

# Original Research Article

## ASSESSING THE KNOWLEDGE AND PRACTICE OF MOTHERS ON EXCLUSIVE BREASTFEEDING IN THE DOHINAYILI COMMUNITY, NORTHERN REGION, GHANA

### ABSTRACT

**Background:** The prevalence of exclusive breastfeeding for the first six months of life has remained low worldwide and in Ghana, despite strong evidence in support of its practice. The practice of exclusive breastfeeding is influenced by maternal knowledge and attitudes as well as socio-demographic and cultural factors.

**Purpose:** This study was aimed at assessing the knowledge and practice of exclusive breastfeeding among mothers in the Tamale metropolis of Ghana.

**Methodology:** This cross-sectional study was conducted among 200 community lactating mothers with infants aged 0–24 months in the Dohinayili community in the Tamale metropolis of Ghana. All data was collected using a questionnaire that contained both closed and open-ended questions. The simple random sampling was used to recruit participants into the study.

**Key findings:** Despite the generally high knowledge of exclusive breast feeding, the mothers did not exclusively breast feed their babies. These mothers did not practice EBF because they misunderstood certain signs of the child to mean wanting to eat food or drink water, regarded breastmilk to be inadequate to meet the nutritional needs of the child and misunderstood healthcare professionals' EBF advice.

**Recommendations:** Beyond dissemination of health messages, healthcare professionals should pay more counselling attention to less educated mothers, and also older children's caregivers.

**Key Words:** *Exclusive breastfeeding, Infants, Lactating mothers, Rural, Ghana.*

### BACKGROUND

Comment [s1]: Please write: ASSESSMENT OF THE NUTRITIONAL KNOWLEDGE AND PRACTICE OF MOTHERS ON EXCLUSIVE BREASTFEEDING IN DOHINAYILI COMMUNITY, NORTHERN REGION, GHANA

Comment [s2]: WRITE BOLD

Comment [s3]: DELATE

Comment [s4]: THIS LINE NEED TO IMPROVE

Comment [s5]: WRITE FULL NAME

Comment [s6]: WHAT TYPES OF FOODS

Comment [s7]: WRITE-DRINKING WATER

Comment [s8]: DELATE

34 One of the most effective strategies for reducing infant morbidity and mortality in resource  
35 limited settings (i.e. human and infrastructural constraints) is the promotion of exclusive  
36 breastfeeding (EBF) for the first 6 months of the infant's life (Mogre et al., 2016). In the last  
37 decade there has been a growing interest in exclusive breastfeeding as the appropriate feeding  
38 method for infants all over the world (Afaya et al., 2017). "Breastfeeding is the cornerstone  
39 for an infant's survival, nutrition and development" (World Health Organisation [WHO],  
40 2015). Early initiation of breastfeeding and exclusive breastfeeding help in child survival, it  
41 accounts for healthy brain development, promotes cognitive and sensory performance and is  
42 noted for enhancing intelligence and academic performance in children (Isaacs et al. 2010,  
43 AAP 2012, UNICEF 2015). Breast milk has the essential nutrients that a newborn need to  
44 grow healthy and strong. Infants who are exclusively breastfed develop fewer infections;  
45 have less severe illnesses and mothers who practice EBF enjoy the benefit of extended  
46 lactation amenorrhea (Nukpezah, Nuvor, & Ninnoni, 2018).

47 Globally, the exclusive breastfeeding rate is 38%, however the World Health Assembly in  
48 2012 set a target to increase the rate of exclusive breastfeeding by at least 50% by 2025.  
49 Exclusive breastfeeding among children less than six months in Ghana is 52.3% (Boateng,  
50 2018).

51 In low income and developing countries, due to poor sanitation conditions, high disease  
52 burden and limitedness in the availability of clean drinking water, it is more necessary to  
53 practice exclusive breastfeeding in the initial stages in life (first six months of the child's  
54 life). This practice of exclusive breastfeeding is more safe, hygienic and the most economical  
55 way of providing food for the newborn (UNICEF 2013). It has been reported in several  
56 studies on breastfeeding that proper practice of breastfeeding can save about 800,000 infant  
57 lives in the developing world alone (UNICEF 2015, WHO 2016). In spite of these  
58 recommendations, it has been documented over the years that the practice of exclusive

Comment [s9]: CITE THIS REFERENCE:  
**Exclusive Breastfeeding & Complementary Feeding Practices and Their Nutritional Knowledge Among Mothers at Chowhali Upazila in Sirajganj District, Bangladesh, doi: 10.11648/j.ipa.20170101.12**

Comment [s10]: WRITE CORRELTY

Comment [s11]: Grammar missing

59 breastfeeding has not been adopted universally, most mothers embrace the idea but fail to  
60 **breastfeed** exclusively few weeks after giving birth to their baby. A lot of factors ranging  
61 from cultural, social and economic conditions have been identified as possible hindrances to  
62 an effective practice of exclusive breastfeeding (Tampah-Naah&Kumi-Kyereme 2013, Fosu-  
63 Brefo& Arthur 2015).

Comment [s12]: WRITE CORRECTLY

64 The Ghana Demographic and Health Survey (GDHS) in 2014 estimated that about 98% of  
65 children in Ghana are breastfed at some point in their life. The median duration of EBF is  
66 about four months and 73% **of breastfed children are given** complementary food by age 6 to 9  
67 months (Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF International,  
68 2015). Despite the health benefits of EBF and efforts to promote exclusive breastfeeding  
69 around the world, the percentage of children who are **exclusively breastfed** have decreased in  
70 Ghana by 17% between 2008 and 2014 (Ghana Statistical Service (GSS), Ghana Health  
71 Service (GHS), & ICF International, 2015).

Comment [s13]: WRITE CORRECTLY

Comment [s14]: WRITE CORRECTLY

72 The risk of conditions such as, breast and ovarian cancer is lessened among mothers who  
73 adequately practice EBF (WHO, 2009). **World health organization** indicated that EBF  
74 protective effect is not limited to the lactation period; it persists for years even after  
75 termination of breastfeeding. The benefits of EBF are bigger in settings of poverty, poor  
76 nutrition and poor hygiene, where baseline disease rates are higher. This is because giving  
77 babies **other feds** before six months is often associated with errors of contamination during  
78 the preparation and administration process. These errors can further lead to diarrheal diseases  
79 like cholera and dysentery which can culminate in childhood mortality (WHO, 2009).

Comment [s15]: WHICH YEAR?

80 According to the World Health Organisation (2009), with EBF coverage of 90%, about 13%  
81 of deaths of children less than 5 years could be averted in low and middle-income countries.  
82 This assertion is in line with other researchers who opined that initiation of breastfeeding  
83 within the first hour of birth may lead to the prevention of about 20% of neonatal deaths

Comment [s16]: WRITE CORRECTLY

84 (Neovita, 2016) in low-income/middle-income countries. And optimal breastfeeding has the  
85 potential of preventing 12% of all under-5 deaths (Black et al., 2012). Children who are  
86 exclusively breast fed have been shown to be less susceptible to childhood diseases and are  
87 14 times more likely to endure ill-health compared with those who are not breastfed (Black et  
88 al., 2012).

Comment [s17]: WRITE CORRECTLY

Comment [s18]: WRITE CORRECTLY

89 Childhood mortality is high in low and middle-income countries where EBF prevalence is  
90 low. In Ghana for instance, the recorded rate of infant mortality is 53 per 1, 000 live births  
91 while mortality rate of children younger than 5 years is 31 per 1000 live births and these  
92 death ratios is partly due to inadequate EBF practice of mothers (Tawiah-Agyemang et al.,  
93 2008). Other studies undertaken in Ghana also concluded that neonatal deaths could be  
94 prevented if all infants start breastfeeding within the first hour of birth (GSS, 2011). Some of  
95 the interventions and policies introduced in Ghana to help encourage EBF practice are infant  
96 and young child feeding (IYCF) program, convention on the rights of the child and baby  
97 friendly Hospital initiative (Jones et al., 2003). Despite the enactment of these policies, the  
98 rate of EBF in Ghana is still lower than the WHO's set goal of 90% for EBF. A report from  
99 Ghana multiple indicator cluster surveys showed that EBF in Ghana dropped drastically from  
100 63.7% in 2008 to 46% in 2011 (GSS, 2011). More specifically, the rate of EBF in Tamale  
101 was 63.3%. In effect, the rate of EBF is low globally (39%), with 36% occurring in low-  
102 income countries (WHO, 2009). Several factors have been identified as impediments to  
103 proper nutrition and infant feeding habits. Substantial among them are, the perceptions  
104 surrounding infants feeding practices and inadequate information and support on good  
105 feeding practices, especially EBF for the first six months of life (Tawiah-Agyemang et al.,  
106 2008). However, from the literature reviewed at the start of this study, it seem evident there  
107 is limited on on the related factors associated with the knowledge and practice of EBF in the  
108 Tamale metropolis and no study had coved a vast majority of EBF among lactating mothers  
109 in the Dohinayili community of the Tamale metropolis. Therefore, this study aimed at  
110 assessing the knowledge and practice of EBF among mothers in the Dohinayili community in  
111 the northern of Ghana.

112

113 METHODS

114 Study Design: The study design was a descriptive cross-sectional design and employed  
115 quantitative methods to gather information.

116

117

118 Study Population: All mothers residing in the Dohinayili community will constitute the target  
119 population for this study. The total population of women in the community is estimated at  
120 1125.

121

122 Setting: The study will be conducted at the Dohinayili community located in the Tamale  
123 Metropolis. Tamale is the Northern Regional Capital and one of the six metropolises in  
124 Ghana and the only metropolitan in the Northern Part of the country. Tamale is a  
125 cosmopolitan city and is among the fastest growing cities in West Africa and thus made the  
126 city the ideal place for the study. The Tamale Metropolis has a total population of 371, 351  
127 (Ghana Statistical Service, 2014) and is inhabited by people from both urban and rural  
128 backgrounds. The community is an urban community inhabited by natives (dagombas) and  
129 people from other tribes.

130

131 Inclusion Criteria: Women of child bearing age who were currently breastfeeding at the time  
132 of the study or who had stopped breastfeeding not later than 1 years.

133

134 Exclusion Criteria: mothers who have never breastfed or are temporary visitors to the town ,  
135 mothers of infants having any serious illness including congenital deformities, mothers who

Comment [s19]: Write capital letter

136 are having psychological illness, mother who had certain disease conditions with  
137 contraindications to breastfeeding e.g.AIDS, Breast cancer.

138

139

140 Sampling: The simple random sampling was used to recruit respondents based on the  
141 inclusion and exclusion criteria.

142

143 Sample Size Determination: The total population of women in the Dohinayili community is  
144 estimated at 1125. The sample size for the survey was computed according to the formula for  
145 sample size determination by Yamane (1967).

$$n = \frac{N}{1 + Ne^2}$$

146 Where  $n$  is required sample size.

147  $N$  is the total population size which is 1125.

148  $e$  is acceptable sampling error (0.05) at 95% Confidence Interval

149 By substitution:

150  $n = \frac{1125}{1+1125(0.05)^2} n= 295$

151 Hence, the sample size for the study = **295** respondents.

152 Using an estimated population of 1125 women a sample size of 295 respondents will be  
153 needed for this study. In order to reduce inaccurate results and make up for non-  
154 responsiveness, the sample size will be rounded off to 324 respondents. Therefore, a total of  
155 324 patients were invited into the study.

156

157 Data collection instrument: A questionnaire consisting of both closed and open-ended  
158 questions was used to collect all data on socio-demographic factors (maternal age, infant's  
159 age, parity, as well as maternal educational level, and marital, occupational and religious  
160 statuses), knowledge on exclusive breastfeeding (EBF), attitude towards EBF, and practice of  
161 EBF. The open-ended questions were included to gain understanding of why mothers gave a  
162 specific answer. Items for the knowledge, attitude and practice of EBF scales of the  
163 questionnaire were adapted from the Food and Agriculture Organization of the United  
164 Nations (FAO) guidelines for assessing nutrition-related knowledge, attitudes and practices  
165 (KAP) manual. This manual contains guidelines that serve as a reference guide and practical  
166 tools for undertaking high quality evaluation of nutrition and health related knowledge and  
167 practices at the community level [29]. This manual has 13 module questionnaires capturing  
168 data on important knowledge, attitudes and practices related to 13 most common nutrition  
169 issues such as feeding infants (0–6 months), feeding young children (6–23 months), diet of  
170 school-aged children and among others. Based on the aims and objectives of this study, the  
171 questionnaire pertaining to feeding infants younger than 6 months was adapted for this study.  
172 The FAO questionnaire has been field tested in several countries to ensure validity,  
173 readability, ease of administration and is less burdensome on respondents.

174 The knowledge scale of the questionnaire consisted of 13 questions assessing mothers'  
175 understanding and intellectual capacity to recall the benefits of EBF, duration of EBF, and  
176 how to improve breastmilk supply. Each correct response was accorded a point and no point  
177 for each wrong response. A knowledge score was generated for each mother based on the  
178 number of correctly answered questions. The practice scale consisted of six items that  
179 assessed mothers' practice of EBF relating to the following: recall of EBF in the last 24 h,  
180 mode of breastfeeding, who gave and what kind of food was given to the baby in the  
181 mothers' absence, introduction of liquids (i.e. plain water, infant formula, tinned milk,

Comment [s20]: Please rewrite

182 powdered or fresh animal milk, juice/juice drinks, clear broth, yogurt, porridge, herbal teas,  
183 solid/marshy foods). The mothers' answers to these questions were used to determine the  
184 practice of EBF. The form and nature of these items were provided by the United Nations  
185 Children's Fund (UNICEF) Multiple Indicator Cluster Surveys and the Demographic and  
186 Health Surveys.

187

188

189 Data collection procedure: After ethical approval is obtained, the principal investigators will  
190 visit the community for the purposes of data collection. During the process of data collection,  
191 the aims and objectives and procedures of the study will be explained and informed consent  
192 will be obtained from respondents. All patients who volunteer to be involved in the study will  
193 be screened for their eligibility. Consent forms will be signed after both formal and verbal  
194 explanations are provided, subsequently, questionnaires were handed over to respondents.  
195 The questionnaires will be self-administered to respondents who can read and write in  
196 English. Those who cannot read nor write in English will be assisted to answer the questions.  
197 The principal investigators will translate the questions into their respective local dialects.  
198 They will be informed that participation is voluntary and they are free to withdraw from the  
199 data collection process at any time without any consequence to them. Completing the  
200 questionnaire on average will take about 10-15 minutes.

Comment [s21]: Write ethical approval number

201

202 Data Management: In accordance with the FAO guidelines, practice of EBF preceded the  
203 knowledge and attitude test. For purposes of content validity and appropriateness for the local  
204 context, items of the questionnaire were reviewed by a team of nutrition experts. This  
205 resulted in the addition of local foods commonly given to infants in the study setting. The  
206 questionnaire was pretested on a sample of 10 mothers with infants aged 0-24 months for  
207 purposes of comprehension, readability and easiness of administration.

Comment [s22]: Which year?

208

209 Data Processing and Analysis: Data analysis was carried out with the aid of IBM Statistical  
210 Package for the Social Sciences (SPSS) version 25 for Windows and reported using, tables  
211 and prose. The process for the data analysis included; data coding, sorting, cleaning, editing  
212 and checking for errors and biases by doing a thorough counting of the study question items  
213 and frequency of occurrences, the grouping of collected data, checking for minimum and  
214 maximum counts and analysing and discussing of data. Both qualitative and quantitative data  
215 was collected and analysed accordingly. Responses for all the open-ended questions  
216 (qualitative data) were read and re-read by all the authors. The responses were coded by the  
217 second author and the results reviewed by RW and PKG. Common themes were identified  
218 through discussions and reflections. All quantitative data were analysed using descriptive  
219 statistics of mean for continuous variables, and frequencies and percentages for categorical  
220 variables. Cross tabulation and chi-square tests were used to determine univariate  
221 associations. To determine factors associated with the practice of EBF, a multivariate logistic  
222 regression was executed. The dependent variable of the logistic model was the practice of  
223 EBF. Only variables that were significantly associated to the practice of exclusive  
224 breastfeeding in the univariate analysis were included into the logistic regression model.  
225 Results are presented as odds ratios and their respective confidence intervals at 95 %. In all  
226 analysis a P-value of  $<0.05$  was considered statistically significant.

227

228 Ethical Consideration: Ethical approval will be sought for the University for Development  
229 Studies/ Tamale Teaching Hospital Ethics Review Board. Permission will be sought from the  
230 community leaders. Written and verbal consent will be sought from participants. Respondents  
231 will be informed that participation is voluntary and they can withdraw from the study anytime  
232 with consequences to them. The privacy of each participant was assured by ensuring that  
233 their names were not included in the questionnaire (anonymity). Participants were also  
234 assured that where signatures appeared on the consent forms will be separated from the

Comment [s23]: Write: one-way analysis of variance (ANOVA)

235 questionnaire and will be kept under lock and key, and after two years of the study, the data  
 236 will be discarded and no records of the data both electronically or hard copy will be available.  
 237 The privacy of participants was ensured by interviewing only one respondent at a time and at  
 238 a venue that was convenient to the respondent.

239

240 **STUDY FINDINGS**

241 As indicated in table1.1, the results show that, a high percentage of the mothers involved in  
 242 this study (72%) were aged between 21 to 30 years and only 1.5% were 30 years old or  
 243 beyond. The mean age of the women was  $27.27 \pm 5.87$ . The majority of participants (61%)  
 244 had no formal education, 15.5 % had tertiary education, 9% had senior high school education,  
 245 and only 7% and 7.55 had junior high school and primary education respectively. Most of the  
 246 women were self-employed (435) and a significant proportion had no employment (34%). A  
 247 large proportion of the women in this study (84.4 %) were married; the other proportion is  
 248 composed of widows, the divorced and single mothers. Most of the participants (80%) were  
 249 Muslims. An overwhelming majority (98%) of participants ever heard about EBF. The main  
 250 sources of information about EBF was from the hospital and friends.

Comment [s24]: PLEASE CHECK THIS VALUE , HAVE ERROR

Comment [s25]: Write all units at the same way

251 **Table 1.1: Socio-demographic characteristics**

Variable		Frequency (N=200)	Percent (%)
<b>Age</b>			
<b>Mean age ± SD</b>		<b>27.27 ± 5.87</b>	
	< 20years	14	7
	21-30 years	144	72
	31-40 years	39	19.5
	41+ years	3	1.5

<b>Educational status</b>	Tertiary	31	15.5
	Senior high school	18	9.0
	Junior high school	14	7.0
	Primary school	15	7.5
	No formal education	122	61
<b>Occupation</b>	Private Sector employment	12	6.0
	Public Sector employment	34	17
	Self-employed	86	43
	No employment	68	34
<b>Marital status</b>	Single	10	5.0
	Married	116	58
	Divorced	30	15
	Widowed	44	22
<b>Family Support</b>	Yes	155	77.5
	No	45	22.5
<b>Religion</b>	Christian	40	20
	Muslim	160	80
<b>Monthly income</b>	<GHS 500	140	70
	GHS 500-1000	40	20
	GHS 1000-2000	10	5
	>GHS 3000	2	0.6
<b>Ever heard about EBF</b>	Yes	196	98
	No	4	2
<b>Sources of information on EBF</b>	Hospital	120	60
	TV/radio	20	10
	Friends	50	25

	Social media/internet	10	5
<b>Sex of child</b>	Male	80	40
	Female	120	60
<b>Place of delivery</b>	Hospital delivery	180	90
	Non hospital deliver	20	10
<b>Age of child</b>	0-6months	80	40.0
	6-24months	120	60

252

### 253 **1.2 Knowledge of mothers on exclusive breastfeeding**

254 The mothers' knowledge in aspects of EBF is presented in Table 1.2. About 29 % of them  
 255 were unable to define EBF; most of them defined EBF as giving the child breast milk and  
 256 water and the others did not have an idea. Twenty four percent of the mothers said breast  
 257 milk only is not sufficient to meet the nutritional needs of the child. The reasons they offered  
 258 for holding this view were that the child may not be satisfied and could die if fed with only  
 259 breast milk for 6 months. Others also had the opinion that the child also feels thirsty and  
 260 should be given water to drink. The majority 91.5% of the mothers did not know that breast  
 261 milk could be expressed, stored safely and given to the child in times of the mother's  
 262 absence. Regarding how to overcome breastfeeding difficulties, 8.9 % of the mothers said  
 263 herbs/drugs could be taken to overcome the difficulty; 6.8 % said breastfeeding should be  
 264 stopped; 10% said breastfeeding should be continued and 4.2 % did not know what to do.

Comment [s26]: Write same way

Comment [s27]: Write same way

Comment [s28]: Write same way

265 **Table 1.2 Knowledge of mothers on exclusive breastfeeding**

<b>Variable</b>	<b>Frequency (%)</b>
First food for the newborn is breastmilk	193 (96.5)
Babies should take only breastmilk for the first 6 months of their life	142 (71.0)
Breastmilk only is sufficient for the baby's first 6 months of life	152 (76.0)

The baby should be breastfed on demand	152 (76.0)
Has knowledge on the benefits of exclusive breastfeeding to the baby	187 (93.5)
Breastmilk supply can be sustained by having good nutrition/eating well	180 (90.0)
Exclusive breastfeeding is beneficial to the mother	173 (86.5)
Breastmilk supply can be sustained by having good nutrition/eating well	160 (80.0)
In times of absence the baby can continue to be exclusively breastfed by expressing breastmilk and storing	19 (9.5)
Health personnel can assist in overcoming breastfeeding difficulties	139 (69.5)
Knowledge category	
High (>70%)	91 (45.5)
Mean $\pm$ SD Knowledge score (maximum score = 20)	13.95 $\pm$ 2.2

Comment [s29]: PLEASE ADD-Early initiation in one row

266

### 267 1.3 Characteristics of mothers who do and do not practice EBF

268 The characteristics of mothers who do and do not practice EBF are presented in Table 1.3

269 Mothers who practiced EBF were more likely to have high knowledge in EBF towards EBF

270 than their counterparts. Furthermore, they were more likely than their counterparts to report

271 having infants younger than 3 months and high level of education.

272

273

274 **Table 1.3 Characteristics of mothers who do and do not practice EBF**

Exclusive breastfeeds			
Variable	Yes	No	P-value
Age of mothers in years			
<30	45 (40.5 %)	27 (34.2 %)	0.230
$\geq$ 30	66 (59.5 %)	52 (65.8 %)	

Comment [s30]: Write unit same way

<b>Child's age in months</b>			
<3	64 (57.7 %)	6 (7.6 %)	<0.001
>3	47 (42.3 %)	73 (92.4 %)	
<b>Employment status</b>			
Employed	85 (76.6 %)	66 (83.5 %)	0.161
Unemployed	26 (23.4 %)	13 (16.5 %)	
<b>Educational level</b>			
Low educational level	34 (30.6 %)	40 (50.6 %)	0.004
High educational level	77 (69.4 %)	39 (49.4 %)	
<b>Parity</b>			
1	42 (37.8 %)	28 (35.4 %)	0.428
>1	69 (62.2 %)	51 (64.6 %)	
<b>Marital status</b>			
Not married	8 (7.2 %)	5 (6.3 %)	0.528
Married	103 (92.8 %)	74 (93.7 %)	
<b>Religion</b>			
Christian	60 (54.1 %)	44 (55.7 %)	0.221
Muslim	51 (45.9 %)	33 (41.8 %)	
<b>Knowledge of EBF</b>			
High	72 (64.9 %)	15 (19.0 %)	<0.001
Low	39 (35.1 %)	64 (81.0 %)	

275

276

#### 277 **1.4 Factors associated with practice of exclusive breastfeeding**

278 To identify factors associated with the practice of exclusive breastfeeding, a multivariable

279 logistic regression model was executed and the findings presented in Table 1.4 Having infants

280 younger than 3 months, high maternal educational level and a thorough knowledge in EBF  
281 remained significantly associated to the practice of EBF.

282  
283  
284  
285

**Table 1.4 Multivariate determinants of exclusive breastfeeding (n = 200)**

Variable	B	AOR (95%CI)	P-value
Child younger than 3 months	2.49	12.02 (4.44, 32.54)	<0.001
High maternal level of education	1.24	3.47 (1.55, 7.75)	0.002
High level of maternal knowledge of EBF	1.77	5.87 (2.59, 13.26)	<0.001

Comment [s31]: Write full name

Comment [s32]: Write same decimal at the manuscript

286  
287  
288

## 289 DISCUSSION

### 290 Knowledge of Exclusive breastfeeding

291 In this study we assessed knowledge in, attitude towards EBF and its practice among  
292 community lactating mothers with infants aged 0–24 months. Factors associated with the  
293 practice of EBF in this sample were also evaluated. Similar to the earlier studies (Tampah-  
294 Naah&Kumi-Kyereme 2013, Mogre et al 2016), a greater number of mothers considered  
295 breastmilk as the best form of food and nutrition for infants, they agreed to the concept of six  
296 months exclusive breastfeeding of which most stated that they became aware of this  
297 information from their health care providers.

298 The mothers' knowledge of EBF was generally high, although some notable gaps were  
299 identified. However, the practice of EBF was found to be lower than desired. Factors  
300 that were found to be associated to the practice of EBF included maternal level of education,  
301 child's age and having high knowledge of EBF. Misconceptions relating to duration of EBF  
302 and the inadequacy of breastmilk to meet their child's nutritional needs were noted. Most  
303 mothers also had inadequate knowledge of the maternal benefits of exclusive breastfeeding.  
304 Similar misconceptions and inadequacies of knowledge have been reported previously  
305 (Apanga, 2014; Issaka et al., 2014). Emphasising on the maternal benefits of EBF could help  
306 encourage mothers to exclusively breastfeed their infants. An important finding of this study  
307 was that most mothers were more likely to consult relatives and significant others to  
308 overcome breastfeeding challenges instead of consulting healthcare providers. Although  
309 consulting relatives and significant others may not be inappropriate, the accuracy and quality  
310 of advice and support given may not be guaranteed making mothers prone to inappropriate  
311 advice and support. Postnatal visits to the health centre are opportunities that healthcare  
312 professionals could rely upon to encourage mothers to seek support in times of difficulties.  
313 Building on the current knowledge and the use of active teaching and learning strategies such  
314 as discussions, lectures, slides, and presentations could be adopted to bridge these gaps in  
315 knowledge.

316 The findings of this study showed that most mothers did know that breast milk can be stored  
317 for future use. Contrary to the result from the study by Boateng, (2018) on exclusive  
318 breastfeeding among rural lactating mothers, which showed that most mothers did not know  
319 that breastmilk could be stored and used in future; for convenience or to be used in the  
320 absence of the nursing mother. It became evident from the result of this research that quite a  
321 sizeable number of mothers knew breast milk can be stored for future use. The difference in  
322 study subjects and setting; rural versus urban dwellers might be the reason behind the

323 difference in results. If information on breast milk storage is communicated well enough to  
324 mothers especially working mothers and the work environment is made friendly enough to  
325 allow for breast milk storage, a private place to breastfeed or scheduled breaks to feed baby,  
326 the rate of exclusive breastfeeding among working mothers could be improved.

### 327 **Practice of exclusive breastfeeding**

328 Sixty two percent of the mothers practiced EBF. This is far higher than the 46 % of Ghanaian  
329 children aged less than 6 months being exclusively breastfed in 2011 (Ghana Statistical  
330 Service [GSS], 2011) but lower than the 64 % reported by Tampah-Naah&Kumi-  
331 Kyeremee(2013) using data from the 2008 Ghana Demographic and Health Survey (GDHS)  
332 (GDHS, 2008). The prevalence of EBF found in this study is far below the WHO  
333 recommended prevalence of 90 % (Jones et al., 2003) demonstrating a wide gap between the  
334 desired and the actual practice of exclusive breastfeeding. The low prevalence of exclusive  
335 breastfeeding could be attributed to misconceptions regarding the inadequacy of breastmilk to  
336 meet the nutritional needs of the child, misunderstanding certain signs of the child to mean  
337 she/he is showing signs of wanting food to eat and misunderstanding healthcare  
338 professional's advice. Similar misconceptions have been reported previously in rural Ghana  
339 and in other West African countries (Aryeetey&Goh, 2013; Issaka et al., 2014; Apanga,  
340 2014. Otoo et al., 2013). Education on exclusive breastfeeding is usually disseminated to  
341 mothers in the form of health talks by midwives, nurses or nutritionists during antenatal  
342 and postnatal clinic visits. As suggested by previous studies (Sadoh, Sadoh&Oniyelu, 2011;  
343 Abaasiati et al., 2014; Onah et al., 2014), the findings of this study calls for an evaluation of  
344 the content of such health talks and the mothers understanding of the messages provided to  
345 them as significant gaps in knowledge of exclusive breastfeeding

346

### 347 **Factors associated with practice of exclusive breastfeeding**

348 Mothers with higher level of education were more likely to report higher practice of exclusive  
349 breastfeeding than their counterparts. Maternal level of education has been found to be an  
350 important determinant of infant feeding practices in several studies in Ghana (Iddrisu, 2014;  
351 Aidam, Pérez-Escamilla & Larte, 2005). Mothers with higher levels of education may be able  
352 to comprehend and appreciate the benefits of EBF to their infants and more motivated to  
353 practice it (Onah et al., 2014). Suggestively, exclusive breastfeeding promotion programs  
354 should be made more appealing to mothers who have lower levels of education. For instance,  
355 healthcare providers could emphasize on the fact that exclusive breastfeeding is not only  
356 beneficial to the infant but also for the mother regarding delayed return of ovulation,  
357 reduction in the risk of developing breast cancer and protection against postpartum bleeding  
358 (Aidam, Pérez-Escamilla & Larte, 2005).

359 Another important determinant of the practice of exclusive breastfeeding was the age of the  
360 child. Significantly, mothers with babies younger than 3 months were more likely to practice  
361 exclusive breastfeeding compared to those having babies aged 3 months or older. Similar  
362 findings have been reported previously in Ghana and other parts of West Africa (Iddrisu,  
363 2013; Otaigbe, Alikor & Nkanginieme, 2008). As the age of the child increases, mothers are  
364 more likely to begin to introduce other foods as they perceive that breast milk alone might not  
365 be sufficient to meet the nutritional needs of the child. These findings suggest that healthcare  
366 professionals should pay special attention to lactating mothers as the baby grows, by  
367 encouraging and supporting them to overcome barriers that may prevent them from  
368 exclusively breastfeeding. Given the fact that most mothers may return to work as the child  
369 grows older, and their lack of confidence to express and store breast milk, it is plausible that  
370 mothers may begin to introduce other foods to the child in order to have time to work and  
371 attend to other activities (Abasiatai, 2014). Misconceptions of mothers regarding expressing  
372 and storing breast milk should be identified and given attention in future EBF promotion

373 programs. Mothers' should be encouraged and supported to gain the appropriate  
374 knowledge and confidence to be able to express and store breastmilk that could be used to  
375 feed the child while they were at work. Notwithstanding the above, we recommend that  
376 future studies should explore the contributing factors responsible for the decrease in the  
377 practice of exclusive breastfeeding as the baby grows older in this setting. Another factor that  
378 was found to be associated to the practice of exclusive breastfeeding was having knowledge  
379 of EBF. Mothers who had higher knowledge were more likely than their counterparts with  
380 low knowledge in EBF to report practicing it. Similar to our findings, studies that report high  
381 maternal knowledge on EBF also report high prevalence of the practice of exclusive  
382 breastfeeding (Sriram et al., 2013; Dhammika & Gunawardena, 2012;

383 Utoo, Ochejele, Obulu & Utoo, 2012) and the reverse is true (Motee et al., 2013). Lack of  
384 knowledge of the benefits of breastfeeding has been reported to contribute to the low level of  
385 exclusive breastfeeding practice in Sub-Saharan Africa (Abasiattai et al., 2014).

Comment [s33]: Write correctly

386 In line with the work by Mohammed et al. (2014), mothers' age did not have much influence  
387 on the knowledge and practice of exclusive breastfeeding. Almost all mothers irrespective of  
388 their age at the time of giving birth were familiar with the concept, unlike the results from the  
389 study by Fosu-Brefo & Arthur 2015 which showed a significant relationship between maternal  
390 age and the knowledge in exclusive breastfeeding. Majority of mothers showed prominent  
391 level of understanding about the essence of breastfeeding an infant. For instance, its role in  
392 protecting an infant from diseases, an ideal source of nutrients, family planning methods and  
393 its health benefits on lactating mothers. They also acknowledged to the fact that breastfeeding  
394 promotes the relationship between mother and child. Even though majority of mothers  
395 explained how safe, convenient and economical it is to breastfeed a baby, not every mother  
396 was able to practice it (Oche et al. 2011).

397

398 CONCLUSION

399 The reflection of a child's general health condition is evident in his or her nutritional status  
400 (Benson & Shekar 2006). Quality diet minimizes diseases and increases growth. Exclusive  
401 breastfeeding is a well campaigned child feeding practice noted for child health and survival.  
402 This study presents data on mother's level of knowledge, attitude and practice of exclusive  
403 breastfeeding. This study results affirm a greater level of understanding about mothers'  
404 knowledge in the importance of exclusive breastfeeding. The general responses concerning  
405 breastfeeding were positive especially about knowledge in breastfeeding, its recommendation  
406 and benefits. The lactating mothers' knowledge of EBF were generally favourable. However,  
407 their practice of EBF was suboptimal. Mothers' misconceptions and misunderstanding of  
408 EBF messages may play an important role in determining the practice of EBF. Maternal  
409 knowledge, maternal level of education and age of the child may also be important in  
410 promoting the practice of EBF. Healthcare professionals should go beyond the mere  
411 dissemination of information to encouraging and helping mothers to overcome barriers of  
412 practicing EBF. Health advocates and health workers were identified as the main agents of  
413 information dissemination. This study acknowledges the support from health care providers.

414

415

416

417 Reference

- 418 Ayed, A. (2014). Knowledge, attitude and practice regarding exclusive breastfeeding among  
419 mothers attending primary health care centers in Abha city. *International Journal of*  
420 *Medical Science and Public Health*, 3(11), 1355.  
421 <https://doi.org/10.5455/ijmsph.2014.140820141>
- 422 Boateng, M. F. (2018). *KNOWLEDGE , ATTITUDE AND PRACTICE OF EXCLUSIVE*  
423 *BREASTFEEDING AMONG MOTHERS IN TECHIMAN , GHANA*. (May).
- 424 Medicine, D. O. F. (2011). *A STUDY OF KNOWLEDGE ATTITUDE AND PRACTICES OF*

Comment [s34]: You can not write references in the conclusion

Comment [s35]: Check languages

425            *BREASTFEEDING AMONG MOTHERS IN SULLIA IN Postgraduate in Pediatrics.*

426 Mogre, V., Ansah, G. A., Marfo, D. N., & Garti, H. A. (2015). Assessing nurses' knowledge  
427            levels in the nutritional management of diabetes. *International Journal of Africa Nursing*  
428            *Sciences*, 3, 40–43. <https://doi.org/10.1016/j.ijans.2015.07.003>

429 Nukpezah, R. N., Nuvor, S. V., & Ninnoni, J. (2018). Knowledge and practice of exclusive  
430            breastfeeding among mothers in the tamale metropolis of Ghana. *Reproductive Health*,  
431            15(1). <https://doi.org/10.1186/s12978-018-0579-3>

432 Ghana Statistical Service (GSS), Ghana Health Service (GHS), and ICF International. (2015).  
433            Ghana Demo- graphic and Health Survey 2014. Rockville, Mary- land, USA: GSS.  
434            Retrieved from; [http://www.statsghana.gov.gh/docfiles/publications/ Ghana%20](http://www.statsghana.gov.gh/docfiles/publications/ Ghana%20DHS%202014%20-%20KIR%20-%206%20April% 202015.pdf)  
435            [DHS%202014%20- %20KIR%20- %206%20April% 202015.pdf](http://www.statsghana.gov.gh/docfiles/publications/ Ghana%20DHS%202014%20-%20KIR%20-%206%20April% 202015.pdf). Accessed on  
436            25/02/2017

437 Guest,

438 Mogre, V., Dery, M., &Gaa, P. K. (2016). Knowledge, atti- tudes and determinants of  
439            exclusive        breastfeeding practice among Ghanaian rural lactating mothers. *International*  
440            *Breastfeeding Journal*. 1–8.

441 United Nations Children's Fund. (2011). Statistics by area/child nutrition: Infant and young  
442            child        feeding. Retrieved from; [http://www.childinfo.org/breastfeed- ing\\_iycf.php](http://www.childinfo.org/breastfeed- ing_iycf.php). Accessed  
443            on        15/08/2016

444 World Health Organization (2012). Resolution WHA65.6. Comprehensive implementation  
445            plan        on maternal, infant and young child nutrition. In: [Sixty-Fifth World Health Asse\*\*mbly\*\*](#)  
446            [Geneva, 21–26 May 2012](#). Resolu- tions and decisions, annexes. Geneva: World

447 Health Organization. S12–13. Retrieved from; <http://www.who.int/nutrition/>  
448 [topics/WHA65.6\\_resolu- tion\\_en.pdf? Ua=1](http://www.who.int/nutrition/topics/WHA65.6_resolution_en.pdf?Ua=1). Accessed on 09/02/2017

449 GDHS. Ghana demographic and health survey. Preliminary Report. Ghana Health Service:  
450 Accra; 2008.

451 Ghana Statistical Service. Ghana multiple indicator cluster survey with an enhanced malaria  
452 module and biomarker. Accra: Ghana Statistical Service; 2011. p. 1–150.

453 Tampah-Naah MA, Kumi- Kyereme A. Determinants of exclusive breastfeeding among  
454 mothers in Ghana: a cross sectional study. International Breastfeeding Journal 2013;  
455 8:13.

456 World Health Organization 2016. Infant and Young Child Feeding. (Accessed 22.02.2017).  
457 <http://www.who.int/mediacentre/factsheets/fs342>

458 Ghana Health Service. Ghana’s National Newborn Health Strategy and Action Plan (2014-  
459 2018). (Accessed 07.04.2016).  
460 [http://www.ghanahealthservice.org/downloads/Ghana\\_National\\_Newborn\\_Strategy\\_F](http://www.ghanahealthservice.org/downloads/Ghana_National_Newborn_Strategy_Final_Version_March_27.pdf)  
461 [ina l\\_Versi on\\_March\\_27.pdf](http://www.ghanahealthservice.org/downloads/Ghana_National_Newborn_Strategy_Final_Version_March_27.pdf).

462 Ghana Health Service 2015. Newborn Care Programme. (Accessed 28.03.2016).  
463 <http://www.ghanahealthservice.org/programme-scat.php?ghs&ghsscid=94&ghspid=3>

464 Ghana Statistical Service(GSS) 2014. 2010 Population and Housing. (Accessed 12.08.2016).  
465 [http://www.statsghana.gov.gh/docfiles/2010\\_District\\_Report/Brong%20Ahafo/TECH](http://www.statsghana.gov.gh/docfiles/2010_District_Report/Brong%20Ahafo/TECHNICAL%20Municipal.pdf)  
466 [IM AN%20 Municipal.pdf](http://www.statsghana.gov.gh/docfiles/2010_District_Report/Brong%20Ahafo/TECHNICAL%20Municipal.pdf).

467 Ghana Statistical Service, Ghana Health Service 2015. Ghana Demographic and Health  
468 Survey 2014. (Accessed 18.06.2016).

Comment [s36]: Cite proper way

469 [http://www.statsghana.gov.gh/docfiles/publications/Ghana%20DHS%202014%20-](http://www.statsghana.gov.gh/docfiles/publications/Ghana%20DHS%202014%20-%20KIR%20-%206%20April%202015.pdf)  
470 [%20KIR%20-%206%20April%202015.pdf](http://www.statsghana.gov.gh/docfiles/publications/Ghana%20DHS%202014%20-%20KIR%20-%206%20April%202015.pdf)

471 Fosu- Brefo R, Arthur Eric 2015. Effect of timely intervention of breastfeeding on child  
472 health in Ghana. Health Economic Review. 2015; 5:8.

473

474 **COMPETING INTERESTS DISCLAIMER:**

475

476 Authors have declared that no competing interests exist. The products used for this research  
477 are commonly and predominantly use products in our area of research and country. There is  
478 absolutely no conflict of interest between the authors and producers of the products because  
479 we do not intend to use these products as an avenue for any litigation but for the advancement  
480 of knowledge. Also, the research was not funded by the producing company rather it was  
481 funded by personal efforts of the authors.

Comment [s37]: Write before references

482 **References**

Comment [s38]: Reference double

483 American Academy of Pediatrics (2012). Breastfeeding and the use of human milk.  
484 Pediatric;129: 827-841.

485 World Health Organization (2016). Infant and Young Child Feeding. (Accessed 22.02.2019).

486 <http://www.who.int/mediacentre/factsheets/fs342/en/>.

487 Ballard O, Morrow A L. (2013). Human Milk Composition: Nutrients and Bioactive Factors.  
488 Pediatric Clinic North America 2013; 60 (1):49-74.

489 Anderzén-Carlsson, A., Lamy, Z. C., Eriksson, M. (2014). Parental experiences of providing  
490 skin-to-skin care to their newborn infant-Part 1: A qualitative systematic review.  
491 International Journal of Qualitative Studies on Health and Well-being 9:10.

492 Dieterich, C. M., Felice, J. P., O'Sullivan, E., Rasmussen, K. M. (2013). Breastfeeding and  
493 Health Outcomes for the Mother-Infant Dyad. Pediatric clinics of North America.  
494 60(1):31-48.

495 Dun-Dery EJ, Laar AK. Exclusive breastfeeding among city-dwelling professional working  
496 mothers in Ghana. International Breastfeeding Journal. 2016;11(1):23.

497 Mead MN. Contaminants in Human Milk: Weighing the Risks against the Benefits of  
498 Breastfeeding. Environmental Health Perspectives. 2008;116 (10): A426-A434.

499 Minas, A. G., & Ganga-Limando, M. Social-Cognitive Predictors of Exclusive Breastfeeding  
500 among Primiparous Mothers in Addis Ababa, Ethiopia. PLoS ONE 2016;11(10)  
501 0164128.

502 Mogre V, Dery M, Gaa PK. Knowledge, Attitudes and Determinants of exclusive  
503 breastfeeding practice among Ghanaian rural lactating mothers. International Breastfeeding  
504 Journal 2016; 11:12.

505 Mondker J, Fernandez A, Rao S. Breastfeeding. Universities Press India 2009.

506 Munblit D, Peroni DG, Boix-Amorós A, Hsu PS, Van't Land B, Gay MCL, Warner JO  
507 (2017). Human Milk and Allergic Diseases: An Unsolved Puzzle. Nutrients 9 (8).

508 National Health and Medical Research Council (2012). Infant Feeding Guidelines. Canberra:  
509 National Health and Medical Research Council.

510 Nkrumah J. Maternal work and exclusive breastfeeding practice: a community based cross-  
511 sectional study in Efutu Municipal Ghana. *International Breastfeeding Journal* 2017;  
512 12:10.

513 Gale C, Logan KM, Santhakumaran S, Parkinson JRC, Hyde MJ, Modi N. Effects of  
514 breastfeeding compared with formula feeding on infant body composition: a  
515 systematic review and meta- analysis. *American Society for Nutrition* 2012; 95: 656-669.

516 Ghana Health Service 2015. Newborn Care Programme. (Accessed 28.03.2016).  
517 <http://www.ghanahealthservice.org/programme-scat.php?ghs&ghsscid=94&ghspid=3>

518 Ganle JK, Obeng B, Segbefia AY, Mwinyuri V, Yeboah JY, Baatiema L. How intra-familial  
519 decision-making affects women's access to and use of maternal healthcare services in  
520 Ghana: a qualitative study. *BMC Pregnancy and Childbirth* 2015; 15:173.

521 Gebreselassie T, Rutstein SO, Mishra V. Contraceptive Use, Breastfeeding, Amenorrhea and  
522 Abstinence During the Postpartum Period: An Analysis of four countries. *DHS*  
523 *Analytical Studies* 2008(4). Calvarton, Maryland, USA: Macro International Inc.

524 Szajewska H. Early nutritional strategies for preventing allergic disease. *Israeli Medical*  
525 *Association Journal* 2012; 14: 58-62

526 United Nations Children's Fund 2016. Community based infant and young child feeding.  
527 (Accessed 09.03.2017). [https://www.unicef.org/nutrition/index\\_58362.html](https://www.unicef.org/nutrition/index_58362.html).

528 United Nations Children's Fund, 2016. Seventy years for every child. (Accessed 28.03.2016).  
529 [http://www.unicef.org/nutrition/index\\_24824.html](http://www.unicef.org/nutrition/index_24824.html)

530 Ziegler E. E. (2006). Growth of breast-fed and formula-fed infants. *Nestle Nutrition*  
531 *Workshop Series Pediatric Program* 2006; 58: 51-9.

532 Tampah-Naah, A. M., &Kumi-Kyereme, A. (2013). Determinants of exclusive breastfeeding  
533 among mothers in Ghana: a cross-sectional study. *International Breastfeeding Journal*.  
534 2013;8:13.

535 WHO. (1981). *International code of marketing of breast-milk substitutes*. Geneva: World  
536 Health Organisation.

537 Black, R. E., Victora, C. G., Walker, S. P., Bhutta Z. A, Christian, P., De Onis M., Ezzati, M.,  
538 Grantham-McGregor, S, Katz J, Martorell, R. (2013). Maternal and child  
539 undernutrition and overweight in low-income and middle-income countries. *The*  
540 *Lancet*.382:427–51.

541 Aryeetey R, Goh Y. Duration of exclusive breastfeeding and subsequent child feeding  
542 adequacy. *Ghana Medical Journal*. 2013;47:24–9.

543 GDHS. (2008). *Ghana demographic and health survey. Preliminary Report*. Ghana Health  
544 Service: Accra.

545 Ghana Statistical Service. *Ghana multiple indicator cluster survey with an enhanced malaria*  
546 *module and biomarker*. Accra: Ghana StatisticalService; 2011. p. 1–150.

547 Jones, G., Steketee, R. W., Black, R. E., Bhutta, Z. A., Morris, S. S., Group BCSS. (2013).  
548 How many child deaths can we prevent this year? *The Lancet*. 2003;362:65–71.

549 Issaka, A. I., Agho, K. E., Page, A. N., Burns, P., Stevens, G. J., Dibley M. J. (2014).  
550 Determinants of early introduction of solid, semi-solid or soft foodsamong infants aged 3–5  
551 months in four Anglophone West African countries. *Nutrients*. 2014;6:2602–18.

552 Otoo, G. E., Lartey, A. A. (2009). Pérez-Escamilla R. Perceived incentives and barriers to  
553 exclusive breastfeeding among periurban Ghanaian women. *Journal of Human*  
554 *Lactation*. 25:34–41.

555 Apanga P. A. (2014). A review on facilitators and barriers to exclusive breastfeeding in West  
556 Africa. *Journal of Biology, Agriculture and Healthcare*. 2014;4:9–15.

557 Sadoh A, Sadoh W, Oniyelu P. (2011). Breast feeding practice among medical women in  
558 Nigeria. *Nigerian medical journal: Journal of the Nigeria Medical Association.*  
559 2011;52:7.

560 Abasiattai, A. M., Etukumana, E. A., Nyong, E., Eyo U. E. (2014). Knowledge and practice  
561 of exclusive breastfeeding among antenatal attendees in Uyo, Southern Nigeria.  
562 *Gaziantep Medical Journal.* 2014;20:130–5.

563 Onah S., Osuorah D. I. C., Ebenebe, J., Ezechukwu, C., Ekwochi U., Ndukwu, I. (2014).  
564 Infant feeding practices and maternal socio-demographic factors that influence practice of  
565 exclusive breastfeeding among mothers in Nnewi South-East Nigeria: a cross-  
566 sectional and analytical study. *International Breastfeeding Journal.* 9:6.

567 Aidam BA, Pérez-Escamilla R, Lartey A. Lactation counseling increases exclusive  
568 breastfeeding rates in Ghana. *The Journal of Nutrition.* 2005; 135:1691–5.

569 Iddrisu S. (2013). (Exclusive breastfeeding and family influences in rural Ghana: a  
570 qualitative study. Malmö, Sweden: Malmö University; Masters thesis.

571 Otaigbe, B., Alikor, E, Nkanginieme K. (2008). Growth pattern of exclusively breastfed  
572 infants in the first six months of life: a study of babies delivered at the University of Port  
573 Harcourt Teaching Hospital, Rivers State, Nigeria. *Nigerian Journal of Medicine.*  
574 17:317–23.

575

576 Sriram S, Soni P, Thanvi R, Prajapati N, Mehariya, K. (2013). Knowledge, attitude and  
577 practices of mothers regarding infant feeding practices. *National Journal of Community*  
578 *Medicine.* 3:147–50.

579 Dhammika, B., Gunawardena, N. S. (2012). Knowledge, practices and concerns regarding  
580 exclusive breastfeeding for six months among mothers of infants in a suburban setting  
581 in Sri Lanka. *Sri Lanka Journal of Child Health.* 41:9–14.

582 Utoo B., Ochejele, S., Obulu, M., Utoo., P. (2012). Breastfeeding knowledge and attitudes  
583 amongst healthworkers in a health care facility in South-SouthNigeria: The need for  
584 middle level health manpower development. Clinics in Mother and Child Health. 9:1.

585 Motee A, Ramasawmy D, Pugo-Gunsam P, Jeewon R. (2013). An assessment of the  
586 breastfeeding practices and infant feeding pattern among mothers in Mauritius.  
587 Journal of Nutrition and Metabolism. 243852.

588 World Health Organization. Infant and young child feeding: model chapter for textbooks for  
589 medical students and allied health professionals; 2009.  
590 <http://www.ncbi.nlm.nih.gov/books/NBK148965/>.

591 Neovita Study Group. (2016).Timing of initiation, patterns of breastfeeding, and infant  
592 survival: prospective analysis of pooled data from three randomized trials. Lancet Glob  
593 Health. 4:e266. PubMed. [https://doi.org/10.1016/S2214-109X\(16\)00040-1](https://doi.org/10.1016/S2214-109X(16)00040-1).

594 Black, R. E., Victora, C. G., Walker, S. P., et al. (2012). Maternal and child undernutrition  
595 and overweight in low-income and middle-income countries. Lancet. 2012;382: 427–51.  
596 PubMed. [https://doi.org/10.1016/S0140-6736\(13\)60937-X](https://doi.org/10.1016/S0140-6736(13)60937-X).

597 Dermici J.R, S.M Sereika and D. Bogen. (2013). Breastfeeding MEDICINE; Vol 8 (3), 282.

598 Fosu-Brefo R and Arthur E., (2015). Effect of Timely initiation of breastfeeding and child  
599 health in Ghana.

600 Tawiah-Agyemang C, Kirkwood BR, Edmond K, Bazzano A, Hill Z. Early initiation of  
601 breast-feeding in Ghana: barriers and facilitators. J Perinatol. 2008;28:S46–52.  
602 <https://doi.org/10.1038/jp.2008.173>

603 Flacking R., Dykes F., Ewald U. (2010). The influence of father’s socio-economic status and  
604 paternity leave on breastfeeding duration: a population-based cohort study.  
605 Scandinavian Journal of Public Health. 38(4):337-43.

606 Zhang, K., Tang, L., Wang, H., Qiu, L.-Q., Binns, C. W., & Lee, A. H. (2015). Why Do  
607 Mothers  
608 of Young Infants Choose to Formula Feed in China? Perceptions of Mothers and  
609 Hospital Staff. *International Journal of Environmental Research and Public Health*,  
610 12(5), 4520– 4532.

611 Oche MO, Umar AS, Ahmed H. Knowledge and practice of exclusive breastfeeding in  
612 Kware,  
613 Negeria. *African Health Sciences* 2011; 11(3): 518-523.

614 Mogre V., Dery, M., Gaa, P. K. (2016). Knowledge, Attitudes and Determinants of exclusive  
615 breastfeeding practice among Ghanaian rural lactating mothers. *International*  
616 *Breastfeeding Journal* 11:12.

617

618

619

620

621

622

623

624

625