[24]. In a study conducted in Turkey, mothers reported that emotional and social support from their spouse was crucial in the world of nuclear family to succeed in breastfeeding[25]. These findings are in accordance with the findings of a study conducted in Hong Kong which reported that encouragement and support from their partners was important to succeed in breastfeeding[22].

The study found that mothers from moderate-high income family were two times more likely to exclusively breastfeed compared to those who came from low income family. This observation is likely because wealthier families have higher education, which relates to higher income which in-turn improves the accessibility of information on breastfeeding from television and internet sources enhancing their knowledge on exclusive breastfeeding. A study conducted in Lucknow, India reported of a significant association, that mothers belonging to lower socio-economic families were less likely to practice exclusive breastfeeding[26]. Similar results were reported by a study conducted in rural Bangladesh stating that mothers coming from high income families had higher odds of exclusive breastfeeding[27]. However, a different study from Bangladesh reported that mothers from low income families having higher likelihood of exclusive breastfeeding as they are not able to afford breastmilk substitutes[28]. Similar findings were reported by a study conducted in urban areas of Nepal which justified that breastfeeding was cheaper then breast milk substitutes[29]. Number of ANC visits was found to have significant association with exclusive breastfeeding. Multivariate analysis showed negative association between EBF and higher number of ANC visits. Mothers who availed between 1-6 ANC services were 2.6 times more likely to exclusively breastfeed compared to mothers who availed 7-12 ANC services. The Ministry of Health, Bhutan recommends 8 ANC visits for normal pregnancy and more than 8 visits for high risk pregnancies[30]. However, the study did not collect data regarding high risk and complications during pregnancy. Therefore, this observation might have occurred because of high risks pregnancies and complications confounding the study. Higher number of ANC visits being positively associated with better breastfeeding outcome was reported by a study conducted in Lucknow city in India[26].

The study had two major limitations. This was a cross-sectional study with a small sample size (n=220). Purposive sampling of three hospitals might have affected the generalizability of the findings to the western region. However, this sampling methodology was based on the strengths of the Bhutanese health care system which provides free health care and is equally accessible to everyone. Moreover,these hospitals are located in the most populated districts of the western region and provide health services to majority of the population in their respective district. Therefore, the findings can be inferred to a vast majority of the population in the western region.

CONCLUSIONS

The prevalence of exclusive breastfeeding at six months was 35.9%. The study identified parity, knowledge, family income, secondary care giver of the child and initiation of breastfeeding as factors associated with exclusive breastfeeding. Initiation of breastfeeding had the highest influence on exclusive breastfeeding therefore, the study recommends strengthening lactation management clinic and to educate mothers on the importance of exclusive breastfeeding. The study saw the need to include fathers in the breastfeeding education.

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AUTHORS CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

HPP: concept, analysis of data, study design, manuscript drafting and critical reviews

PP: concept, analysis of data, study design, manuscript drafting and revisions

SS: concept, analysis of data, study design, manuscript drafting and revisions

Authors agree to be accountable for all respects of the work in ensuring that questions related to the accuracy and integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

None

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