

## Determinants of Exclusive Breastfeeding Practices in Kandahar, Afghanistan: A Cross-Sectional Analytical Study

Bilal Ahmad Rahimi<sup>1</sup>, Enayatullah Mohamadi<sup>2</sup>, Mohammad Haroon Stanikzai<sup>3</sup>, Abdul Wahed Wasiq<sup>4</sup>

<sup>1</sup>Associate Professor and Head, Department of Pediatrics, Faculty of Medicine, Kandahar University, Kandahar, Afghanistan. <sup>2</sup>Head of Comprehensive Health Clinic, Mirza Mohammad Khan Qalacha CHC, Kandahar Directorate of Public Health, Kandahar, Afghanistan. <sup>3</sup>Assistant Professor and Head, Department of Public Health, Faculty of Medicine, Kandahar University, Kandahar, Afghanistan. <sup>4</sup>Professor and Head, Department of Internal Medicine, Faculty of Medicine, Kandahar University, Kandahar, Afghanistan.

### Abstract

#### Background

It is recommended for mothers to start breastfeeding their infants within the first hour after birth and exclusively breastfeed them for the first 6 months of their life. Exclusive breastfeeding (EBF) has both short- and long-term benefits for both mother and infant. Main objective of this study was to establish the determinants of EBF practices among mothers in Kandahar, Afghanistan.

#### Materials and Methods

This was a cross-sectional analytical study conducted in Kandahar, Afghanistan. Researcher-made questionnaire was used to collect the data from 1,028 mothers with children <2 years of age who visited either of the seven health clinics of the city during a period of 6 months (June–November, 2018). Data was analysed using SPSS software version 22.0

#### Results

Among 1,028 mothers, 95.9% were uneducated, 53.9% had low socio-economic status, and 94.2% had ante-natal care (ANC) visits. EBF rate was 51.2% (526/1028). During first 6 months of life, 11.1% of the infants were given foods other than milk while 51.4% used pacifier. Weaning was started in nearly half (49.2%) of the infants before 6 months of age. Main barriers to EBF were living in city, male gender, giving sedative syrup (Promethazine) to infant, breastfeeding the infant  $\geq 8$  times in 24 hours, and giving expressed milk.

#### Conclusion

EBF rate in Kandahar is better than many parts of the world, but there are still many barriers that need to be removed. Main barriers of EBF rate in Kandahar needs to be decreased by increasing the health education and overall education status of the mothers.

**Key Words:** Breastfeeding, Barriers, Human milk, Lactation, Risk factors, Weaning.

\*Please cite this article as Rahimi BA, Mohamadi E, Stanikzai MH, Wasiq AW. Determinants of Exclusive Breastfeeding Practices in Kandahar, Afghanistan: A Cross-Sectional Analytical Study. Int J Pediatr 2020; 8(4): 11125-40. DOI: [10.22038/ijp.2019.42987.3601](https://doi.org/10.22038/ijp.2019.42987.3601)

#### \*Corresponding Author:

Bilal Ahmad Rahimi, MD, DTM&H, MCTM(TP), PhD(CTM), Assoc. Prof. and Head, Department of Pediatrics, Faculty of Medicine, Kandahar University, Kandahar, Afghanistan. Postal address: Department of Pediatrics, Faculty of Medicine, Kandahar University, Durahi, Beside Aino Mena Town, District 10, Kandahar, Afghanistan.

Email: [drbilal77@yahoo.com](mailto:drbilal77@yahoo.com)

Received date: Aug.14, 2019; Accepted date: Jan. 22, 2020

## 1- INTRODUCTION

Exclusive breastfeeding (EBF) is defined as Feeding the infant only with human milk, including expressed milk, during the first six months of life and no other liquids and solid foods except medications (1). World Health Organization (WHO) recommends mothers to start breastfeeding their infants within the first hour after birth and exclusively breastfeed them for the first 6 months of their life (1). EBF has both short- and long-term benefits for both mother and infant (1, 2). Breastfeeding decreases the infant's risk of developing diarrhea, otitis media, and obesity as well as being a cost effective intervention that decreases morbidity and mortality in the infant (3). Studies have revealed that initiating breastfeeding within the first hour after birth decreases the infant mortality rate from 19–22% (4–6).

Advantages for mothers who breastfeed their children are: quick return to the pregestational body weight after delivery (7), lower risk of developing breast cancer (8), and decreased chances of postpartum depression due to the establishment of strong positive emotional bond between mother and her child (9). Worldwide, approximately 38% of infants are exclusively breastfed until the age of four months (2). In Iran, higher rates of EBF have been reported from Yazd (72.9%) (10), and Tehran (45%) (11); while the lowest rates of EBF were present in the provinces of Zahedan and Qazvin (12). According to Afghanistan Demographic and Health Survey (AfDHS) 2015, nearly all Afghan children (98%) were breastfed at some point in the first two years of their life, while less than half (43%) are exclusively breastfed until the age of 6 months. After birth, 41% of infants were breastfed within 1 hour while 91% are breastfed within the first 24 hours of birth (13). Our study is the first ever research conducted in Kandahar on the barriers of

EBF. Main objective of this study was to establish the determinants of EBF practices among mothers in Kandahar, Afghanistan; as well as to assess maternal knowledge and attitudes to EBF in Kandahar, Afghanistan.

## 2- MATERIALS AND METHODS

### 2-1. Study Design

This was a cross-sectional analytical study. Data was collected during a 6-month-period (June–November, 2018) using researcher-made questionnaire. Questionnaire contained 53 questions regarding general characteristics, socio-economic status, pregnancy, delivery, breastfeeding, and nutrition of the mother and infant.

### 2-1. Study Design and period

This was a cross-sectional analytical study. Data was collected during a 6-month-period (June–November, 2018).

### 2-2. Study population

The study population was composed of mothers who had children < 2 years of age and visited any of the seven Comprehensive Health Centers (CHCs) in Kandahar city, Afghanistan.

### 2-3. Research question

What are the determinants of EBF practices among mothers in Kandahar, Afghanistan?

### 2-4. Primary objective

To establish the determinants of EBF practices among mothers in Kandahar, Afghanistan.

### 2-5. Secondary objectives

- To assess maternal knowledge and attitudes to EBF in Kandahar.
- To determine the maternal and infant related factors as well as sociodemographic, psychosocial,

cultural, and pregnancy related factors affecting EBF in Kandahar.

## 2-6. Inclusion criteria

- Mothers who had children < 2 years of age and visited any of the seven CHCs in Kandahar city, Afghanistan.
- Permanent residents of Kandahar city.

## 2-7. Exclusion criteria

- Caregivers who were not mothers of the children.
- Mothers who refused to consent to interview.

## 2-8. Sample size calculations

Sample size was calculated using the following formula:

$$n = \frac{p(1-p)}{(E/1.96)^2}$$

Where, n is the sample size, p is the prevalence of outcome expressed as a proportion, E is the margin of error which is 0.05 in this case, 1.96 is the standard normal z-value corresponding to the 95% confidence interval (CI). The sample size and power calculations have been performed in Stata version 15.0. Our sample size was 1,028 mothers.

## 2-9. Ethical considerations

Written informed consents were taken from all the participants prior to the study. Information of the participants will not be disclosed. Ethical approval was taken from Kandahar University Ethics Committee with code number of KDRU-EC-2018.16.

## 2-10. Data analysis

Data were analysed using SPSS version 22.0 (Chicago, IL, USA). Descriptive statistics, such as percentages and proportions, were used to describe the sociodemographic and other details of the study participants. Chi-square test was used to study the association between EBF and the related factors. *P*-value of <0.05 was considered statistically significant. All variables that showed statistically significant association were put in logistic regression to establish the determinants of EBF.

## 3- RESULTS

In this cross-sectional study, data was collected from 1,028 mothers who visited any of the seven CHCs of Kandahar city during a period of 6 months. Mean  $\pm$  standard deviation (minimum – maximum) of age of the mothers and their infants in our study was  $29.9 \pm 7.3$  (18–53) years and  $8.6 \pm 5.6$  (1–28) months, respectively. Mean age  $\pm$  standard deviation (SD) of weaning in infants was  $4.3 \pm 2.3$  months.

Among these mothers, 740/1028 (72%) were < 35 years old while 288/1028 (28%) were  $\geq$  35 years of age. Nearly half (504/1028 [49%]) of the mothers were 20–29 years. Almost all (986/1028 [95.9%]) of the mothers were uneducated, with more than half (554/1028 [53.9%]) having low socio-economic status. Majority (590/1028 [57.4%]) of the mothers had >2 children (**Table.1**).

Most (858/1028 [83.5%]) of the infants were born in health facilities. At least one of the ANC and PNC visits was attended by 968/1028 (94.2%), and 856/1028 (83.3%) of the mothers, respectively. Colostrum was given to 646/1028 (62.8%) of the infants (**Table.2**).

**Table-1:** Basic characteristics of the study participants.

Characteristic	Frequency (n)	Percentage (%)
Maternal age group (n=1028)	14	1.4
15–19 years	258	25.1
20–24 years	246	23.9
25–29 years	222	21.6
30–34 years	150	14.6
35–39 years	138	13.4
≥ 40 years		
Residence (n=1028)		
Urban	878	85.4
Rural	150	14.6
Maternal education (n=1028)		
Uneducated	986	95.9
Primary	26	2.5
Secondary	16	1.6
Paternal education (n=1028)		
Uneducated	834	81.1
Primary	62	6
Secondary	110	10.7
Bachelor degree	22	2.1
Socio-economic status (n=1028)		
Low	554	53.9
Middle	438	42.6
High	36	3.5
Mother tongue (n=1028)		
Pashto	844	82.1
Dari	184	17.9
Family (n=1028)		
Joint	626	60.9
Nuclear	402	39.1
Number of children (n=1028)		
1–2 children	438	42.6
>2 children	590	57.4
Birth interval (n=940)		
≤ 2 years	678	72.1
> 2 years	262	27.9
Gender of infant (n=1028)		
Male	486	47.3
Female	542	52.7
Age of child		
0–6 months	414	40.2
7–12 months	434	42.2
13–24 months	180	17.5
Maternal BMI (n=1028)		
Underweight	196	19.1
Normal	582	56.6
Overweight	162	15.8
Obese	88	8.6

Maternal smoking (n=1028)		
Yes	18	1.8
No	1010	98.2
Paternal smoking (n=1028)		
Yes	202	19.6
No	826	80.4
Passive smoking (n=1028)		
Yes	190	18.5
No	838	81.5

BMI: Body mass index; n: Number.

**Table-2:** Pregnancy- and delivery-related characteristics of the study participants.

Characteristic	Frequency (n)	Percentage (%)
Mode of delivery (n=1028)		
Normal vaginal	980	95.3
Cesarean section	48	4.7
Place of delivery (n=1028)		
Health facility	858	83.5
Home	170	16.5
ANC visits (n=1028)		
1 visit	36	3.5
2 visits	56	5.4
3 visits	148	14.4
≥ 4 visits	728	70.8
No visit	60	5.8
PNC visit (n=1028)		
1 visit	314	30.5
2 visits	182	17.7
3 visits	122	11.9
≥ 4 visits	238	23.2
No visit	172	16.7
EBF counselling (n=1028)		
Yes	888	86.4
No	140	13.6
Message given by media about EBF (n=1028)		
Yes		
No	788	76.7
	240	23.3
Encourage to practice EBF after delivery (n=1026)		
Yes		
No	856	83.4
	170	16.6
Initiation of breastfeeding after delivery (n=1028)		
Within 1 hour		
> 1 hour	646	62.8
	382	37.2
EBF practice in hospital (n=976)		
Yes	788	80.7
No	188	19.3
Colostrum given to infant (n=1028)		
Yes	646	62.8
No	382	37.2

Who encouraged mother to visit health facility? (n=1028)

Community health worker		
Medical staff	178	17.3
Family member	26	2.5
Others	520	50.6
No one	114	11.1
	190	18.5

ANC: Antenatal care; EBF: Exclusive breastfeeding; n: Number; PNC: Post-natal care.

EBF rate was 51.2% (526/1028). During the first 6 months of life, 114/1028 (11.1%) of the infants were given foods other than human, cow, or formula milk; while 528/1028 (51.4%) were using pacifier. Weaning was started in nearly half (506/1028 [49.2%]) of the infants before reaching the recommended age of 6 months. During the breastfeeding period, only 48/1028 (4.7%), 62/1028 (6%), 116/1028 (11.3%), 122/1028 (11.9%), and 238/1028 (23.3%) of the mothers used more eggs, nuts, milk and other dairy products, vitamins and minerals

supplements, and meat, respectively (**Table.3**). More than half (256/502 [51%]) of the mothers stopped breastfeeding their infants before the age of 6 months by giving the reason that they did not have enough milk. Other main reasons given by mothers were that they were sick or had to take medicine (72/502 [14.3%]), and they became or wanted to become pregnant again (54/502 [10.8%]). Also, the main reason (38/76 [50.1%]) given by mothers who stopped breastfeeding their infants during 6–24 months was that they did not have enough milk (**Table.4**).

**Table-3:** Breastfeeding and nutrition characteristics of the study populations.

Characteristic	Frequency (n)	Percentage (%)
EBF (n=1028)		
Yes	526	51.2
No	502	48.8
EBF by age in months		
0–3 months	414	40.3
≥ 4 months	614	59.7
Diet of infant in the first 6 months (n=1028)		
Only breastfeeding	526	51.2
Formula	378	36.8
Rice	60	5.8
Cerelac	22	2.1
Meat	12	1.2
Sweetened tea	18	1.7
Cow milk	10	1.0
Fruit	2	0.2
Who Encouraged mother to stop EBF? (n=502)		
Mother-in-law	98	19.5
Husband	36	7.2
Physicians and medical staff	28	5.6
Another family member	12	2.4
No one	328	65.3

Age of Stopping BF completely (n=76)		
First 6 months	12	15.8
7–12 months	24	31.6
13–24 months	36	47.4
> 24 months	4	5.2
Who encouraged mother to stop BF completely? (n=76)		
Mother-in-law	18	23.7
Husband	4	5.3
Physicians and medical staff	4	5.3
Another family member	6	7.9
No one	44	57.8
Weaning age (n=1028)		
≥ 6 months	522	50.8
< 6 months	506	49.2
Infant sleeping with mother on the same bed (n=1028)		
Yes	960	93.4
No	68	6.6
Sedative syrup (promethazine) given to infant (n=1028)		
Yes	342	33.3
No	686	66.7
BF frequency in 24 hours (n=1028)		
≥ 8 times	648	63
< 8 times	380	37
Average time of BF (n=1028)		
< 10 minutes	370	36
≥ 10 minutes	658	64
Breast used for BF (n=1028)		
Both breast	980	95.3
One breast	48	4.7
Expressed milk given (n=1028)		
Yes	166	16.1
No	862	83.9
Breastfeeding mostly given during (n=1028)		
Night	372	36.2
Day	648	63.8
Weighing the infant in first 6 months (n=1028)		
Yes	530	51.6
No	498	48.4
Pacifier used in first 6 months of life (n=1028)		
Yes	528	51.4
No	500	48.6
Mother's diet during BF period		
Drinking more water (n=1028)		
Yes	352	34.2
No	676	65.8
Eating more meat (n=1028)		
Yes	238	23.2
No	790	76.8

Eating more nuts (n=1028)		
Yes	62	6
No	966	94
Consuming milk and other dairy products (n=1028)		
Yes	116	11.3
No	912	88.7
Eating more vegetables (n=1028)		
Yes	524	51
No	504	49
Taking vitamins and minerals supplement (n=1028)		
Yes	122	11.9
No	906	88.1
Eggs (n=1028)		
Yes	48	4.7
No	980	95.3

BF: Breastfeeding; EBF: Exclusive breastfeeding; n: Number.

**Table-4:** Reasons given by mothers who stopped breastfeeding their infants.

Reason	Frequency (n)	Percentage (%)
Reasons given by mothers who stopped BF before 6 months of infant's age (n=502)		
I did not have enough milk	256	51.0
I was sick or had to take medicine	72	14.3
I became pregnant or wanted to become pregnant again	54	10.8
I had depressive symptoms	34	6.8
I had twins	28	5.5
My infant became sick and could not suck milk	24	4.8
My infant lost interest in nursing or began to wean him or herself	14	2.8
I had too many household duties	10	2.0
I thought that my infant was not gaining enough weight	6	1.2
My infant began to bite	2	0.4
I did not like breastfeeding	2	0.4
Reasons given by mothers who stopped BF during 6–24 months of infant's age (n=76)		
I did not have enough milk	38	50.1
I became pregnant or wanted to become pregnant again	20	26.3
I was sick or had to take medicine	8	10.5
My infant became sick and could not breastfeed	6	7.9
I had too many household duties	2	2.6
I had depressive symptoms	2	2.6

Chi-square analysis revealed 25 variables having association with EBF failure, with crude odds ratio of >1 and statistically significant *p*-value of <0.05 (**Table.5**). Logistic regressions of all 25 variables were conducted. Among these 25 variables, living in city (Adjusted odds ratio [AOR]: 6.0, 95% CI: 2.1–16.9, *p*-value= 0.001); male gender (AOR: 3.5,

95% CI: 1.8–6.9, *p*-value <0.001); giving sedative syrup (Promethazine) to infant (AOR: 2.3, 95% CI: 1.1–5.0, *p*-value= 0.02); breastfeeding the infant ≥8 times in 24 hours (AOR: 13.2, 95% CI: 5.5–32.0, *p*-value <0.001); and giving expressed milk (AOR: 2.6, 95% CI: 1.0–6.4, *p*-value 0.04) were the main barriers to EBF (**Tables 6 and 7**).

**Table-5:** Determinants and their association with EBF.

Variable (Factor)	EBF	Non-EBF	COR (95% CI)	P- value
Maternal age (n=1028)				
< 35 years (n=740)	410	330	1.2 (1.1–1.3)	0.002
≥ 35 years (n=288)	116	172	1	
Residence (n=1028)				
Rural (n=150)	98	52	1.8 (1.2–2.8)	0.008
Urban (n=878)	428	450	1	
Socio-economic status (n=1028)				
Low–middle (n=992)	504	488	1	0.390
High (n=36)	22	14	1.5 (0.9–3.8)	
Mother tongue (n=1028)				
Pashto (n=844)	420	424	1	0.173
Dari (n=184)	106	78	1.3 (0.9–1.9)	
Maternal education (n=1028)				
Educated (n=42)	34	8	4.1 (1.4–11.9)	0.005
Uneducated (n=986)	492	494	1	
Paternal education (n=1028)				
Educated (n=194)	116	78	1.4 (1.0–2.1)	0.059
Uneducated (n=834)	410	424	1	
Maternal smoking (n=1028)				
Yes (n=18)	10	8	1.2 (0.3–4.4)	0.790
No (n=1010)	516	494	1	
Paternal smoking (n=1028)				
Yes (n=202)	100	102	0.9 (0.7–1.3)	0.709
No (n=826)	426	400	1	
Passive smoking (n=1028)				
Yes (n=190)	90	100	0.9 (0.6–1.2)	0.412
No (n=838)	436	402	1	
Gender of infant (n=1028)				
Male (n=486)	220	266	1	0.011
Female (n=542)	306	236	1.2 (1.1–1.5)	
Number of children (n=1028)				
1–2 children (n=438)	242	196	1.2 (1.0–1.4)	0.111
>2 children (n=590)	284	306	1	
Birth interval (n=940)				
≤ 2 years (n=678)	320	358	1	0.011
> 2 years (n=262)	158	104	1.5 (1.1–2.0)	
Maternal BMI (n=1028)				
Normal (n=582)	322	260	1.2 (1.0–1.4)	0.031
Abnormal (n=446)	204	242	1	
Family (n=1028)				
Joint (n=626)	298	328	1	0.044
Nuclear (n=402)	228	174	1.2 (1.0–1.6)	
EBF counselling (n=1028)				
Yes (n=888)	470	418	1.1 (1.0–1.2)	0.044
No (n=140)	56	84	1	
Message given by media about EBF (n=1028)				
Yes (n=788)	438	350	1.2 (1.1–1.3)	<0.001
No (n=240)	88	152	1	
Place of delivery (n=1028)				
Health facility (n=858)	474	384	1.2 (1.1–1.3)	<0.001
Home (n=170)	52	118	1	
Mode of delivery (n=1028)				
Normal vaginal (n=980)	498	482	1	0.472
Cesarean section (n=48)	28	20	1.3 (0.6–3.0)	
Colostrum given to infant (n=1028)				<0.001

## Exclusive Breastfeeding in Afghanistan

Yes (n=646)				
No (n=382)	376	270	1.3 (1.2–1.5)	
	150	232	1	
EBF practice in hospital (n=976)				
Yes (n=788)				
No (n=188)	434	354	1.1 (1.0–1.2)	0.003
	72	116	1	
Infant sleeping with mother on the same bed (n=1028)				
Yes (n=960)	504	456	1.1 (1.0–1.1)	0.023
No (n=68)	22	46	1	
Sedative syrup (promethazine) given to infant (n=1028)				
Yes (n=342)	80	262	1	<0.001
No (n=686)	446	240	1.8 (1.5–2.1)	
BF frequency in 24 hours (n=1028)				
≥ 8 times (n=380)				
< 8 times (n=648)	88	292	1	<0.001
	438	210	2.0 (1.7–2.3)	
Pacifier used in first 6 months of life (n=1028)				
Yes (n=528)	154	374	1	<0.001
No (n=500)	372	128	2.8 (2.2–3.5)	
Breast used for BF (n=1028)				
Both breasts (n=980)	512	468	1.0 (1.0–1.1)	0.027
One breast (n=48)	14	34	1	
Expressed milk given (n=1028)				
Yes (n=166)	68	98	1	0.042
No (n=862)	458	404	1.1 (1.0–1.2)	
Average time of BF (n=1028)				
< 10 minutes (n=370)	104	266	1	<0.001
≥ 10 minutes (n=658)	422	236	1.7 (1.5–2.0)	
Predominant BF time (n=1028)				
Night (n=656)	236	420	1	<0.001
Day (n=372)	290	82	3.4 (2.5–4.6)	
ANC visits (n=1028)				
Yes (n=968)	516	452	1.1 (1.0–1.1)	<0.001
No (n=60)	10	50	1	
Number of ANC visits (n=976)				
1 visit (n=34)	14	20	1	0.326
>1 visits (n=942)	502	440	1.0 (1.0–1.1)	
PNC visits (n=1028)				
Yes (n=856)	474	382	1.2 (1.1–1.3)	<0.001
No (n=172)	52	120	1	
Number of PNC visits (n=856)				
1 visit (n=314)	180	134	1.1 (0.8–1.4)	0.537
>1 visits (n=542)	294	248	1	
Weighing the infant in first 6 months (n=1028)				
Yes (n=530)	386	144	2.6 (2.1–3.2)	<0.001
No (n=498)	140	358	1	
Drinking more water during BF (n=1028)				
Yes (n=352)				
No (n=676)	204	148	1.3 (1.0–1.7)	0.026
	322	354	1	
Consuming more milk and other dairy products during BF period (n=1028)				
Yes (n=116)				0.001
No (n=912)	84	32	2.5 (1.5–4.3)	

	442	470	1	
Eating more nuts during BF (n=1028)				
Yes (n=62)				0.749
No (n=966)	30	32	1	
	496	470	1.0 (1.0–1.1)	
Eating more vegetables during BF (n=1022)				
Yes (n=524)	258	266	1	0.446
No (n=498)	262	236	1.1 (0.9–1.3)	
Taking vitamins and minerals supplement during BF (n=1028)				
Yes (n=122)	66	56	1.1 (0.7–1.8)	0.626
No (n=906)	460	446	1	
Eating more eggs during BF (n=1028)				
Yes (n=48)				0.255
No (n=980)	30	18	1.6 (0.7–3.6)	
	496	484	1	
Eating more meat during BF (n=1028)				
Yes (n=238)				0.218
No (n=790)	110	128	1	
	416	374	1.1 (1.0–1.2)	

ANC: Antenatal care; BF: Breastfeeding; COR: Crude odds ratio; EBF: Exclusive breastfeeding; PNC: Post-natal care.

**Table-6:** Logistic regression of the determinants (barriers) associated with EBF.

Variables (Factors)	AOR (95% CI)	P-value
Maternal age	0.5 (0.2–1.0)	0.042
Residence	6.0 (2.1–16.9)	0.001
Maternal education	0.3 (0.0–4.8)	0.424
Gender of infant	3.5 (1.8–6.9)	<0.001
Birth interval	1.3 (0.5–3.1)	0.611
Maternal BMI	1.7 (0.8–3.8)	0.167
Family	0.9 (0.4–2.2)	0.855
ANC visits	0.7 (0.0–43.3)	0.847
PNC visits	0.5 (0.2–1.1)	0.076
EBF counselling	2.8 (0.5–14.8)	0.230
Message given by media about EBF	0.1 (0.1–0.4)	0.001
Place of delivery	2.4 (0.6–10.4)	0.242
Colostrum given to infant	0.6 (0.2–1.5)	0.294
EBF practice in hospital	0.6 (0.2–1.8)	0.338
Infant sleeping with mother on the same bed	0.6 (0.1–2.9)	0.543
Sedative syrup (promethazine) given to infant	2.3 (1.1–5.0)	0.02
BF frequency in 24 hours	13.3 (5.5–32.0)	<0.001
Expressed milk given	2.6 (1.0–6.4)	0.04
Pacifier used in first 6 months of life	0.7 (0.3–1.8)	0.509
Breastfeeding with both breasts	0.3 (0.0–1.7)	0.160
Average time of BF	1.9 (0.7–4.9)	0.186
Weighing the infant in first 6 months	0.1 (0.0–0.2)	<0.001
Predominant BF time	0.6 (0.2–1.6)	0.312
Drinking more water during BF	0.2 (0.1–0.6)	0.007
Consuming milk and other dairy products during BF period	0.5 (0.21–1.1)	0.074

ANC: Ante-natal care; AOR: Adjusted odds ratio; BF: Breastfeeding; BMI: Body mass index; EBF: Exclusive breastfeeding; PNC: Post-natal care.

**Table-7:** Barriers to EBF in different parts of the world.

Author, Year, Reference	Location	Study Design, Sample Size, Study duration	Barriers to EBF
Olang <i>et al.</i> , 2012 (24)	Iran	<ul style="list-style-type: none"> <li>Retrospective study</li> <li>n = 63,071</li> <li>Four months</li> </ul>	<ul style="list-style-type: none"> <li>Physicians' recommendation</li> <li>Insufficient breast milk</li> <li>Family recommendation</li> <li>Crying infant</li> <li>Non-specific reasons</li> </ul>
Hazir <i>et al.</i> , 2012 (33)	Pakistan	<ul style="list-style-type: none"> <li>Cross-sectional study</li> <li>n = 3,103</li> <li>Six months</li> </ul>	<ul style="list-style-type: none"> <li>Working mothers</li> <li>Wealthy family</li> <li>Living in Punjab province</li> <li>Uneducated mothers</li> </ul>
Velusamy <i>et al.</i> , 2017 (6)	South India	<ul style="list-style-type: none"> <li>Three prospective birth cohort studies</li> <li>n = 1,088</li> <li>Seven years</li> </ul>	<ul style="list-style-type: none"> <li>Maternal education</li> <li>Concrete house</li> <li>≥ 2 children in the family</li> <li>Joint family structure</li> <li>Birth during summer</li> </ul>
Hmone <i>et al.</i> , 2017 (34)	Yangon, Myanmar	<ul style="list-style-type: none"> <li>Cross-sectional study</li> <li>n = 353</li> <li>Six weeks</li> </ul>	<ul style="list-style-type: none"> <li>Working women</li> <li>Low-income households</li> <li>Low breastfeeding knowledge</li> <li>Not receiving information from health professionals</li> </ul>
Dorgham <i>et al.</i> , 2014 (35)	Taif, Saudi Arabia	<ul style="list-style-type: none"> <li>Cross-sectional study</li> <li>n = 400</li> <li>Four months</li> </ul>	<ul style="list-style-type: none"> <li>Maternal education</li> <li>Father's education</li> <li>Mode of delivery</li> <li>Infant's age</li> </ul>
Yelmaz <i>et al.</i> , 2016 (36)	Turkey	<ul style="list-style-type: none"> <li>Cross-sectional study</li> <li>n = 200</li> <li>Six months</li> </ul>	<ul style="list-style-type: none"> <li>Maternal age</li> <li>Planned pregnancy</li> <li>Postpartum education</li> <li>Nipple problems</li> <li>Night feeding</li> <li>Formula initiation</li> </ul>
Yeneabat <i>et al.</i> , 2014 (37)	Northwest Ethiopia	<ul style="list-style-type: none"> <li>Cross-sectional study</li> <li>n = 592</li> <li>Twenty days</li> </ul>	<ul style="list-style-type: none"> <li>Maternal and paternal occupation</li> <li>Place of residence</li> <li>Postnatal counseling on exclusive breast-feeding</li> <li>Mode of delivery</li> <li>Birth order of the index infant</li> </ul>
Dun-Dery and Laar, 2016 (38)	Ghana	<ul style="list-style-type: none"> <li>Cross-sectional study</li> <li>n = 369</li> <li>Seven months</li> </ul>	<ul style="list-style-type: none"> <li>Cesarean delivery</li> <li>No infant feeding recommendation by health workers at birth</li> <li>Less maternity leave</li> <li>Inconvenient feeding method</li> </ul>
Ogbo <i>et al.</i> , 2017 (39)	Sydney, Australia	<ul style="list-style-type: none"> <li>Retrospective study</li> <li>n = 17,564</li> <li>One year</li> </ul>	<ul style="list-style-type: none"> <li>Younger mothers (&lt;20 years)</li> <li>Mothers smoking during pregnancy</li> <li>Intimate partner violence</li> <li>Assisted delivery</li> <li>Low socio-economic status</li> <li>Pre-existing maternal health problems</li> <li>Lack of partner support</li> </ul>
do Nascimento <i>et al.</i> , 2010 (40)	Joinville, Brazil	<ul style="list-style-type: none"> <li>Cross-sectional study</li> <li>n = 1,470</li> <li>Four years</li> </ul>	<ul style="list-style-type: none"> <li>Higher infant age</li> <li>Pacifier use</li> <li>Lower maternal education</li> </ul>
This study	Kandahar, Afghanistan	<ul style="list-style-type: none"> <li>Cross-sectional study</li> <li>n = 1,028</li> <li>Six months</li> </ul>	<ul style="list-style-type: none"> <li>Living in city</li> <li>Male gender</li> <li>Giving sedative syrup (Promethazine) to infant</li> <li>Breastfeeding the infant ≥8 times in 24 hours</li> <li>Giving expressed milk</li> </ul>

EB: Exclusive breastfeeding; n: Number.

#### 4- DISCUSSION

In this cross-sectional study, we studied 1,028 mothers with their infants to establish the determinants of EBF practices among mothers in Kandahar, Afghanistan. EBF rate in our study was 51.2%. It is more than the Afghanistan DHS 2015 data which reported the EBF rate of 43% for Afghanistan (13). Lower EBF rates have been reported from Kuwait (2%) (14), India (11.4%) (15), Brazil (15.2%) (16), Nigeria (33.5%) (17), and Zimbabwe (36%) (18). Higher EBF rate has been observed in studies conducted in Iran (56.4%) (19), and Ethiopia (60.9%) (20). A study in Tehran, Iran revealed that only 45% of the mothers practiced EBF (11); while the lowest rates of EBF were present in the provinces of Zahedan, Yazd, and Qazvin (12). In our study, mothers who delivered in health facility were more likely to practice EBF than the mothers who delivered at home. This result is similar to studies conducted in Nepal (21), Bangladesh (22), Indonesia (23), and Ethiopia (20). On the other hand, a study in Canada showed the opposite results (24). They pointed out its reason as the negative effect of formula supplementation. Our findings strengthen the Baby-Friendly Hospital Initiative (BFHI) of WHO to be implemented in all health facilities. Implementation of BFHI has greatly helped in increasing the EBF rates (25). Our study showed that mothers who gave birth by cesarean section (58.3%) than by normal vaginal delivery (50.8%) practiced EBF more. Our finding is opposite to the studies done in Iran (26), India (27), Nepal (21), Ethiopia (20, 28), Uganda (29), Nigeria (30), and Canada (24). Cesarean section is usually accompanied with pain and discomfort, which may prevent mother from breastfeeding. Cesarean section affects maternal and fetal stress response that disturbs lactogenesis causing ineffective start of breastfeeding and failure after

discharge from the health facility (31). More female infants in our study were exclusively breastfed than male infants (56.5% vs. 45.3%). This can be due to the reason that many mothers in Kandahar start weaning earlier in male infants. Male is usually preferred over female infant and they think that starting weaning earlier will make the infant stronger. Our results are contrary to the results of many studies where EBF is practiced more in male than female infants (32, 33). This study revealed that 62.8% of the infants were given colostrum and they had greater likelihood of EBF. Similar positive association between giving of colostrum and EBF was reported from Nepal (21), Bangladesh (22), Indonesia (23), and Nigeria (30). Main reason given by mothers for discarding colostrum was advice by the elders of the family that colostrum is difficult to digest and it can make the infant sick. Mothers living in urban areas were less likely to practice EBF in our study. Similar results have been reported from Iran (34), India (35), Saudi Arabia (36), and Ethiopia (37). This study showed that ratio of EBF was less in infants who were given sedative drug (promethazine). Promethazine is an antihistaminic drug with the side effect of sedation. In Kandahar, females usually use promethazine for sedation in their infants who cry a lot, especially at night. They have a mistaken belief that infants who cry a lot need a sedative drug instead of consulting a physician. In addition, they think that using this drug will result in a quiet sleep for both infant and mother. Another main reason is the lower socio-economic status of the family who cannot afford to consult a physician and instead buy medicine for their infant. In our study, mothers with 1–2 children were more likely to EBF their infants as compared to the mothers with >2 children. It is assumed that increase in the number of children in a family is negatively associated with the duration of EBF (15). This can be due to

smaller size of the family, so that mother can exclusively breastfeed and give more time to her infant. Our findings are contradictory to the results of studies conducted in Jordan (38), Zimbabwe (18), and Brazil (16). Nearly all (94.2%) of mothers in our study had attended at least one ANC visit, which had a positive association with EBF. Similar positive association of ANC visits and EBF have been reported from India (39), Indonesia (23), Uganda (29), and Nigeria (40). Our study showed that mothers who had had EBF counselling were more likely to EBF their infants. Similar positive association has been reported from India (27), Nepal (41), Uganda (29), Ethiopia (28), and USA (42). Health workers play an important role in EBF counselling. They should be well trained to give better advice to mothers about EBF during ANC and PNC visits. Barriers to EBF in our study are compared with the ones reported in studies from different parts of the world in Table.7.

#### 4-1. Study Limitations

Main limitations of our study were being representative of mostly urban area and therefore it cannot be generalized for the entire population, cross-sectional nature of the study, determination of other known risk factors (such as inadequacy of breast milk, poor weight gain, false beliefs in mothers, etc.), and inability to follow up the infants longitudinally.

#### 5- CONCLUSION

Main barriers to EBF in our study were living in city, male gender, giving sedative syrup (Promethazine) to infant, breastfeeding the infant  $\geq 8$  times in 24 hours, and giving expressed milk. EBF rate in Kandahar is better than national EBF rate in Afghanistan and many parts of the world, but there are still many barriers that need to be removed. These results will help policy makers and health professionals to establish the basis for

designing plans and interventions, in order to bridge the gaps between the current practices of EBF and the recommendations of WHO and UNICEF. To achieve these goals, Baby Friendly Hospital Initiative (BFHI) should be implemented in all health facilities, as well as public and health staff's awareness about proper breastfeeding practices should be enhanced.

**6- CONFLICT OF INTEREST:** None.

#### 7- ACKNOWLEDGEMENTS

We present our highest and sincere thanks to the authorities of MPH program, Faculty of Medicine, Kandahar University, and Afghanistan Ministry of Higher Education. We are also very thankful to all Kandahar CHCs' staff and our study participants.

#### 8- REFERENCES

1. Horta BL, Victora CG. Long-term effects of breastfeeding: A systematic review. World Health Organization. 2013 [cited 2019 Aug 18]. Available at: [https://www.who.int/maternal\\_child\\_adolescence/documents/breastfeeding\\_long\\_term\\_effects/en/](https://www.who.int/maternal_child_adolescence/documents/breastfeeding_long_term_effects/en/).
2. Victora CG, Bahl R, Barros AJD, França GVA, Horton S, Krasevec J, et al. Breastfeeding in the 21st century: Epidemiology, mechanisms, and lifelong effect. *Lancet*. 2016;387(10017):475–90.
3. Rajeshwari K, Bang A, Chaturvedi P, Kumar V, Yadav B, Bharadva K, et al. Infant and young child feeding guidelines: 2010. *Indian Pediatr*. 2010;47(12):995–1004.
4. Pakpour A, Alijanzadeh M, Poursmaeil M, Taherkhani F, Mohammadgholiha R, Jozi N. Predictive Factors Associated with Breastfeeding Initiation and Duration Behaviors of 6-months Postpartum Mothers Referred to Health Centers in the City of Qazvin Based on Theory of Planned Behavior. *Iran J Heal Educ Heal Promot*. 2016;4(1):20–30.
5. Debes AK, Kohli A, Walker N,

- Edmond K, Mullany LC. Time to initiation of breastfeeding and neonatal mortality and morbidity: A systematic review. *BMC Public Health*. 2013;13(SUPPL.3):S19.
6. Jamei F, Ostovar A, Javadzade H. Predictors of exclusive breastfeeding among nulliparous Iranian mothers: Application of the theory of planned behavior. *Int J Pediatr*. 2017;5(3):4457–67.
  7. Jarlenski MP, Bennett WL, Bleich SN, Barry CL, Stuart EA. Effects of breastfeeding on postpartum weight loss among U.S. women. *Prev Med (Baltim)*. 2014;69:146–50.
  8. Babita, Kumar N, Singh M, Malik JS, Kalhan M. Breastfeeding Reduces Breast Cancer Risk: A Case-Control Study in North India. *Int J Prev Med*. 2014;5(6):791–795.
  9. Assarian F, Moravveji A, Ghaffarian H, Eslamian R, Atoof F. The association of postpartum maternal mental health with breastfeeding status of mothers: A case-control study. *Iran Red Crescent Med J*. 2014;16(3):e14839.
  10. Esfandiyari R, Moghadam MHB, Khakshour A, Faroughi F, Saeidi M. Study of maternal knowledge and attitude toward exclusive breast milk feeding (BMF) in the first 6 months of infant in yazd-iran. *Int J Pediatr*. 2014;2(3):175–81.
  11. Noughabi Z, Tehrani G, Foroushani A, Nayeri F, Baheiraei A. Prevalence and factors associated with exclusive breastfeeding at 6 months of life in Tehran: a population-based study. *East Mediterr Heal J*. 2014;20(1):24–32.
  12. Olang B, Farivar K, Heidarzadeh A, Strandvik B, Yngve A. Breastfeeding in Iran: prevalence, duration and current recommendations. *Int Breastfeed J*. 2009;4:8.
  13. Central Statistics Organization (CSO), Ministry of Public Health (MoPH), ICF. Demographic and Health Survey 2015. Kabul, Afghanistan: Central Statistics Organization; 2017.
  14. Dashti M, Scott JA, Edwards CA, Al-Sughayer M. Predictors of breastfeeding duration among women in Kuwait: Results of a prospective cohort study. *Nutrients*. 2014;6(2):711–28.
  15. Velusamy V, Premkumar PS, Kang G. Exclusive breastfeeding practices among mothers in urban slum settlements: Pooled analysis from three prospective birth cohort studies in South India. *Int Breastfeed J*. 2017;12(35):13.
  16. de Oliveira MM, Camelo JS. Gestational, perinatal, and postnatal factors that interfere with practice of exclusive breastfeeding by six months after birth. *Int Breastfeed J*. 2017;12(1):42.
  17. Onah S, Osuorah DIC, Ebenebe J, Ezechukwu C, Ekwochi U, Ndukwu I. Infant feeding practices and maternal socio-demographic factors that influence practice of exclusive breastfeeding among mothers in Nnewi South-East Nigeria: A cross-sectional and analytical study. *Int Breastfeed J*. 2014;9(1):21.
  18. Mundagowa PT, Chadambuka EM, Chimberengwa PT, Mukora-Mutseyekwa F. Determinants of exclusive breastfeeding among mothers of infants aged 6 to 12 months in Gwanda District, Zimbabwe. *Int Breastfeed J*. 2019;14:30.
  19. Vafae A, Khabazkhoob M, Moradi A, Najafpoor AA. Prevalence of exclusive breastfeeding during the first six months of life and its determinant factors on the referring children to the health centers in Mashhad, northeast of Iran-2007. *J Appl Sci*. 2010;10(4):343–8.
  20. Adugna B, Tadele H, Reta F, Berhan Y. Determinants of exclusive breastfeeding in infants less than six months of age in Hawassa, an urban setting, Ethiopia. *Int Breastfeed J*. 2017;12:45.
  21. Chandrashekhara TS, Joshi HS, Binu V, Shankar PR, Rana MS, Ramachandran U. Breast-feeding initiation and determinants of exclusive breast-feeding - a questionnaire survey in an urban population of western Nepal. *Public Health Nutr*. 2007;10(2):192–7.
  22. Joshi PC, Angdembe MR, Das SK, Ahmed S, Faruque ASG, Ahmed T. Prevalence of exclusive breastfeeding and associated factors among mothers in rural Bangladesh: a cross-sectional study. *Int Breastfeed J*. 2014;9:7.
  23. Susiloretni KA, Krisnamurni S, Sunarto, Widiyanto SYD, Yazid A, Wilopo

- SA. The effectiveness of multilevel promotion of exclusive breastfeeding in rural Indonesia. *Am J Heal Promot.* 2013;28(2):e44-55.
24. Al-Sahab B, Lanes A, Feldman M, Tamim H. Prevalence and predictors of 6-month exclusive breastfeeding among Canadian women: a national survey. *BMC Pediatr.* 2010;10:20.
25. Pries AM, Huffman SL, Mengkheang K, Kroeun H, Champeny M, Roberts M, et al. Pervasive promotion of breastmilk substitutes in Phnom Penh, Cambodia, and high usage by mothers for infant and young child feeding. *Matern Child Nutr.* 2016;12:38–51.
26. Haghghi M, Taheri E. Factors associated with breastfeeding in the first hour after birth, in baby friendly hospitals, Shiraz-Iran. *Int J Pediatr.* 2015;3(5):889–96.
27. Sharma M, Kanani S. Grandmothers' influence on child care. *Indian J Pediatr.* 2006;73(4):295–8.
28. Seid AM, Yesuf ME, Koye DN. Prevalence of Exclusive Breastfeeding Practices and associated factors among mothers in Bahir Dar city, Northwest Ethiopia: a community based cross-sectional study. *Int Breastfeed J.* 2013;8(1):14.
29. Matovu A, Kirunda B, Rugamba-Kabagambe G, Tumwesigye NM, Nuwaha F. Factors influencing adherence to exclusive breast feeding among HIV positive mothers in Kabarole district, Uganda. *East Afr Med J.* 2008;85(4):162–70.
30. Onah S, Osuorah DIC, Ebenebe J, Ezechukwu C, Ekwochi U, Ndukwu I. Infant Determinants of cessation of exclusive breastfeeding in Ankesha Guagusa Woreda, Awi Zone, Northwest Ethiopia: a cross-sectional study. *BMC Pregnancy Childbirth.* 2014;14:262.
38. Khasawneh W, Khasawneh AA. Predictors and barriers to breastfeeding in north of Jordan: could we do better? *Int Breastfeed J.* 2017 Dec;12(1):13.
39. Tiwari R, Mahajan PC, Lahariya C. The determinants of exclusive breast feeding in urban slums: a community based study. *J Trop Pediatr.* 2009;55(1):49–54.
- feeding practices and maternal socio-demographic factors that influence practice of exclusive breastfeeding among mothers in Nnewi South-East Nigeria: A cross-sectional and analytical study. *Int Breastfeed J.* 2014;9(1):6.
31. Hobbs AJ, Mannion CA, McDonald SW, Brockway M, Tough SC. The impact of caesarean section on breastfeeding initiation, duration and difficulties in the first four months postpartum. *BMC Pregnancy Childbirth.* 2016;16(1):90.
32. Basu S, Aundhakar C, Galgali A. Gender Discrimination in Relation to Exclusive Breast Feeding Practices amongst Twins in Rural India. *Int J Heal Sci Res.* 2014;4(5):139–43.
33. Nagra S, Gilani A. Variations in infant feeding practices in Pakistan with socioeconomic stratification. *J Trop Pediatr.* 1987;33(2):103–6.
34. Olang B, Heidarzadeh A, Strandvik B, Yngve A. Reasons given by mothers for discontinuing breastfeeding in Iran. *Int Breastfeed J.* 2012;7(1):7.
35. Chandhiok N, Singh KJ, Sahu D, Singh L, Pandey A. Changes in exclusive breastfeeding practices and its determinants in India, 1992-2006: Analysis of national survey data. *Int Breastfeed J.* 2015;10(34):23.
36. Amin T, Hablas H, Al Qader AA. Determinants of initiation and exclusivity of breastfeeding in al Hassa, Saudi Arabia. *Breastfeed Med.* 2011;6(2):59–68.
37. Yeneabat T, Belachew T, Haile M. 40. Ogunlesi TA. Maternal socio-demographic factors influencing the initiation and exclusivity of breastfeeding in a Nigerian semi-urban setting. *Matern Child Health J.* 2010;14(3):459–65.
41. Khanal V, Lee AH, Karkee R, Binns CW. Postpartum Breastfeeding Promotion and Duration of Exclusive Breastfeeding in Western Nepal. *Birth.* 2015;42(4):329–36.
42. Li R, Fein SB, Chen J, Grummer-Strawn LM. Why mothers stop breastfeeding: Mothers' self-reported reasons for stopping during the first year. *Pediatrics.* 2008;122(SUPPL. 2):S69-76.