Exclusive breastfeeding until 6 months postpartum in Lebanon –a systematic review and an online survey

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Declaration

I declare that this thesis is my own work and has not been submitted for the award of higher degree elsewhere.

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To my nuclear family, I'm touched beyond words…

Dedication

To my daughter Nel,

You were the motivation and inspiration behind this work. Thank you for being you, and making it happen.

Abstract

Breastfeeding is the ultimate food source for infants and it is highly valuable for both mothers and children's health. The WHO recommends exclusive breastfeeding (EBF) until six months postpartum. In Lebanon, the EBF rates until six months postpartum are amongst the lowest worldwide, and the factors affecting EBF have been rarely investigated. A systematic review to determine the associations between socio-cultural-demographic factors and EBF at six months postpartum in middle-income countries was conducted. The review has shown that the most frequently reported determinant of EBF was maternal employment, followed by maternal education and maternal age. This study was the first in Lebanon to explore the association between certain demographic, social and cultural factors with EBF for the six months postpartum of mothers residing across Lebanon. The study employed social media to recruit 593 mothers to complete an online questionnaire. Data analysis consisted of bivariate analysis and multivariate logistic regressions. The findings show that EBF until six months postpartum is not associated with the housekeeper presence, positively associated with having a prenatal plan to breastfeed, the mother disagreeing that free formula samples should be distributed to the mothers after delivery at the hospital, having the baby's crib kept by the mother's bed side at the hospital, not being offered a free formula sample at the hospital, the mother's partner perceiving breastfeeding as very important, not having the mother's father living in the same household besides the partner and children when the child was between zero and six months and being non-Lebanese. It is the first study conducted in low and middle-income countries to explore the maternal attitudes and opinions regarding feeding practices and their association with EBF until six months. This study shows that ensuring appropriate systems, services and support for mothers, while applying

the social-ecological model, should be a priority for the stakeholders to improve maternal and child health.

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List of abbreviations

BFHI	Baby-friendly Hospital Initiative
EBF	Exclusive breastfeeding
GI	Gastrointestinal
HBM	Health belief model
MMAT	Mixed methods appraisal tool
MoPH	Ministry of public health
NGO	Non-governmental organisation
PPD	Postpartum depression
SCT	Social cognitive theory
SDG	Sustainable development goals
SEM	Socio-ecological model
TPB	Theory of planned behaviour
TTM	Transtheoretical model
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organisation

Chapter 1: Introduction

This first chapter illustrates the importance of breastfeeding, the situation of breastfeeding in the Lebanese context, and presents the aim and objectives of the study.

Importance of breastfeeding

Health benefits

Breastfeeding is recognised as the ultimate food source for babies (USDHHS, 2013). Breast milk is the first natural food for infants, providing all the infant's nutritional needs and energy for first six months postpartum, around half or more of the infant's needs during the rest of the first year of life, and up to one third until the child's second year of life (World Health Organization, 2018a). Breastfeeding is crucial for both the infant's and mother's health (WHO, 2002, UNICEF, 2012, Feltner et al., 2018), and it has both short-term as well as long-term benefits (UNICEF and WHO, 2015), whether in developed or developing countries (Office of the Surgeon General (US) et al., 2011).

Infant health benefits

The section below illustrates the short-term advantages on infant health during breastfeeding.

1-The short-term benefits

Amongst the short-term benefits of breastfeeding is the prevention of illnesses and reducing morbidity, and the evidence is clear. Worldwide, breast milk has been shown to reduce the risk of acute illnesses compared to other nutritional sources, as demonstrated by a review conducted by the Pan American Health Organisation (PAHO) which included 188 articles (León-Cava et al., 2002). The overall morbidity is higher in infants fed formula compared to infants fed breast

milk in poor countries (Victora et al., 2016, Sankar et al., 2015) as well as in affluent nations where the reduction in morbidity associated with breast-feeding is of public health significance (Dewey et al., 1995).

In particular, a prospective study conducted in the Netherlands, where confounding variables were adjusted for in the analysis has determined that, in comparison with infants who were never breastfed, the infants who were EBF until four months of age, and partially afterwards, had lower risks of infection in the upper respiratory tract infection until six months of age (Adjusted Odds Ratio) [AOR]: 0.65, (95% CI: 0.51–0.83), lower risks of infection in the lower respiratory tract infection until six months of age [AOR]: 0.50, (95% CI: 0.32–0.79), and lower risks of lower respiratory tract infection infections between seven and 12 months of age [AOR]: 0.46, (95% CI: 0.31–0.69) (Duijts et al., 2010). Comparable trends were determined for infants who were exclusively breastfed for 6 months or longer (Duijts et al., 2010). Additionally, during the first year of life, a prospective birth cohort study conducted in Australia, which included 2602 children has determined, after adjustment of confounding variables, that predominant breast feeding for less than six months was associated with two or more hospital or doctor visits ([OR] 2.07, (95% CI 1.47 to 2.90), $p < 0.0005$) or hospital admission ([OR] 2.65, (95% CI 1.30 to 5.41), $p = 0.007$) because of wheezing lower respiratory illnesses (Oddy et al., 2003). This has been determined as well by a prospective study including a representative sample of 926 infants in Greece, where extended EBF was associated with less infectious episodes ($rs=-0.07$, $p=0.019$) and less hospital admissions for infection ($rs=-0.06$, $p=0.037$) in the first 12 months of life (Ladomenou et al., 2010). This study accounted for confounding variables, however its main limitations are relying on the mothers' recall of diseases and diarrhea explanation (Ladomenou et al., 2010). Furthermore, a retrospective study conducted from 1997 to 2009, which included

502948 children, concluded that during the first six months of life, there was a greater hazard ratio of hospitalization for usual childhood illnesses among infants fed formula ([HR]: 1.40; 95% CI 1.35-1.45) and infants fed mixed diets ([HR]: 1.18; 95% CI 1.11-1.25) compared with infants fed exclusively breastmilk, after adjusting for confounding variables (Ajetunmobi et al., 2015). Moreover, in high-income nations, a correlation between lack of breastfeeding and infant death has been determined by a Lancet meta-analysis (Victora et al., 2016) and a study which included a nationally representative sample of 8944 infants in the United States of America (Chen and Rogan, 2004).

Another short-term benefit attributed to breastfeeding has been related to gastroenteritis. In fact, gastroenteritis incidence rates are lower in infants fed breast milk, as determined by, amongst others, a research conducted in Bangladesh amongst hospitalized infants (Glass and Stoll, 1989). These findings were demonstrated in more recent studies. In the Netherlands, it was found that, in comparison with infants who were never breastfed, the infants who were EBF until four months of age, and partially afterwards, had lower risks of infection in the gastrointestinal tract until six months of age [AOR]: 0.41, (95% CI: 0.26–0.64), and similar results were shown until 6 months of age or longer (Duijts et al., 2010). Another longitudinal survey of more than 3000 mother-infant pairs in the Philippines, which controlled for many environmental causes of diarrhea, showed that adding any liquid to the breast-milk diet doubled or tripled the likelihood of diarrhea (Popkin et al., 1990). Similarly, a review conducted by the Pan American Health Organisation (PAHO), which included 188 articles, has determined that the rates of diarrhea, as well as deaths due to these diseases, are lower in infants fed breastmilk compared to the non-breastfed infants (León-Cava et al., 2002). After adjusting for confounders, a prospective study has shown that, in the first 12 months of life, the incidence of diarrheal illness among formula

fed infants was twice that of breastfed infants (Dewey et al., 1995). In a case-control study conducted in Germany, Switzerland, and Austria, breastfeeding has been found to be beneficial against rotavirus-related gastroenteritis (Plenge-Bönig et al., 2010). Being breastfed during the period of disease inception decreased the risk of acute gastroenteritis due to rotavirus (OR, 0.53; 95% CI, 0.37–0.76), and this protective effect was stronger in infants from zero to six months of age (OR, 0.33; 95% CI, 0.19–0.55) than in seven to twelve months of age (Plenge-Bönig et al., 2010). It has been determined that, in comparison to infants who receive formula, infants who receive breast milk have reduced episodes of gastroenteritis and hospitalization for diarrhea (Kramer and Kakuma, 2012, Victora et al., 2016, Howie et al., 1990, Dewey et al., 1995, Quigley et al., 2007). The maternal antibodies contained in the breast milk appear to provide the breast milk with its protective effect. As a matter of fact, a study determined that when the infants were exclusively breastfed for more than two weeks, they had fewer enterovirus infections by one year of age in comparison with the infants who were exclusively breastfed for two weeks or less (Sadeharju et al., 2007). The decreased rate of enterovirus infections in infants who were exclusively breastfed for more than two weeks was associated with an elevated rate of maternal enterovirus antibody levels in the breast milk (Sadeharju et al., 2007).

With regards to the positive impact on the gastrointestinal function, it has been shown that numerous constituents of the breast milk trigger the gastrointestinal (GI) development and motility, and these in turn, promote the maturity of the GI tract; actually, more components protect and reduce the risk of the necrotizing enterocolitis (NEC) and further infections as suggested by a hypothesis (Claud and Walker, 2001) and an animal study (Steinwender et al., 2001). These constituents comprise of hormones, such as thyroid hormone, cortisol, somatomedin-C, insulin-like growth factors, and insulin, which may impact the growth of the

intestines and the function of the mucosa (Rodriguez-Palmero et al., 1999). Other components are growth factors, such as the nerve growth factor and epidermal growth factor (EGF), which impact the GI tract growth and may protect against diseases (Rodriguez-Palmero et al., 1999). Additional components are the GI mediators such as motilin and neurotensin which may play a role in GI motility (Lucas et al., 1986, Rodriguez-Palmero et al., 1999, Berseth et al., 1990) and free amino acids such as taurine and glutamine which stimulate the growth of the intestines (Sheard and Walker, 1988). Further constituents are the anti-inflammatory agents, such as Interleukin-10, which basically reduces the injury and inflammation to the GI tract (Garofalo et al., 1995, Fituch et al., 2004). Moreover, the polyunsaturated fatty acids modulate the inflammatory reactions and may protect the GI tract from NEC (Caplan and Jilling, 2001). Furthermore, the enzymes present in the breast milk, such as platelet-activating factor acetylhydrolase, may protect the GI tract by degrading the platelet-activating factor, which is induced during NEC (Caplan et al., 1997). More constituents of the breast milk reduce the risks of NEC, such as the immunoglobulins IgA, that may provide the GI tract protection from foreign microorganisms (Newburg and Walker, 2007). Furthermore, the microbes of the Bifidobacteria and Lactobacillus species colonisation of the newborn intestines are associated with breast milk (Beattie and Weaver, 2011, Pannaraj et al., 2017). These species are usually contained in probiotics and have been used to manage gastroenteritis (Vandenplas et al., 2011) and reduce colic in children (Schreck Bird et al., 2017) and prevent NEC (Braga et al., 2010). Moreover, in comparison with formula, breast milk improves the rate of stomach emptying (Billeaud et al., 1990, Cavkll, 1981), and in premature infants in particular, it enhances the lactase activity in the intestines (Shulman et al., 1998a), reduces the intestinal permeability (Shulman et al., 1998b), and reduces the risk of NEC (Newburg and Walker, 2007).

Furthermore, some benefits relating to the urinary tract infection have been attributed to breastfeeding. In a case-control study conducted in one hospital ward, it was found that, compared with infants who were bottle fed, breast-fed infants had a RR of urinary tract infection of 0.38 (95% CI 0.22-0.65) (Pisacane et al., 1992). This protective effect of breastfeeding was mostly significant after birth, and decreased until seven months of age, as determined by a prospective case-control study which included 200 cases (Mårild et al., 2004). A possible explanation for this protective effect could be that infants receiving breast milk have a higher content of oligosaccharides, lactoferrin and secretory IgA in their urine in comparison to infants fed formula (Goldblum et al., 1989). However, more studies are needed to confirm the impact of breastfeeding on infant urinary tract infection.

Other short-term breastfeeding benefits have been attributed to respiratory diseases. A decrease in frequency and duration in respiratory illnesses has been long-established in infants receiving breast milk in comparison with infants who received formula as shown by several primary and secondary studies (León-Cava et al., 2002, Kramer and Kakuma, 2012, Victora et al., 2016, Howie et al., 1990, Kovar et al., 1984, Bier et al., 2002). A nationally representative study in the USA which included 2277 children, has shown that after adjusting for confounders, there was a heightened risk for pneumonia ([OR]: 4.27; 95% CI: 1.27–14.35) in the subjects who were fully breastfed for four to less than six months compared with equal or more than six months (Chantry et al., 2006). In a survey conducted in the United Kingdom, it was shown that infants who were exclusively breastfed had a decrease in risk for hospitalization for lower respiratory tract infections in comparison with infants who were not breastfed (AOR: 0.66; 95% CI: 0.47– 0.92) (Quigley et al., 2007). The protective effect of the breast milk against respiratory illnesses in

comparison with the formula seems to weaken by one year of age (Kovar et al., 1984, Bier et al., 2002).

Another short-term advantage of breast milk relates to otitis media; it has been established that breastfed infants had less incidence of otitis media and recurrent otitis media in comparison to formula-fed infants (Victora et al., 2016). A meta-analysis including 24 studies has determined that exclusive breastfeeding during the six months postpartum was associated with the greatest protection against acute otitis media [OR]: 0.57 95% CI: 0.44-0.75), compared with 'more versus less' breastfeeding [OR]: 0.67; 95% CI: 0.59-0.76) and 'ever versus never' breastfeeding [OR]: 0.67; 95% CI: 0.56-0.80) (Bowatte et al., 2015). Nevertheless, as suggested by a review, further research is required to explore the relationship between breastfeeding and otitis media, with consideration to the exact definitions employed of infant feeding, whether exclusive or partial, and whether feeding was at the breast or by a bottle (Abrahams and Labbok, 2011). Interestingly, receiving the milk from the breast appears to be more advantageous than receiving pumped breast milk, as determined from a cross-sectional study conducted at one year postpartum (Boone et al., 2016).

Furthermore, many papers have suggested that full-term and pre-term infants receiving breast milk have enhanced visual function in comparison with infants receiving formula. The docosahexaenoic acid (DHA), which is a constituent of the phospholipids in the brain, retina, and red cell membranes, is believed to be the reason for this advantage (Anderson et al., 1990, Carlson et al., 1993). DHA is a constituent of the human breast milk (Brenna et al., 2007), but not of cow's milk (Simopoulos, 1997). In a meta-analysis including five studies, it was determined that breast milk, in very preterm newborns, may play a protective role against incidence and severity of retinopathy of prematurity (ROP); for any-stage ROP, the ORs (95%

[CIs]) were as such: exclusive human milk versus exclusive formula, 0.25 (0.13-0.49), exclusive human milk versus any formula, 0.29 (0.12-0.72); mainly human milk versus mainly formula, 0.51 (0.26-1.03); and any human milk versus exclusive formula, 0.54 (0.15-1.96) (Zhou et al., 2015). The antioxidant capacity of breast milk in comparison to formula may play a role in this association (Friel et al., 2002).

An additional impact of breastfeeding has been observed on hearing function. In premature infants receiving breast milk, auditory-evoked responses develop faster; in fact, the rates of decrease in absolute latency of waves III and V over the interval period were greater in subjects fed human milk ($P = 0.04$), compared with subjects fed formula ($P = 0.02$) (Amin et al., 2000). In healthy term infants, during the 16 weeks of age, infants receiving breast milk show more rapid brainstem auditory evoked potential maturation than infants receiving infant formula unsupplemented with DHA (Ünay et al., 2004). However, more studies need to be conducted to confirm the relationship between breastfeeding and hearing function.

Breastfeeding has been shown to be related to mortality as well. A recent Lancet meta-analysis determined that children who were breastfed for longer periods have lower infectious mortality (Victora et al., 2016). In fact, on the basis of the three studies, the meta-analysis determined that protection from infant mortality provided by breastmilk decreased with age during infancy [pooled ORs]: 5.8 (95% CI 3.4-9.8) for infants aged less than two months, [pooled ORs]: 4.1 (95% CI 2.7-6.4) for two- to three-month-olds, [pooled ORs]: 2.6 (95% CI 1.6-3.9) for four- to five-month-olds, [pooled ORs] :1.8 (95% CI 1.2-2.8) for six- to eight-month-olds, and [pooled ORs]: 1.4 (95% CI 0.8-2.6) for nine-eleven-month-olds (Victora et al., 2016).

Breast milk's additional benefits relate to its anti-microbial components. Amongst these agents are proteins, such as lysozyme, lactoferrin, and secretory component of immunoglobulin A (IgA), which usually withstand proteolytic degradation, bind to the surface of the mucosa and hence prevent the attachment of the microbes and hinder the microbial activity (Lönnerdal, 1985, Goldman et al., 1994, Goldman and Smith, 1973). The lactoferrin has antimicrobial activity and affects microbial killing (Sinha et al., 2013). In fact, it has been shown that supplementing the premature infants' diets with bovine lactoferrin, which is most comparable to human lactoferrin, is related to a decrease in the late-onset sepsis and NEC (Manzoni et al., 2009). On the other hand, the lysozyme acts against bacteria by cleaving their cell walls (Wohlkönig et al., 2010). With regards to the secretory immunoglobulin A (sIgA), the plasma cells synthesise them against particular antigens; these sIgAs are obtained from the enteromammary and bronchomammary immune systems and they contribute highly to the protecting nature of the breast milk (Kleinman and Walker, 1979, Fishaut et al., 1981). When the mother is subject to foreign antigens through her respiratory or GI tract, the plasma cells generate sIgA antibody. Specifically, in the mammary gland, the plasma cells produce sIgA in the interstitial spaces, and in turn, deposited into the milk; therefore by consuming the breast milk, the infant is provided with passive sIgA antibody against the antigens (Goldman et al., 1994). Other agents are lipids, where elements of lipid metabolism may have a role in enhancing host defences against microbial components. In fact, free fatty acids and monoglycerides, which are products of lipid hydrolysis, act like detergents that destroy viruses, bacteria and protozoa (Isaacs et al., 1990, Hamosh, 2001). Furthermore, the host defence is affected, given that these free fatty acids and monoglycerides are generated from lipid hydrolysis, which is stimulated by breast milk bile salt-stimulated lipase (Hamosh, 2001). Further agents are the carbohydrates, in particular, the oligosaccharides. The

oligosaccharides present in glycoproteins and carbohydrate polymers may enable the growth the bifidobacteria and lactobacillus species and in turn, modify the bacterial flora of the intestines (Boehm et al., 2002). Given that these oligosaccharides have a structure similar to the bacterial antigen receptors, they behave as receptor analogues for many antimicrobial components (Kunz and Rudloff, 1993). For instance, the urinary oligosaccharides are similar to the bacterial epithelial receptors; therefore, they minimise the bonding of the bacteria to urinary epithelial cells (Coppa et al., 1990, Coppa et al., 2006). Additional components are the leukocytes. Breast milk contains leukocytes, the majority of which are neutrophils and macrophages (Hassiotou et al., 2013). By phagocytosis and intracellular killing, these white blood cells play a role in antimicrobial activity (Lönnerdal, 1985). Furthermore, the lymphocytes present in breast milk may play a role in the production of cytokine (T-cells) or IgA (B-cells) (Lönnerdal, 1985).

2-Long-term advantages

The benefits of breastfeeding last for a long time, after breastfeeding comes to an end. A systematic review which included 13 articles determined that children aged 12–23 months, who were not breastfed had 2.0-fold higher risk of mortality when compared to the subjects who were breastfed (Sankar et al., 2015). For instance, compared with formula feeding, breastfeeding may be associated with a lower probability of certain chronic diseases, as shown by a retrospective study conducted for 12 years, which included 502948 children (Ajetunmobi et al., 2015). Amongst those chronic diseases is obesity. One review has suggested that the association between breastfeeding and obesity is a myth (Casazza et al., 2013); however, this study did not look solely at the impact of breastfeeding in regards to obesity and was not intended to be a

systematic review. It was exploring obesity myths; in regards to breastfeeding, it explored one WHO study, one primary study and one commentary. This study was noticeably limited in the number of studies included. In fact, breastfeeding and obesity prevention may be linked as has been determined by the WHO (World Health Organization, 2017) or studies done by the Centers for Disease Control and Prevention (CDC) (Grummer-Strawn and Mei, 2004) or Lancet meta-analysis (Victora et al., 2016), or large reviews conducted by the Agency for Healthcare Research and Quality which included 400 individual studies (Ip et al., 2009), or a meta-analysis which included 17 studies (Harder et al., 2005). These findings have been replicated in different parts of the world. A longitudinal study conducted across Japan has found that, after adjusting for confounders, exclusive breastfeeding at six to seven months of age was associated with reduced risk of overweight AOR 0.85 (95% CI, 0.69-1.05) and obesity AOR 0.55 (95% CI, 0.39-0.78) compared with formula feeding, at seven years of age (Yamakawa et al., 2013). Furthermore, similar results were confirmed by a study conducted in the American continent, including 2553 mother-infant pairs; it was found that at one year of age, in comparison with other feeding styles, EBF at three months of age was associated with the lower BMIzs; for some expressed milk adjusted β: +.12 (95% CI: 0.01-0.23) for partial breastfeeding +.28 (95% CI: 0.16-0.39) and for exclusive formula feeding+.45 (95% CI: 0.30-0.59) (Azad et al., 2018). A meta-analysis including nine studies has concluded that breast-feeding decreased the risk of obesity in childhood [AOR]: 0.78, 95% CI (0.71-0.85) (Arenz et al., 2004).

Moreover, it has been determined that for infants receiving breast milk, the incidence of type 2 diabetes mellitus was decreased in children particularly in comparison with infants who were receiving formula, and the evidence is clear. In fact, breastfeeding for longer than one year was determined an independent predictor of diabetic status (OR, 0.24; 95% CI, 0.13-0.99) (Young et

al., 2002). A meta-analysis, which included 11 studies, has found that breastfeeding reduced the odds of type 2 diabetes [pooled OR]: 0.65 (95% CI: 0.49-0.86). A systematic review has concluded from seven studies and 76 744 subjects that individuals who were breastfed had a lower risk of type 2 diabetes later in life compared to the subjects who were formula fed [OR]: 0.61; (95% CI: 0.44-0.85), (P = 0.003) (Owen et al., 2006). This reduction has been observed for the type 1 diabetes mellitus or insulin-dependent diabetes (IDDM) incidence as well (Victora et al., 2016), even if this effect is marginal, as no clear difference was found in the duration of breast-feeding between diabetic and non-diabetic children in a matched control group which had been breast-fed (Samuelsson et al., 1993). This effect is most likely due to a cell-mediated response to the beta-casein, a cow's milk protein, which may play a role in the pathogenesis of type I diabetes mellitus (Cavallo et al., 1996).

On the other hand, some studies have suggested an association between breastfeeding and cardiovascular diseases. A systematic review and meta-analysis which included 105 studies has reported an association between breastfeeding and a reduced risk of cardiovascular disease risk factors such as dyslipidemia, obesity, or elevated C-reactive protein (CRP) (Horta et al., 2015). Moreover, a trial including adolescents born preterm has determined that those who received breast milk, had a reduced ratio of low-density lipoprotein to high-density lipoprotein in comparison to those who received formula (mean difference −0·33; 95% CI −0·64-−0·02, (p=0·04) after adjustment for the following potential confounding factors age, sex, body-mass index, social class, birthweight, and gestation) which suggests a lower risk for cardiovascular diseases (Singhal et al., 2004). Furthermore, a systematic review including 17 studies has indicated that, in subjects aged more than 16 years old, mean total blood cholesterol was less (P = 0.037) among the subjects ever breastfed than among those fed formula milk (mean difference:

−0.04 mmol/L; 95% CI: −0.08, 0.00 mmol/L); moreover, the difference in cholesterol was larger (P = 0.005) and more consistent in studies that analyzed "exclusive" feeding patterns (−0.15 mmol/L; −0.23, −0.06 mmol/L) than in studies that analyzed nonexclusive feeding patterns (−0.01 mmol/L; −0.06, 0.03 mmol/L) (Owen et al., 2008). Among 87,252 female participants of the longitudinal Nurses' Health Study, it was shown that, after adjustment with confounders, women who were breastfed had hazard ratios of 0.92 (95% CI 0.80–1.05) for coronary heart disease and 0.91 (95% CI 0.79–1.06) for stroke in comparison with women who were never breastfed (Rich-Edwards et al., 2004). Nevertheless, a review, including the most important publications on human milk and lactation from the last half of 2004 and 2005 has suggested there was no clear relationship between breastfeeding and cardiovascular diseases (Schack-Nielsen and Michaelsen, 2006). Other studies have found no association between breastfeeding and adult levels of high-density lipoproteins (Parikh et al., 2009) or the cardiometabolic risk factors at 11.5 years of age (Martin et al., 2014). However, there were some limitations of these previous studies such as recall bias, selection bias, not adjusting for particular infant or paternal characteristics (Parikh et al., 2009), or long-term follow-up, or the authors excluding mothers who were not able to breastfeed or preterm or low-birth-weight infants (Martin et al., 2014). Therefore, more studies need to be undertaken to establish a clear benefit of breastfeeding regarding cardiovascular diseases.

Besides, it was suggested that breastfeeding may protect against cancer later in life (Schack-Nielsen and Michaelsen, 2006). A meta-analysis has shown that a significant, negative association was observed between long-term breastfeeding and childhood acute lymphoblastic leukemia risk ([OR] = 0.76; 95% CI: 0.68-0.84) and acute myeloblastic leukemia risk [OR]:0.85; 95% CI: 0.73-0.98); similar results were shown for short-term breastfeeding (Kwan et al., 2004).

Another meta-analysis including 17 studies has determined that, compared with no or shorter breastfeeding, any breastfeeding for six months or longer was associated with a 20% reduced risk for childhood leukemia (OR 0.80; 95% CI, 0.72-0.90) (Amitay and Keinan-Boker, 2015). In a national, population-based case-control study in the UK, it was determined that having been breastfed was associated with a reduced risk for childhood leukaemia [OR] 0.89, 95% Cl 0.80–1.00, (P = 0.06), and for all childhood cancers combined [OR]: 0.92, 95% Cl (0.84–1.00), (p= 0.05) (UK Childhood Cancer Study Investigators, 2001).

Other likely associations were explored between breastfeeding and reduction in malocclusion. This association has been illustrated in a systematic review and meta-analysis that included 48 studies consisting of observational and interventional methodologies (Peres et al., 2015a). However, the studies included in this meta-analysis lacked information regarding the feeding mode, whether the infants were fed the breast milk at the breast or with a bottle (Peres et al., 2015a). In particular, exclusive breastfeeding was found to be protective against severe malocclusion in five-year-old children (Peres et al., 2015b). More studies are required to establish a clear association between breastfeeding and malocclusion.

Alternatively, a review including 56 studies has suggested that breastfeeding may play a role in decreasing the risk of allergic disease (Van Odijk et al., 2003). It was determined that breastfeeding reduced the risk of asthma in childhood, however, the evidence was weaker regarding reductions in the risk of eczema up to two years of age and allergic rhinitis up to five years of age, as determined by a systematic review and meta-analysis that included 89 articles (Lodge et al., 2015). “Ever breastfeeding” had a protective impact on asthma from five to 18 years as suggested when the effect estimates from three cohort studies and 10 cross-sectional studies were pooled: random effects (re) OR 0.88 (95% CI; 0.82-0.95); overall I2 was 44%

(Lodge et al., 2015). Most of these studies failed to adjust for key confounders such as socio-economic status and family history of allergic disease (Lodge et al., 2015). Regarding eczema, the studies included failed to adjust for essential confounders such as family history of allergic disease (Lodge et al., 2015). A reduced risk of eczema was found below the age of two years from pooling six cohort studies' estimates comparing exclusive breastfeeding greater than three–four months with other feeding categories (re OR 0.74; 95% CI 0.57-0.97, I2 62%); However, no association was determined between the risk of eczema up to 2 years for the exposure of more versus less breastfeeding (15 cohorts and one cross-sectional study) (re OR 0.95; 95% CI 0.85-1.07, I2 = 70% (Lodge et al., 2015). Regarding allergic rhinitis, pooling of 12 estimates for more versus less breastfeeding suggested a non-significant protective effect for allergic rhinitis: re OR 0.92; 95% CI 0.84, 1.01, I2 74% (Lodge et al., 2015).

On the other hand, on the long-term, when compared to formula feeding, breastfeeding may be associated with a lower probability of certain acute illnesses and hospitalisation (Ajetunmobi et al., 2015), and this effect lasts after breastfeeding has come to an end. For instance, in the first 12 months of life, the recurrent otitis media rate was 10% in subjects exclusively breast-fed for at least six months and was 20.5% in the subjects who were breast-fed for less than four months (Duncan et al., 1993). After adjusting for confounders, a prospective study has shown that, in the first 12 months of life, for the breastfed infants, the percentage with any otitis media was 19% lower and with prolonged episodes (>10 days) was 80% lower, in comparison to formula fed infants (Dewey et al., 1995). Moreover, in the first year of life, it was determined that, for every additional month of full breastfeeding, 30% of hospital admissions could have been kept away (Talayero et al., 2006). In a secondary analysis of the National Health and Nutrition Examination Survey III (NHANES III), it was concluded that, after adjusting for some variables, there was an

increased risk for ≥ three episodes of OM (OR: 1.95; 95% CI: 1.06–3.59) in the subjects, from six to 24 months of age, who were exclusively breastfed for four to < six months compared with ≥ six months (Chantry et al., 2006). This shows that the more the breastfeeding lasts, the more the protective effect of post-breastfeeding increases.

Another observed long–term advantage of breastfeeding is related to the nervous system. A Lancet meta-analysis has concluded that many studies have shown that cognitive development is marginally improved by breastfeeding later in childhood and adolescence (Victora et al., 2016). As a matter of fact, a positive association was determined between the duration of breastfeeding and the marks of two cognitive tests Intelligence, the Wechsler Adult Intelligence Scale (WAIS) and the Børge Priens Prøve (BPP) test in young adults; 13 confounders were adjusted for, but not the maternal intelligence variable (Mortensen et al., 2002). Similarly, a large randomized trial, consisting of a breastfeeding promotion intervention in Belarus has concluded that, at six and a half years of age, the experimental group had greater means on the Wechsler Abbreviated Scales of Intelligence measures; the cluster-adjusted mean differences (95% CI) were 7.5 (0.8 to 14.3) for verbal IQ, 2.9 (−3.3 to 9.1) for performance IQ, and 5.9 (−1.0 to 12.8) for full-scale IQ (Kramer et al., 2008). When the subjects turned 16 years old, no differences were determined in overall neurocognitive function; still, a minor advantage for a verbal function was noted in the group received breast milk for at least three months (Yang et al., 2018). In a study including data from the United Kingdom Millennium Cohort Study, at five years of age, for the subjects who had received breast milk, after adjusting for many variables, a modest increase in British Ability Scales tests scores were found compared to the ones who were never breastfed, particularly in the infants born preterm (Quigley et al., 2012). Moreover, similar findings were found in research conducted in France; after adjusting for many confounders, but not maternal

intelligence, toddlers who were ever breast-fed scored 3.7 ± 1.8 (P = .038) points higher than toddlers who were never breast-fed on the CDI and 6.2 ± 1.9 (P = .001) points higher than toddlers who were never breast-fed on the ASQ (Bernard et al., 2013). Furthermore, in the American continent, after adjustment for confounders, including maternal intelligence, it was determined that longer lactation duration was associated with higher Peabody Picture Vocabulary Test score (0.21;, 0.03-0.38 points per month breastfed) at three years of age, longer lactation duration was associated with higher intelligence on the Kaufman Brief Intelligence Test (0.35; 0.16-0.53 verbal points per month breastfed; and 0.29; 0.05-0.54 nonverbal points per month breastfed) at seven years of age (Belfort et al., 2013). In premature infants as well, enhanced long-term cognitive development has been detected with breastfeeding (Horwood et al., 1998, Vohr et al., 2007). Besides, a recent Lancet study found that breastfeeding might improve intelligence many years later, increase educational attainment and income during adult age (Victora et al., 2015). Nonetheless, it has been suggested that the cognitive benefits of breastfeeding may be overstated, mainly in regards to full-term healthy infants, as some studies do not adjust for potential confounding factors (Schulze and Carlisle, 2010). In fact when maternal intelligence was controlled for, little evidence was found between breastfeeding and cognitive development in children, as shown from studies included in the review conducted by the Agency for Healthcare Research and Quality which included 400 individual studies (Ip et al., 2007).

A further impact of breastfeeding has been shown on stress reduction. The maternal-infant attachment is enhanced during breastfeeding which may, in turn, have an analgesic impact. It has been shown that, during small invasive procedures, breastfeeding effectively reduces response to pain in infants (Carbajal et al., 2003). One justification for the analgesic impact of breastfeeding

could be the cortisol content, as shown in a mixed cross-sectional and longitudinal study which recruited 166 infants and performed testing at 382 visits; salivary cortisol was 40% higher in breast-fed infants fed breast milk in comparison with infants fed formula milk, after adjustment with confounders (8.66 μg/dL vs 6.20 μg/dL, p = .015) (Cao et al., 2009). Similar findings were reached in a cross-sectional study, even though the differences were not statistically significant (Neelon et al., 2015). In addition, the lactation hormones, known as oxytocin and prolactin, are the main elements of the stress axis; they affect the social behaviours, such as the maternal-infant bonding, in a positive way (Carter and Altemus, 1997). It has been conc.uded that among 5672 non-breast fed 10 year old subjects, parental separation or divorce was associated with a higher risk of anxiety, with a regression coefficient of 9.4 (95% CI 6.1- 12.8), where the association was lower among the breast fed subjects 2.2 (95% CI −2.6-7.0) (Montgomery et al., 2006). Additionally, an association has been determined between breastfeeding behaviour problems in five-year-old children, where children who were breastfed for at least four months, had reduced risk of an abnormal total Strengths and Difficulties Questionnaire score (multivariable-adjusted OR compared with never breastfed children 0.67, 95% CI: 0.54- 0.83) (Heikkilä et al., 2011).

Maternal health benefits

Mothers as well as infants benefit from breastfeeding, whether on a short-term or long-term basis.

On a short-term basis, oxytocin is secreted while breastfeeding (Moberg and Prime, 2013, McNeilly et al., 1983) and this, in turn, leads to facilitating the recovery from childbirth by impacting the uterine involution; the uterine activity increased by 17 to 730% with breastfeeding (or nipple stimulation) (Chua et al., 1994). Furthermore, breastfeeding may increase the maternal weight loss after delivery (Kramer and Kakuma, 2004, WHO, 2001a, Dewey et al., 1993). Even though several studies have determined an association between postpartum maternal weight loss and breastfeeding, a recent review has concluded that more studies need to be conducted to confirm this association (Lambrinou et al., 2019).

On a long-term basis, the risks of maternal hypertension are reduced by breastfeeding. In fact, a meta-analysis which included seven studies indicated that, compared with mothers who didn't breastfeed, the pooled (ORs) of hypertension for > 0–6 months were 0.92 (95% CI: 0.88–0.96, $I2 = 67.5\%$), for >6–12 months were breastfeeding 0.89 (95% CI: 0.86–0.92, $I2 = 0$) and for >12 months, were 0.88 (95% CI: 0.84–0.93, $I2 = 43.9\%$) (Qu et al., 2018). Another review has concluded, based on evidence from five cohort studies, that the longer the duration of breastfeeding, the more reduced is the risk of hypertension (Feltner et al., 2018). A study comprising 3,119 postmenopausal women of the Korea National Health and Nutrition Examination Survey has indicated that, in comparison to the lowest quintile groups, the OR and 95% CI were 0.49 (0.31-0.75) for hypertension among the highest quintile of number of breastfed children (5-11), and 0.55 (0.37-0.82) for hypertension among the highest quintile of duration of breastfeeding (96-324 months) (Park and Choi, 2018).

Another cross-sectional study conducted in China including 9128 mothers has determined that, after adjustment for confounding factors, in comparison with women who breastfed, the OR of hypertension was 1.18 (95% [CI], 1.05-1.32) for women who did not breastfeed; moreover, compared with women who did not breastfeed, the ORs for > zero to six months of breastfeeding were 0.87 (95% CI, 0.76-0.99), the ORs for > six to 12 months of breastfeeding were 0.83 (95% CI, 0.68-1.00), the ORs for >12 months of breastfeeding were 0.79 (95% CI, 0.65-0.97) (Zhang et al., 2015).

Besides, studies have found that the risks of cardiovascular disease are reduced by lactation duration. In fact, common carotid intima-media thickness was inversely associated with breastfeeding duration: mean differences between ≥10 months of breastfeeding vs. zero to less than one month of breastfeeding ranged from −0.062 mm for unadjusted models (p-trend<0.001) to −0.029 mm for adjusted models (p-trend=0.010) (Gunderson et al., 2015b). Another study has found that, after adjustment for confounding factors, women who breastfed in their lifetime for more than 12 months were less likely to have hypertension (OR=0.88, p<0.001), hyperlipidemia (OR=0.81, p<0.001) or cardiovascular disease (OR= 0.91, p=0.008) compared to women who never breastfed; and women who breastfed one child for 7-12 months were less likely to develop cardiovascular disease (HR 0.72 (0.53 - 0.97)) in comparison to women who never breastfed (Schwarz et al., 2009). A prospective cohort study of 89,326 parous women has determined as well that after adjustment for confounders, in comparison with women who never breastfed, the women who breastfed during their lifetime for 2 years or more, had a 23% lower risk of coronary heart disease (95% CI 6-38; P-trend = .02) (Stuebe et al., 2009). Additionally, a study conducted in China including 500,000 women concluded that women who ever breastfed had a reduced risk of CVD, with adjusted HRs of 0.91 (95% CI, 0.84–0.99) for coronary heart disease and 0.92

(95% CI, 0.85–0.99) for stroke, in comparison with women who had never breastfed; in addition, the breastfeeding duration for ≥24 months had an 18% (HR, 0.82; 0.77–0.87) lower risk of coronary heart disease and a 17% (HR, 0.83; 0.79–0.87) lower risk of stroke in comparison with never breastfeeding (Peters et al., 2017). However, the protective effect of breastfeeding against maternal cardiovascular diseases may decrease as the women ages (Perrine et al., 2016).

Alternatively, in regards to the relationship between breastfeeding and the incidence of osteoporosis in different age groups, the evidence is contradictory. A greater bone mineral density was found amongst mothers who breastfed during adolescence in comparison with their peers who did not breastfeed (total proximal femur area difference, 0.053 gm/cm2 [95% CI, 0.029-0.077]) (Chantry et al., 2004). However, this association has not been attained in other studies (Grainge et al., 2001). However, the main limitations of this study are the recall bias, where women had to recall events that happened more than 20 years ago, and testing many outcomes which leads to the concern of multiple significance testing (Grainge et al., 2001). Furthermore, among parous women of older age, a history of breastfeeding has been shown to protect against osteoporosis and bone fracture, the adjusted OR for "ever versus never" breastfeeding was 0.47 (95% CI, 0.22–0.991) (Cumming and Klineberg, 1993). Nevertheless, these results were not duplicated in other studies, such as in Bauer et al. (1993), however the main limitation of that study was the recall bias, and the site of the bone mass testing. In a developing country, prolonged breastfeeding has been shown to have no damaging effects on bone mass density in post-menopausal mothers (Lenora et al., 2009). A meta-analysis including six studies has indicated that the evidence is not clear in regards to the effect of breastfeeding on osteoporosis (Chowdhury et al., 2015). This indicates that the benefit of breastfeeding in regards

to osteoporosis is not fully established and more studies need to be conducted to verify this association.

Mothers benefit as well from breastfeeding as it has been shown to decrease the risks of type 2 diabetes (World Health Organization, 2017), particularly in the years after birth (Feltner et al., 2018). A meta-analysis has determined that the summary RR for the longest lactation duration versus the smallest was 0.68 (95% CI: 0.57–0.82, I2 = 75%, pheterogeneity = 0.001, six studies), the summary RR for a three month increase in the lactation duration per infant was 0.89 (95% CI: 0.77–1.04, I2 = 93%, pheterogeneity < 0.0001, three studies) and the summary RR for a one year increase in the total lactation duration was 0.91 (95% CI: 0.86–0.96, I2 = 81%, pheterogeneity = 0.001, four studies) (Aune et al., 2014). Another study has determined that the more the breastfeeding duration, the more the protective effect against developing type 2 diabetes: adjusted RH for > 0-6 months breastfeeding, 0.75 (95% CI, 0.51-1.09); >6 months to <12 months, 0.52 (95% CI, 0.31-0.87), and ≥ 12 months 0.53 (0.29-0.98) vs none (0 days) (P-trend = .01) (Gunderson et al., 2018). The positive effect of breastfeeding has been reported for mothers who did not develop gestational diabetes (Stuebe et al., 2005) as well as for the mothers who developed gestational diabetes that resolves post-partum (Gunderson et al., 2015a).

Another long-term benefit of breastfeeding on the health of mothers relates to cancer. Mothers benefit as well from breastfeeding as it decreases the risks of some cancers such as endometrial carcinoma, ovarian and breast cancer. In fact, In a meta-analysis using pooled data from 17 studies, “ever breastfeeding” was associated with an 11% reduction in risk of endometrial cancer (pooled OR 0.89, 95% CI 0.81-0.98) (Jordan et al., 2017). Another meta-analysis including 15 articles with 623570 participants concluded that breastfeeding was associated with a reduced risk of endometrial carcinoma (high versus low/no: RR = 0.74; 95% CI, 0.58–0.95) (Zhan et al.,

2015). A meta-analysis that included 35 studies concluded that the risk of epithelial ovarian cancer was reduced by 8% for every five-month increase in the duration of breastfeeding (RR: 0.92; 95% CI: 0.90-0.95) (Luan et al., 2013). A Lancet metanalysis which included 47 studies in 30 countries has shown that the relative risk of breast cancer was reduced by 4·3% (95% CI 2·9–5·8; p<0·0001) for every 12 months of breastfeeding (Collaborative Group on Hormonal Factors in Breast Cancer, 2002).

Psychosocial benefits

Some women indicate that one of the reasons they decide to breastfeed is the longing to experience bonding with their infant (Bai et al., 2009). Among mothers who breastfed and did not breastfeed, it was believed that breastfeeding may create a closer bond between the infant and the mother compared to formula feeding (Guttman and Zimmerman, 2000). On the other hand, few studies have shown that breastfeeding has been linked to a decreased maternal response to stress; mothers who exclusively breast fed exclusively showed slower heart rate and greater levels of parasympathetic cardiac modulation compared the mothers who did not exclusively breastfeed (Mezzacappa et al., 2005). However, more studies need to be conducted to confirm the association. It is believed that the hormones prolactin and oxytocin, which are the main elements of the stress axis presented earlier, positively influence behaviours such as mother-infant bonding (Carter and Altemus, 1997). Besides, it has been shown that breastfeeding is negatively associated with maternal neglect and child abuse, in fact, the odds of maternal maltreatment for non-breastfed children were 4.8 times the odds for children who were fed breastmilk for ≥ four months, and after adjustment for confounders, the odds persisted as 2.6 times higher (Strathearn et al., 2009). Moreover, the WHO states that mothers benefit as well from breastfeeding as it decreases the risks of postpartum depression (PPD) (World Health

Organization, 2017). In fact, there was a reduction in depression scores up to three months postpartum in mothers who were exclusive breastfeeding for ⩾ three months ($F\ 1,65 = 3.73$, $p < 0.10$, $\eta\ p\ 2 = 0.05$) (Figueiredo et al., 2014). Up to one in seven mothers experience PPD (American Psychological Association, 2018). PPD harms the maternal and child interaction (Brummelte and Galea, 2016), and these damaging impacts on the relationship between the mother and child have been reported on a long-term basis as well (Myers and Johns, 2018).

Environmental and economic benefits

Breastfeeding is safe for the environment (World Health Organization, 2018a) as it is generated and provided to the consumer without pollution (World Alliance for Breastfeeding Action, 2018). Moreover, it is a naturally renewable resource and necessitates no packaging or transport and leads to no wastage (La Leche League GB, 2016). Alternatively, breastfeeding helps suppress fertility in the mother (World Health Organization, 2018a). It prolongs the postpartum anovulation (Wang and Fraser, 1994, Campbell and Gray, 1993) therefore, it helps in spacing the children and reducing over-population (La Leche League GB, 2016). In addition to the benefits mentioned above, breastfeeding is economically advantageous (León-Cava et al., 2002). The economic advantages can be experienced on many fronts, whether by the families or by the society at large. As a matter of fact, buying formula milk can be costly (INFACT Canada, 1997). It is estimated to be between 1,138.5 and 1,188.00 United States Dollar(s) (USD) per year (The Breastfeeding Center of Ann Arbor, 2020). Moreover, feeding the infants formula cost the health care system more money than breastfeeding, and care could be enhanced and essential savings could be realised with breastfeeding (Ball and Wright, 1999, Cattaneo et al., 2006). Employers who provide breastfeeding support for their employees save money (United States Breastfeeding Committee, 2011), this is because breastfed children have reduced rates of infections and less

frequent admissions to the hospitals than children fed formula, in addition to less absenteeism of the employee to care for sick children, due to the better health status of breastfed children (United States Breastfeeding Committee, 2011).

Breastfeeding endorsement and recommendations

Major health authorities are strong advocates of breastfeeding. The World Health Organisation (WHO) acknowledges that the threat of malnutrition as well as morbidity and mortality augment with discontinued breastfeeding and inappropriate complementary food (WHO, 2002) and endorses exclusive breastfeeding until six months postpartum (WHO, 2001b). Exclusive breastfeeding refers to when the baby is solely fed breast milk and no other food or drink or water (WHO, 2015). This recommendation has been endorsed globally by many organisations, such as the American Academy of Pediatrics (American Academy of Pediatrics, 2018), the American Public Health Association (American Public Health Association, 2007), the American Dietetic Association (James and Lessen, 2009), the National Association of Pediatric Nurse Practitioners (National Association of Pediatric Nurse Practicioners, 2018), the European Association of Perinatal Medicine, European Breast Cancer Coalition, European Federation of Nurses Associations, European Lactation Consultant Association, European Midwives Association, Federation of European Nutrition Societies, International Confederation of Midwives, International Council of Nurses, International Pediatric Association and the Union of National European Paediatric Societies and Associations (European Commission et al., 2006), the United Kingdom National Health Services (NHS) (National Health Services, 2017). All these organisations and more, recognise that exclusive breastfeeding is the optimal nutrition for infants up to six months after birth.

The World Bank determined that ideal breastfeeding practices provide a child with lasting "good health and prosperity" (Walters et al., 2017). The United Nations International Children's Emergency Fund (UNICEF) and WHO highlight the importance of breastfeeding to achieve several Sustainable Development Goals (SDGs): it enhances nutrition (SDG2), it hinders the child mortality and reduces the risk of non-communicable diseases (SDG3), and promotes education and cognitive development (SDG4) (United Nations, 2017). Breastfeeding also contributes to ending poverty, improving economic growth and decreasing inequalities (United Nations, 2017).

The research on the problem

Despite the multiple benefits of breastfeeding, the EBF rates globally are under 50% (United Nations Children's Fund, 2018), and understanding and explaining this low rate is a focus of research across the world. In particular, the EBF rates in low-income countries are 49%, in lower-middle-income countries 47%, and in upper-middle countries, they are only 24% (United Nations Children's Fund, 2018). In developing countries overall, the rate of EBF until six months postpartum is 47% (UNICEF, 2015). A review has determined that in developing countries, some socio-demographic, socio-cultural, medical, environmental and psychological factors were found to impact the maternal-infant feeding process during the first six months postpartum (Balogun et al., 2015). In fact, some factors are considered barriers to breastfeeding such as maternal employment (Perera et al., 2012, Ulak et al., 2012, Yeneabat et al., 2014, Asemahagn, 2016), lower income (Asemahagn, 2016, Agho et al., 2011), lower maternal education (do Nascimento et al., 2010), or perceptions of lack of breast-milk (Agunbiade and Ogunleye, 2012). Other factors are considered facilitators such as early initiation of breastfeeding (Arusei et al., 2011), workplace flexibility (Agbo et al., 2013), having doctors or midwives attending the

delivery (Dearden et al., 2002), younger maternal age (Teka et al., 2015), rural residence (Yeneabat et al., 2014), or increasing maternal education (Gayawan et al., 2014). A systematic review (please refer to chapter 3) was conducted to determine the demographic, social and cultural factors identified as facilitators or barriers of EBF for the entire six months postpartum in middle-income countries.

The situation in Lebanon

Lebanon is a developing country (UN, 2012), specifically an upper-middle-income country (World Bank, 2017), located on the Eastern coast of the Mediterranean sea (LGIC, 2005). The Lebanese climate is Mediterranean, with four distinct seasons (World Travel Guide, 2018). It has a surface area of 10450 Km^2 (IM, 2016) and consists of eight governorates (Localiban, 2016). In 2012, Lebanon's population was 4,140,289 (Worldatlas, 2015). In 2015, Lebanon's population reached 6,184,701(CIA, 2016), where more than 1,300,000 refugees were expected (UNHCR, 2016). In Lebanon, 87.8% of the population is urban, and Beirut is the major urban area (CIA, 2016). Most of the Lebanese population live by the Mediterranean coast (Central Intelligence Agency, 2018). Christians constitute 36.2%, Muslims 57.7%, and Druze 5.2% of the population (Central Intelligence Agency, 2018). Among the languages spoken in Lebanon are Arabic, French, and English (LGIC, 2005). The young, female, rate of literacy in Lebanon is 99.1% (UNICEF, 2013). More than 80% of the female population are enrolled in secondary education, and in fact, around 50% of the women are enrolled in tertiary or university education (United Nations Educational Scientific and Cultural Organization, 2019). In general, there were more women than men enrolled in universities in 2009-2010 (Central Administration of Statistics, 2012). According to a survey conducted by a job site and a global online market

research company, Lebanon positions first in the region in terms of women in the workplace; 88% of the participants reported that both women and men work in the same workplace, the highest percentage in the MENA region (An-Nahar, 2017). The maternity leave has been increased recently to 70 days (Trading economics, 2019), and there is no mention of the breastfeeding breaks in the legislation of maternity law (International Labour Organization, 2011).

The median age of the Lebanese population is 30.5 years (Index Mundi, 2018), the life expectancy at birth is 79.8 years (United Nations Development Programme, 2018). The human development index rank is 67 (Index Mundi, 2018). In Lebanon, around half of the population lacks health coverage (Al-Nashif and El-Khoury, 2012). The physician density is 2.38 (per 1000 population), and the nursing and midwifery personnel density is 2.562 (per 1000 population) (World Health Organization, 2016). Lebanon has experienced substantial progress in reproductive health outcomes and indicators (World Health Organization Regional Office for the Eastern Mediterranean, 2018b). Specifically, improvement has been witnessed in attaining the target of the Millennium Development Goal 5, particularly enhancing maternal health (World Health Organization Regional Office for the Eastern Mediterranean, 2018b). The maternal mortality ratio is 15 (per 100,000 live births) (World Health Organization, 2016). Additionally, Lebanon has made important attempts to reach the Millennium Development Goal 4 target, specifically decreasing child mortality. In spite of the improvements, the infant and child mortality rates are average amongst the surrounding countries (World Health Organization Regional Office for the Eastern Mediterranean, 2018b). The neonatal mortality rate (per 1000 live births) is 4.5 (World Health Organization, 2016) the under-5 mortality rate is 7.8 (per 1000 live births) (World Health Organization, 2016). The total fertility rate is 1.9 (World Health

Organization Regional Office for the Eastern Mediterranean, 2018a) and 96% of deliveries are undertaken in health facilities (World Health Organization Regional Office for the Eastern Mediterranean, 2018a). The cesarean deliveries rates are of an average of 23%, the highest in the Arab region (UNDP, 2008). As a matter of fact, more recent data shows that the cesarean section deliveries rates further increased, and currently constitute 46% of all deliveries (World Health Organization Regional Office for the Eastern Mediterranean, 2018a). In Lebanon, the necessary equipment for safe maternal and newborn health care is accessible, and the ratio of numbers of midwives to deliveries is about three times higher than that of obstetricians to deliveries (DeJong et al., 2010).

Breastfeeding in Lebanon

In Lebanon, the rates of exclusive breastfeeding until six months is 27% (UNICEF, 2015). This figure is below the average of developing countries (47%) (UNICEF, 2015) and worldwide (41%) (United Nations Children's Fund, 2018). Additionally, the average rate of exclusive breastfeeding is around 18 days (UNDP, 2008). In Lebanon, around 15 lactation consultants are available in several regions, moreover, around 12 groups and organizations have been working towards promoting and supporting breastfeeding (MAMABOND, 2018). Only recently, in 2015, the Lebanese ministry of public health launched a national campaign to support breastfeeding (World Health Organization Regional Office for the Eastern Mediterranean, 2018c). This was the first national initiative aiming to raise the awareness and work on endorsing the WHO breastfeeding recommendations (World Health Organization Regional Office for the Eastern Mediterranean, 2018c).

In Lebanon, endorsing the breastfeeding policies and applying these policies are not always in line, in addition to a frail engagement of professional organisations, as well as an important influence of the breast milk substitute industry, the absence of implementation of the law 47/2008, lack of publicizing the law, lack of financial backing in the MoPH, the presence of the Syrian refugees in Lebanon shifted the priorities in resource allocations (Akik et al., 2017). On the other hand, humanitarian organisations assisting the large population of refugees in Lebanon mostly do not conform with the infant and young child feeding (IYCF) policies, and breast milk substitutes are being distributed (Shaker-Berbari et al., 2018).

Research on the predictors of breastfeeding behaviour is rare in Lebanon (Hamade et al., 2013). Only one quantitative study which covered the first six months postpartum has been undertaken; however, it was conducted only on women accessing health centres of the Ministry of Social Affairs, who are usually of a lower socioeconomic group, and whose main limitation was a recall for up to five years earlier (Batal et al., 2006). This study determined that exclusive breastfeeding was associated with place of residence and negatively associated with maternal education (Batal et al., 2006). This outcome is not in line with the findings of the systematic review that in developing countries, less educated mothers are less likely to exclusively breastfeed (Balogun et al., 2015).

Two other quantitative studies were conducted only in the capital Beirut and covered less than six months postpartum. One of them was conducted only on first-time mothers and concluded that at three months postpartum, maternal unemployment, planned pregnancy, intention to breastfeed at time of delivery, source of maternal emotional support other than own mother, were positively associated with exclusive breastfeeding (Hamade et al., 2013). The second study,

which did not take into account the solid food intake of the infants, concluded that at four months postpartum, early discharge from hospital, high parity, religion, maternal unemployment and paediatrician being a female were positively associated with full breastfeeding, or receiving only human milk (Al-Sahab et al., 2008). One cross-sectional study whose aim was to explore the maternity leave in Lebanon and the issues the mothers encounter in that regard, determined that early return to work was shown as a barrier to breastfeeding (Saadé et al., 2010).

Furthermore, one qualitative study conducted for only the 4 months postpartum has shown that beliefs, such as having an inability of milk production, producing bad milk, and transmitting abdominal cramps to children through the milk (Osman et al., 2009). Another qualitative study conducted in Beirut specifically, body image and exhaustion (Nabulsi, 2011) were barriers to breastfeeding expressed by mothers.

The gaps in knowledge

Balogun et al. (2015) have noted a gap in the literature covered in their review and determined that research exploring the influence of preconception and prenatal breastfeeding plan on exclusive breastfeeding is required in developing countries. Feeding plan refers to a mother's intentions before delivery regarding the infant feeding (Sasaki et al., 2010). In Cambodia, a lack of antenatal exclusive breastfeeding plan was related to the termination of exclusive breastfeeding (Sasaki et al., 2010). In China, an antenatal non-exclusive breastfeeding plan (meaning breast milk and other food intake plan) was correlated with the termination of breastfeeding (Li et al., 2003). Another study conducted in Iran has reached similar conclusions (Noughabi et al., 2013). Consequently, research into breastfeeding plans in Lebanon may help with developing policy recommendations to facilitate breastfeeding.

There are several possible explanations for the lower rates of exclusive breastfeeding in Lebanon, whether at the hospitals level, social and community level, or governmental level. The Millennium Development Goals report prepared by the UN and the Lebanese government stated that only 26% of hospitals instigate breastfeeding within one-hour post-delivery in Lebanon (UNDP, 2008). No rooming-in was declared in 59% of the hospitals declared, and 67% of the women were never helped to initiate breastfeeding (Khayat and Campbell, 2000). In fact, 9% of the hospitals are deemed "baby-friendly hospitals"[1] (Labbok, 2012). The "baby-friendly hospital initiative" (BFHI) is a UNICEF and WHO initiative to impact medical centres to ensure the most exceptional care for infant feeding and mother and child connection (BFUSA, 2012a). Breastfeeding promotion is invigorated in "baby-friendly" hospitals, such as delivering information concerning the breastfeeding advantages and process, practising rooming-in, giving infants only breast-milk, help mothers initiating breastfeeding within an hour of delivery (BFUSA, 2012b). Lebanon implemented the Law 47/2008 for "Organizing the Marketing of Infant and Young Child Feeding Products and Tools" in 2008 (WHO, 2008). However, the knowledge, education and communication policies are not satisfactorily implemented (WBTI, 2010) and the criteria for monitoring mechanism are not independent, nor transparent, nor free from commercial influence (WHO et al., 2016). Monitoring is crucial to identify violations and report them to the appropriate authorities so they can intervene and end such actions (WHO, 2016).

Moreover, the infant's father attitude towards breastfeeding may be an essential factor as to whether the mother breastfeeds or not, given that the role of the man gender is superior, and the

[1] "Baby-Friendly Hospital Initiative (BFHI) was launched in 1991 following the Innocenti Declaration call for all hospitals to practice the Ten Steps, as "Operational Target 2: Ensure that every facility providing maternity services fully practises all 10 of the 'Ten Steps to Successful Breastfeeding'."" LABBOK, M. H. (2012). Global baby-friendly hospital initiative monitoring data: update and discussion. *Breastfeeding Medicine,* 7, 210-222.

Lebanese society has a patriarchal structure (Civil Society Knowledge Center, 2017). In fact, Lebanon is in the top 10 worst countries in gender equality (World Economic Forum, 2016), the gender inequality index rank is 78 (World Health Organization, 2016), and given that the current Lebanese system of personal status laws infringes women's human rights, comprising non-discrimination, equality in marriage and marriage termination, physical integrity and health (HRW, 2015).

In Islam, it is recommended that breastfeeding lasts up to two years post-partum (Shaikh and Ahmed, 2006), and in Lebanon, 57.7% of the population are Muslims, and 36.2% are Christians (Central Intelligence Agency, 2018). Thus, religion may be an interesting factor to explore.

On the other hand, thousands of female migrant workers relocate every year to the Arab countries to gain their living and provide for their families (International Labour Organization, 2019). In Lebanon, specifically, there are around 250,000 women migrant domestic workers (ILO, 2016). This is a considerable number given that the Lebanese population was about 4,000,000 (Worldatlas, 2015) before reaching recently about 6,000,000 (CIA, 2016), where more than 1,300,000 refugees were expected (UNHCR, 2016).

Many of the women migrant domestic workers living in Lebanon are housekeepers (International Labour Organization, 2019). Housekeepers are defined as "one employed to manage the domestic duties involved in maintaining a house" (Merriam-Webster, 2019). Very few studies have explored the presence of housekeepers' relation with breastfeeding, such as in the Arabic gulf regions (Musaiger, 1995) and Singapore (Phang et al., 2015).

Furthermore, regarding the type of delivery, the cesarean deliveries rates are of an average of 23%, the highest in the Arab region (UNDP, 2008). As a matter of fact, more recent data shows that the cesarean section deliveries rates further increased, and currently constitute 46% of all deliveries (World Health Organization Regional Office for the Eastern Mediterranean, 2018a). Having a cesarean section has been determined as a barrier to exclusive breastfeeding (Yeneabat et al., 2014) and breastfeeding (Shawky and Abalkhail, 2003, Leung et al., 2002, McLeod et al., 2002). Nevertheless, it was determined that if breastfeeding was initiated, the mode of delivery was not related to breastfeeding rate at six months (Prior et al., 2012).

Aim of the study

To identify the association between demographic, social and cultural factors with exclusive breastfeeding for the six months postpartum in Lebanon.

Objectives of the study

1-To determine the association between maternal age, maternal education, maternal preconception and prenatal breastfeeding plans, the maternal attitudes in relation to early initiation of breastfeeding, the maternal attitudes in relation to rooming-in, the maternal attitudes in relation to skin-to-skin, the maternal attitudes in relation to free formula sample distribution and exclusive breastfeeding for the six months postpartum.

2-To determine the association between the paternal attitude towards breastfeeding reported by the mother and exclusive breastfeeding for the six months postpartum.

3-To determine the association between maternal employment, place of residence, religion, housekeeper presence, whether the housekeeper is involved in childcare, type of delivery, pediatrician gender, and exclusive breastfeeding for the six months postpartum.

Research question

What demographic, social and cultural factors are associated with exclusive breastfeeding for the six months postpartum in Lebanon?

Chapter 2: Paradigm and theoretical framework

The following chapter debates the selection of the theoretical framework and paradigm adapted for the study while presenting the alternative frameworks considered.

The successful public health interventions are founded on the comprehension of health behaviours and the settings in which they take place (National Institutes of Health, 2019). Consequently, any public health program to ameliorate a health behaviour could be developed with a comprehension of pertinent theories of behaviour change and the capacity to use them competently (National Institutes of Health, 2019). The theories of health behaviour detect the goals for change and the approaches for achieving these changes (Glanz et al., 2008). The most widely used theories of health behaviour are the Health Belief Model, the Social Cognitive Theory, the Theory of Planned Behaviour, the Transtheoretical Model/Stages of Change, and the Social Ecological Model (National Institutes of Health, 2019).

The study theoretical framework

The theoretical frameworks presented earlier were all considered when planning the study; nonetheless, as previously discussed, they do not precisely match the study I was planning to conduct. As a result, the theoretical framework that best supports this research is the ecological model, also referred to as Socio-Ecological model (SEM). This model was initially developed by Bronfenbrenner (1977). SEM helps in understanding the factors that affect the behaviour (Glanz and Bishop, 2010) and highlights several levels of impact (National Institutes of Health, 2017). This model directs the development of comprehensive interventions (Glanz et al., 2008) through social environments (Glanz and Bishop, 2010). SEM focuses on several levels of influence, that

are usually the individual, interpersonal, organisational, community and public policy levels, and on the notion that the behaviours shape and are shaped by the social environment (McLeroy et al., 1988, Glanz et al., 2008). The SEM concepts share common grounds with the SCT concepts in that providing an environment favourable to change is crucial to assist in the adoption of health behaviours (Bandura, 1986). An example could be the attention concentrated on exploring and enhancing the health-promoting characteristics of communities to decrease the presence of unhealthy food choices, given the mounting epidemic of obesity in developed nations (Story et al., 2008). Below is the diagram that illustrates the framework of my research (*Figure 2.1*).

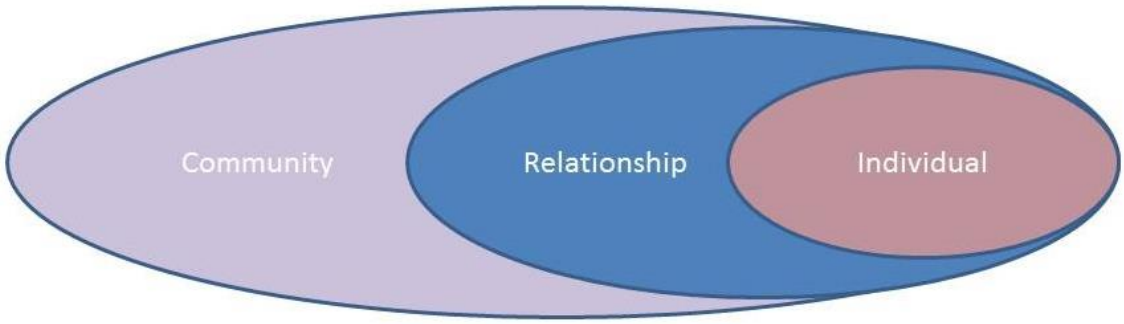


Figure 2. 1: SEM diagram

Many authoritative organisations have used the ecological model to guide interventions in health behaviour. These include the violence prevention alliance of the World Health Organisation

(World Health Organization, 2018c) or the Centers for Disease Control and Protection, for violence prevention (Centers for Disease Control and Prevention, 2018), or Colorectal Cancer Control Program (Centers for Disease Control and Prevention, 2015). This model has been adopted extensively in many fields of study in public health. It was employed to understand physical activity among minority women in the USA (Fleury and Lee, 2006). Furthermore, it was used to study the school violence in the Middle East (Khoury-Kassabri et al., 2004) and particularly against peers and teachers (Khoury-Kassabri et al., 2009) as well as bullying (Hong and Garbarino, 2012, Swearer and Espelage, 2004). This framework has been employed as well to understand the determinants of dietary behaviours (Robinson, 2008) and to promote healthy eating at schools (Townsend and Foster, 2013). On the other hand, this framework has been used to understand the effect of sexual assault on women's health (Campbell et al., 2009). In regards to breastfeeding studies in particular, this model has been broadly used, while taking into consideration the factors that exist in the context the mothers are living in, whether at the individual level or other broader levels (Tiedje et al., 2002, Dunn et al., 2015a, Dunn et al., 2015b, Labbok et al., 2008, Bentley et al., 2003, Reeves and Woods-Giscombé, 2015).

As illustrated previously, the ecological model comprises several layers. As such, this framework could comprise only three layers, depending on the existing situation (Stokols, 1996). Indeed, some studies, such as (Rowe et al., 2013), have used a three-layered model. Therefore, given that this study covers only factors that are enclosed within individual, relationship or community levels, with no factors relating to higher levels such as the policy level, the model that is best adapted for this study would consist of three levels only: Individual, Relationship and Community.

The individual level covers the following variables: maternal age, maternal education, maternal preconception and prenatal breastfeeding plans, maternal attitudes in relation to early initiation of breastfeeding, maternal attitudes in relation to rooming-in, maternal attitudes in relation to skin-to-skin, maternal attitudes in relation to free formula sample distribution.

The relationship level covers the following variables: the paternal attitude towards breastfeeding reported by the mother[2].

The community level covers the following variables: housekeeper presence, whether the housekeeper is involved in childcare, type of delivery, pediatrician gender, maternal employment, place of residence, religion[3].

Alternative theoretical frameworks considered

The Health Belief Model

The health belief model (HBM) is amongst the earliest theories of health behaviour and is still one of the most broadly acknowledged in the field (Glanz and Bishop, 2010). Developed in the 1950s, this model covers concepts which predict the reasons individuals take action to avoid, screen for or manage disease conditions (Glanz et al., 2008). It has been a dominant theoretical framework adapted to elucidate and predict the acceptance of the recommendations provided in health care settings (Janz and Becker, 1984) and has obtained substantial research attentiveness

[2] I did not explore the others' attitudes, like peers' attitudes, not to add to the length of the questionnaire because there were already 45 questions to ask the mothers. In addition, I was focusing more on the Lebanese culture and context and exploring the paternal influence.

[3] These factors were considered as community level factors as the mother herself doesn't have much control on them, they are external and their rules mostly imposed on her. For instance, employment was considered as community level factors, as the mother doesn't really have a say in the employment policies, and they are imposed on her. The same goes to religion, as in Lebanon, the individual does not have much say in religion, he/she cannot really change the religion he/she is born into, and has to abide by its rules.

(Prentice-Dunn and Rogers, 1986). This framework has informed us about many critical components in preventive health actions (Prentice-Dunn and Rogers, 1986).

The main concept of the health belief model is that the readiness of people to take action is affected by their beliefs about the risks of a disease or health problem, and the perception of the advantages of taking an action to sidestep it (Rimer and Glanz, 2005, Rosenstock, 1974). The fundamental constructs of the health belief model are the perceived susceptibility, severity, benefits, barriers, the indications to action, and recently, the self-efficacy (Rosenstock et al., 1988). It is assumed that for a behaviour modification to be successful, the individual should feel that he or she is under threat by their existing way of acting (referring to the perceived susceptibility and severity constructs) and should trust that modification of a particular type will lead to a valued result at a satisfactory cost (referring to the perceived benefit construct). Besides, the individual must perceive herself or himself as capable (referring to the self-efficacious construct) to prevail over the perceived challenges to take action (Glanz et al., 2008). The HBM constructs do not all have the same effectiveness in predicting behaviours, as concluded in a meta-analysis (Carpenter, 2010). The relationship among the constructs is not distinct, and this has resulted in the discrepancy in the HBM application (Glanz et al., 2008). In addition to these constructs, several factors might impact the perceptions and therefore indirectly affect the behaviours related to health (Glanz et al., 2008). These factors may be social, demographic or sociopsychological factors (Glanz et al., 2008).

The health belief model literature suggests that the social scientists have adopted this model as an effort to take action with factual and significant challenges facing the communities, as shown by a meta-analysis (Harrison et al., 1992). This model has been used in health themes that are related to prevention and have no symptoms, where the beliefs are more significant than overt

symptoms, such as detecting early cancer or screening for high blood pressure (Glanz and Bishop, 2010).

Social Cognitive Theory

The social cognitive theory (SCT) has been best illustrated by Bandura (Bandura, 1986). In this model, efficacy beliefs function as one of the other determinants which control motivation and behaviour (Bandura, 1998). This model elucidates the human behaviour in a three-way, continually changing, reciprocal model, where there is constant interaction between personal factors, environmental factors and behaviour (Glanz et al., 2008). According to this theory, the norms control the actions of the individual through two processes, which comprise the social sanctions, and self-sanctions (Bandura, 1998). These rules impact the behaviour by the social consequences they entail (Bandura, 1998). The actions that abide by the social rules entails positive social reactions, whereas the behaviours that do not comply with the norms results in social censure (Bandura, 1998). The simple foundation of this model is that individuals learn from their own experiences, as well as from others' experiences, by observing the actions of other individuals and the consequences of these actions (Bandura, 1986, Glanz et al., 2008). "Self-control, and self-efficacy" are the main concepts of this model, which are pertinent to health behaviour modification interventions (Will et al., 2004). "Goal-setting, self-monitoring and behavioural contracting" are a few of the components of behaviour change founded on the SCT models concepts of self-control, reinforcement and self-efficacy (Glanz and Bishop, 2010). In particular, goal-setting and self-monitoring appear to be valuable agents of effective interventions (Glanz and Bishop, 2010). Self-efficacy explained as an individual's confidence in her or his ability to take action and persevere despite the challenges, is essential for behaviour change (Bandura, 1982). To increase the patients' self-efficacy, health professionals could set

small, achievable goals, specify rewards, and monitor and reinforce (Bandura, 1986). The central concept of the SCT model is reciprocal determinism. This entails that an individual could be both a facilitator for change and a responder to change. (Glanz and Bishop, 2010).Therefore, any modification in the environment, such as role models, or reinforcements, are helpful to encourage healthier behaviours (Glanz and Bishop, 2010). This concept is shared with the social-ecological models' key concept and is gaining momentum (Glanz and Bishop, 2010).

The social cognitive theory has been adopted in studies regarding internet uses, more specifically, the media attendance, and the variables that explain and predict it (LaRose and Eastin, 2004). More recent applications of this model could be in counselling interventions for preventing and managing diseases given that it combines constructs from cognitive, behaviouristic and emotional models of behaviour change (Glanz and Bishop, 2010).

The Theory of Planned Behaviour

The theory of planned behaviour (TPB) emphasises on theoretical constructs related to individual motivational elements as determinants of the probability of carrying out a particular behaviour (Glanz et al., 2008). Concisely, the theory of planned behaviour assumes that human behaviour is directed by those three types of beliefs: 1- the "behavioural beliefs", or the beliefs regarding the possible results or other features of the behaviour, 2- the "normative beliefs", or the beliefs regarding the formal anticipations of other individuals, and 3- the "control beliefs", or the beliefs regarding the existence of variables that may promote or deter a behaviour performance (Ajzen, 2002). The behavioural beliefs generate a positive or negative attitude concerning the behaviour; normative beliefs end up in perceived social pressure or subjective norm; lastly, the control beliefs result in perceived behavioural control, the alleged easiness or arduousness of executing

the behaviour (Ajzen, 2002). In combination, attitude toward the action (Ajzen, 2002, Glanz et al., 2008), subjective norm (Ajzen, 2002, Ajzen, 2001) and perception of behavioural control (Ajzen, 2002, Ajzen, 2001) lead to the formation of a behavioural intention. Lastly, with a satisfactory degree of substantial control over the behaviour, the individual is expected to perform their intentions once the opportunity emerges (Ajzen, 2002). This theory presumes that the prime predictor of a behaviour is behavioural intention (Ajzen, 1991, Ajzen, 2002). Nevertheless, given that several behaviours are not easy to execute, which may limit the will control, it is beneficial to contemplate the perceived behavioural control in addition to the intention (Ajzen, 2002). If people are reasonable in judging the difficulty of carrying on a behaviour, a measure of perceived behavioural control could represent the actual control and help in the prediction of the behaviour being considered (Ajzen, 2002).

This model is efficient in explaining intentions, perceived behavioural control being as significant as attitude throughout health-related behaviour types, as illustrated in Godin and Kok (1996) review. The theory of planned behaviour can be practically used in several domains (Ajzen, 2001). This theory is proposed as an extension to the "Theory of Reasoned Action" (Ajzen, 1985). The theory of reasoned action is relevant when the behaviour under study is related to the use of one's will (Madden et al., 1992). Nonetheless, when the behaviour under investigation intrudes upon the supposition of the control of one's own will, the theory of planned behaviour has been shown to be superior to the theory of reasoned action to predict the behaviour under study (Madden et al., 1992). The general, "content-free" theory of planned behaviour has been shown to perform similarly or even better than the alternative theories which are intended for applying in particular domains (Ajzen, 2001).

The TransTheoretical Model/Stages of Change

The TransTheoretical Model (TTM) consists of core constructs and employs stages of change to incorporate processes and principles of change across main theories of intervention (Glanz et al., 2008). It is considered a cycle of individual cognitive-behavioural indicators which illustrate six definite stages of change along with ten general processes of intentional change (Moore, 2005). Long-term modifications in health behaviour consist of many actions and adaptations during a long period (Glanz and Bishop, 2010). Readiness to attempt the modifications differs from one person to the other; some may not be ready, whereas others may have started realising changes in their habits such as smoking or dietary habits (Glanz and Bishop, 2010). The stages of change model is a heuristic model, which represents a series of phases in effective behaviour change: "pre-contemplation, contemplation, preparation, action, and maintenance" (Glanz et al., 2008). These stages of change are not always followed in a linear process; individuals may repeat specific stages, such as relapsing in previous stages, conditional on their motivation level (Glanz and Bishop, 2010).

The TTM has been used in many situations (Glanz et al., 2008). This model can be applied in settings such as to recognise the reason why individuals who are at an elevated risk of developing diabetes, may not be ready to try a behaviour modification (Glanz and Bishop, 2010). This model can be used as well in organisations to conceptualise the organisations on the model continuum depending on their superiors or employees readiness for change (Glanz et al., 2008) (Prochaska et al., 2001). The concept of readiness or stages of change, has been explored in research pertaining to health behaviour and this notion was valuable in elucidating and predicting changes for many behaviours such as smoking habits (Dijkstra et al., 1999), dietary habits (Glanz et al., 1998, Johnson et al., 2008) or physical activity habits (Marcus et al., 1998, Sarkin et al.,

2001) or stress management (Velicer et al., 1998) and exercise behaviours in adolescents (Nigg and Courneya, 1998). However, other studies such as a longitudinal study (Plotnikoff et al., 2001) and a meta-analysis (Bridle et al., 2005) and a review (Spencer et al., 2002) have concluded that the evidence for the effectiveness of the Transtheoretical Model in health behaviour interventions is not conclusive.

Reasons for not adopting the aforementioned models

Although the theoretical models illustrated previously may manifest similar broad ideas, every model uses a distinctive vocabulary to communicate the particular factors regarded as significant (National Institutes of Health, 2019). Taken one by one, none of the models would be the most appropriate model to adopt for this study, as each model focuses on one facet of the study, the individual level, as presented previously. Basically, the Health Belief Model focuses mainly on the individual's beliefs about the risks of a health problem, and the Social Cognitive Theory, even though it generally refers to the environment, comprises mainly of two concepts, the "self-control, and self-efficacy". On the other hand, the Theory of Planned Behaviour focuses on individual motivational elements as determinants of the probability of carrying out a particular behaviour, whereas the TransTheoretical Model employs stages of change to incorporate processes and principles of change. Even though my study includes individual factors, which are the focus of these illustrated models, it covers as well additional factors and additional levels to the individual himself or herself. Thus, these models would not be the most suitable to use for this study. Consequently, a theory that covers individual level, as well as higher level factors, would be the most appropriate choice for this study. As a matter of fact, the public health interventions that will eventually be implemented as a result of this study will not be addressed solely at the individual levels; they will also target the higher levels that impact the health

behaviour. These types of interventions are acknowledged as being amongst the most effective (National Institutes of Health, 2019).

Paradigms categorisation

Distinguishable theoretical positions have defined governing mindsets about social phenomena; these positions are the philosophical backcloths to conduct research (Pring, 2004). These are referred to as paradigms, which are the basis of every research (Bowling, 2014). The philosophical stances are given a variety of titles (Pring, 2004), and the terminology is not consistent in social science literature (Crotty, 1998). Paradigms were classified into two categories (McNeill and Chapman, 2005, Bowling, 2014, Bryman, 2012, Crossan, 2003, Darlatson-Jones, 2007), more than two (Guba, 1990, Bunniss and Kelly, 2010, Mackenzie and Knipe, 2006), or even five categories (Denzin and Lincoln, 2011). For this study, the two dominant schools of thought were explored: positivism and constructivism or interpretivism (McNeill and Chapman, 2005, Mackenzie and Knipe, 2006).

Positivism

Positivism emerged in the twentieth century (Caldwell, 2003) and stayed prominent in sociology as a way to examine the social world until the 1960s (McNeill and Chapman, 2005). Subsequently, this doctrine started to fade, mainly since the emergence of the achievements of the "growth of knowledge" philosophers such as Kuhn (Caldwell, 2003). Positivism was founded by Auguste Comte (Bourdeau, 2014). It is an approach adopted in social sciences inspired by the research methods of the natural sciences (Bowling, 2014). It entails that social forces or laws arising from the organisations of the society control and govern people and that these laws depend on the social structure and surpass human influence (McNeill and Chapman, 2005).

Positivists consider that human actions can be evaluated in a scientific, objective manner, similar to the subject matter of the natural sciences (McNeill and Chapman, 2005). Positivism yield scientific laws of human conduct, and assumes that there is an "absolute truth" which can be applied to build a greater society (McNeill and Chapman, 2005). Positivists are not involved in determining the meaning of circumstances to humans because these cannot be evaluated in an objectively and scientifically (Bowling, 2014). They believe the individual is less paramount than the society (McNeill and Chapman, 2005). The prior positivists embraced a Cartesian approach of enquiry consisting of parting the "knower of what is to be known" (Williams and May, 1996). As a matter of fact, the values and ethical considerations of this doctrine require that inquirers should stay remote from the participants to ensure that their actions do not affect the population of interest (Denzin and Lincoln, 2005).

Positivists trust that there is one objective reality that can be determined by the senses (Bowling, 2014). They suggest that only knowledge established by the senses is accepted as knowledge (Bryman, 2012). Therefore empiricism, or observed evidence, is the foundation for building reliable and valid knowledge (Bowling, 2014). According to empiricists, sense experience is the optimum basis for our knowledge and theories, in contrast to the rationalists, who claim that reason is the basis for our knowledge (Markie, 2015). Empiricism is embodied in the concept of neutrality with regards to whatever can be known (Williams and May, 1996). The methodology adopted is value-neutral and therefore, generates value-neutral knowledge; knowledge is regarded as absolute, value-free, and not sited in a political or historical setting (Scotland, 2012).

Positivists are realists; this position assumes that objects exist independently and are not reliant on their existence on the knower (Cohen et al., 2011). Therefore, positivism provides an objective and valid investigation (Williams and May, 1996). Furthermore, positivists view

reliability as a central feature of the scientific method; the research should be inspected and repeated by others to confirm its accuracy (McNeill and Chapman, 2005).

Concepts should be constructed in a firm, linear and systematic manner on a foundation of provable fact (Bowling, 2014). Positivists pursue forecasts and generalisations (Scotland, 2012), highlight positive facts, and formulate laws utilising quantitative methods (Bowling, 2014). Research methods generating quantitative data are considered more reliable than other methods because they are generally structured in standardised and systematic manners (McNeill and Chapman, 2005). Survey questionnaires or structured interviews are examples of quantitative data; these produce statistics, reveal correlations and associations, uncover cause and effects links and provide "social laws" (McNeill and Chapman, 2005). The quantitative approach involves deductive reasoning (Bryman, 2012), a principle assumed by positivism (Bryman, 2012). The deduction, also called Aristotelian deduction (Cohen et al., 2011), entails that the researcher begins with general thoughts and builds a theory and hypotheses to be examined from it, then these hypotheses will be tested by data collection and analysis (Bowling, 2014). These can be either acceptable and verified, or negative and falsified (Popper, 2002). Popper indicated that deductive reasoning could solve all the epistemological problems and contribute to scientific progress (Popper, 2002).

The positivism tenets can be outlined as follows:

The positivism tenets have been elucidated in the literature. The positivism axiology asserts that the values are excepted, and the influence is rejected; the ethics are external, and incline towards deception (Denzin and Lincoln, 2011). The positivism ontology is realist. Reality is "out there" and is controlled by fixed natural laws and processes. The knowledge of these bodies, laws and processes is usually outlined as context and time-free generalisations. A few generalisations are

cause and effect laws (Guba, 1990). The positivism epistemology is dualist or objectivist. The investigator is required to assume a distant, non-interactive attitude with values, biases and confounders excepted not to affect results (Guba, 1990). The positivism methodology is experimental or manipulative. The questions and hypotheses are specified at the beginning in propositional form and exposed to empirical assessments and falsification under cautiously controlled conditions (Guba, 1990). The positivism methods are quantitative (Bowling, 2014). The quantitative methods focus on objective measurements and the statistical or numerical analyses of the data collected through surveys or polls, and then generalising it across groups of people (Babbie, 2010).

Positivism paradigm discussion

This school of thought and its techniques have many strong points such as generalizability, eliminating confounders, credibility, assessing cause and effects interactions, providing precise numerical data independent of the inquirer, and higher preference amongst policymakers (Johnson and Onwuegbuzie, 2004) as well as rigour (Indick, 2002). Rigour relates to bias minimisation as well as validity and reliability of the data (Bowling, 2014). However, positivism holds a few limitations.

One limitation is that the procedures employed to explore the natural world are not directly transferable to the social world at all times (Scotland, 2012) and that the scientific clarification of the human actions could never be complete (Berliner, 2002). Besides, this approach might be "fallible", based on misperceived things, and the predictions involved could be accurate due to chance (Shank and Brown, 2013). Moreover, positivism disregards the intentionality of the person; hence the behaviours are not completely comprehended, in fact, behaviours should be comprehended from the viewpoint of the participants (Scotland, 2012). Furthermore, the

investigator may not capture all occurrences because the emphasis is on hypothesis testing rather than generation - known as confirmation bias - and the knowledge generated may be too general to apply for particular situations (Johnson and Onwuegbuzie, 2004). Besides, (Scotland, 2012) asserts that positivists mislead themselves when they think their inquiry is value free. Basically, knowledge generation is embedded with politics (Scotland, 2012) as inquirers are adherent to numerous social groups, and individual choices are taken along the inquiry process (Johnson and Onwuegbuzie, 2004). For instance, theory selection, political plans, opinions, and approaches of analysis might impact the variables selection, the actions to be studied, as well as the outcome interpretation (Huberman, 1987). Indeed, statistical tests may be inaccurately elected, mishandled, and their outcome misunderstood; hence the consequences of inferential statistics cannot be accepted as they appear (Scotland, 2012). Further examples of subjectivism and intersubjectivism in quantitative research include the choice of the alpha levels or the decision on what data to highlight or publish (Johnson and Onwuegbuzie, 2004). Consequently, some may argue that undertaking a completely objective and value-free inquiry is a "myth" (Johnson and Onwuegbuzie, 2004).

Alternative paradigms considered

The alternative paradigm that was considered for this research is interpretivism, also referred to as constructivism. Interpretivism entails that reality is numerous and constructed socially via the interaction of humans and that humans utilise signs to interpret each other and allocate meaning to experience (Bowling, 2014). Moreover, it entails that external forces do not enforce them, hence using the natural science instruments misrepresents reality (Bowling, 2014). Reality is considered "inter-subjective", not external, nor objective (McNeill and Chapman, 2005). Weber

(2009), an advocate of these notions, did not agree that scientific investigation can reach a complete depiction of the reality of a phenomenon. Furthermore, Mead (1934) indicated that human actions are the outcome of their interpretations of the circumstances, not the influence of external forces. It entails that truth is an agreement amid constructors, that facts are dependent on how the investigator constructs reality (Pring, 2000). To elucidate social actions, the researcher has to develop a trusting relationship with the individuals being studied and see the world from their perspective (McNeill and Chapman, 2005). The validity, or conceiving the world as it really is, is crucial; however, highlighting the validity may be attained at the expense of its reliability or representativeness (McNeill and Chapman, 2005).

The interpretivism tenets can be outlined as such: The Axiology is that values are involved (Denzin and Lincoln, 2011), the ontology is relativist (Guba, 1990), the epistemology is subjectivist (Guba, 1990), the methodology is hermeneutic (Guba, 1990), and the methods are qualitative (McNeill and Chapman, 2005).

Interpretivism paradigm discussion

Despite its many advantages, such as the validity, the richness of the data of the complex situations it explores, and the understanding of humans' perceptions, the interpretive paradigm has raised some criticism.

Some argue that there is no consolidated body of theory or methodology that can be labelled as qualitative research, therefore any effort to agree on the quality criteria for qualitative research will not probably thrive (Rolfe, 2006). Striving to accrue reliability implicates a compulsory agreement and compliance in the data analysis, which is to the detriment of the validity of the results (Rolfe, 2006). Interpretivism discards a foundation to knowledge, leading to doubt its

validity; additionally, it cannot be assessed with the same criteria as positivism, and legitimacy and trustworthiness are to be reached without claiming unchallenged certainty (Scotland, 2012). As a matter of fact, expert inquirers might not achieve the same outcome as the inquirer (Rolfe, 2006) and criteria to add validity, like peer review, are considered useless because they presuppose an underlying objective reality to merge upon (Angen, 2000). Moreover, inquirers acknowledge that they endorse a strong relativism which impedes the application of systematic criteria for arbitrating the inquiry quality (Johnson and Onwuegbuzie, 2004). Alternatively, the sturdy ontological relativistic assertion that numerous, conflicting, but similarly valid accounts of the same occurrence are numerous realities, raises some issues (Johnson and Onwuegbuzie, 2004). Indeed, beliefs might be false beliefs; understandings might be misunderstandings; what is viewed ardently as true might be basically incorrect (Burbules and Phillips, 2000). Furthermore, the knowledge generated by constructivism has narrow transferability as it is disintegrated and not consolidated in a unified entity (Scotland, 2012). Policy makers do not often allocate funding to interpretive inquiries because generalisations are usually lacking, the data is greatly contextualised, and interpretations assume subjective individual constructions (Scotland, 2012). Fundamentally, the findings are affected by the investigator's personal biases and peculiarities (Johnson and Onwuegbuzie, 2004). Besides, the research methods are intimate and open-ended; hence the autonomy and privacy of the participants may be jeopardised (Scotland, 2012). Inquirers inflict their subjective interpretations on the participants who are susceptible and have restricted control on issues such as the use of the data and what and how much data is published (Scotland, 2012). Ethical considerations and toning down thick descriptions of the contextualizations are important factors to respect by the inquirer (Scotland, 2012). Moreover, interpretivism disregards the external forces that affect the behavior;

consequently, the participants' elucidation of phenomena are insufficient because they are not fully aware or comprehend the external forces affecting their agency (Scotland, 2012).

My epistemological position

Social scientists adopt theories which aid to comprehend society and impact the topic of inquiry as well as the interpretation of the outcomes (Bryman, 2012). Undertaking an inquiry is unfeasible without pledging, even tacitly, to ontological and epistemological positions (Scotland, 2012). After exploring the strengths and weaknesses of these dominant schools of thoughts, I acknowledge the fact that no paradigm is superior to the other. However, I feel more at ease with, and can relate to the positivist philosophy's ontological, epistemological and axiological positions. I certainly understand that this doctrine has many drawbacks; nevertheless, in my opinion, it holds more robustness than the interpretivist doctrine. Consequently, I am inclined to feel more at ease with the notion of a single objective reality. Besides, I do not fully agree with the importance of the personal, close involvement of the researcher with the participants, that amplifies the influence of bias and confounders. I believe, as suggested by Burbules and Phillips (2000), that inquirers need to surpass expressing their personal beliefs of elucidations, and aim to strive for beliefs or knowledge produced by scientific enquiry. Even though inquirers are fallible, the search for knowledge is "self-corrective", knowledge might be difficult to reach, and sometimes researchers end up erroneously crediting a finding when it is not true, all these factors are no condemnation to the soundness of the scientific inquiry (Burbules and Phillips, 2000).

Consequently, the paradigm that best underlines this research is logical positivism or logical empiricism. This paradigm is relevant because, in health behaviour, it is the foremost paradigm that underpins the primary body of theory and research (Glanz et al., 2008). The ontology of this

paradigm is “one reality, one truth”, its epistemology is “objective”, and its methodology is “quantitative” (Markula and Silk, 2011).

Implications in my field

Quantitative and qualitative research are both used in public health (Rychetnik et al., 2002). However, public health experts are required to include scientific evidence in their practice (Brownson et al., 2011), and public health has progressed in enhancing the scientific criteria for evidence (Victoria et al., 2004). In the public health field, it is acknowledged that the quantitative, randomised controlled trials (RCTs) generate the best credible evidence (Rychetnik et al., 2002); however, these are not sufficient (Victoria et al., 2004). The designs generally employed are the quantitative cross-sectional, quasi-experimental or time-series analyses (Brownson et al., 2011). In the health and health care field, several methods of inquiry, as well as the manners by which investigation instruments are managed, are influenced by the positivist culture (Bowling, 2014). The evidence-based practice seeks to enhance the effect of health and social care operations (Bowling, 2014). The foundations of evidence-based practice are that unsystematic and intuitive approaches to clinical practice are avoided (Goldenberg, 2006), actual decisions are built on research evidence, and evidence is specified and elucidated depending on specific criteria (Bowling, 2014). The criteria are usually limited and originate from quantitative research with a positivist structure (Bowling, 2014). The research encompasses preferably large RCTs, systematic reviews and meta-analysis, which are considered at the peak of the hierarchy of methods for the evidence generation; this evidence is deemed to be objective and reproducing reality (Bowling, 2014). This perception of evidence is basically positivist, and has been challenged by post-positivist theories (Goldenberg, 2006). Consequently, my philosophical stance is in line with the predominant philosophical background adopted in my field.

Implications for my research

My research interests revolve around exploring social determinants under the broad umbrella of maternal and child health. Studies have shown that the approach adopted to explore the social determinants of health is a quantitative method approach using numbers and statistics (Dubois and Girard, 2003, Braveman et al., 2011, Marmot et al., 2012). Moreover, since quantitative research is interested in "how" phenomena occur (Johnson and Onwuegbuzie, 2004), this factor is an additional convergence between my broad research interests and positivism. Since I am adopting a positivist stance, as suggested in the literature (Bowling, 2014), my research hypothesis will be plainly stated at the beginning, in addition, in line with the deductive approach, my literature review will be broad, critical and inclusive of relevant research. Besides, my research will be undertaken using quantitative, structured questionnaires, comprising of measurement scales already assessed for reliability and validity with reasonably large samples (Bowling, 2014). To ensure reliability, my study will be conducted in a way to be repeated, reviewed and evaluated by other researchers to authenticate its accuracy (McNeill and Chapman, 2005). To achieve rigour in my research, I will aim to have a systematic collection and analysis of the data, to be mindful of the significance of interpretation and not an assumption of the data, to retain detailed records of interviews, surveys and questionnaires (Bowling, 2014). As stated earlier, it is not easy to accomplish value free hypotheses, and the scientific enquiry approach is influenced by the inquirer's cultural beliefs and values (Bowling, 2014). Given that values can intervene in the inquiry process at any time (Bryman, 2012), therefore, in order to apply objectivity and value-free concepts as much as possible, and make sure that my own self-interests don't negatively affect my efforts to find the truth, it is crucial that I am mindful of my

personal biases, truthful, open, transparent, and undertake my investigation in a rigorous way (Bowling, 2014). To warrant further objectivity, I will be neutral, avoid having my personal opinions and preconceptions bias and confound any step of my research process, and undertake my inquiry under controlled conditions, whether in sampling procedures, designing questionnaires or keeping a distance from the participants (McNeill and Chapman, 2005).

By adopting a positivist stance, I will gain rigour, credibility, reliability and representativeness, while missing out on some crucial points provided by interpretivism. In fact, by using survey questionnaires, only data about the factors included in the documents will be collected and analysed, and essential, more profound matters may be omitted. Understanding complex situations and contexts, considering reality from the individuals' perspectives, considering the more profound and richer meanings the individuals allocate to their perceptions, experiences and social interactions will be lacking.

Chapter 3: Literature review: *Demographic and sociocultural determinants of exclusive breastfeeding for the six months postpartum in middle-income countries: a systematic review*

The following chapter presents the systematic review conducted. It illustrates the steps followed, such as the background, the findings and discussion of the results of the systematic review undertaken.

Background

The importance of breastfeeding has been well-documented. The WHO acknowledges that the threat of morbidity and mortality augment with discontinued breastfeeding and inappropriate complementary food (WHO, 2002) and endorses exclusive breastfeeding until six months postpartum (WHO, 2001b). The low rates of exclusive breastfeeding until six postpartum, as well as the research conducted in Lebanon so far and the gaps in knowledge, have been presented in the introduction chapter.

An initial scoping review in this area determined that only two reviews (Balogun et al., 2015, Mangrio et al., 2017) and one review protocol (AlSaad et al., 2017) were conducted in regards to determinants of breastfeeding for the first six months postpartum. Balogun et al. (2015) review explored only three databases: CINAHL, MEDLINE and PsycINFO, and included studies conducted in developing countries, only in the English language, which covered the duration of 6 months postpartum or less. A more recent systematic review covering factors related to the cessation of breastfeeding was published (Mangrio et al., 2017). This review covered four databases, included studies conducted worldwide, only of quantitative nature, and only factors related to the cessation of breastfeeding (Mangrio et al., 2017). Another recent systematic review

protocol has been published, aiming at exploring the determinants of breastfeeding in the Middle East (AlSaad et al., 2017). This review protocol proposes to include only cross-sectional studies in the English language, only in Middle Eastern countries.

This present systematic review will explore additional electronic databases and include more languages; it will consist of studies whose participants are mothers and infants of at least six months old, in middle-income countries, covering exclusive breastfeeding specifically until six months postpartum. The studies will be critically appraised using a validated tool. This systematic review will assist in identifying what has been researched with regards to maternal preconception and prenatal breastfeeding plans, physician sex, religion, housekeeper presence, cesarean delivery, maternal age, maternal employment, maternal education, family income, place of residence paternal attitude towards breastfeeding reported by the mother, maternal maternal attitudes in relation to rooming-in, maternal attitudes in relation to skin-to-skin, maternal attitudes in relation to free formula sample distribution and the association with exclusive breastfeeding in low and middle-income countries. This review will guide my study in Lebanon and will provide recommendations in the evolution of public health policies focusing on enhancing the rate of exclusive breastfeeding at six months postpartum in middle-income countries.

Systematic review aim

The aim of the systematic review is to determine the associations between socio-cultural-demographic factors and exclusive breastfeeding at six months postpartum in middle-income countries during the last ten years[4].

Systematic review question

The review question is: What social, cultural and demographic factors are associated with exclusive breastfeeding at six months postpartum in middle-income countries during the last ten years?

Systematic review methodology

For this empirical study, a systematic review adopting a narrative synthesis (Popay et al., 2006) was conducted from April 2018 to August 2018. A narrative synthesis was selected given that the conditions to conduct a meta-analysis were not met, as will be discussed further ahead in the chapter.

Inclusion and exclusion criteria

The inclusion and exclusion criteria and the search strategy were adapted from the SPIDER framework. This tool has been used in mixed-methods research (Cooke et al., 2012), and refers to S: Sample, PI: Phenomenon of Interest, D: Design, E: Evaluation, R: Research type. The inclusion and exclusion criteria for this systematic search are presented in Table 2.1.

[4] As per discussions with supervisors - due to the large number of articles retrieved and the constraints of being a PhD student

Table 2. 1: Inclusion and exclusion criteria

Inclusion criteria	
Sample	Mothers having an infant of at least six months old
Phenomenon of **I**nterest	Sociocultural and demographic factors affecting exclusive breastfeeding until six months postpartum
Design	Qualitative, quantitative, mixed-methods, reviews
Evaluation	Outcomes such as participation rates, and/or knowledge, perspectives, barriers, facilitators
Research type	Qualitative, quantitative, mixed-methods, reviews
Location	Middle-income countries
Publication	Publications in peer-reviewed journals
Language	English and French
Dates	Data collected between 2007 and 2017 (inclusive)
Exclusion criteria	
Sample	Mothers or infants on chronic medications or with chronic illnesses (such as HIV, mental illnesses, cancer, diabetes…) or (preterm, low-birth-weight infants) will be excluded.
Study design	Interventions or trainings

Systematic review search strategy

The electronic databases explored for this review were "Academic search complete", CINAHL, PsycINFO, Pubmed, "Web of Science" and EMBASE. These were selected as Academic Search Complete is a prominent resource for world-class research (EBSCO, 2019), CINAHL provides

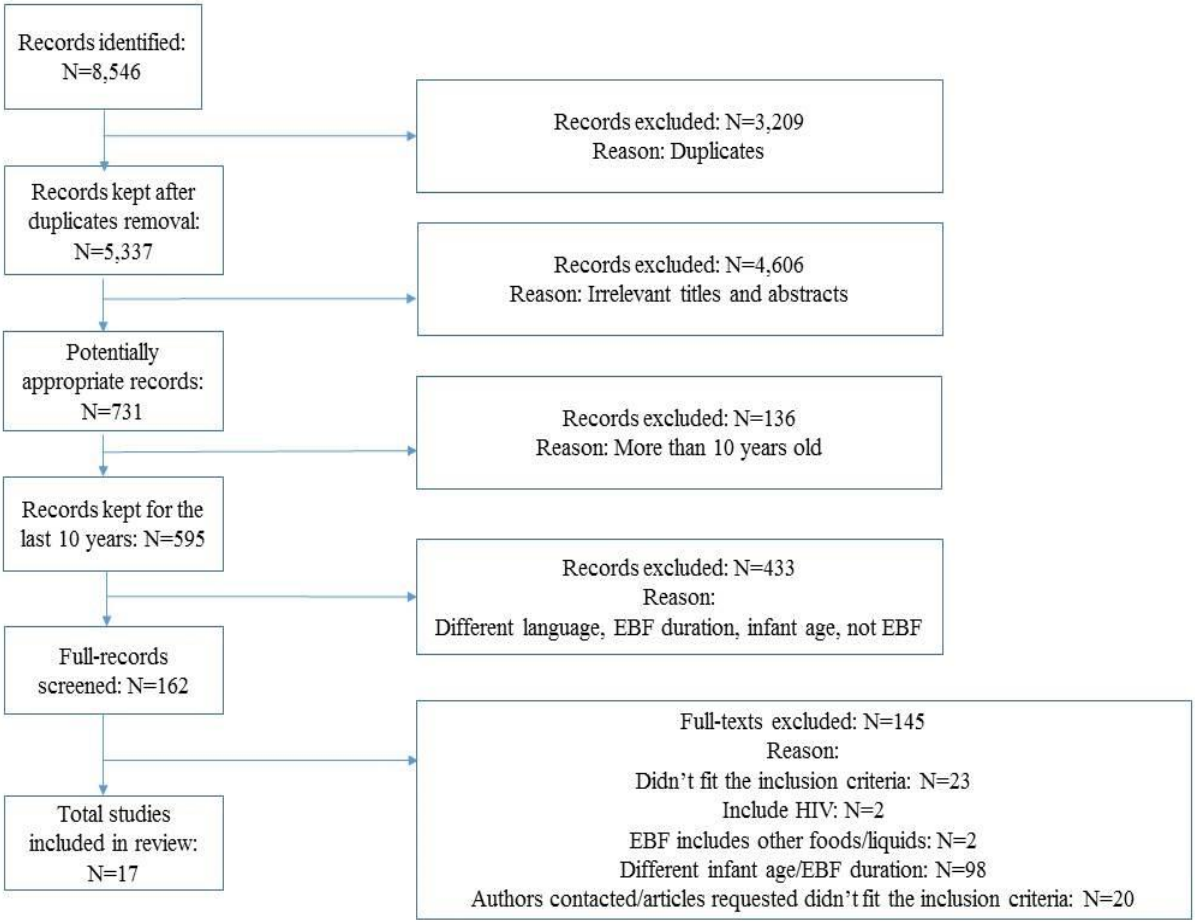
the best nursing and allied health literature (EBSCO Health, 2019), PsycINFO is one of the best resources for behavioural and social science research (American Psychological Association, 2019). Furthermore, Pubmed as it includes more than 29 million references for biomedical research (National Center for Biotechnology Information, 2019), Web of Science as it includes world-class research within more than 33000 journals (Clarivate Analytics, 2019), and EMBASE as it covers a large array of biomedical research (OVID, 2019). The following search terms with their specific "medical subject headings" (MESH), synonyms, thesaurus, truncations, and free-texts adapted for the different databases were used: breastfeeding, factors, and middle-income countries. The search terms were used in AND/OR combination. (Please find: the search strategy and keywords and Boolean operators used in Pubmed presented in Appendix 1, the search strategy and keywords and Boolean operators used in CINAHL presented in Appendix 2, The search strategy and keywords and Boolean operators used in Academic Search Complete presented in Appendix 3, the search strategy and keywords and Boolean operators used in PsycINFO presented in Appendix 4, the search strategy and keywords and Boolean operators used in Web of Science presented in Appendix 5, the search strategy and keywords and Boolean operators used in Embase presented in Appendix 6). Filters for literature examination consisted of the date of publishing, starting from 2001. "Citation searching" and "citation pearl growing[5]" were used as well (Booth, 2008). Some of the studies retrieved in the search could not be identified as publications, even after consulting with librarians; therefore, these studies' authors were contacted by email, as recommended by the Cochrane collaboration (Young and Hopewell, 2011). In total, the emails of eight authors were retrieved. Some of them did not respond, others

[5] "The technique involves starting with a very precise search to find one key relevant citation, you then examine index terms and free text terms found in the relevant citation." BOOTH, A. (2008). Unpacking your literature search toolbox: on search styles and tactics. *Health Info Libr J,* 25**,** 313-317.

mentioned that the study was not published, whereas others provided me with the published studies.

The results of the search strategy are presented in the flow chart in Figure 3.1. The number of articles initially retrieved from the search strategy is 8546 articles. Of these, in the end, only 17 studies matched the inclusion criteria. The studies were excluded due to many reasons, mainly because they had different aims, included participants with certain conditions, considered exclusive breastfeeding as having other liquids or solids intake, or had different breastfeeding durations or infants' age. The literature flow chart is illustrated below in Figure 3.1.

Figure 3. 1: Literature search flow chart



Data extraction

Both quantitative and qualitative data sheets were designed for the review. For quantitative studies, a standardised data extraction form tailored to this individual review and its question and adapted from (Langlois et al., 2013) was used. The main modification is the addition of the inclusion criteria or the factors that are of interest to the review, and the definition of breastfeeding used. For qualitative studies, a standardised form adapted from (Cochrane Methods Qualitative and Implementation, 2011) was used. The main modifications were the addition of the research information (such as authors, year…), the definition of breastfeeding used in the study and the inclusion criteria, which are the variables of interest. The information extracted from quantitative papers is presented in Appendix 7, and the information extracted from qualitative papers is presented in Appendix 8. A summary of the characteristics describing the seventeen included studies which met the inclusion criteria is provided in Appendix 9.

Quality assessment

Many tools have been used to appraise the literature, and these tools have been adopted according to the different study designs. Indeed, some of the tools employed are the following: for research of a quantitative design (Effective Public Health Practice Project, 2018), for systematic reviews (Critical Appraisal Skills Programme, 2018b, National Heart Lung and Blood Institute, 2019) for randomised controlled trials (Preferred Reporting Items for Systematic Reviews and Meta-Analyses, 2015, Critical Appraisal Skills Programme, 2018d, National Heart Lung and Blood Institute, 2019), for cohort studies (Critical Appraisal Skills Programme, 2018e, Strengthening the Reporting of Observational Studies in Epidemiology, 2009, National Heart Lung and Blood Institute, 2019), for cross-sectional studies (National Heart Lung and Blood Institute, 2019, Strengthening the Reporting of Observational Studies in Epidemiology, 2009),

for case-control studies (Critical Appraisal Skills Programme, 2018c, Strengthening the Reporting of Observational Studies in Epidemiology, 2009, National Heart Lung and Blood Institute, 2019), or for qualitative studies (Critical Appraisal Skills Programme, 2018a). Due to the inclusion of studies of three methodologies, quantitative, qualitative, and mixed methods research, in the present systematic review, the "Mixed Methods Appraisal Tool" (MMAT) was used in this review (Pluye et al., 2011), to critically appraise the literature and limit bias. In comparison to other tools, the MMAT covers criteria for the appraisal of research of mixed methods design (National Collaborating Centre for Methods and Tools, 2019) particularly. This tool is appropriate to use in public health settings (National Collaborating Centre for Methods and Tools, 2019). For the qualitative and quantitative literature included, the score is the number of criteria met divided by four. Therefore, the scores vary from 25%, or one criterion met, to 100%, or all criteria met. An example of a study scored is provided in Appendix 10.

Narrative synthesis of the included studies

According to the Cochrane Handbook for Systematic Reviews of Interventions, a review provides for the analysis of the several included primary studies, and these analyses could be either narrative or quantitative (Higgins and Green, 2011). A narrative analysis refers to an organised discussion and a summary of the findings and features of those studies, whereas a quantitative involves statistical analysis, usually referred to as a meta-analysis (Higgins and Green, 2011). Conducting a meta-analysis is not always appropriate or feasible, such as when a review has a broad scope, covers several interventions or different studies(Higgins and Green, 2011). In this systematic review, conducting a meta-analysis of the included primary studies was not feasible, given that the studies had different research methodologies. These were of a longitudinal, case-control, cross-sectional, or qualitative nature, each providing different

analysis, such as correlations or associations even amongst cross-sectional studies, and reported their findings differently. Subsequently, a narrative synthesis of the quantitative literature was conducted. In addition, a sub-group analysis could not be conducted either, for several reasons. Firstly, this has to be specified and planned at the protocol stage (Cochrane Consumers and Communication, 2016). Secondly, even if it were to be conducted later, heterogeneity was present between the subgroup of studies, making subgroup analysis challenging to perform (Cochrane Consumers and Communication, 2016). In all cases, the subgroup analyses should be kept to a minimum to reduce bias, and there should be a clear clinical purpose to conduct them (Cochrane Consumers and Communication, 2016).

In this present systematic review, the critical components of the narrative synthesis framework were adopted, and these covered: conducting a primary synthesis of the included studies, discovering data connections within and between studies, evaluating the rigour of the synthesis of the data (Popay et al., 2006). These were specified early on to avoid bias (Higgins and Green, 2011). To conduct the narrative synthesis, the qualitative studies were synthesised to assist the interpretation of the quantitative studies (Higgins and Green, 2008). The quantitative review was completed first, followed by the qualitative review, and then the two reviews were integrated (Mays et al., 2005, Booth et al., 2016). For the qualitative literature, in particular, the thematic synthesis (Booth et al., 2016, Thomas and Harden, 2008) was conducted. The thematic synthesis of qualitative studies is founded on the thematic analysis, and covers three main steps that could overlap: “free line-by-line coding of the findings of primary studies, the organisation of these free codes into related areas to construct descriptive themes, and the development of analytical themes” (Booth et al., 2016). The themes generated from the thematic analysis of the qualitative

studies were added to the quantitative synthesis, and the findings of all the studies were grouped together.

Systematic review findings

This systematic review included 17 studies conducted across 11 middle-income countries: Brazil, Peru, Egypt, China, Sri Lanka, India, Cambodia, Malaysia, Myanmar, Iran and Lao PDR. These studies included 7393 participants and were of quantitative and qualitative nature.

Amongst the quantitative studies included in the review, one was a case-control study (Cavalcanti et al., 2015), six were of cross-sectional design (Gogoi et al., 2015, Karande and Perkar, 2012, Al Ghwass and Ahmed, 2011, Arya et al., 2015, Noughabi et al., 2013, Sasaki et al., 2010) and seven were of a longitudinal design (Matias et al., 2012, Qiu et al., 2010, Suresh et al., 2014, Samuel et al., 2012, Perera et al., 2012, Vieira et al., 2014, Firouzbakht et al., 2017).

On the other hand, a limited number of research which met the inclusion criteria of the systematic review was found and only three qualitative studies were included (Sulaiman et al., 2016, Thet et al., 2016, Lee et al., 2013).

The quantitative and qualitative findings of the 17 included studies were grouped mainly into demographic, social and cultural determinants of EBF for the first six months postpartum and presented below.

Barriers and facilitators to EBF for the six months postpartum: Demographic factors

Maternal age, education, employment were considered determinants of EBF for the six months postpartum. Mothers aged less than 20 years had higher EBF rates compared to older mothers (OR 2.9 95% CI (1.3-8.3) (Al Ghwass and Ahmed, 2011). Moreover, mothers aged less than 30

years had higher EBF rates compared to women aged over 30 years of age ($p < 0.01$) (Perera et al., 2012), whereas mothers aged between 20 – 35 years old exclusively breastfed more compared to younger mothers, aged less than 20 years old (OR 2.5, 95% CI (1.4–4.5) (Cavalcanti et al., 2015).

Mothers who had approximately five to eight years of schooling had higher EBF rates, in comparison to less years of schooling (OR 2.1; 95%CI (1.2 – 3.6) (Cavalcanti et al., 2015). The more educated mothers had higher EBF rates in comparison to the less educated mothers (Pearson Chi-square: 11.2, P=0.02) (Gogoi et al., 2015). Having a maternal educational level ≤ eight years of schooling had a higher risk of discontinuing EBF (HR 1.34 95% (1.17-1.53) (Vieira et al., 2014). On the other hand, it was found that the literacy level of the mother was negatively associated with the duration of EBF ($p<0.0001$) (Arya et al., 2015).

The mother returning to work after six months postpartum was considered a facilitator to EBF (HR:1.471 (95% CI 1.204-1.796) (Qiu et al., 2010). At six months postpartum, maternal employment was associated with a 87% decrease in EBF (AOR = 0.13, 95% CI = 0.00-0.47) (Matias et al., 2012), ”working outside the home” (no further details provided in paper) was related to lower EBF (Samuel et al., 2012), mothers starting work was significantly associated with a decrease in EBF (no further details provided in paper) (Perera et al., 2012), as well as the mother working outside the home (HR1.73 95%CI 1.53-1.95) (Vieira et al., 2014). EBF cessation was positively associated with maternal employment (OR = 4.71, 95% CI = 2.77–8.01, $p<0.001$) (Sasaki et al., 2010). Furthermore, employment was perceived as a barrier in two qualitative studies (Thet et al., 2016, Lee et al., 2013). while on the other hand, work was not always perceived as a barrier by working mothers in a qualitative study (Sulaiman et al., 2016).

On the other hand, the infant's sex being male was determined as a facilitator to EBF OR 2.04 95% CI (1.3-3.2) (Al Ghwass and Ahmed, 2011).

Barriers and facilitators to EBF for the 6 months postpartum: social factors

The socioeconomic status, place of residence and family type were considered determinants of EBF. Higher socioeconomic status of the mother was correlated with a decreased duration of EBF (P<0.0001) (Arya et al., 2015). Furthermore, residing in a rural area decreased the hazard of cessation of EBF (HR 0.590 95% CI 0.462-0.754) (Qiu et al., 2010). On the other hand, mothers being in nuclear families EBF for a longer duration than mothers in joint families (Pearson Chi-square 10.38, p = 0.001) (Gogoi et al., 2015).

Barriers and facilitators to EBF for the 6 months postpartum: cultural factors

Higher EBF rates were correlated with giving birth in an institution (p<0.001) (Arya et al., 2015) and associated with giving birth in a Baby-Friendly Hospital (HR 0.85 95% CI 0.73-0.99) (Vieira et al., 2014). In addition, formula supplementation in the hospital negatively affected EBF (OR = 0.41, 95% CI: 0.17–0.95) (Noughabi et al., 2013), and EBF was positively associated with breastfeeding instructions received at the hospital (HR 0.80; 95% CI 0.68-0.92) (Vieira et al., 2014). EBF was associated with prenatal care offered by public services (HR 1.34; 95% CI 1.17-1.55) (Vieira et al., 2014), with mothers having four or more antenatal care visits compared to less than four visits was a facilitator (OR 2.8 % CI (1.8-4.3)) (Al Ghwass and Ahmed, 2011), and lower EBF rates were correlated with lower number of antenatal care visits (p<0.001) (Arya et al., 2015). On the other hand, EBF was associated with the partner's appreciation for breastfeeding ([HR] 0.62; [95% CI] 0.48-0.79) (Vieira et al., 2014), moreover,

EBF cessation was positively associated with lack of paternal attendance at breast-feeding classes (OR = 1.93, 95% CI = 1.13–3.28, p<0 .05) (Sasaki et al., 2010). EBF was influenced by advice from health staff and the mothers' mothers as well as traditional beliefs, as reported in a qualitative study (Lee et al., 2013). Mothers receiving conflicting infant feeding advice negatively affected EBF (OR = 0.53, 95% CI: 0.37– 0.78) (Noughabi et al., 2013). On the other hand, the mother's intention to exclusively breastfeed positively affected EBF (OR = 5.85, 95% CI: 2.88–11.9) (Noughabi et al., 2013). Moreover, EBF cessation was positively associated with the lack of a maternal antenatal EBF plan ([OR] = 10.01, 95% [CI] = 3.68–27.24, p <0.001) (Sasaki et al., 2010), the mother being passionate (towards BF) and, to a lesser degree having intentions (to BF), as suggested in a qualitative study tended to EBF more (Sulaiman et al., 2016). Higher maternal attitudes scores were associated with EBF for 4-6 months (F=6.580, df = 3 , 234 p<0.001) (Karande and Perkar, 2012).

Other determinants of EBF at 6 months postpartum:

Infant birth weight ≥ 3300 g was positively associated with EBF at six months postpartum (ARR = 2.18, 95% CI = 1.29-4.37) (Matias et al., 2012). EBF was negatively associated with controlling the number of nighttime feeds at the breast (HR 1.58; 95% CI 1.11-2.23) (Vieira et al., 2014). EBF was negatively associated with the presence of cracked nipples (HR 2.54; 95% CI 2.06-3.13) (Vieira et al., 2014), and negatively associated with the use of a pacifier (HR 1.40; 95% CI 1.14-1.71) (Vieira et al., 2014). A crying infant, assuming that this was caused by inadequate milk (no details provided in study) negatively impacted EBF (Samuel et al., 2012). On the other hand, the absence of breastfeeding difficulties was determined as a facilitator of EBF (OR 1.8 95 %CI :1.1-2.8) (Al Ghwass and Ahmed, 2011), initiation of breastfeeding within an hour after delivery was considered a facilitator (OR 2.2 95 % CI :1.1, 4.3) (Al Ghwass and

Ahmed, 2011), an infant having first breast contact 6–30 minutes after delivery positively affected EBF (OR = 2.35, 95% CI: 1.17–4.72) (Noughabi et al., 2013). A nursery stay (<24 h) after birth was significantly associated with EBF failure (AOR: 2.16, 95% CI: 1.1-4.24) (Suresh et al., 2014).

Discussion

An overview of barriers and facilitators to exclusive breastfeeding for the six months postpartum in the literature was presented in this review. The studies included in this systematic review were conducted across 11 middle-income countries, and their MMAT quality scores ranged between 50% and 75% (Please refer to appendix 9 for more details). Studies including mothers or infants on chronic medications or with chronic illnesses (such as HIV, mental illnesses, cancer, diabetes…) or (preterm, low-birth-weight infants), as well as studies covering trainings and interventions were excluded. Overall, 17 studies were included, their data was synthesised, and the barriers and facilitators to exclusive breastfeeding for the six months postpartum were grouped into three main categories: demographic, social and cultural factors. None of the following factors were explored within the studies included in the review: the physician's gender, the housekeeper presence, maternal opinions about skin-to-skin, rooming-in, free infant formula, and breastfeeding preconception plan. One of the studies was interested in determining whether environmental cigarette smoke affected breastfeeding behaviour. The authors did not find a statistical significant association between smoking behaviour and possibly attribute this finding to the relatively small sample size (Firouzbakht et al., 2017). The study conducted by Gogoi et al. (2015) mentioned that observations were conducted in addition to the interviews; however, no evidence of this method or its findings were reported in the text. Among the demographic factors, maternal age was found to be a determinant of exclusive breastfeeding until

six months postpartum, however, the findings were conflicting. Two studies of a 75% MMAT score concluded that the younger the mother was, the more she exclusively breastfed (Al Ghwass and Ahmed, 2011, Perera et al., 2012), whereas a third study of a lower MMAT score concluded that the older the mother is, the more she EBF (Cavalcanti et al., 2015). There was no common maternal age value amongst those studies. A possible explanation for this may be that the categorization of maternal age differs in the three studies, as it was grouped as less than and more than 20 years old in one study (Al Ghwass and Ahmed, 2011), or less than or more than 30 years old in another (Perera et al., 2012), or categorized into brackets of between 20 and 35 years old in a third one (Cavalcanti et al., 2015). In addition, it is worth noting that one cross-sectional study was conducted in one clinic in one rural area in Egypt, limiting the generalisability and external validity, and the authors adjusted for confounders in the analysis and recruited a large sample size (1048 mothers) (Al Ghwass and Ahmed, 2011). Whereas the prospective study, which included 500 mothers, failed to adjust for confounders, had high drop-out rates, and was conducted in only one district of Sri Lanka (Perera et al., 2012). The third study was a representative study which included data from a national survey conducted in Brazil, which adjusted for confounders; however one main weakness of that study was the recall of the participants for up to five years (Cavalcanti et al., 2015). This review found that maternal education was determined as a determinant of EBF, however the results were not homogeneous. Three studies have found that the more the mother is educated, the more she exclusively breastfed, whereas one study has found a inverse relationship. The discrepancies in these studies of different MMAT scores may be explained by the fact that the maternal education variable was categorized differently in the different studies: less than four, or five to eight years, or more than nine years of schooling in (Cavalcanti et al., 2015), or for instance, by levels of high-school,

higher-secondary (Gogoi et al., 2015), or ≤ eight years or > eight years of schooling (Vieira et al., 2014) or by high-school, post-graduate levels (Arya et al., 2015). Other possible explanations for these differences may relate to the shortcomings of the studies such as small sample size and low power, lack of generalizability, recall bias or not adjusting for confounders. The study conducted in one district of India had quite a small sample size (n=105), therefore low power (Gogoi et al., 2015). Whereas the prospective study was conducted with a large sample size (n=1344), however, it was restricted to one city of Brazil (Vieira et al., 2014). The national survey study conducted in Brazil had a recall bias for up to five years (Cavalcanti et al., 2015), and in the two studies conducted in India, only correlations were computed and confounders were not adjusted for (Gogoi et al., 2015, Arya et al., 2015).

Despite their methodological differences, and even with low sample sizes and power such as (n=117) (Matias et al., 2012) or (n= 50) (Samuel et al., 2012), eight studies have concluded that maternal employment was associated with EBF until six months postpartum. Maternal employment was determined as a barrier in seven out of eight studies, however, one qualitative study involving 40 participants determined that work was not always a barrier to EBF for the first six months postpartum (Sulaiman et al., 2016). This study involved only participants who returned to work postpartum, and it is worth noting that 27.5% of the participants were working from home. It is, therefore, possible that this may explain the discrepancy in findings between this study and the others. In this study, women were framed as being “passionate”, “ambivalent” or “equivalent”, where the passionate would not let anything negative impact the breastfeeding, the equivalent had a belief that breast milk and formula milk were equally important, and the ambivalent stands between these two extremes. Only one cross-sectional study conducted in the

rural areas of Egypt has found that the infant's sex being male was positively associated with EBF until 6 months postpartum (Al Ghwass and Ahmed, 2011).

Among the social factors, it was determined that the socioeconomic status of the mother in India was negatively correlated with EBF (Arya et al., 2015), in this study, no adjustment for confounders was taken into account. On the other hand, in a study conducted in one district of India, it was concluded that mothers being in nuclear families was positively correlated with EBF (Gogoi et al., 2015), however, this study included only 105 mothers and no adjustment for confounders was conducted in the analysis. Therefore, these findings should be interpreted with caution. A prospective study conducted in one province of China which included 1520 women, concluded that residing in a rural area was positively associated with EBF (Qiu et al., 2010), however, this result could not be generalized, particularly given that this study was conducted in the context of Melamine-contaminated formula milk in China.

Among the cultural factors, one study has found that in India, giving birth in an institution compared to home, was positively correlated with EBF, however, this study didn't take into account any confounding variables (Arya et al., 2015). Findings from studies in which confounding variables were adjusted for, showed that EBF was positively associated with giving birth in a baby-friendly hospital in Brazil (Vieira et al., 2014), and negatively associated with formula supplementation in the hospital in the capital of Iran (Noughabi et al., 2013). In addition, one study conducted on a large sample size in Brazil while accounting for confounders found that EBF was positively associated with breastfeeding instructions received at the hospital (Vieira et al., 2014). Amongst studies who used different grouping of antenatal care visits, it was commonly found that antenatal care visits were positively associated with EBF (Vieira et al., 2014), and the higher the number of visits, the more the EBF is facilitated, as determined in a

study conducted in rural areas of Egypt (Al Ghwass and Ahmed, 2011) and a study conducted in Iran, however with no adjustment for confounders (Arya et al., 2015). One study has found that EBF was positively associated with the partner's appreciation for breastfeeding (Vieira et al., 2014) and in a cross-sectional study, in which adjusting for confounders was taken into account, it was found that EBF cessation was positively associated with lack of paternal attendance at breast-feeding classes (Sasaki et al., 2010), however, these findings cannot be extrapolated as it was conducted in one clinic in Cambodia, limiting the external validity.

EBF was influenced by advice from health staff and the mothers' mothers as well as traditional beliefs (Lee et al., 2013). This qualitative study was conducted in two districts of Lao, PDR, using two focus groups of well-educated first-time mothers, and the data collector was a male, so it is important to bear in mind a potential bias. A cross-sectional study, which took into account adjusting for confounders, has found that mothers receiving conflicting infant feeding advice negatively affected EBF (Noughabi et al., 2013), however, these findings may be somewhat limited as it was conducted in one city in Iran. Moreover, two cross-sectional studies which adjusted for confounders, have shown that maternal intentions or plans to breastfeed affect EBF. In a study that was conducted in the capital of Iran, it was found that a mother's prenatal intention to exclusively breastfeed positively affected EBF (Noughabi et al., 2013). In addition, it was determined that EBF cessation was positively associated with the lack of a maternal antenatal EBF plan (Sasaki et al., 2010). This study included 312 mothers attending one clinic in Cambodia, therefore, these findings may be somewhat limited. A qualitative study has suggested that the mother being passionate (towards BF) and, to a lesser degree having intentions (to BF), tended to EBF more (Sulaiman et al., 2016). This study included only working mothers, from different ethnicities in Malaysia, and it is worth nothing that 11 out the 40 mothers (27.5%)

worked from home, which may explain the findings of the study. Higher maternal attitudes scores were found to be associated with EBF (Karande and Perkar, 2012), however, these findings must be interpreted with caution as no adjustment for confounding was conducted and the participants were recruited in one hospital in India.

The literature included in this review has some further shortcomings such as the scarcity of the reference to the theoretical frameworks adopted. One study presented the theoretical framework adopted (Sulaiman et al., 2016), where two theoretical frameworks were used: the work–family conflict framework and the Theory of Planned Behaviour (TPB). Others used a conceptual framework that they developed to guide their data collection (Thet et al., 2016), whereas (Vieira et al., 2014) grouped their variables according to a theoretical hierarchical model for discontinuation of EBF. The determinants were categorized relatively to their closeness to the outcome, categorized into sociodemographic determinants, prenatal determinants, determinants related to the time around delivery and postnatal determinants (Vieira et al., 2014). The work–family conflict framework, one of the frameworks adopted by (Sulaiman et al., 2016), aids in comprehending how women handle their numerous roles (Greenhaus and Beutell, 1985). The theories of health behaviour detect the goals for modification and the approaches for achieving these modifications (Glanz et al., 2008). The "theory of planned behaviour" (TPB) emphasises theoretical constructs related to individual motivational elements as determinants of the probability of carrying out a particular behaviour (Glanz et al., 2008). TPB presumes the prime predictor of behaviour is behavioural intention (Ajzen, 1991), which is regulated by an attitude to the behaviour and social normative perceptions concerned with it (Glanz et al., 2008) and comprises another construct, the "perceived behavioural control" (Ajzen, 1991).

The present systematic review was designed to determine the determinants of EBF until six months postpartum in middle-income countries, and it has shown that the most frequently reported determinant of EBF was maternal employment, followed by maternal education and maternal age. Some antenatal or postnatal practices, advices and beliefs were also reported as determinants of EBF, however, the generalisability of the published research is challenging, and more studies with similar inclusion criteria need to be conducted. However, even though with not entirely identical inclusion criteria, the findings of this review broadly supports the work of other reviews in this area such as (Balogun et al., 2015, Mangrio et al., 2017). This review has found that maternal employment is the most commonly reported barrier to EBF until six months postpartum in line with previous reviews, even though the criteria were not entirely similar (Balogun et al., 2015, Mangrio et al., 2017), in addition, the maternal age, and maternal education level were reported as determinants in accordance with the review conducted by (Mangrio et al., 2017). Similarly to Balogun et al. (2015), the systematic review has found that the beliefs of the mothers or their significant others are cited as well as determinants of EBF until six months postpartum. This review indicates that no study has covered the association between the maternal attitudes in relation to rooming-in, maternal attitudes in relation to skin-to-skin, maternal attitudes in relation to early initiation of breastfeeding and maternal attitudes in relation to distribution of free formula samples and EBF until six months postpartum in middle-income countries. Including these factors in this study may provide an insight as to whether these factors influence EBF until six months postpartum in a middle-income country.

Limitations and strenghts of the review

This review had some limitations. Only literature in English and French could be searched, which leads to the omission of some research in other languages. Besides, given that this is part

of a thesis dissertation, only the student could conduct the systematic review, and not more individuals could be involved, as is generally recommended (Smith et al., 2011). In addition, the dates of screening were restricted to the last 10 years, due to the large number of articles retrieved and the time and resource constraints of being a PhD student. Despite the heterogeneity of the methodological designs, using one checklist for quality, the MMAT was considered an advantage to the review and provided one measure on the quality of the literature. In comparison to other tools, such as the ones presented earlier in the chapter, the MMAT includes criteria for the appraisal of research of mixed methods design in particular (National Collaborating Centre for Methods and Tools, 2019). Furthermore, this tool is appropriate to use in public health settings (National Collaborating Centre for Methods and Tools, 2019).

The gaps addressed in this study

Given the importance of breastfeeding to the health of the mother and the child, whether on a short-term or long-term basis and given the low rates of EBF in Lebanon and the scarcity of research regarding breastfeeding practices in this country, this study is of paramount importance. This research is the first to be conducted using social media to explore the determinants of EBF in low and middle-income countries. Furthermore, it is the first study conducted in low and middle-income settings to explore the maternal attitudes and opinions regarding feeding practices and their association with EBF until six months. Moreover, this study will provide original contribution such as covering unexplored associations between EBF and specific factors (for example, amongst others, the housekeeper presence and involvement in childcare). This research will provide health care professionals, policy-makers and advocates with the necessary information about the determinants of breastfeeding, to guide public health policies by endorsing the implementation of maternal and child health interventions to address the main barriers of exclusive breastfeeding. This will eventually contribute to enhancing maternal and child health.

Chapter 4: Methods

This chapter outlines the steps followed to build the methodology adopted for this study. It starts with specifying the study design and ends with the data analysis plan of the data collected.

Study design

The research is a cross-sectional study consisting of an online survey conducted across Lebanon. Online surveys have substantial benefits over other survey formats (Evans and Mathur, 2005). The internet is a rewarding area for undertaking survey research for researchers in wide ranges of disciplines (Wright, 2005). The web does not present a "cheap and easy" research process (Konstan et al., 2005). However, online surveys provide many advantages over conventional surveys, such as reaching subjects in distant sites, the capacity of reaching hard to contact subjects, and the suitability of the automated data collection, which in turn minimize the time and effort for the researcher (Wright, 2005) and the cost (Van Selm and Jankowski, 2006). Additionally, they offer cost savings concerning the recording machines, travel, telephone, or paper to use (Wright, 2005). Furthermore, the rate of internet users in Lebanon is 80.4% (IWS, 2015), a rate comparable to high-income countries such as the USA, where 87% of adults use the internet (PRC, 2015). There are two types of online surveys available for collecting data: the web-based survey and the email (Van Selm and Jankowski, 2006). However, given that a database of emails of all the mothers residing across the Lebanese territory is practically non-existent, the web-based survey was determined as the best option for this study. In addition to the advantages presented previously, the decision to use an online methodology was made taking into consideration the Lebanese context. In fact, in Lebanon, there are specialised lockers that could be rented at the post offices where a Lebanese resident could receive his or her mail (Libanpost, 2019); however, the individual has to personally make the trip to the nearest post

office to check his or her mail. Furthermore, even though the postal system has been renewed in Lebanon, Lebanese residents do not use it to date, as most streets have no names, and residents still pay utilities to the man who comes to the door of their house and collect bank statements at the near-by branches (The Economist, 2002). Therefore, sending paper-based surveys by mail to the residences across Lebanon is not a valid option. Besides, given that I was interested in collecting information from a large sample size of mothers residing across the whole country, and given that I was undertaking this PhD on my own with no support from research assistants to collect face-to-face data from participants, the online methodology was the most appropriate methodology to employ in these cirsumstances.

The cross-sectional, or survey design, consists of computations at one point in time (Salkind, 2010) and assesses the association between variables (Bryman, 2012). A weakness of this design is whether an association is determined, one cannot be confident about either the causality of the association (Bryman, 2012) or the direction of cause and effect (Bowling, 2014), given that the characteristics of a randomised controlled trial are absent (Bryman, 2012). However, it is worth mentioning that the external validity of a cross-sectional design is robust, usually with a representative sample, where the results can be generalized (Bryman, 2012). Most importantly, given the nature of the research question, where I am exploring an association between variables, a cross-sectional design is the most suitable design to adopt.

Recruitment

Mothers residing across the Lebanese territory, and having a child between 6 and 24 months of age were invited to the study and recruited via the internet, using social media platforms, in particular, Facebook (Facebook, 2016) and Whatsapp (Whatsapp Inc, 2020), which are the top

two mostly used social media platforms in Lebanon (NorthWestern University In Qatar, 2015) . A recent scoping review has determined that social media can be the most important recruitment procedure for observational research and hard-to-reach participants (Topolovec-Vranic and Natarajan, 2016). Moreover, social media increases recruitment efficiency and cost-effectiveness in clinical trials (Shere et al., 2014). The recruitment adapted for this study was passive, such as placing announcements online (Harvard Catalyst, 2017). It consisted of posting on a Facebook page, and on Facebook pages and groups that deal with maternal and child health or parenting topics, in addition to health and care organisations such as health centres, hospitals and day care centres across the Lebanese territory. Around 140 organisations in Lebanon were contacted, as these had social media outlets to reach their customers or patients. These organisations may post on their respective Facebook pages or groups or other social media or internet media communication, whether via electronic mails or Whatsapp messenger. The administrators of the organisations and Facebook groups and pages were contacted, and their formal written approval was sought. The Facebook page developed for this study included the same information and the same recruitment announcement. This recruitment channel was an advantageous method given that 80.4% of the Lebanese population are internet users (IWS, 2015). More particularly, in terms of Facebook penetration rate, Lebanon is amongst the top five countries in the region (GIP, 2014). More specifically, in terms of Facebook usage, women in Lebanon are the most active compared to other women in the Arab world (GIP, 2014). The postings were planned to be posted every two weeks. If that the sample size has not been reached, posters advertising the research may be displayed in health centres, hospitals and day care centres premises. The list of primary health care centres was retrieved online, from the following web pages: (The Humanitarian Data Exchange, 2017), hospitals (Syndicat des hopitaux au Liban, 2014) and day

care centres (Syndicat des proprietaires de garderies au Liban, 2017). The recruitment did not involve fabrication of online identities. The postings used on Facebook complied with the Facebook terms of service.

Participants

The subjects were mothers having at least one biological child between 6 months and 24 months of age.

Sample size

The sample size aimed for is 593 mothers. Since there was no previous study conducted in Lebanon to provide the information needed for the usual formulas to calculate sample size, I used the rule of thumb formula (Concato et al., 1995, Peduzzi et al., 1995, Peduzzi et al., 1996). I was originally interested in 16 variables: maternal age, maternal education, maternal preconception and prenatal breastfeeding plans, the maternal attitudes in relation to early initiation of breastfeeding, the maternal attitudes in relation to rooming-in, the maternal attitudes in relation to skin-to-skin, the maternal attitudes in relation to free formula sample distribution, the paternal attitude towards breastfeeding reported by the mother, maternal employment, place of residence, religion, housekeeper presence, whether the housekeeper is involved in childcare, type of delivery, pediatrician gender. According to the rule of thumb formula, ten events for each variable are needed, consequently, that is 160 events in total if there are 16 variables or factors. An event can be seen as one exclusively breast-feeding, and, according to the data published by UNICEF, there are overall 27% of the mothers exclusively breastfeed in Lebanon (UNICEF, 2015); as a result, the sample size calculation is 160/27% =593. As a total, 593 mothers will be recruited for this study.

Data collection and survey design

An online survey questionnaire was designed using Qualtrics (Qualtrics, 2016a). The survey was made available in both languages, English and Arabic. I translated to questionnaires to Arabic. I pretested the questionnaire was pretested with around 10 mothers, in both languages, and I sat next to the mothers while they were filling out the survey online and noted every comment they had and adjusted the questionnaire accordingly.

Some of the questions covered in this study have been addressed previously in the literature, such as the paternal attitudes reported by the mother (da Silva et al., 2012), others, such as the housekeeper presence or maternal opinions concerning some postpartum practices were developed for this study. Some questions, such as with regard to the intentions of feeding, were adapted from validated questionnaires such as the "Infant Feeding Practices Study II" (CDC, 2014).

I did not ask if a mother gave birth in a baby-friendly hospital as this is something not widely known in Lebanon, however, the other questions included in the questionnaire (such as rooming in,…) provide an idea about whether the practices followed in a hospital after delivery pertain to the baby-friendly practices. I included questions asking whether the mother did ask for the baby's crib to be put by her side for instance, as the mother is allowed in some delivery wards or institutions, in discussion with her physician, to have a birth plan to follow and request some practices to be followed after birth. Moreover, I did not ask specifically if a mother was a citizen, resident, expatriate, or refugee, as I was only interested in the nationality, and in order not to raise any sensitive issues that would come at the expense of losing participants.

The questions were sequential, as short as possible, close-ended (HUPSR, 2007), precise and unequivocal (Fink, 2003), and the responses were mutually exclusive and exhaustive (Cowles

and Nelson, 2015). Reference frames were provided, vague terms, complex sentences, double-barreled questions and leading language were avoided (HUPSR, 2007).

The Likert scale, mostly used in Public Health research, was used for some questions on the attitude, belief or behaviour (Losby and Wetmore, 2012). It is acknowledged that scales are the most common approach to measure attitudes (Oskamp and Wesley Schultz, 2014); particularly, the 5-point Likert Scale, which is the most commonly used (Losby and Wetmore, 2012), was incorporated in this survey. The 5-point Likert scales of importance, frequency and agreement were selected according to Brown (2010).

The questionnaire developed consisted of 45 questions, grouped into four sections: section 1-questions relating to the child, section 2-questions relating to the mother, section 3-questions relating to child feeding, and section 4-questions regarding opinions about postpartum practices. The questionnaire was designed to be a mixture of paging and scrolling design (Peytchev et al., 2006): each section was presented on an individual separate page, and the mother was able to scroll down all the questions relating to a specific section on one single page.

The measures of explicit attitudes based on self-report and closed-ended questions are one of the two primary types of questions that are employed to measure opinions and attitudes (Oskamp and Wesley Schultz, 2014). They present a few advantages over the open-ended questions by being objective, easy to score (Oskamp and Wesley Schultz, 2014) and having more reliable and consistent answers (Fink, 2003). As a matter of fact, they are of key importance in extensive surveys (Fink, 2003).

The inclusion criteria, the child's age between six and 24 months, were outlined in the announcements and provided as the eligibility question for filtering at the beginning of the survey. The mother, whose child has not reached six months old was invited to participate again

once the child is six months old, provided that the sample size has not been reached. The mothers fulfilling the inclusion criteria and interested in participating in the research, could either directly click on the link provided online or eventually copy the link provided on the posters into the web browser. Second, they should acknowledge the inclusion criteria by answering the eligibility question online. Third, they should acknowledge the reading of the participant information sheet and the consent form. Fourth, they should fill out the questionnaires. (Please find the participation sheet in English attached as appendix 11, consent form in English as appendix 12, and questionnaire in English as appendix 13, the participation sheets in Arabic as appendix 14, the consent forms in Arabic as appendix 15, the questionnaire in Arabic as appendix 16).

Data analysis

Data analysis was conducted using the SPSS package (IBM, 2016). Descriptive statistics were conducted to compare the characteristics of exclusive breastfeeding for six months postpartum versus non-exclusive breastfeeding groups. Bivariate (chi-square and t-test) and multivariate logistic regression analysis were conducted to explore the factors that impact the exclusive breastfeeding. For small cell sizes, (expected values less than 5), the Fisher test was used instead of Chi-Square (Kim, 2017).

Variables whose p values were less than 0.05 in the bivariate analyses, were considered statistically significant, and in turn, included in the multivariate regressions. Factors in the multivariate regressions whose odds ratio's 95% CI did not include one were deemed to be statistically significant. In the event of small cell sizes, the Firth regression was conducted (Firth, 1993, Cornell Statistical Consulting Unit, 2012). The regression analysis was guided by the

model adapted for this study, which consists of 3 levels, the individual, relationship and community levels. Therefore, the regression analysis was computed accordingly:

1-The individual level covers the following variables: maternal age, maternal education, maternal preconception and prenatal breastfeeding plans, maternal attitudes in relation to early initiation of breastfeeding, maternal attitudes in relation to rooming-in, maternal attitudes in relation to skin-to-skin, maternal attitudes in relation to free formula sample distribution.

2-The relationship level covers the following variables: the paternal attitude towards breastfeeding reported by the mother.

3-The community level covers the following variables: housekeeper presence, whether the housekeeper is involved in childcare, type of delivery, pediatrician gender, maternal employment, place of residence, religion, nationality.

Data cleaning

Sample size

All the mothers replied yes to the selection criteria of having a child between six and 24 months. However, when asked about the age of their child specifically later on, some provided ages that were younger than six months or older than 24 months. There were 577 surveys left after these ineligible surveys were removed.

Additionally, some mothers answered “No” to certain questions in the consent form; these were removed from the total pool of questionnaires collected.

After cleaning the data, 567 out of 593 surveys collected were included in the analysis, so 95.61% of the questionnaires collected were included.

Variables management

A- Dependent variable

To perform the analysis, a variable column for the dependent variable was added in SPSS and labelled: "Dep_variable". It was dichotomised and labelled accordingly to the following:

0 = EBF ≥ 0 and <6 months

1 = EBF ≥ 6 months[6]

B- Religion variable

For the religion variable, two more labels were added to SPSS according to the answers provided in the questionnaires,

1)- Druze: under label 4

2)- Given that atheism is not a religion, I decided to put under one title the ones who answered none of my business, the undecided, and the atheists under one label: atheism/undisclosed/undecided: "other" under label 5.

C- Maternal age variable

For the maternal age variable, some mothers had errors in their answers such as typing "1" year old, so these answers were labelled as "0" and considered in the analysis as "missing values" not to bias the computations.

D- Education variable

[6] This categorization has been used in previous cross-sectional studies with the same objective and design as this study

For the education variable, all the answers provided in the questionnaires that referred to a doctorate level (medical, pharmacy, philosophy) were included under the "doctorate" label, and the answers provided that referred to "technique" school were considered as high school and were included under the "secondary level" label. Please find the new variables in table 4.1 below.

Table 4. 1: List of new variables created

	Additional labels	**Additional labels**
Dependent variable	0 = EBF ≥ 0 and <6 months	1 = EBF ≥ 6 months
Religion variable	"Druze": under label 4	"other": under label 5
Maternal age variable	"0": missing values	
Education variable	"doctorate" label: doctorate level (medical, pharmacy, philosophy)	"secondary" label: technique or high school level

Ethical considerations

The research followed the ethical guidelines established from the "Nuremberg Code" (U.S.DHHS, 2005), the Belmont Report, the Declaration of Helsinki, and the Council for International Organisations of Medical Sciences (NIH, 2016). The four principles of medical ethics: autonomy, where the right of an individual to make his or her own choice must be respected, justice, where the individuals should be treated fairly and equitably, with benefits spread justly, beneficence where benefits are provided to the individuals and non-maleficence where there is a commitment not to cause harm purposefully (Beauchamp and Childress, 2001) will be followed. Indeed, these principles should be respected at every step of the internet research (Association of Internet Researchers, 2017), mainly social media recruitment, which

must abide by similar regulatory and ethical rules as traditional recruitment (Harvard Catalyst, 2017).

Ethical approval from Lancaster University was sought through applying to the Faculty of Health and Medicine Research Ethics Committee (FHMREC). The ethics approval was granted in January 2018. Besides, formal written consent was sought from the administrators of the organisations where the recruitment announcement was planned to be posted. Individual consent for all participants was requested as well before accessing the survey. Mothers were notified in the consent form that they will be anonymised. There were no anticipated instances where confidentiality may be breached as the study is not covering subjects of harm or self-harm. The researcher contact information was mentioned on the information sheet (BPS, 2007).

In the event that any question may cause minimal discomfort to the mothers, whether they may be of sensitive nature, bring some emotions, cause remorse, or, additionally, if a mother becomes distressed during the questionnaire study, the survey was designed with an option for the mother to leave the survey, and re-access it where she left off by clicking on the survey link again. Furthermore, mothers were informed that they were free to withdraw from the research at any time (BPS, 2007) during the survey. Besides, mothers were directed to a local Lebanese Non-Governmental Agency (NGO) that supports breastfeeding, Lactica, or a nearby primary health care centre, in the event that they needed any assistance.

Participants were involved in neither the design nor the conduct of the research. Furthermore, no incentives or payment were offered for the mothers. Even though there may be no direct benefit to the mothers participating in this study, they may feel that participation may be interesting.

On the other hand, there were no expected potential risks to the researcher. The researcher was not physically present with the participants; therefore there was close to zero risk for the researcher of any possible distress or danger arising during the data collection.

No hard copies were collected, no audio or video recordings took place. Only electronic data were used in this study. The data was anonymised and stored in password protected hard disks and a laptop computer belonging to the researcher and was not be accessible to others. The data will be deposited by the researcher using Pure, and stored and archived for ten years in protected storage on the server of Lancaster University. After that date, the research data management service at Lancaster University library will be responsible for deleting the data.

It has been argued that the use of electronic data collection generates some ethical challenges as there is no totally secure communication online (Buchanan and Hvizdak, 2009); however, the software Qualtrics provides high levels of data security and protection (Qualtrics, 2016b). High-end firewall systems protect the servers, and regular scans are conducted to make sure that any vulnerability is rapidly detected; complete backups are complete every day (Qualtrics, 2016b). Qualtrics' confidential system component design utilises various tests to ensure that packets from one subsystem are solely expected by a designated subsystem (Qualtrics, 2016b). The client's data are stored in a particular location, not in a "cloud", and data are processed in that same location, not moved to another location (Qualtrics, 2016b). The "Transport Layer Security" encryption (referred to HTTPS) is utilised for transmitted data (Qualtrics, 2016b). Please refer to Appendix 17 for the ethics application form, Appendix 18 for the organisation approval form, Appendix 19 for the study poster in English, and Appendix 20 for the study poster in Arabic.

Challenges and limitations anticipated

Some challenges may arise: The internet connection in Lebanon may have been considered slow (Zgheib, 2015) and expensive, which may have led to a lack of internet access in remote areas or their use of local "internet cable" suppliers (GISW, 2011). However, new management of the national telecom operator promised improvement in April 2017, with faster and cheaper plans (The961, 2017). There may be a possibility that the sample may be limited in representativeness and biased to people not having access to the internet, however, the rate of internet users in Lebanon is 80.4% (IWS, 2015) and comparable to high-income countries such as the USA, where 87% of adults use the internet (PRC, 2015). Additionally, although self-completion questionnaires may be inexpensive and fast, they may involve low response rates or misinterpretation of information (Bryman, 2012). Other issues, similarly to traditional mailed surveys, may arise, such as individuals may misrepresent some characteristics and variables or reply in a "socially desirable way" (Wright, 2005), however, it has been shown that participants of web-based surveys are less likely to respond in a "socially desirable way" due to the interviewer's absence (Cowles and Nelson, 2015). Pretesting the tool will detect these challenges, as well as the length of the questionnaire, and address them. To minimize the low response rate concern, multiple reminders may be posted frequently (Granello and Wheaton, 2004).

Alternatively, online surveys may raise technical difficulties; therefore a simple questionnaire format and design, easily downloadable, will be used (Granello and Wheaton, 2004). Moreover, other than reporting falsified demographic data, such as providing multiple responses, the difficulty in verifying the information on the web are additional challenges pertaining particularly concerning social media (Topolovec-Vranic and Natarajan, 2016). Some ineligible

persons may feel motivated to participate or fill the questionnaire on multiple occasions (Konstan et al., 2005) despite not being offered any financial compensation. Consequently, validity checking is fundamental; a manual review of the survey answers will be conducted such as to detect multiple IP addresses and decide whether these duplicate IP addresses may derive from dial-up Internet Service Providers, or eligible individuals may share the same computer or Internet connection (Konstan et al., 2005).

Budget and funding

There was no source of funding for this research.

Data collection timeline

The data collection phase started on January 14, 2018. The study Facebook page was uploaded, and the contact with the administrators' organisations was initiated. The administrators were managing Facebook pages and groups that deal with maternal and child health or parenting topics, or health centres, hospitals and day care centres across the Lebanese territory, which had a social media outlet. The data collection ended on June 25, 2018.

Chapter 5: Findings

This chapter presents the results of the study. It illustrates the number of the organisations and participants enrolled, as well as the description and the facilitators and barriers to the EBF until six months postpartum.

Number of organisations

Around 140 organisations were contacted. Of these, many agreed to upload the study post on their social media outlet; however, not all agreed to sign the approval form. Ultimately, 39 administrators signed the approval forms. Of these, around 52% were day care centres, 28% Facebook and Whatsapp groups for mothers and parenting, 10% were health care centres, and 10% were Facebook and Whatsapp groups for infant feeding. The organisations which provided an official approval are presented in Appendix 21.

Sample size

The sample size was reached in June 2018 when 593 mothers had completed the questionnaire. However, after data cleaning, 567 out of 593 surveys collected were included in the analysis. Therefore, 95.61% of the questionnaires collected were included.

Characteristics of the population

A-Youngest child characteristics

Table 5.1 shows the youngest child characteristics. The mean (±SD) age of the children was 13.3± 6 months, 46.9% were girls, and 53.1% were boys. Almost all children were born in a hospital (99.6%), around half of them were born by cesarean delivery (47.8%), and nearly all

children had no chronic disease (91.4%) and were not taking chronic medication (92.9%) when they were aged between zero and six months.

Table 5. 1: Youngest child characteristics

Youngest child characteristics	**n (Percentage %)**	**Mean (Standard Deviation)***	**Median (Interquartile Range)**
Gender			
Girls	266 (46.9)		
Boys	301 (53.1)		
Age (months)		13.3 (6)	12 (10)
Birth weight			
<1,000 g	4 (0.7)		
Between 1,000 g and 1,500 g	15 (2.6)		
Between 1,500g and 2500g	64 (11.3)		
Between 2,500 and 4,000g	432 (76.2)		
Between 4,000 and 4,500g	32 (5.6)		
>4,500g	20 (3.5)		
Pregnancy duration			
Full-term	501 (88.4)		
Early	66 (11.5)		
Type of delivery			

Vaginal delivery	296 (52.2)		
Cesarean delivery	271 (47.8)		
Born in a hospital			
Yes	565 (99.6)		
No	2 (0.4)		
Pediatrician gender			
Male	336 (59.3)		
Female	231 (40.7)		
Child having a chronic disease between zero and six months			
Yes	49 (8.6)		
No	518 (91.4)		
Child taking chronic medications between zero and six months			
Yes	40 (7.1)		
No	527 (92.9)		

*(Percentages for categorical variables; mean ± standard deviation (SD) for continuous variables)

B-Maternal characteristics

Table 5.2 shows the maternal characteristics. The mean (±SD) age of the mothers was 30.4± 4.5 years, most of them were Lebanese (88%), other nationalities included: American, Armenian, Australian, Belgian, Brazilian, British, Canadian, Chilean, Danish, Dutch, French, Iraqi, Irish, Polish, Palestinian, Spanish, Swedish, Syrian, Tunisian, Ukrainian, and Venezuelan. Most of the

participants were married (99.5%), had graduate and postgraduate degrees (91.5%), most of them had no chronic disease (95.8%) and were not taking a chronic medication (95.6%) when their child was aged between zero and six months. 51.5% of the mothers were working when the child was between zero and six months, 54% of the mothers had no family member living with them besides their partner when the child was aged between zero and six months. 26.5% of the mothers had a live-in and 19.9 % of the mothers had a live-out housekeeper present in their home when the child was aged between zero and six months, and these housekeepers were somehow involved in the childcare when the child was between zero and six months. Some of these mothers were born outside Lebanon; however, they were residing across all the Lebanese territory when the child was aged between zero and six months.

Table 5. 2: Maternal characteristics

Maternal characteristics	**n (Percentage %)**	**Mean (Standard Deviation)**	**Median (Interquartile Range)**
Number of children (N=553)		1.6 (0.8)	1 (1)
Age (years)		30.4 (4.5)	30 (6)
Nationality			
Lebanese	499 (88)		
Marital status			
Married	564 (99.5)		

Divorced	1 (0.2)		
Separated	1 (0.2)		
Single	1 (0.2)		
Education			
Intermediate level (grade 9)	8 (1.4)		
Secondary level (grade 12)	40 (7.1)		
University level (Bachelors)	253 (44.6)		
University level (Masters)	232 (40.9)		
University level (Doctorate)	34 (6.0)		
Mother having a chronic disease when the child was between zero and six months			
Yes	24 (4.2)		
No	543 (95.8)		
Mother taking a chronic medication when the child was between zero and six months			
Yes	25 (4.4)		
No	542 (95.6)		
Working status when the child was between zero and six months of age			

Working	292 (51.5)		
Not working	275 (48.5)		
If yes, hours per week		35.5 (12.5)	40 (15)
Place of mother's birth			
Akkar	8 (1.4)		
Baalbek-Hermel	13 (2.3)		
Beirut	166 (29.3)		
Beqaa	30 (5.3)		
Mount-Lebanon	141 (24.9)		
North	58 (10.2)		
Nabatiye	18 (3.2)		
South	49 (8.6)		
Outside Lebanon	84 (14.8)		
Place of residence when the child was between zero and six months old			
Akkar	6 (1.1)		
Baalbek-Hermel	8 (1.4)		
Beirut	174 (30.7)		

Beqaa	25 (4.4)		
Mount-Lebanon	241 (42.5)		
North	53 (9.3)		
Nabatiye	18 (3.2)		
South	42 (7.4)		
Family member living with the mother besides the partner and the children when the child was between zero and six months			
Mother's mother	139 (24.5)		
Mother's father	32 (5.6)		
Partner's mother	51 (9)		
Partner's father	16 (2.8)		
Mother's siblings	34 (6)		
Partner's siblings	14 (2.5)		
None	363 (54)		
Other	28 (4.9)		
Presence of live-in housekeeper/cleaner when the child was between zero and six months			
Yes	150 (26.5)		

No	417 (73.5)		
Involvement of live-in housekeeper/cleaner in childcare			
Never	68 (12.0)		
Seldom	30 (5.3)		
Sometimes	32 (5.6)		
Often	13 (2.3)		
Almost always	7 (1.2)		
Presence of live-out housekeeper/cleaner when the child was between zero and six months			
Yes	113 (19.9)		
No	454 (80.1)		
Involvement of live-out housekeeper/cleaner in childcare			
Never	87 (15.3)		
Seldom	11 (1.9)		
Sometimes	11 (1.9)		
Often	1 (0.2)		
Almost always	3 (0.5)		

C-Feeding practices characteristics

Table 5.4 shows the feeding practices characteristics. Before getting pregnant, more than half of the mothers (59.3%) intended to breastfeed only, whereas, during pregnancy, 65.6% intended to breastfeed only. If the mothers planned to breastfeed, they assumed that the mean (±SD) age of the child will be 6.38 ± 3.366 months when first given food or formula. Only 9.5% of the mothers reported that they never breastfed their child, and 32.6% replied to have breastfed within an hour of birth. The mean (±SD) duration of breastfeeding was 6.5 ± 5.4 months, whereas the mean (±SD) duration of exclusive breastfeeding was 4.6 ± 2.2 months[7] and 37.7% of the children were exclusively breastfed until six months of age.

Table 5. 3: Feeding practices characteristics

Feeding practices characteristics	**n (Percentage%)**	**Mean (Standard deviation)**	**Median (Interquartile Range)**
Preconception plans			
Breastfeed only	336 (59.3)		
Formula feed only	11 (1.9)		
Both breast and formula feed	109 (19.2)		
Had not decided	111 (19.6)		
Prenatal plans			
Breastfeed only	372 (65.6)		
Formula feed only	17 (3.0)		

[7] The WHO definition of EBF was used in the survey for the mothers to answer accordingly, so in case the mother willingly didn't provide food or other liquids after six months postpartum, unfortunately there is no way to trace back the mothers and clarify to them that their infants could be at risk.

Both breast and formula feed	141 (24.9)		
Had not decided	37 (6.5)		
If you intended to breastfeed, how old did you think your child will be when first given food or formula		6.4 (3.4)	6 (0)
If the mother ever breastfed the child			
Yes	513 (90.5)		
No	54 (9.5)		
How long did the mother breastfeed the child			
Duration of breastfeeding (months)		6.5 (5.5)	4.25 (7)
The child is still breastfeeding	210 (37)		
Not applicable	41 (7.2)		
How long did the mother exclusively breastfeed the child (in months)		4.6 (2.2)	5 (3)
Initiation of breastfeeding			
Within an hour of birth	185 (32.6)		
After an hour of birth	277 (48.9)		
Exclusively breastfed until six months			
Yes	(214) 37.7%		

No	(353) 62.3%		

D-Beliefs/opinions regarding some feeding practices

Table 5.4 shows the beliefs/opinions regarding some feeding practices. The majority of mothers (74.3%) believed that breastfeeding within an hour of birth is very important, The majority of mothers (66.8%) believed that keeping the baby's crib by the mother's bed-side is very important, 68.3% of the mothers asked for the baby's crib to be kept by her bedside at the hospital, 66.7% of the mothers had the baby's crib was kept by her bedside. The majority of mothers (72.1%) believed that holding the baby skin-to-skin after delivery is very important, 61.9% of the mothers asked for holding the baby skin-to-skin after delivery. 57% of the mothers held their baby skin-to-skin after delivery, 43.6% of the mothers strongly disagreed with the following statement: free formula samples should be distributed to the mothers after delivery at the hospital, whereas 12.9% agreed and 3% strongly agreed. 5.1% of the mothers asked for a free formula sample at the hospital; 31.7% of the mothers were offered a free formula sample at the hospital. 61.6% of the mothers best described their partners as very supportive regarding them breastfeeding and 58% of the mothers reported breastfeeding as very important in their partners' opinions.

Table 5. 4: Beliefs/opinions regarding some feeding practices

Beliefs/opinions regarding some feeding practices	**n (Percentage %)**
Importance of breastfeeding within an hour of birth according to the mother	
Not important	12 (2.1)

Slightly important	7 (1.2)
Fairly important	32 (5.6)
Important	95 (16.8)
Very important	421 (74.3)
Importance of keeping the baby's crib by the mother's bedside according to the mother	
Not important	11 (1.9)
Slightly important	12 (2.1)
Fairly important	51 (9.0)
Important	114 (20.1)
Very important	379 (66.8)
Whether the mother asked for the baby's crib to be kept by her bedside at the hospital	
Yes	387 (68.3)
No	180 (31.7)
Whether the baby's crib was kept by her bedside at the hospital	
Yes	378 (66.7)
No	189 (33.3)
Importance of holding the baby skin-to-skin after delivery according to the mother	
Not important	10 (1.8)
Slightly important	16 (2.8)
Fairly important	34 (6.0)
Important	98 (17.3)
Very important	409 (72.1)

Whether the mother asked for holding the baby skin-to-skin after delivery	
Yes	351 (61.9)
No	216 (38.1)
Whether the mother held her baby skin-to-skin after delivery	
Yes	323 (57.0)
No	244 (43.0)
To what extent does the mother agree or disagree with the following statement: Free formula samples should be distributed to the mothers after delivery at the hospital?	
Strongly disagree	247 (43.6)
Disagree	139 (24.5)
Undecided	91 (16.0)
Agree	73 (12.9)
Strongly agree	17 (3.0)
Whether the mother asked for a free formula sample at the hospital	
Yes	29 (5.1)
No	358 (94.9)
Whether the mother was offered a free formula sample at the hospital	
Yes	180 (31.7)
No	387 (68.3)
Best description of the partner's support regarding the mother's breastfeeding according to the mother (N=558)	
Very supportive	349 (61.6)
Supportive	134 (23.6)

Neither supportive or not supportive	60 (10.6)
Unsupportive	10 (1.8)
Very unsupportive	5 (0.9)
How important is breastfeeding in the partner's opinion according to the mother	
Not important	14 (2.5)
Slightly important	24(4.2)
Fairly important	61 (10.8)
Important	139 (24.5)
Very important	329 (58.0)

Different factors affecting exclusive breastfeeding until 6 months postpartum[8]

1-Bivariate analysis: t-test and Chi-square (or Fisher's):

Results of the correlations indicate that there is a statistically significant association between the nationality and EBF at six months postpartum (values in parentheses correspond to Pearson Chi-Square or Fisher exact test) (16.723), p <0.001, where EBF until six months postpartum is reduced when mothers have Lebanese nationality. There was a significant association between the employment status when the child was between zero and six months and EBF at six months postpartum (6.066), p=0.014, where the mother not being employed was more likely to EBF until six months postpartum. Besides, results of the correlations indicate that there is a statistically significant association between the mother's father living with the mother besides the partner and the children when child was between zero and six months, and EBF at six months postpartum (7.060), p=0.008, where EBF until six months postpartum decreased when the mother's father was living in the same household when the child was between zero and six months. A statistically significant association was found between no family member living with the mother besides the partner and the children when child was between zero and six months, and EBF at six months postpartum (3.939), p=0.047, where mothers having no one present at home besides the partner and children when the child was between zero and six months were more likely to EBF until six months postpartum.

Besides, EBF at six months postpartum was statistically significantly correlated with preconception plans (values in parentheses correspond to Pearson Chi-Square or Fisher exact

[8] Multiple tests adjustment has not been decided a priori, as the study's significance tests are used for descriptive purposes, in addition, given that "adjustments for multiple testing are required in confirmatory studies whenever results from multiple tests have to be combined in one final conclusion and decision" and "A good predefined statistical analysis plan and a prespecification of the hypotheses and their priorities will in general reduce the multiplicity problem" BENDER, R. & LANGE, S. (2001). Adjusting for multiple testing—when and how? *Journal of clinical epidemiology,* 54**,** 343-349.

test) (29.781), p <0.001, EBF until six months postpartum decreased when mothers did not plan to breastfeed before they got pregnant. Additionally, EBF at six months postpartum was statistically significantly correlated with prenatal plans (48.580), p <0.001. EBF until six months postpartum decreased when mothers do not plan to breastfeed while they were pregnant.

Furthermore, EBF at six months postpartum was statistically significantly correlated with the importance of breastfeeding within an hour of birth according to the mother (values in parentheses correspond to Pearson Chi-Square or Fisher exact test) (11.788), p=0.016, where mothers believing that breastfeeding within an hour of birth is important were more likely to EBF until six months postpartum. EBF at six months postpartum was statistically significantly correlated with the importance of keeping the baby's crib by the mother's bed-side according to the mother = (10.622), p=0.029, where mothers believing that keeping the baby's crib by the mother's bedside is important were more likely to EBF until six months postpartum. EBF at six months postpartum was statistically significantly correlated with whether the mother asked for the baby's crib to be kept by her bed side at the hospital = (9.936), p=0.002, EBF until six months postpartum is lowered when mothers do not ask for the baby's crib to be kept by her bedside at the hospital. Furthermore, EBF at six months postpartum was statistically significantly correlated with whether the baby's crib was kept by her bed side at the hospital = (7.941), p=0.005, EBF until six months postpartum are lowered when the baby's crib is not kept by the mother's bedside at the hospital. EBF at six months postpartum was statistically significantly correlated with the extent to which the mother agree or disagree with the following statement: Free formula samples should be distributed to the mothers after delivery at the hospital = (55.622), p <0.001, EBF until six months postpartum is reduced when the mother agrees with the following statement: free formula samples should be distributed to the mothers after delivery at

the hospital. EBF at six months postpartum was statistically significantly correlated with whether the mother was offered a free formula sample at the hospital = (5.797), p= 0.016, Mothers not being offered a free formula sample at the hospital were more likely to EBF until six months postpartum, EBF at six months postpartum was statistically significantly correlated with the best description of the partner's support regarding the mother's breastfeeding according to the mother = (13.670), p=0.006, EBF until six months postpartum decreases when the partner is not being supportive regarding the mother's breastfeeding. Additionally, EBF at six months postpartum was statistically significantly correlated with how important is breastfeeding in the partner's opinion according to the mother = (20.943), p <0.001. Mothers whose partners perceive breastfeeding as important are more likely to EBF until six months postpartum.

Table 5. 5: Youngest child characteristics affecting exclusive breastfeeding until six months postpartum

	EBF for 6 months		**Total**	**% of EBF**	**Chi-square / Fisher's test / t-test**	**P-value**
	Yes	**No**				
Child Gender					0.005	0.945
Girls	100	166	266	37.6		
Boys	114	187	301	37.9		
Age (months)					-0.168	0.868
Birth weight					0.836	0.985
<1,000 g	2	2	4	50		
Between 1,000 g and 1,500 g	6	9	15	40		

Between 1,500g and 2500g	23	41	64	35.9		
Between 2,500 and 4,000g	165	267	432	38.2		
Between 4,000 and 4,500g	11	21	32	34.4		
>4,500g	7	13	20	35		
Pregnancy duration					2.549	0.110
Full-term	195	306	501	38.9		
Early	19	47	66	28.8		
Type of delivery					3.180	0.075
Vaginal	122	174	296	41.2		
Cesarean section	92	179	271	33.9		
Born in a hospital					none	0.142
Yes	212	353	565	80		
No	2	0	2	100		
Gender of the child's pediatrician					0.721	0.396
Female	92	139	231	39.8		
Male	122	214	336	36.3		
Child having a chronic disease between zero and six months					1.160	0.281
Yes	15	34	49	39.6		
No	199	319	518	38.4		

Child taking chronic medications between zero and six months						
Yes	11	29	40	27.5	1.921	0.166
No	203	324	527	38.5		

Table 5. 6: Maternal characteristics affecting exclusive breastfeeding until six months postpartum

	EBF for 6 months		**Total**	**% of EBF**	**Chi-square / Fisher's test / t-test**	**P-value**
	Yes	**No**				
Number of children					-1.046	0.296
Maternal age	211	351	562	37.5	1.734	0.084
Nationality					16.723	***0.000****
Lebanese	173	326	499	34.7		
Other	41	27	68	60.3		
Marital status					1.686	1.00
Married	214	350	564	37.9		
Divorced	0	1	1	0		
Separated	0	1	1	0		
Single	0	1	1	0		
Maternal education					1.152	0.894
Intermediate level (grade 9)	4	4	8	50		
Secondary level	16	24	40	40		

(grade 12)						
University level (Bachelors)	98	155	253	38.7		
University level (Masters)	84	148	232	36.2		
University level (Doctorate)	12	22	34	35.3		
Mother having a chronic disease when the child was between zero and six months					0.784	0.376
Yes	7	17	24	29.2		
No	207	336	543	38.1		
Mother taking a chronic medication when the child was between zero and six months					2.102	0.147
Yes	6	19	25	24		
No	208	334	542	38.4		
Employment status when the child was between zero and six months					6.066	***0.014****
Working	96	196	292	32.9		
Not working	118	157	275	42.9		
Religion					4.799	0.185

Christian	84	150	234	35.9		
Muslim	123	188	311	39.5		
Druze	1	9	10	10		
Other	6	6	12	50		
Place of mother's birth					11.875	0.157
Akkar	3	5	8	37.5		
Baalbek-Hermel	5	8	13	38.5		
Beirut	57	109	166	34.3		
Beqaa	11	19	30	36.7		
Mount-Lebanon	45	96	141	31.9		
North	20	38	58	34.5		
Nabatiye	7	11	18	38.9		
South	22	27	49	44.9		
Outside Lebanon	44	40	84	52.4		
Residence when the child was between zero and six months					3.517	0.845
Akkar	4	2	6	66.67		
Baalbek-Hermel	3	5	8	37.5		
Beirut	68	106	174	39.1		
Beqaa	7	18	25	28		
Mount-Lebanon	89	152	241	37		
North	21	32	53	39.6		
Nabatiye	7	11	18	38.9		
South	15	27	42	35.7		

Family member living with the mother besides the partner and the children when the child was between zero and six months						
Mother's mother	43	96	139	30.9	3.631	0.057
Mother's father	5	27	32	15.6	7.060	***0.008****
Partner's mother	14	37	51	27.4	2.526	0.112
Partner's father	4	12	16	25	1.138	0.314
Mother's siblings	9	25	34	26.5	1.956	0.162
Partner's siblings	5	9	14	35.7	0.025	1.000
None	148	215	363	40.8	3.939	***0.047****
Other	11	17	28	39.3	0.030	0.863
Presence of live-in housekeeper/cleaner when the child was between zero and six months old					0.100	0.751
Yes	55	95	150	36.7		
No	159	258	417	38.1		
Presence of live-out housekeeper/cleaner when					2.079	0.149

the child was between zero and six months old						
Yes	36	77	113	31.9		
No	178	276	454	39.2		
How often did this live-in housekeeper/cleaner take care of the child when the child was between zero and six months					2.334	0.683
Never	29	39	68	42.6		
Seldom	10	20	30	33.3		
Sometimes	11	21	32	34.4		
Often	3	10	13	23.1		
Almost always	2	5	7	28.6		
How often did this live-out housekeeper/cleaner take care of the child when the child was between zero and six months					2.503	0.748
Never	28	59	87	32.2		
Seldom	2	9	11	18.2		
Sometimes	5	6	11	45.5		
Often	0	1	1	0		
Almost always	1	2	3	33.3		

Table 5. 7: Feeding practices characteristics affecting exclusive breastfeeding until six months postpartum

	EBF for 6 months		Total	% of EBF	Chi-square/Fisher's test or t-test	P-value
	Yes	**No**				
Preconception plans					29.781	***0.000****
Breastfeed only	153	183	336	45.5		
Formula feed only	1	10	11	9.1		
Both breast and formula feed	21	88	109	19.3		
Had not decided	39	72	111	35.1		
Prenatal plans					48.580	***0.000****
Breastfeed only	176	196	372	47.3		
Formula feed only	0	17	17	0		
Both breast and formula feed	30	111	141	21.3		
Had not decided	8	29	37	21.6		
Initiation of breastfeeding					1.293	0.255
Within an hour of birth	84	101	185	45.4		
After an hour of birth	111	166	277	40.1		

Table 5. 8: Beliefs/opinions regarding some feeding practices affecting exclusive breastfeeding until six months postpartum

	EBF for 6 months		Total	% of EBF	Chi-square/Fisher's test or t-test	P-value
	Yes	**No**				
Importance of breastfeeding within an hour of birth according to the mother					11.788	***0.016****
Not important	3	9	12	25		
Slightly important	2	5	7	28.6		
Fairly important	5	27	32	15.6		
Important	30	65	95	31.6		
Very important	174	247	421	41.3		
Importance of keeping the baby's crib by the mother's bedside according to the mother					10.622	***0.029****
Not important	2	9	11	18.2		
Slightly important	3	9	12	25		
Fairly important	13	38	51	25.5		
Important	36	78	114	31.6		
Very important	160	219	379	42.2		
Whether the mother asked for the baby's crib					9.936	***0.002****

to be kept by her bedside at the hospital						
Yes	163	224	387	42.1		
No	51	129	180	28.3		
Whether the baby's crib was kept by the mother's bedside at the hospital					7.941	***0.005****
Yes	158	220	378	41.8		
No	56	133	189	39.6		
Importance of holding the baby skin-to-skin according to the mother					4.146	0.386
Not important	6	4	10	60		
Slightly important	8	8	16	50		
Fairly important	15	19	34	44.1		
Important	36	62	98	36.7		
Very important	149	260	409	36.4		
Whether the mother asked for holding the baby skin-to-skin after delivery					1.355	0.244
Yes	139	212	351	39.6		
No	75	141	216	34.7		
Whether the mother					0.025	0.874

held her baby skin-to-skin after delivery						
Yes	121	202	323	37.5		
No	93	151	244	38.1		
To what extent does the mother agree or disagree with the following statement: Free formula samples should be distributed to the mothers after delivery at the hospital?					55.622	***0.000****
Strongly disagree	136	111	247	55.1		
Disagree	34	105	139	24.5		
Undecided	21	70	91	23.1		
Agree	19	54	73	26.1		
Strongly agree	4	13	17	23.5		
Whether the mother asked for a free formula sample at the hospital					0.585	**0.444**
Yes	9	20	29	31		
No	205	333	538	38.1		
Whether the mother was offered a free formula sample at the hospital					5.797	***0.016****

Yes	55	125	180	30.6		
No	159	228	387	41.1		
The best description of the partner's support regarding the mother's breastfeeding according to the mother					13.670	***0.006****
Very supportive	152	197	349	43.6		
Supportive	43	91	134	32.1		
Neither supportive or not supportive	15	45	60	25		
Unsupportive	4	6	10	40		
Very unsupportive	0	5	5	0		
How important is breastfeeding in the partner's opinion according to the mother					20.943	***0.000****
Not important	1	13	14	7.1		
Slightly important	6	18	24	25		
Fairly important	16	45	61	26.2		
Important	43	96	139	30.9		
Very important	148	181	329	45		

2-Multivariate Logistic Regressions

After conducting the bivariate analyses, the subsequent step was to perform the multiivariate logistic regressions of the variables that had a p-value < 0.05.

The following were the variables of interest, specified at the beginning of the study, which had a p-value < 0.05 in the bivariate analysis: Preconception plans, prenatal plans, importance of breastfeeding within an hour of birth according to the mother, importance of keeping the baby's crib by the mother's bed-side according to the mother, to what extent does the mother agree or disagree with the following statement: free formula samples should be distributed to the mothers after delivery at the hospital, best description of the partner's support regarding the mother's breastfeeding according to the mother, how important is breastfeeding in the partner's opinion according to the mother, employment status when child was between zero and six months.

In addition to the variables of interest specified at the beginning of the study, the following are additional variables that had a p-value < 0.05 in the bivariate analyses: Whether the mother asked for the baby's crib to be kept by her bedside at the hospital, whether the baby's crib was kept by her bedside at the hospital, whether the mother was offered a free formula sample at the hospital, nationality, presence of mother's father at home besides the partner and children when the child was between zero and six months, none present at home besides the partner and children when the child was between zero and six months.

The multivariate logistic regression models were computed according to the three levels of the ecological model presented previously (individual level, relationship level and community levels).

Model 1 - Individual level variables: preconception plans, prenatal plans, importance of breastfeeding within an hour of birth according to the mother, importance of keeping the baby's crib by the mother's bedside according to the mother, to what extent does the mother agree or disagree with the following statement: free formula samples should be distributed to the mothers after delivery at the hospital, whether the mother asked for the baby's crib to be kept by her bedside at the hospital.

Model 2 - Relationship level variables: best description of the partner's support regarding the mother's breastfeeding according to the mother, how important is breastfeeding in the partner's opinion according to the mother, presence of mother's father at home besides the partner and children when the child was between zero and six months, no one present at home besides the partner and children when the child was between zero and six months.

Model 3 - Community level variables: Employment status when the child was between zero and six months, whether the baby's crib was kept by her bedside at the hospital, whether the mother was offered a free formula sample at the hospital, nationality.

Statistically significant determinants of EBF until six months postpartum

After computing the multivariate logistic regression analyses and adjusting for the variables in the models, the following seven factors were found to be essential determinants of EBF until six months postpartum:

- Prenatal plans

- The extent to which the mother agrees or disagrees with the statement “free formula samples should be distributed to the mothers after delivery at the hospital”
- How important breastfeeding is in the partner’s opinion according to the mother
- Whether the baby’s crib was kept by her bedside at the hospital
- Whether the mother was offered a free formula sample at the hospital
- Nationality
- Mother’s father living in the same household when the child was between 0 and 6 months

As presented in tables 5.9a, 5.9b and 5.9c, after adjusting for other variables in the model, the results indicate that the odds of exclusively breastfeeding until six months postpartum are reduced by 31.8% when mothers do not plan to breastfeed while they are pregnant. Besides, the odds of exclusively breastfeeding until six months postpartum are lowered by 15.7% when the mother agrees with the following statement: free formula samples should be distributed to the mothers after delivery at the hospital. Moreover, the odds of exclusively breastfeeding until six months postpartum are reduced by 39.7% when the baby’s crib is not kept by the mother’s bedside at the hospital. Furthermore, the odds of exclusively breastfeeding until six months postpartum are lowered by 60.4% when the mother’s father was living in the same household when the child was between zero and six months. In addition, the odds of exclusively breastfeeding until six months postpartum are reduced by 60.8% when mothers have Lebanese nationality. On the other hand, mothers whose partners perceive breastfeeding as very important are 41% more likely to EBF until six months postpartum. Besides, the mother not being offered a free formula sample at the hospital was 47% more likely to EBF until six months postpartum. The results picked up more factors that are likely to lower breastfeeding rather than increase it.

Table 5. 9a: Multivariate logistic regressions. Determinants of exclusive breastfeeding until six months postpartum.

Dependent variable: exclusive breastfeeding until six months postpartum – Model 1

Multivariate Model 1	**Independent variable**	**Adjusted Odds ratio (according to each level)**				
		P-value	**beta coefficient**	**95% CI of coefficient**	**OR [9]**	**95% CI**
Model 1	Preconception plans	0.684	-0.04	[-0.21; 0.14]	0.97	[0.81; 1.14]
Model 1	Prenatal plans	***0.001****	-0.38	[-0.62; -0.16]	0.68	[0.54; 0.86]
Model 1	Importance of breastfeeding within an hour of birth according to the mother	0.194	0.17	[-0.08; 0.43]	1.18	[0.92; 1.54]
Model 1	Importance of keeping the baby's crib by the mother's bed-side according to the mother	0.682	0.05	[-0.2; 0.32]	1.05	[0.82; 1.37]
Model 1	To what extent does the mother agree or disagree with the following statement: Free formula samples should be distributed to the mothers after delivery at the hospital?	***0.003****	-0.17	[-0.29; -0.06]	0.84	[0.75; 0.94]
Model 1	Whether the mother asked for the baby's	0.210	-0.28	[-0.72; 0.16]	0.76	[0.49; 1.17]

[9] ORs and CIs retrieved in excel by typing =EXP(beta coefficient)

	crib to be kept by her bedside at the hospital					

Table 5. 10 b: Multivariate logistic regressions. Determinants of exclusive breastfeeding until six months postpartum. Dependent variable: exclusive breastfeeding until six months postpartum – Model 2

Multivariate Model 2	**Independent variable**	**Adjusted Odds ratio (according to each level)**				
		P-value	**beta coefficient**	**95% CI of coefficient**	**OR [10]**	**95% CI**
Model 2	Best description of the partner's support regarding the mother's breastfeeding according to the mother	0.454	-0.11	[-0.41; -0.18]	0.89	[0.66; 0.84]
Model 2	How important is breastfeeding in the partner's opinion according to the mother	***0.005****	0.35	[0.10; 0.61]	1.42	[1.11; 1.84]
Model 2	Presence of mother's father in the household besides the partner and children when the child was between zero and six months	***0.049****	-0.93	[-2.01;-0.00]	0.4	[0.13; 1]
Model 2	None present at home besides the partner and children when the child	0.268	0.22	[-0.17;0.6]	1.24	[0.85; 1.82]

[10] ORs and CIs retrieved in excel by typing =EXP(beta coefficient)

	was between zero and six months					

Table 5. 11 c: Multivariate logistic regressions. Determinants of exclusive breastfeeding until six months postpartum. Dependent variable: exclusive breastfeeding until six months postpartum – Model 3

Multivariate Model 3	**Independent variable**	**Adjusted Odds ratio (according to each level)**				
		P-value	**beta coefficient**	**95% CI of coefficient**	**OR [11]**	**95% CI**
Model 3	Employment status when the child was between zero and six months	0.080	0.32	[-0.04; 0.68]	1.38	[0.96; 1.97]
Model 3	Whether the baby's crib was kept by her bedside at the hospital	***0.009****	-0.51	[-0.89;-0.13]	0.6	[0.41; 0.88]
Model 3	Whether the mother was offered a free formula sample at the hospital	***0.048****	0.39	[0.003;0.78]	1.47	[1; 2.17]
Model 3	Nationality	***0.001****	-0.94	[-1.48;-0.41]	0.39	[0.23; 0.67]

[11] ORs and CIs retrieved in excel by typing =EXP(beta coefficient)

Chapter 6: Discussion and Conclusion

The following chapter discusses the findings of the study, provides recommendations for future work, practice and policy, and presents the challenges encountered while conducting the study.

This study has generated some novel findings that have not been reported previously in the literature. Some of the more novel findings to emerge from this study are that, in a middle-income country, exclusive breastfeeding until six months postpartum is associated with the mother's opinion about formula distribution at the hospitals, the mother's father living in the same household, as well as being Lebanese.

Individual level determinants

This is the first study conducted in low and middle-income settings to explore the maternal attitudes and opinions regarding feeding practices and their association with EBF until six months. This study has found that the maternal attitudes and opinions towards infant feeding practices postpartum influence EBF until six months after birth. Specifically, the mother believing that breastfeeding within an hour of birth is important, the mother disagreeing that free formula samples should be distributed to the mothers after delivery at the hospital, the mothers believing that keeping the baby's crib by the mother's bed-side is important, and the mother asking for the baby's crib to be kept by her bedside at the hospital, were all found to be positively correlated with EBF until six months postpartum. However, after adjusting for confounding variables, of these factors, only one factor remained statistically significant: the mother's opinion concerning the distribution of free formula at the hospital after delivery. This is the first study conducted in low and middle-income country settings to explore these factors, therefore, due to lack of data, these results were not comparable to the literature. These findings show the value of empowering mothers with the proper information on the importance of the practices that occur directly after giving birth, for the mothers to be equipped with the right information and act accordingly.

Furthermore, the study was set out with the aim to determine the preconception and prenatal plans association with EBF until six months postpartum. These results have shown that mothers who had planned to breastfeed, before and during the pregnancy, were more likely to exclusively breastfeed their children until 6 months postpartum. The association between having prenatal plans to breastfeed and EBF until 6 months remained statistically significant after adjusting for confounders. This finding has also been reported in previous studies, as presented in the literature review chapter (Noughabi et al., 2013, Sasaki et al., 2010). This also accords with findings of earlier systematic reviews (Balogun et al., 2015). Having the intention to breastfeed, particularly during pregnancy, is a predictor of EBF until six months postpartum.

Another objective of this study was to determine the association between EBF until six months postpartum and maternal education, and no statistically significant association was found. In previous studies, as illustrated in the literature review chapter, the findings are not homogeneous. Maternal education of around five to eight years of study compared to less years (Cavalcanti et al., 2015), were determined as facilitators for EBF until six months postpartum. Furthermore, it was found that the more educated the mother, the more she EBF (Gogoi et al., 2015, Vieira et al., 2014) On the other hand, it was found that the more educated the mother, the less she EBF (Arya et al., 2015). The lack of a statistically significant association in this study may be due to the fact that the mothers who participated in this study were mostly well-educated. As a matter of fact, 91.5 % of the participants in the study had a university degree and above. The bias of the data in regards to the education level could be explained by either the possibility that more educated women tend to be more motivated or interested to participate, or by the fact that women in Lebanon are getting more and more educated. As illustrated in the introduction chapter, the young, female, rate of literacy in Lebanon is 99.1% (UNICEF, 2013). More than 80% of the female population is enrolled in secondary education, and in fact, around 50% of the women were enrolled in tertiary or university education (United Nations Educational Scientific and Cultural Organization, 2019). In general, there were more women than men

enrolled in universities in 2009-2010 (Central Administration of Statistics, 2012). Our findings differ from the findings of previous studies conducted in this country. A study conducted in Lebanon more than a decade ago (Batal et al., 2006) concluded that exclusive breastfeeding was negatively associated with maternal education. However, this was conducted only on women accessing health centres of the Ministry of Social Affairs, who are usually of a lower socioeconomic group and these women might have had different educational attainment and relied upon the ability of mothers to recall up to five years earlier. A new outcome, not explored in the literature to date, was that maternal attitudes in relation to the skin-to-skin practice were not significantly associated with EBF until six months postpartum. The reason for this non-statistically significant relationship is not apparent, but could be explained by the fact that, given the high rate of cesarean sections in the study, mothers may have been notified that the infant should not be held skin-to-skin after having a cesarean section. It is believed that, skin-to-skin is practically a rare practice after cesarean birth (Rowe-Murray and Fisher, 2002, Erlandsson et al., 2007, Hung and Berg, 2011). A further potential explanation may be mothers may be either not previously informed or not convinced about the importance of holding the baby skin-to-skin and its positive impact on breastfeeding.

Relationship level determinants

Other variables covered in the current study are related to the relationship between the mother and her surroundings. The mothers' partners perceiving breastfeeding as very important, the partner being supportive regarding the mother's breastfeeding, not having the mother's father living in the same household besides the partner and children when the child was between zero and six months, and having no one present at home besides the partner and children when the child was between zero and six months were positively correlated with EBF until six months postpartum.

Nevertheless, after adjusting for confounders, the mothers' partners perceiving breastfeeding as very important, and not having the mother's father living in the same household besides the partner and

children when the child was between zero and six months still had a statistically significant association with EBF until six months postpartum, which was an unanticipated finding. Previous research, as presented in the literature review chapter, has found that being in nuclear families (meaning families consisting of the two parents and the children), and the partner's appreciation of BF (Vieira et al., 2014) and support such as being present at the antenatal visits (Sasaki et al., 2010), have been found to be determinants of EBF until six months postpartum However, the presence of the mother's father at home has not been explored or determined to be associated with EBF until six months postpartum in the literature, as shown in the literature review chapter or the two previous reviews conducted (Balogun et al., 2015, Mangrio et al., 2017). The superior role of the man gender and the patriarchal structure of the Lebanese society (Civil Society Knowledge Center, 2017) may be a likely explanation to the fact that women's behaviours in the Lebanese culture are influenced by the men in her family, whether it is her husband or her father. Additionally, as mentioned in the introduction chapter, Lebanon is in the top 10 worst countries in gender equality (World Economic Forum, 2016), the gender inequality index rank is 78 (World Health Organization, 2016), and the current Lebanese system of personal status laws infringes women's human rights, comprising non-discrimination, equality in marriage and marriage termination, physical integrity and health (HRW, 2015). Women have always been oppressed in Lebanon (Rolland, 2003). The family in Lebanon is traditionally seen as an economic unit in which the father is the central figure, the producer and his family depends on him (Rolland, 2003). In some Lebanese regions, if the woman causes any damage to an honor, as it is assumed (premarital or extramarital sexual relations), the father and brothers of a woman can kill her (Rolland, 2003). In Lebanon, some religions allow polygamy, permit marriage as early as when the individual reaches puberty, within the lineage, and women traditionally married in order to bear sons as a protection for their own future (Rolland, 2003). If a woman does not bear any children, particularly male children, she can be threatened with divorce (Rolland, 2003). In the event of a divorce, a Lebanese mother does not maintain the custody of her children, for instance, a Lebanese

Catholic mother loses the custody of her son or daughter when he/she turns two (Hyndman-Rizk, 2020). This study sheds light on the importance of raising awareness about the value of breastfeeding to the fathers of the mothers as well, given that their presence plays a crucial role in whether the mother exclusively breastfeeds her child until six months after birth or not. Furthermore, the partners of today, who receive proper breastfeeding information with their wives, will become the fathers of tomorrow and will be equipped with the necessary tools to empower their daughters, the future mothers.

Community level determinants

One of the objectives of the study was to identify the association between maternal employment and EBF until six months postpartum. The mother being employed was negatively correlated with EBF until six months postpartum; however, after adjusting for confounding variables, this association did not remain statistically significant. Even though maternal employment was the most commonly reported barrier to EBF until 6 months postpartum in the previous systematic reviews, not all the studies included in the reviews found a statistical significant association (Balogun et al., 2015) (Mangrio et al., 2017). In the literature review chapter, employment was mostly determined as a barrier to EBF until six months postpartum (Matias et al., 2012, Samuel et al., 2012, Perera et al., 2012, Thet et al., 2016, Vieira et al., 2014, Lee et al., 2013, Sasaki et al., 2010) whereas other studies have determined maternal employment after 6 months postpartum a facilitator to EBF until six months postpartum (Qiu et al., 2010). Interestingly, work was not always a barrier to EBF for the first six months postpartum (Sulaiman et al., 2016). However, this study involved only participants who returned to work postpartum, and it is worth noting that 27.5% of the participants were working from home. Even though the employment factor was not found statistically significant after adjustment, some modifications in the current situation in the Lebanese job environment could be implemented to facilitate EBF until six months postpartum, such as increasing the maternity leave, which is currently 70 days (Trading economics, 2019), as well as providing breastfeeding breaks for pumping the milk at

work. As a matter of fact, the International Labour Organisation recommends providing support for breastfeeding at the workplace, whether in the form of breastfeeding breaks or the availability of breastfeeding facilities (International Labour Organization, 2012). However, in Lebanon, there is no mention of the breastfeeding breaks in the legislation of maternity law (International Labour Organization, 2011). It is worth noting that an earlier qualitative study conducted in one Lebanese city (Nabulsi, 2011) has concluded that mothers found employment to be a barrier to breastfeeding. As presented in the introduction chapter, Lebanon positions first in the region in terms of women in the workplace (An-Nahar, 2017). Therefore, further research addressing the conditions of the mothers' employment in Lebanon, such as whether they are provided with breastfeeding breaks, will be worth exploring.

Concerning the third objective of the study, no statistically significant association was found between EBF until six months postpartum and religion. This is in line with previous research conducted in India, although different religions were considered (Gogoi et al., 2015) as well as with the two previous systematic reviews (Balogun et al., 2015, Mangrio et al., 2017) which did not show religion as a determinant of EBF until 6 months postpartum. Nevertheless, this finding does not match the findings of a previous study conducted in Lebanon, where it was found that Muslim mothers breastfed about twice as more as the Christian mothers (Al-Sahab et al., 2008). The authors of the study had different criteria in that they were interested in the breastfeeding duration only until four months postpartum and in only one city of Lebanon. They did not account for the solid food intake of the infants and the breastfeeding status was not known after delivery at the hospital. A few studies in several countries have found an influence of religion on breastfeeding practices (Mohamad et al., 2013, Burdette and Pilkauskas, 2012), however, the influence of religion specifically on EBF until six months postpartum was not explored.

The present study was designed as well to determine the association between EBF until six months postpartum and the housekeeper presence. No statistically significant association was found between EBF until six months postpartum and the housekeeper presence or with whether the housekeeper was involved in childcare. This association has not been previously explored in the literature, however, one recent study conducted in the Arab Gulf region, not focusing on EBF in particular, concluded that the mother–child attachment is negatively impacted by the presence of housekeepers and that the absence of the mother tends to impact the breastfeeding practice (Al-Matary and Ali, 2013). In this study, only 26.5% of the mothers had a live-in housekeeper when the child was between zero and six months old, of these, the majority (88%) was involved in childcare. On the other hand, only 19.9% of the mothers had a live-out housekeeper when the child was between zero and six months old, and of these, the majority (84.7%) was involved in childcare. Therefore, in spite of the small sample size of the housekeepers, most of the housekeepers were involved in childcare. Consequently, the non-statistically significant findings may be somewhat limited by the small number of housekeepers mentioned in the study. Further research could be undertaken to investigate this relationship.

Another variable of interest included in the study was the type of delivery. No statistically significant association was found between EBF until six months postpartum and the type of delivery. 52.2% of the mothers included in our study had a vaginal delivery, whereas 47.8% of the mothers had a cesarean section. Even though our sample was not a random representative sample of the Lebanese population, these rates are consistent with the national rates where the cesarean section deliveries constitute 46% of all deliveries (World Health Organization Regional Office for the Eastern Mediterranean, 2018a). Only one study included in a previous systematic review (Balogun et al., 2015) has found that c-section was a barrier to EBF, however, the EBF was until two months postpartum, and the country was a low income country (Chandrashekhar et al., 2007). On the other hand, five studies included in another systematic review (Mangrio et al., 2017) have concluded that c-section was a barrier to EBF, of different durations, nine weeks (Hauck et al., 2011), three months (Oakley et al., 2014) or six

months (Agboado et al., 2010, Ayton et al., 2015, Brown and Jordan, 2013) postpartum, however, in developed countries.

This study did not detect a statistically significant association between EBF until six months postpartum and the pediatrician gender. Only one previous study conducted in Lebanon, which had different criteria, such as not taking into account the infant solid food intake, and exploring only the first four months after birth, the paediatrician being a female were positively associated with breastfeeding (Al-Sahab et al., 2008). This same study was included in the systematic review conducted by Balogun et al. (2015) and was the only study that found the pediatrician gender a determinant of EBF. No study included in the systematic review (Mangrio et al., 2017) has found the pediatrician gender as a determinant of EBF until six months postpartum. Further studies could be conducted to explore this factor.

Moreover, no statistically significant association was determined between EBF until six months postpartum and maternal age, and this was not very surprising. As illustrated in the literature review chapter, only two studies have found that maternal age affected exclusive breastfeeding until six months postpartum in middle-income countries, and the findings were conflicting. Two studies found that the younger the mother, the more she EBF (Al Ghwass and Ahmed, 2011, Perera et al., 2012), whereas a third study concluded that the older the mother is, the more she EBF (Cavalcanti et al., 2015). In a review that included quantitative studies conducted worldwide, the maternal young age was reported as a barrier of EBF in five different studies (Mangrio et al., 2017).

One unanticipated finding of this study was that having a Lebanese nationality is a barrier to EBF until six months postpartum in Lebanon. The participants that decided to enroll in the study were from 22 nationalities (listed in detail in the previous chapter). As shown in the literature review chapter, nationality, as a determinant, has not been previously found to be associated with EBF until six months postpartum. However, this finding broadly supports the work of other studies in this area, linking racial

and ethnic disparities with breastfeeding. A review covering this topic in the USA (Jones et al., 2015) determined that there were discrepancies in breastfeeding practices between races and ethnicities in one country. Nevertheless, as illustrated in the introduction chapter, Lebanon has been lagging in the rates of EBF compared to other countries: 27% compared to 47% in developing countries and 38% worldwide (UNICEF, 2015). Moreover, according to the World Breastfeeding Trends Initiative and the World Health Organisation (WBTI, 2010, WHO et al., 2016). Lebanon has not adequately implemented the laws that will empower EBF until six months postpartum, such as the law 47/2008 for "Organizing the Marketing of Infant and Young Child Feeding Products and Tools" (WHO, 2008), which in turn impacts the citizens behaviours.

In addition to the previous factors, and after adjusting for confounding variables, the following practices were considered facilitators of EBF until six months postpartum: the mother having the baby's crib kept by her bedside at the hospital, and the mother not being offered a free formula sample at the hospital. This finding is consistent with the WHO recommendations to attain successful breastfeeding (World Health Organization, 2018b), where practising rooming-in, respecting the "International Code of Marketing of Breast-Milk Substitutes" and refraining from offering milk substitutes at the hospitals (World Health Organization, 1981) should be implemented. As illustrated in the introduction chapter, only 9% of the Lebanese hospitals are deemed "baby-friendly hospitals"[12] (Labbok, 2012). Besides, even though Lebanon implemented the Law 47/2008 for "Organizing the Marketing of Infant and Young Child Feeding Products and Tools" in 2008 (WHO, 2008), the knowledge, education, and communication policies are not satisfactorily implemented (WBTI, 2010). Furthermore, the criteria for the monitoring mechanism are not independent, nor transparent, nor free from commercial influence (WHO et al., 2016). As a matter of fact, there is a divide between the

[12] "Baby-Friendly Hospital Initiative (BFHI) was launched in 1991 following the Innocenti Declaration call for all hospitals to practice the Ten Steps, as ''Operational Target 2: Ensure that every facility providing maternity services fully practises all 10 of the 'Ten Steps to Successful Breastfeeding'.'" LABBOK, M. H. (2012). Global baby-friendly hospital initiative monitoring data: update and discussion. *Breastfeeding Medicine,* 7**,** 210-222.

breastfeeding policies endorsement and application, in addition to a frail engagement of professional organisations, as well as an important influence of the breast milk substitute industry (Akik et al., 2017). The issues were broadly related to the absence of implementation of the law 47/2008, lack of publicizing the law, lack of financial backing in the MoPH, the conflict of interest of some health professionals who are getting incentives from the formula milk companies, the presence of the Syrian refugees in Lebanon shifted the priorities in resource allocations (Akik et al., 2017). This shows that improving the situation and implementing the policies will lead to an improvement in the rates of EBF until six months postpartum.

In this study, the mean (±SD) duration of exclusive breastfeeding was 4.63 ± 2.253 months and the prevalence of exclusive breastfeeding until 6 months after birth was 37.7%,which is higher than the 27% rate reported by UNICEF (UNICEF, 2015). The findings of this study may be due to various reasons. One of them is the fact that the women who decided to partake in this survey were most likely interested or educated in matters relating to maternal and child health, and in breastfeeding particularly. Besides, this may be due to the fact that in the recent past, several events in the country contributed to raising awareness about breastfeeding. As a matter of fact, the Ministry of Public Health (World Health Organization Regional Office for the Eastern Mediterranean, 2018c) initiated a campaign in 2015, on the other hand, the NGO Lactica was founded in 2014 (Lactica, 2014), as well as Facebook groups such as (Breastfeeding in Lebanon, 2011) (Mama 2 mama Beirut, 2011) which may all have contributed to the greater awareness of the importance of breastfeeding in Lebanon.

Taken together, the findings of this research have shown that the determinants of EBF until six months postpartum encompassed the three levels of the ecological model. At the individual level: the mother having prenatal plans, having an opinion regarding the distribution of free formula samples at the hospitals. At the relationship level: the importance of breastfeeding in the partner's opinion according to the mother the mother's father living in the same household when the child was between zero and

six months. At the community level: the nationality, keeping the baby's crib by the mother's bedside, the mother being offered a free formula sample.

Recommendation for research

This research has provided many questions in need of further investigation. A natural progression of this work is to explore the provision of information and raising the awareness of the importance of breastfeeding to the fathers of the mothers on EBF. Furthermore, even though there was no statistical significant relationship between EBF until six months and the housekeepers' presence and involvement with the children, the fact that most of the housekeepers were involved in child care raises important issues and could be usefully explored in further research. Moreover, investigating this area of research through a qualitative lens will lead to an increase in the richness of the data, the understanding of humans' perceptions, and the validity of the findings. Considering the high rate of c-section performed in Lebanon, it would be interesting to investigate the impact of the c-section on skin-to-skin in Lebanon, this would be a fruitful area for further work. Moreover, given the recent increase in support groups for breastfeeding in Lebanon, further research could be conducted to determine the source of information the mother receives or whether the information she receives from these support groups have any impact on their breastfeeding practices.

Recommendation for practice and policy

An improvement in practices generally necessitates clear, effective guidelines and policies that encompass the breastfeeding facilitators, as well as a helpful environment. As such, the baby-friendly practices should be reinforced, besides, all the hospitals should abide by the "Baby-Friendly Hospital Initiative" (BFHI) and provide the appropriate training for the staff dealing with maternal and child health. The findings of this study provide further information for the development of public policies in Lebanon to promote and support EBF. Ensuring appropriate systems, services and support for breastfeeding, targeting mothers and their families should be a priority for the stakeholders, policy-

makers and experts. The government and health care policy-makers should reinforce the implementation of the existing law that prohibits offering the formula for the mothers in the hospitals after delivery. The hospitals should review and modify their policies such as the guidelines related to keeping the baby's crib by the mother's side after delivery, in addition to fully adopting the "Baby-Friendly Hospital Initiative" (BFHI) policies. The guidelines should be regularly communicated to the hospital personnel as well as the mothers and families. The importance of EBF to the woman should be strengthened. Providing her with the proper information will lead to her empowerment and in turn to her taking the right decisions in regards to her infant feeding. Furthermore, the importance of EBF to mother's family members should be emphasised. In particular, to the mother's father and the mother's husband, as these two family members seem to influence the breastfeeding practices. For instance, awareness campaigns such as mass media campaigns addressing the importance of breastfeeding could be undertaken as these have been shown to produce a positive change in various health practices and behaviours (Wakefield et al., 2010, Snyder, 2007, Schroy et al., 2008). In particular, breastfeeding social marketing, adopting the social-ecological model and targeting the family, would have a positive impact on breastfeeding practices, as previously shown by Pérez-Escamilla (2012).

Study strengths

This study involved notable strengths. One strength of the study is using and explicitly stating the WHO exact definition of exclusive breastfeeding in the questionnaire: exclusive breastfeeding refers to when the baby is solely fed breast milk and no other food or drink or water (WHO, 2015), as evidence suggests that mothers do not generally understand or correctly define EBF (Still et al., 2017). As illustrated in the literature review chapter, no research has previously explored the association between EBF until six months postpartum and socio-demographic factors using social media as a recruitment factor and an electronic questionnaire accessible to mothers across a country. To date, this is the first study conducted in a low and middle-income setting that used this methodology. In Lebanon, to the best of my knowledge, one study conducted in 2008, covering the migration of nurses, used an

electronic questionnaire that was sent to the participants by email (El-Jardali et al., 2008). As mentioned previously, the internet is a rewarding area for undertaking survey research in wide ranges of disciplines (Wright, 2005). Online surveys provide many advantages over conventional surveys, such as reaching subjects in remote sites, the capacity of reaching hard to contact individuals, and the suitability of the automated data collection, which in turn minimise the time and effort for the researcher (Wright, 2005). As a matter of fact, this study was able to reach participants from all the geographical areas of the country, particularly through the Facebook page that was created for the study. The Facebook posts were delivered to a large audience, and the study successfully covered residents of 22 nationalities across the Lebanese territory. In addition, many mothers were reached via the organisations which agreed to post about the study, from health care centres, to daycare centres, to Facebook groups which were localized across the regions in Lebanon. Mothers from every governorate in Lebanon filled the survey. The geographical distribution of the participants was: Mount-Lebanon (42.5%), Beirut (30.7%), North (9.3%), South (7.4%), Beqaa (4.4%), Nabatiye (3.2%), Baalbek-Hermel (1.4%) and Akkar (1.1%) and can be comparable to the geographical demographic density in Lebanon. Indeed, Mount-Lebanon governorate is home for the largest share of the population (City Population, 2017). The study sample size was large, and compared to the literature, it included a larger sample than around 80% of the quantitative studies extracted in the literature review chapter (Cavalcanti et al., 2015, Gogoi et al., 2015, Matias et al., 2012, Karande and Perkar, 2012, Arya et al., 2015, Suresh et al., 2014, Noughabi et al., 2013, Perera et al., 2012, Sasaki et al., 2010, Samuel et al., 2012, Firouzbakht et al., 2017). Furthermore, in this study, many variables were collected and were computed in the analysis as confounders.

Study challenges

Some challenges were anticipated, as mentioned in the methods chapter. There was a possibility that the sample of the participants may be limited in representativeness and generalizability to the whole population or other settings worldwide, and biased to excluding people not having access to the

internet, however, the rate of internet users in Lebanon is 80.4% (IWS, 2015) and comparable to high-income countries such as the USA, where 87% of adults use the internet (PRC, 2015). Other challenges anticipated were the low response rates (Bryman, 2012). To minimise the low response rate issue, multiple reminders were posted frequently (Granello and Wheaton, 2004). Nevertheless, the response rate in this study could not be computed given that the questionnaire link was posted online and could be accessed to all, so it is reasonably impossible to know who came across the link and chose not to fill the survey. Previous studies, included in the literature review, followed other methodologies, where the participants were approached to fill out the questionnaire such as (Noughabi et al., 2013, Perera et al., 2012, Sasaki et al., 2010, Qiu et al., 2010, Gogoi et al., 2015, Vieira et al., 2014), therefore the response rate could be calculated. Additionally, to overcome technical challenges, a simple questionnaire format and design, easily downloadable, was used (Granello and Wheaton, 2004). Moreover, as I have previously acknowledged in the 'theoretical framework and paradigm' chapter, one of the drawbacks of a positivist approach is the scarcity of the richness of the data, the understanding of humans' perceptions, and the validity. Despite being more inclined towards to the positivist paradigm, I recognise that these would be better reached by adapting the interpretive paradigm. However, including such a large sample and covering all the Lebanese territory would have been impossible following the interpretive paradigm. The children were aged 13 months on average, therefore recall bias could be considered a limitation in this study. The highly educated sample of participants may have biased the results and contributed to the limitations of this research towards finding a statistical significance of some factors in bivariate or multivariate analyses.

Organisations administrators

One of the challenges faced during the data collection was the contact frequency with the organisations' administrators, in fact, the administrators were contacted several times. First, by email, second, for most of them, this was followed up by a phone call, as many did not reply to emails from an unknown sender, suspecting a virus or hacker. Subsequently, I had to contact them by phone to

verbally inform them about the study, and send the official information by email again. Eventually, phone calls and emails messages were sent frequently as kind reminders for the administrators to send back the signed official approval. No study included in the literature chapter has addressed this challenge.

Another challenge encountered was the administrators' official signature of the approval document. Most of the administrators who were approached had initially approved. Nonetheless, after several reminders for the official document signature, many ignored me, and two of the ones that had emailed me initially saying yes, mentioned afterwards that "they were not comfortable in signing any paper". Therefore, in this country, a written "yes" confirmation by email or verbal "yes" confirmation by phone, is easily granted. On the other hand, asking for a signed formal document seems to be a drawback. This is a critical issue to consider for future research in this country, as this society may not be used to similar strict ethical procedures, and may find them threatening, which may ultimately lead to fewer respondents.

An additional challenge encountered as well was the fact that many organisations had a Facebook page and not a Facebook group. In this instance, only the administrator of the page was allowed to post on the Facebook page. So the administrators of the Facebook pages had to be reminded every two weeks to post the study announcement, at times, it seemed this could be a burden, so this affected the frequency of the posting. However, in regards to the Facebook groups, any individual could post on the group, anytime.

Questionnaire design

Some mothers answered "No" to individual questions in the consent form (Please refer to Appendix 12), and a final "Yes" to the last point of participating in the study. These participants were removed from the total pool of questionnaires collected. The Lancaster University Ethics committee (Lancaster University, 2019) advises to have several individual questions in the consent form; however, on

reflection, fewer detailed questions must be included in the consent form, given that including many details may be daunting and comes at the detriment of losing participants. Future researchers should consider designing the questionnaire in a way for the participant to click on a Yes or a No instead of typing it, and if a No is selected, the survey will basically be terminated. This will enable: only the respondents who consented to all the statements to be retained, a reduction in typing errors while writing yes and no, and a decrease in researcher time spent on checking all the answers and the typing errors of the consent form questions.

Questionnaire content

It was evident that some of the topics were sensitive, such as the issues of income and money (Argyle and Furnham, 2013, Furnham, 2014), particularly in this region (Peacenews, 2018). In order not to receive blank replies and, in turn, a low response rate because of including the sensitive variable "income", this variable was deliberately omitted from the survey. Although the religion variable was sensitively worded, it generated some unanticipated replies from the participants. In response to the question on religion (Please refer to the questionnaire, question 19) three mothers added comments in regards to the variable religion, and I quote:

"dont want to answer", "I won't answer because i don't think it may change any thing in the survey", "Non of your business, especially that I don't know the objective behind this research yet I am helping you out".

Indeed, religion has always been a sensitive topic to discuss in Lebanon (Cerván, 2011). Other factors were deliberately omitted from the survey to shorten the length of the questionnaire, to accommodate the fact that the participants were mothers with a busy schedule, not to lose any participants and receive incomplete questionnaires.

Conclusion

The present research aimed to identify the association between demographic, social and cultural factors with exclusive breastfeeding for the six months postpartum in Lebanon.

This research adds to the existing body of knowledge of the determinants of EBF until six months postpartum by exploring certain factors for the first time. As a matter of fact, this is the first study conducted in low and middle-income settings to explore the maternal attitudes and opinions regarding feeding practices and their association with EBF until six months. One of the more novel findings to emerge from this study is that, in a middle-income country, exclusive breastfeeding until 6 months postpartum is associated with the mother's opinion about formula distribution at the hospitals, the mother's father living in the same household, as well as being Lebanese. In spite of not finding a statistically significant association between the housekeeper presence and involvement in childcare with EBF until six months postpartum, the majority of the housekeepers were found to be involved in child care.

This study has shown that exclusive breastfeeding until six months postpartum is positively associated with having a prenatal plan to breastfeed, with the mother disagreeing that free formula samples should be distributed to the mothers after delivery at the hospital, with having the baby's crib kept by the mother's bedside at the hospital, with not being offered a free formula sample at the hospital, with the mothers' partners perceiving breastfeeding as very important, with not having the mother's father living in the same household besides the partner and children when the child was between zero and six months and being non-Lebanese.

This is the first cross-sectional study regarding breastfeeding conducted using an online methodology, covering all the Lebanese territory, and using social media as a recruitment channel. The generalizability of these results is subject to certain limitations, as the sample of participants cannot be representative of the whole country or to other contexts worldwide.

Some challenges in regards to conducting this research in Lebanon were related to the ethical procedures. On the one side, the detailed ethics consent form provided to the participants, which contained many detailed questions and confirmations came to the detriments of losing some participants. On the other side, the requested official signed approval letters of the administrators ultimately led to losing some respondents, as some administrators had already approved, but then opted for not signing a paper, due to not feeling at ease with signing documents, or probably not to waste more time and effort. Other challenges relate to addressing some sensitive issues, such as religion.

A natural progression of this research is to explore the provision of information and raising the awareness of the importance of breastfeeding to the fathers of the mothers on EBF. Furthermore, even though there was no statistically significant relationship between EBF until six months and the housekeepers' presence and involvement with the children, the fact that most of the housekeepers were actively involved in childcare in Lebanon raises important issues and could be usefully explored in further research. Moreover, investigating this area of research using a qualitative methodology will increase the richness of the data, the understanding of humans' perceptions, and the validity of the findings. The baby-friendly practices should be reinforced, besides, all the hospitals should abide by the "Baby-Friendly Hospital Initiative" (BFHI) and provide the appropriate training for the staff dealing with maternal and child health. Additionally, the importance of EBF to mother's family members should be emphasised. For instance, awareness campaigns such as mass media campaigns and social marketing addressing the importance of breastfeeding, while adapting the social-ecological model and targeting the family, will have a positive impact on breastfeeding practices. The findings of this study may provide further information for the development of public policies in Lebanon to promote and support EBF. The government should reinforce the existing law that prohibits offering the formula for the mothers in the hospitals after delivery. The hospitals should review and modify their

policies in addition to fully adopt the “Baby-Friendly Hospital Initiative” (BFHI) policies, in particular to the policies regarding keeping the baby’s crib by the mother’s bedside after delivery.

Appendices

Appendix 1. Search strategy: Pubmed database example

"breast feeding" [MeSH] OR breastfeeding OR "breast feeding" OR breast-fed OR "breast fed" OR breastfed	AND	*factor OR factors OR determinant OR determinants OR facilitator OR facilitators OR constraint OR constraints OR barrier OR barriers OR predictor OR predictors*	AND	"developing countries" [MeSH] OR "developing countr*" OR "middle income country" OR "middle income countries" OR "developing nations" OR "developing nation" OR "LOWER MIDDLE INCOME ECONOMIES" OR "UPPER MIDDLE INCOME ECONOMIES" OR ALBANIA OR ALGERIA OR "AMERICAN SAMOA" OR ANGOLA OR ARGENTINA OR ARMENIA OR AZERBAIJAN OR BANGLADESH OR BELARUS OR BELIZE OR BHUTAN OR BOLIVIA OR "BOSNIA AND HERZEGOVINA" OR BOTSWANA OR BRAZIL OR BULGARIA OR "CABO VERDE" OR CAMBODIA OR CAMEROON OR CHINA OR COLOMBIA OR "COSTA RICA" OR "COTE D'IVOIRE" OR CUBA OR DJIBOUTI OR DOMINICA OR "DOMINICAN REPUBLIC" OR ECUADOR OR EGYPT OR "EL SALVADOR" OR "EQUATORIAL GUINEA" OR FIJI OR GABON OR GEORGIA OR GHANA OR GRENADA OR GUATEMALA OR GUYANA OR HONDURAS OR INDIA OR INDONESIA OR "IRAN" OR IRAQ OR JAMAICA OR JORDAN OR KAZAKHSTAN OR KENYA OR KIRIBATI OR KOSOVO OR "KYRGYZ REPUBLIC" OR "LAO" OR LEBANON OR LESOTHO OR LIBYA OR "MACEDONIA" OR MALAYSIA OR MALDIVES OR "MARSHALL ISLANDS" OR MAURITANIA OR MAURITIUS OR MEXICO OR "MICRONESIA" OR MOLDOVA OR MONGOLIA OR MONTENEGRO OR MOROCCO OR MYANMAR OR NAMIBIA OR NICARAGUA OR NIGERIA OR PAKISTAN OR PALAU OR PANAMA OR "PAPUA NEW GUINEA" OR PARAGUAY OR PERU OR PHILIPPINES OR ROMANIA OR "RUSSIAN FEDERATION" OR SAMOA OR "SAO TOME AND PRINCIPE" OR SERBIA OR "SOLOMON ISLANDS" OR "SOUTH AFRICA" OR "SRI LANKA" OR "ST. LUCIA" OR "ST. VINCENT AND THE GRENADINES" OR SUDAN OR SURINAME OR SWAZILAND OR "SYRIA" OR TAJIKISTAN OR THAILAND OR "TIMOR-LESTE" OR TONGA OR TUNISIA OR TURKEY OR TURKMENISTAN OR TUVALU OR UKRAINE OR UZBEKISTAN OR VANUATU OR VENEZUELA OR VIETNAM OR "WEST BANK AND GAZA" OR YEMEN OR ZAMBIA

Appendix 2. Search strategy: CINAHL database example

"breast feeding" OR (MM "breast feeding") OR (TI "breast feeding") OR (AB "breast feeding") OR breastfeeding OR (MM breastfeeding) OR (TI breastfeeding) OR (AB breastfeeding) OR "breast-fed" OR (MM "breast-fed") OR (TI "breast-fed") OR (AB "breast-fed") OR "breast fed" OR (MM	AND	*Factor OR (MM factor) OR (TI factor) OR (AB factor) OR factors OR (MM factors) OR (TI factors) OR (AB factors) OR determinant OR (MM determinant) OR (TI determinant) OR(AB determinant) OR determinants OR (MM determinants) OR (TI determinants) OR(AB determinants) OR facilitator OR (MM facilitator) OR (TI facilitator) OR (AB facilitator) OR facilitators OR (MM facilitators) OR (TI facilitators) OR (AB facilitators) OR constraint OR (MM constraint) OR (TI constraint) OR (AB*	AND	"developing countries" OR (MM "developing countries") OR (TI "developing countries) OR (AB "developing countries") OR "developing countr*" OR (MM "developing countr*") OR (TI "developing countr*") OR (AB "developing countr*") OR "middle income country" (MM "middle income country") OR (TI "middle income country") OR (AB "middle income country") OR "middle income countries" OR (MM "middle income countries") OR (TI "middle income countries") OR (AB "middle income countries") OR "developing nations" OR (MM "developing nations") OR (TI "developing nations") OR (AB "developing nations") OR "developing nation" OR (MM "developing nation") OR (TI "developing nation") OR (AB "developing nation") OR "lower middle income economies" OR (MM "lower middle income economies") OR (TI "lower middle income economies") OR (AB "lower middle income economies") OR " lower middle income economy" OR (MM "lower middle income economy") OR (TI "lower middle income economy") OR (AB "lower middle income economy") OR "upper middle income economies" OR (MM "upper middle income economies") OR (TI "upper middle income economies") OR (AB "upper middle income economies") OR "upper middle income economy" OR (MM "upper middle income economy") OR (TI "upper middle income economy") OR (AB "upper middle income economy") OR ALBANIA OR ALGERIA OR "AMERICAN SAMOA" OR ANGOLA OR ARGENTINA OR ARMENIA OR AZERBAIJAN OR BANGLADESH OR BELARUS OR BELIZE OR BHUTAN OR BOLIVIA OR "BOSNIA AND HERZEGOVINA" OR BOTSWANA OR BRAZIL OR BULGARIA OR "CABO VERDE" OR CAMBODIA OR CAMEROON OR CHINA OR COLOMBIA OR "COSTA RICA" OR "COTE D'IVOIRE" OR CUBA OR DJIBOUTI OR DOMINICA OR "DOMINICAN REPUBLIC" OR ECUADOR OR EGYPT OR "EL SALVADOR" OR "EQUATORIAL GUINEA" OR FIJI OR GABON OR GEORGIA OR GHANA OR GRENADA OR GUATEMALA OR GUYANA OR HONDURAS OR INDIA OR INDONESIA OR "IRAN" OR IRAQ OR JAMAICA OR JORDAN OR KAZAKHSTAN OR KENYA OR KIRIBATI OR KOSOVO OR "KYRGYZ REPUBLIC" OR "LAO" OR LEBANON OR LESOTHO OR LIBYA OR "MACEDONIA" OR MALAYSIA OR MALDIVES OR "MARSHALL ISLANDS" OR MAURITANIA OR MAURITIUS OR MEXICO OR "MICRONESIA" OR MOLDOVA OR MONGOLIA OR MONTENEGRO OR

"breast fed") OR (TI "breast -fed") OR (AB "breast -fed") OR breastf ed OR (MM breastf ed) OR (TI breastf ed) OR (AB breastf ed)		*constraint) OR constraints OR (MM constraints) OR (TI constraints) OR (AB constraints) OR barrier OR (MM barrier) OR (TI barrier) OR (AB barrier) OR barriers OR (MM barriers) OR (TI barriers) OR (AB barriers) OR predictor OR (MM predictor) OR (TI predictor) OR (AB predictor) OR predictors OR (MM predictors) OR (TI predictors) OR (AB predictors)*		MOROCCO OR MYANMAR OR NAMIBIA OR NICARAGUA OR NIGERIA OR PAKISTAN OR PALAU OR PANAMA OR "PAPUA NEW GUINEA" OR PARAGUAY OR PERU OR PHILIPPINES OR ROMANIA OR "RUSSIAN FEDERATION" OR SAMOA OR "SAO TOME AND PRINCIPE" OR SERBIA OR "SOLOMON ISLANDS" OR "SOUTH AFRICA" OR "SRI LANKA" OR "ST. LUCIA" OR "ST. VINCENT AND THE GRENADINES" OR SUDAN OR SURINAME OR SWAZILAND OR "SYRIA" OR TAJIKISTAN OR THAILAND OR "TIMOR-LESTE" OR TONGA OR TUNISIA OR TURKEY OR TURKMENISTAN OR TUVALU OR UKRAINE OR UZBEKISTAN OR VANUATU OR VENEZUELA OR VIETNAM OR "WEST BANK AND GAZA" OR YEMEN OR ZAMBIA

Appendix 3. Search strategy: Academic Search Complete database example

"breast feeding" OR (SU "breast feeding") OR (TI "breast feeding") OR (AB "breast feeding") OR breastfeeding OR (SU breastfeeding) OR (TI breastfeeding) OR (AB breastfeeding) OR "breast-fed" OR (SU "breast-fed") OR (TI "breast-fed") OR (AB "breast-fed") OR "breast fed"	AND	*Factor OR (SU factor) OR (TI factor) OR (AB factor) OR factors OR (SU factors) OR (TI factors) OR (AB factors) OR determinant OR (SU determinant) OR (TI determinant) OR(AB determinant) OR determinants OR (SU determinants) OR (TI determinants) OR(AB determinants) OR facilitator OR (SU facilitator) OR (TI facilitator) OR (AB facilitator) OR facilitators OR (SU facilitators) OR (TI facilitators) OR (AB facilitators) OR constraint OR (SU constraint)*	AND	"developing countries" OR (SU "developing countries") OR (TI "developing countries) OR (AB "developing countries") OR "developing country" OR (SU "developing country") OR (TI "developing country") OR (AB "developing country") OR "middle income country" OR (SU "middle income country") OR (TI "middle income country") OR (AB "middle income country") OR "middle income countries" OR (SU "middle income countries") OR (TI "middle income countries") OR (AB "middle income countries") OR "developing nations" OR (SU "developing nations") OR (TI "developing nations") OR (AB "developing nations") OR "developing nation" OR (SU "developing nation") OR (TI "developing nation") OR (AB "developing nation") OR "lower middle income economies" OR (SU "lower middle income economies") OR (TI "lower middle income economies") OR (AB "lower middle income economies") OR " lower middle income economy" OR (SU "lower middle income economy") OR (TI "lower middle income economy") OR (AB "lower middle income economy") OR "upper middle income economies" OR (SU "upper middle income economies") OR (TI "upper middle income economies") OR (AB "upper middle income economies") OR "upper middle income economy" OR (SU "upper middle income economy") OR (TI "upper middle income economy") OR (AB "upper middle income economy") OR ALBANIA OR ALGERIA OR "AMERICAN SAMOA" OR ANGOLA OR ARGENTINA OR ARMENIA OR AZERBAIJAN OR BANGLADESH OR BELARUS OR BELIZE OR BHUTAN OR BOLIVIA OR "BOSNIA AND HERZEGOVINA" OR BOTSWANA OR BRAZIL OR BULGARIA OR "CABO VERDE" OR CAMBODIA OR CAMEROON OR CHINA OR COLOMBIA OR "COSTA RICA" OR "COTE D'IVOIRE" OR CUBA OR DJIBOUTI OR DOMINICA OR "DOMINICAN REPUBLIC" OR ECUADOR OR EGYPT OR "EL SALVADOR" OR "EQUATORIAL GUINEA" OR FIJI OR GABON OR GEORGIA OR GHANA OR GRENADA OR GUATEMALA OR GUYANA OR HONDURAS OR INDIA OR INDONESIA OR "IRAN" OR IRAQ OR JAMAICA OR JORDAN OR KAZAKHSTAN OR KENYA OR KIRIBATI OR KOSOVO OR "KYRGYZ REPUBLIC" OR "LAO" OR LEBANON OR LESOTHO OR LIBYA OR "MACEDONIA" OR MALAYSIA OR MALDIVES OR

OR (SU "breast fed") OR (TI "breast -fed") OR (AB "breast -fed") OR breastfed OR (SU breastfed) OR (TI breastfed) OR (AB breastfed)		*OR (TI constraint) OR (AB constraint) OR constraints OR (SU constraints) OR (TI constraints) OR (AB constraints) OR barrier OR (SU barrier) OR (TI barrier) OR (AB barrier) OR barriers OR (SU barriers) OR (TI barriers) OR (AB barriers) OR predictor OR (SU predictor) OR (TI predictor) OR (AB predictor) OR predictors OR (SU predictors) OR (TI predictors) OR (AB predictors)*		"MARSHALL ISLANDS" OR MAURITANIA OR MAURITIUS OR MEXICO OR "MICRONESIA" OR MOLDOVA OR MONGOLIA OR MONTENEGRO OR MOROCCO OR MYANMAR OR NAMIBIA OR NICARAGUA OR NIGERIA OR PAKISTAN OR PALAU OR PANAMA OR "PAPUA NEW GUINEA" OR PARAGUAY OR PERU OR PHILIPPINES OR ROMANIA OR "RUSSIAN FEDERATION" OR SAMOA OR "SAO TOME AND PRINCIPE" OR SERBIA OR "SOLOMON ISLANDS" OR "SOUTH AFRICA" OR "SRI LANKA" OR "ST. LUCIA" OR "ST. VINCENT AND THE GRENADINES" OR SUDAN OR SURINAME OR SWAZILAND OR "SYRIA" OR TAJIKISTAN OR THAILAND OR "TIMOR-LESTE" OR TONGA OR TUNISIA OR TURKEY OR TURKMENISTAN OR TUVALU OR UKRAINE OR UZBEKISTAN OR VANUATU OR VENEZUELA OR VIETNAM OR "WEST BANK AND GAZA" OR YEMEN OR ZAMBIA

Appendix 4. Search strategy: PsycINFO database example

"breast feeding" OR (MA "breast feeding") OR (TI "breast feeding") OR (AB "breast feeding") OR breastfeeding OR (MA breastfeeding) OR (TI breastfeeding) OR (AB breastfeeding) OR "breast-fed" OR (MA "breast-fed") OR (TI "breast-fed") OR (AB "breast-fed") OR "breast	AND	*Factor OR (MA factor) OR (TI factor) OR (AB factor) OR factors OR (MA factors) OR (TI factors) OR (AB factors) OR determinant OR (MA determinant) OR (TI determinant) OR(AB determinant) OR determinants OR (MA determinants) OR (TI determinants) OR(AB determinants) OR facilitator OR (MA facilitator) OR (TI facilitator) OR (AB facilitator) OR facilitators OR (MA facilitators) OR (TI facilitators) OR (AB facilitators) OR constraint OR (MA*	AND	"developing countries" OR (MA "developing countries") OR (TI "developing countries) OR (AB "developing countries") OR "developing countr*" OR (MA "developing countr*") OR (TI "developing countr*") OR (AB "developing countr*") OR "middle income country" OR (MA "middle income country") OR (TI "middle income country") OR (AB "middle income country") OR "middle income countries" OR (MA "middle income countries") OR (TI "middle income countries") OR (AB "middle income countries") OR "developing nations" OR (MA "developing nations") OR (TI "developing nations") OR (AB "developing nations") OR "developing nation" OR (MA "developing nation") OR (TI "developing nation") OR (AB "developing nation") OR "lower middle income economies" OR (MA "lower middle income economies") OR (TI "lower middle income economies") OR (AB "lower middle income economies") OR " lower middle income economy" OR (MA "lower middle income economy") OR (TI "lower middle income economy") OR (AB "lower middle income economy") OR "upper middle income economies" OR (MA "upper middle income economies") OR (TI "upper middle income economies") OR (AB "upper middle income economies") OR "upper middle income economy" OR (MA "upper middle income economy") OR (TI "upper middle income economy") OR (AB "upper middle income economy") OR ALBANIA OR ALGERIA OR "AMERICAN SAMOA" OR ANGOLA OR ARGENTINA OR ARMENIA OR AZERBAIJAN OR BANGLADESH OR BELARUS OR BELIZE OR BHUTAN OR BOLIVIA OR "BOSNIA AND HERZEGOVINA" OR BOTSWANA OR BRAZIL OR BULGARIA OR "CABO VERDE" OR CAMBODIA OR CAMEROON OR CHINA OR COLOMBIA OR "COSTA RICA" OR "COTE D'IVOIRE" OR CUBA OR DJIBOUTI OR DOMINICA OR "DOMINICAN REPUBLIC" OR ECUADOR OR EGYPT OR "EL SALVADOR" OR "EQUATORIAL GUINEA" OR FIJI OR GABON OR GEORGIA OR GHANA OR GRENADA OR GUATEMALA OR GUYANA OR HONDURAS OR INDIA OR INDONESIA OR "IRAN" OR IRAQ OR JAMAICA OR JORDAN OR KAZAKHSTAN OR KENYA OR KIRIBATI OR KOSOVO OR "KYRGYZ REPUBLIC" OR "LAO" OR LEBANON OR LESOTHO OR LIBYA OR

fed" OR (MA "breast fed") OR (TI "breast -fed") OR (AB "breast -fed") OR breastf ed OR (MA breastf ed) OR (TI breastf ed) OR (AB breastf ed)		*constraint) OR (TI constraint) OR (AB constraint) OR constraints OR (MA constraints) OR (TI constraints) OR (AB constraints) OR barrier OR (MA barrier) OR (TI barrier) OR (AB barrier) OR barriers OR (MA barriers) OR (TI barriers) OR (AB barriers) OR predictor OR (MA predictor) OR (TI predictor) OR (AB predictor) OR predictors OR (MA predictors) OR (TI predictors) OR (AB predictors)*		"MACEDONIA" OR MALAYSIA OR MALDIVES OR "MARSHALL ISLANDS" OR MAURITANIA OR MAURITIUS OR MEXICO OR "MICRONESIA" OR MOLDOVA OR MONGOLIA OR MONTENEGRO OR MOROCCO OR MYANMAR OR NAMIBIA OR NICARAGUA OR NIGERIA OR PAKISTAN OR PALAU OR PANAMA OR "PAPUA NEW GUINEA" OR PARAGUAY OR PERU OR PHILIPPINES OR ROMANIA OR "RUSSIAN FEDERATION" OR SAMOA OR "SAO TOME AND PRINCIPE" OR SERBIA OR "SOLOMON ISLANDS" OR "SOUTH AFRICA" OR "SRI LANKA" OR "ST. LUCIA" OR "ST. VINCENT AND THE GRENADINES" OR SUDAN OR SURINAME OR SWAZILAND OR "SYRIA" OR TAJIKISTAN OR THAILAND OR "TIMOR-LESTE" OR TONGA OR TUNISIA OR TURKEY OR TURKMENISTAN OR TUVALU OR UKRAINE OR UZBEKISTAN OR VANUATU OR VENEZUELA OR VIETNAM OR "WEST BANK AND GAZA" OR YEMEN OR ZAMBIA

Appendix 5. Search strategy: Web of science database example

"breast feeding" OR breastfeeding OR "breast feeding" OR breast-fed OR "breast fed" OR breastfed	AND	*factor OR factors OR determinant OR determinants OR facilitator OR facilitators OR constraint OR constraints OR barrier OR barriers OR predictor OR predictors*	AND	"developing countries" OR "developing countr*" OR "middle income country" OR "middle income countries" OR "developing nations" OR "developing nation" OR "LOWER MIDDLE INCOME ECONOMIES" OR "LOWER MIDDLE INCOME ECONOMY" OR "UPPER MIDDLE INCOME ECONOMIES" OR "UPPER MIDDLE INCOME ECONOMY" OR ALBANIA OR ALGERIA OR "AMERICAN SAMOA" OR ANGOLA OR ARGENTINA OR ARMENIA OR AZERBAIJAN OR BANGLADESH OR BELARUS OR BELIZE OR BHUTAN OR BOLIVIA OR "BOSNIA AND HERZEGOVINA" OR BOTSWANA OR BRAZIL OR BULGARIA OR "CABO VERDE" OR CAMBODIA OR CAMEROON OR CHINA OR COLOMBIA OR "COSTA RICA" OR "COTE D'IVOIRE" OR CUBA OR DJIBOUTI OR DOMINICA OR "DOMINICAN REPUBLIC" OR ECUADOR OR EGYPT OR "EL SALVADOR" OR "EQUATORIAL GUINEA" OR FIJI OR GABON OR GEORGIA OR GHANA OR GRENADA OR GUATEMALA OR GUYANA OR HONDURAS OR INDIA OR INDONESIA OR "IRAN" OR IRAQ OR JAMAICA OR JORDAN OR KAZAKHSTAN OR KENYA OR KIRIBATI OR KOSOVO OR "KYRGYZ REPUBLIC" OR "LAO" OR LEBANON OR LESOTHO OR LIBYA OR "MACEDONIA" OR MALAYSIA OR MALDIVES OR "MARSHALL ISLANDS" OR MAURITANIA OR MAURITIUS OR MEXICO OR "MICRONESIA" OR MOLDOVA OR MONGOLIA OR MONTENEGRO OR MOROCCO OR MYANMAR OR NAMIBIA OR NICARAGUA OR NIGERIA OR PAKISTAN OR PALAU OR PANAMA OR "PAPUA NEW GUINEA" OR PARAGUAY OR PERU OR PHILIPPINES OR ROMANIA OR "RUSSIAN FEDERATION" OR SAMOA OR "SAO TOME AND PRINCIPE" OR SERBIA OR "SOLOMON ISLANDS" OR "SOUTH AFRICA" OR "SRI LANKA" OR "ST. LUCIA" OR "ST. VINCENT AND THE GRENADINES" OR SUDAN OR SURINAME OR SWAZILAND OR "SYRIA" OR TAJIKISTAN OR THAILAND OR "TIMOR-LESTE" OR TONGA OR TUNISIA OR TURKEY OR TURKMENISTAN OR TUVALU OR UKRAINE OR UZBEKISTAN OR VANUATU OR VENEZUELA OR VIETNAM OR "WEST BANK AND GAZA" OR

				YEMEN OR ZAMBIA

Appendix 6. Search strategy: Embase database example

(Emtree subject heading) breast feeding (map) term, *breast feeding OR breastfeeding OR breast feeding OR breast-fed OR breast fed OR breastfed*	AND	*factor OR factors OR determinant OR determinants OR facilitator OR facilitators OR constraint OR constraints OR barrier OR barriers OR predictor OR predictors*	AND	developing countries OR developing country OR middle income country OR middle income countries OR developing nations OR developing nation OR LOWER MIDDLE INCOME ECONOMIES OR LOWER MIDDLE INCOME ECONOMY OR UPPER MIDDLE INCOME ECONOMIES OR UPPER MIDDLE INCOME ECONOMY OR ALBANIA OR ALGERIA OR AMERICAN SAMOA OR ANGOLA OR ARGENTINA OR ARMENIA OR AZERBAIJAN OR BANGLADESH OR BELARUS OR BELIZE OR BHUTAN OR BOLIVIA OR BOSNIA AND HERZEGOVINA OR BOTSWANA OR BRAZIL OR BULGARIA OR CABO VERDE OR CAMBODIA OR CAMEROON OR CHINA OR COLOMBIA OR COSTA RICA OR COTE D'IVOIRE OR CUBA OR DJIBOUTI OR DOMINICA OR DOMINICAN REPUBLIC OR ECUADOR OR EGYPT OR EL SALVADOR OR EQUATORIAL GUINEA OR FIJI OR GABON OR GEORGIA OR GHANA OR GRENADA OR GUATEMALA OR GUYANA OR HONDURAS OR INDIA OR INDONESIA OR IRAN OR IRAQ OR JAMAICA OR JORDAN OR KAZAKHSTAN OR KENYA OR KIRIBATI OR KOSOVO OR KYRGYZ REPUBLIC OR LAO OR LEBANON OR LESOTHO OR LIBYA OR MACEDONIA OR MALAYSIA OR MALDIVES OR MARSHALL ISLANDS OR MAURITANIA OR MAURITIUS OR MEXICO OR MICRONESIA OR MOLDOVA OR MONGOLIA OR MONTENEGRO OR MOROCCO OR MYANMAR OR NAMIBIA OR NICARAGUA OR NIGERIA OR PAKISTAN OR PALAU OR PANAMA OR PAPUA NEW GUINEA OR PARAGUAY OR PERU OR PHILIPPINES OR ROMANIA OR RUSSIAN FEDERATION OR SAMOA OR SAO TOME AND PRINCIPE OR SERBIA OR SOLOMON ISLANDS OR SOUTH AFRICA OR SRI LANKA OR ST LUCIA OR ST VINCENT AND THE GRENADINES OR SUDAN OR SURINAME OR SWAZILAND OR SYRIA OR TAJIKISTAN OR THAILAND OR TIMOR-LESTE OR TONGA OR TUNISIA OR TURKEY OR TURKMENISTAN OR TUVALU OR UKRAINE OR UZBEKISTAN OR VANUATU OR VENEZUELA OR VIETNAM OR WEST BANK AND GAZA OR YEMEN OR ZAMBIA

Appendix 7: Data extraction form (quantitative)

General information:

Study ID:	Data extractor:	Date form completed:
First author:		Publication date:
Author contact details:		
Database and Citation:		
Publication type Journal Article ☐ Abstract ☐ Other (specify e.g. book chapter)_____		
Country of study:		
Funding source of study:		Potential conflict of interest from funding? Y / N / unclear

Study characteristics

Study characteristics	Study criteria	(yes, no, unclear)
Type of study	Experimental study including randomized controlled trials (RCTs) or cluster-randomized trials (CRTs).	
	Quasi-experimental studies including quasi-randomized trials, before-after studies and interrupted time series studies.	
	Observational studies including cohort, case-control and cross-sectional studies.	
	Mixed-methods studies	
Participants and setting	Healthy mothers of healthy infants of at least 6 months old in a middle income country.	
Type of outcome measure	Factors in relation to exclusive breastfeeding at 6 months postpartum.	

Definition of exclusive breastfeeding used		
Types of determinants	maternal age maternal education level maternal employment status marital status family type family income Religion Place of residence Breastfeeding preconception plan Breastfeeding prenatal plan Paternal Breastfeeding attitude as seen by the mother Physician sex Housekeeper presence Type of delivery Maternal opinion about “rooming-in” Maternal opinion about “Skin-to-skin” Maternal opinion about “Free infant formula”	
Other determinants covered		
Results	Quantitative results of the association between determinants of interest and exclusive breastfeeding at 6 months postpartum	
Aim of study / research question		
Start date of data collection		

End date of data collection		
Ethical approval obtained for the study		
Population description		
Setting and context (multicenter, hospital…)		
Inclusion criteria		
Exclusion criteria		
Method of recruitment of participants		
Representativeness of sample: Are participants in the study likely to be representative of the target population?		
Informed consent obtained		
Sample size		
Sample size calculation (what assumptions were made?) Were these assumptions appropriate?		
Clusters *(if applicable, no., type, no. people per cluster)*		
Baseline imbalances *(if applicable)*		
Withdrawals and exclusions		

Missing data		
How is the outcome reported? What tool has been used? (Self or study assessor)		
Is this tool validated?		
…And has it been used as validated?		
Is it a reliable outcome measure?		
Is there adequate power for this outcome?		
Significant association of the determinants with exclusive breastfeeding at 6 months (if yes, is it a barrier or facilitator): maternal age maternal education level maternal employment status marital status family type family income Religion Place of residence Breastfeeding preconception plan Breastfeeding prenatal plan Paternal Breastfeeding attitude as seen by the mother		

Physician sex Housekeeper presence Type of delivery Maternal opinion about "rooming-in" Maternal opinion about "Skin-to-skin" Maternal opinion about "Free infant formula" Other determinants:		
Confounding factors/ effect modifiers accounted for		
Statistical methods used and appropriateness of these methods		
Authors' reported limitations of study's methods/results		
Study limitations		
Key conclusions of study authors		
Correspondence required for further study information, such as missing details of the determinants of interest in the results *(from whom, what and when)*		
Recommendations made by authors		
Scientific quality		

(MMAT)		

Appendix 8: Data extraction form (qualitative)

General information:

Study ID:	Data extractor:	Date form completed:
First author:		Publication date:
Author contact details:		
Database and Citation:		
Publication type Journal Article ☐ Abstract ☐ Other (specify e.g. book chapter)_____		
Country of study:		
Funding source of study:		Potential conflict of interest from funding? Y / N / unclear

Aims of study
Ethics (how ethical issues were addressed, and consent)
Study setting
Theoretical background of study
Definition of exclusive breastfeeding used
Sampling approach
Participant characteristics
Data collection methods
Data analysis approach
Determinants (as barriers or facilitators) in relation to exclusive breastfeeding at 6 months, covered in study:
mother's age
mother's education level
mother's employment status
Marital status
Family type
Family income
religion

Place of residence

Breastfeeding preconception plan

Breastfeeding prenatal plan

Paternal Breastfeeding attitude as seen by the mother

Physician sex

Housekeeper presence

Type of delivery

Maternal opinion about "rooming-in"

Maternal opinion about "Skin-to-skin"

Maternal opinion about "Free infant formula"

Other determinants covered:

Key themes identified in the study	How are findings presented?	verbatim quote	author statement	author statement supported by verbatim quote
Theme 1				
Theme 2				
Theme 3				

Limitations reported by authors

Limitations

Recommendations made by authors

Assessment of study quality (MMAT)

Appendix 9: Summary of study characteristics of the 17 included studies

No	Authors, year	Country	Year of data collection	Participants (n)	Design	Aim/Research question	Facilitators/Barriers	Quality [13]
1	(Cavalcanti et al., 2015)	Brazil	2006	Mothers and infants (*n*=124 cases and 248 controls)	Case-control	To analyze the factors associated with exclusive breastfeeding (EBF) for at least six month, as opposed to weaning up to the second month of life in the state of Pernambuco, Brazil.	mothers aged between 20 – 35 years old EBF more compared to younger mothers, aged less than 20 years old (OR 2.5, 95% CI (1.4 – 4.5) and Mothers who had maternal education of approximately five to eight years of schooling EBF more, in comparison to less years of schooling (OR 2.1; 95%CI (1.2 – 3.6)	50%
2	(Gogoi et al., 2015)	India	2015	Mothers having children 6 months to 2 years of	Cross-sectional (in additi	To assess the prevalence of EBF and to study the factors affecting	mothers being in nuclear families EBF for a	75%

[13] MMAT quality assessment scoring

				age (*n*=105)	on to observation, however, no mention of this in text)	breastfeeding practices in slums of Dibrugarh district.	longer duration than mothers in joint families (Pearson Chi-square 10.38, p = 0.001) and The more educated mothers being in middle school or high school EBF more in comparison to the less educated mothers (Pearson Chi-square: 11.2, P=0.02)	
3	(Matias et al., 2012)	Peru	2005-2006	Post-partum first-time mothers and infants(*n*= 117)	Longitudinal	to identify factors associated with exclusive breastfeeding (EBF) among 117 Peruvian mothers planning to breastfeed exclusively	At 6 months postpartum, maternal employment was associated with a 87% decrease in EBF (AOR = 0.13, 95% CI = 0.00-0.47) and Infant	75%

							birth weight ≥ 3300 g was positively associated with EBF at 6 months postpartum (ARR = 2.18, 95% CI = 1.29-4.37)	
4	(Qiu et al., 2010)	China	2004-2005	Post-partum mothers and infants (*n*=1520)	Prospective cohort	To determine the duration of breastfeeding and associated factors during the first six months postpartum.	The mother returning to work after six months postpartum was a facilitator (HR:1.471 (95% CI 1.204-1.796). residing in a rural area decreased the hazard of cessation of EBF (HR 0.590 95% CI 0.462-0.754).	75%
5	(Karande and Perkar, 2012)	India	2009-2010	Parents with 6-12 months infants (*n*=238)	Cross-sectional	To explore the relationship between maternal and paternal infant feeding attitudes and their impact on the duration on exclusive	higher maternal attitudes scores were associated with EBF for 4-6 months (F=6.580,	50%

						breastfeeding	df = 3 , 234 p<0.001)	
6	(Al Ghwass and Ahmed, 2011)	Egypt	2010	mothers of infants 6-24 months old (*n*=1059)	Cross-sectional	To determine prevalence of exclusive breastfeeding during the first 6 months of life and to identify factors that interfere with this practice in the study area	Mothers aged less than 20 years had higher EBF rates compared to older mothers (OR 2.9 95% CI (1.3,8.3) and the infant's sex being male was a facilitator to EBF OR 2.04 95% CI (1.3-3.2) and mothers having four or more antenatal care visits compared to less than four visits was a facilitator (OR 2.8 % CI (1.8-4.3)) and absence of breastfeeding difficulties was determined as a facilitator	75%

							of EBF (OR 1.8 95 %CI :1.1-2.8)	
7	(Arya et al., 2015)	India	-	mothers of infants 6-24 months of age (*n*=400)	Cross-sectional	To find the proportion of mothers practicing exclusive breastfeeding for 6 months, prevailing breastfeeding practices and influence of socio-cultural factors on breast feeding practices	the literacy level of the mother was negatively associated with the duration of EBF ($p<0.0001$) and Higher socioeconomic status of the mother was correlated with a decreased duration of EBF ($P<0.0001$) Higher EBF rates were correlated with giving birth in an institution ($p<0.001$) and lower EBF rates were correlated with lower number of antenatal care visits ($p<0.001$)	75%
8	(Suresh et al.,	India	2011	mother-newborn	Prospective	To determine the	A nursery stay (<24	75%

	2014)			dyads (*n*=400)	cohort	breastfeeding problems in the 1st postnatal week, their predictors and impact on EBF rate at 6 months	h) after birth was significantly associated with EBF failure (AOR: 2.16, 95% CI: 1.1-4.24)	
9	(Noughabi et al., 2013)	Iran	2011	mothers with 6–24 months infants (*n*=547)	Cross-sectional	To determine the prevalence of exclusive breastfeeding in Tehran, Islamic Republic of Iran in the first 6 months of life, and the factors that influence it	formula supplementation in the hospital negatively affected EBF (OR = 0.41, 95% CI: 0.17–0.95) and Mothers receiving conflicting infant feeding advice negatively affected EBF (OR = 0.53, 95% CI: 0.37–0.78) . Mother's intention to exclusively breastfeed positively affected EBF (OR = 5.85, 95% CI: 2.88–11.9) and an infant	50%

							having first breast contact 6–30 minutes after delivery positively affected EBF (OR = 2.35, 95% CI: 1.17–4.72)	
10	(Samuel et al., 2012)	India	-	Pregnant women in the last trimester of pregnancy (*n*=50)	Prospective observational	To objectively measure rates of breast-feeding to infants born in a baby-friendly hospital in Bangalore, India, and to capture home-based compliance to exclusive breastfeeding (EBF).	,"working outside the home" was related to lower EBF and A crying infant, assuming that this was caused by inadequate milk negatively impacted EBF	50%
11	(Perera et al., 2012)	Sri Lanka	2010	Full-term infants (*n*=500)	Prospective observational	To determine actual exclusive breast feeding rates in a cohort of Sri Lankan children and to determine the reasons that lead to cessation of breastfeeding before six months of age.	Mothers aged less than 30 years had higher EBF rates, compared to women aged over 30 years of age ($p < 0.01$) and mothers starting work was significantly associated with a	75%

							decrease in EBF	
12	(Firouzbakht et al., 2017)	Iran	2014	Post-partum women and infants (*n*=290)	Prospective cohort	To assess the relationship between exposure to environmental cigarette smoke and breastfeeding behaviour.	No factor was found significant	50%
13	(Sasaki et al., 2010)	Cambodia	2005-2006	Mothers with children 6 to 24 months (*n*=343)	Cross-sectional	To investigate the present status of infant feeding practices and identify factors thataffect EBF practices during the first 6 months following infant birth in Phnom Penh, Cambodia.	EBF cessation was positively associated with maternal employment (OR = 4.71, 95% CI = 2.77–8.01, p<0.001) and EBF cessation was positively associated with lack of paternal attendance at breast-feeding classes (OR = 1.93, 95% CI = 1.13–3.28, p<0.05) and EBF cessation was positively associated with the lack of a maternal antenatal EBF plan	50%

							([OR] = 10.01, 95% [CI] = 3.68–27.24, p <0.001)	
14	(Vieira et al., 2014)	Brazil	2004-2005	Post-partum mothers and infants (*n*=1344)	Prospective cohort	To identify factors associated with discontinuation of EBF in a municipality in northeastern Brazil, including variables that have received little or no attention in previous literature.	having a maternal educational level ≤ eight years of schooling had a higher risk of discontinuing EBF (HR 1.34 95% (1.17-1.53) and mother working outside the home (HR1.73 95%CI 1.53-1.95) is associated with a decrease in EBF and higher BF rates are associated with giving birth in a Baby-Friendly Hospital (HR 0.85 95% CI 0.73-0.99) and EBF was	75%

							positively associated with breastfeeding instructions received at the hospital (HR 0.80; 95% CI 0.68-0.92). EBF was associated with prenatal care offered by public services (HR 1.34; 95% CI 1.17-1.55). EBF was associated with the partner's appreciation for breastfeeding ([HR] 0.62; [95% CI] 0.48-0.79). EBF was negatively associated with controlling the number of nighttime feeds at the breast (HR 1.58; 95% CI 1.11-2.23). EBF was negatively associated	

							with the presence of cracked nipples (HR 2.54; 95% CI 2.06-3.13). EBF was negatively associated with the use of a pacifier (HR 1.40; 95% CI 1.14-1.71)	
15	(Sulaiman et al., 2016)	Malaysia	2011	Mothers age 18 and above; working; at least one infant aged between 6-24 months (n=40 women)	qualitative	To describe the enablers and barriers working women experience in continuing breast milk feeding after they return to work postpartum in urban Malaysia.	**Barriers:** Working full-time was not always a barrier, the mother being passionate (towards BF) and, to a lesser degree having intentions (to BF), as suggested in a qualitative study tended to EBF more	75%
16	(Thet et al., 2016)	Myanmar	2014	Mothers being 18–40 years old, with a 6–12 month-old infant. (n=24 mothers, 10 husbands, 10	qualitative	To examine the barriers to exclusive breastfeeding and how different household members participate in decision-making	work was considered a barrier to EBF	75%

				mothers and mothers-in-law)				
17	(Lee et al., 2013)	Lao, PDR	-	24 mothers being 18–40 years old, with a 6–12 month-old infant.	qualitative	To identify the reasons and influences behind the BF decisions of first-time mothers in Lao PDR as well as the role of attitudes, beliefs and experiences in influencing those practices.	Employment was considered a barrier to EBF and EBF was influenced by advice from health staff and the mothers' mothers as well as traditional beliefs, .	75%

Appendix 10: Example quality assessment scoring

Matias 2012 - MMAT

Types of mixed methods study components or primary studies	Methodological quality criteria (see tutorial for definitions and examples)	Responses			
		Yes	No	Can't tell	Comments
Screening questions (for all types)	Are there clear qualitative and quantitative research questions (or objectives*), or a clear mixed methods question (or objective*)?	yes			
	Do the collected data allow address the research question (objective)? E.g., consider whether the follow-up period is long enough for the outcome to occur (for longitudinal studies or study components).	yes			
	Further appraisal may be not feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.				
1. Qualitative	1.1. Are the sources of qualitative data (archives, documents, informants, observations) relevant to address the research question (objective)?				
	1.2. Is the process for analyzing qualitative data relevant to address the research question (objective)?				
	1.3. Is appropriate consideration given to how findings relate to the context, e.g., the setting, in which the data were collected?				
	1.4. Is appropriate consideration given to how findings relate to researchers' influence, e.g., through their interactions with participants?				
2. Quantitative randomized controlled (trials)	2.1. Is there a clear description of the randomization (or an appropriate sequence generation)?				
	2.2. Is there a clear description of the allocation concealment (or blinding when applicable)?				
	2.3. Are there complete outcome data (80% or above)?				
	2.4. Is there low withdrawal/drop-out (below 20%)?				
3. Quantitative nonrandomized	3.1. Are participants (organisations) recruited in a way that minimizes selection bias?			Can't tell	
	3.2. Are measurements appropriate (clear origin, or validity known, or standard instrument; and absence of contamination between groups when appropriate) regarding the exposure/intervention and outcomes?	yes			
	3.3. In the groups being compared (exposed vs. non-exposed; with intervention vs. without; cases vs. controls), are the participants comparable, or do researchers take into account (control for) the difference between these groups?	yes			
	3.4. Are there complete outcome data (80% or above),	yes			

	and, when applicable, an acceptable response rate (60% or above), or an acceptable follow-up rate for cohort studies (depending on the duration of follow-up)?				
4. Quantitative descriptive	4.1. Is the sampling strategy relevant to address the quantitative research question (quantitative aspect of the mixed methods question)?				
	4.2. Is the sample representative of the population understudy?				
	4.3. Are measurements appropriate (clear origin, or validity known, or standard instrument)?				
	4.4. Is there an acceptable response rate (60% or above)?				
5. Mixed methods	5.1. Is the mixed methods research design relevant to address the qualitative and quantitative research questions (or objectives), or the qualitative and quantitative aspects of the mixed methods question (or objective)?				
	5.2. Is the integration of qualitative and quantitative data (or results*) relevant to address the research question (objective)?				
	5.3. Is appropriate consideration given to the limitations associated with this integration, e.g., the divergence of qualitative and quantitative data (or results*) in a triangulation design?				
	Criteria for the qualitative component (1.1 to 1.4), and appropriate criteria for the quantitative component (2.1 to 2.4, or 3.1 to 3.4, or 4.1 to 4.4), must be also applied.				

*These two items are not considered as double-barreled items since in mixed methods research, (1) there may be research questions (quantitative research) or research objectives (qualitative research), and (2) data may be integrated, and/or qualitative findings and quantitative results can be integrated

Score: 75%

Appendix 11: Participation Information Sheet in English

My name is Nadine Zablith and I am conducting this research as a student in the PhD programme in Public Health at Lancaster University, Lancaster, United Kingdom.

What is the study about?
The purpose of this study is to explore the factors that are related with infant feeding in Lebanon from the time the child is born until he/she is 6 months old.

Why have I been invited?
You have been invited because the study requires information from mothers who have a child between 6 and 24 months of age.

Do I have to take part?
No. It's completely up to you to decide whether or not you take part in the study. You are free to withdraw at any moment while filling the questionnaire. Not taking part will have no negative repercussions in relation to any treatment.

What will I be asked to do if I take part?
If you decide you would like to take part, you would be asked to answer an online survey questionnaire, consisting of four main sections, available in Arabic and English. The questionnaire will take around 10-15 minutes.You have the option to leave the survey, and re-access it where you left off by clicking on the survey link again.

Will my data be identifiable?
The information you provide is anonymous. The data collected for this study will be stored securely and the files will be kept in a password-protected computer. The data will be deposited in Lancaster University's institutional data repository for ten years. At the end of this period, they will be deleted and destroyed.

What will happen to the results?
The results will be summarised and reported in a dissertation/thesis and may be submitted for publication in an academic journal. The results may be presented in conferences as well and provided to organisations in the field of maternal and child health. If you wish to receive a copy of the document reporting the results of this research, please do not hesitate to contact me.

Are there any risks?
There are no risks anticipated with participating in this study. However, if you experience any discomfort following participation you are encouraged to inform the researcher and contact the resources provided at the end of this sheet.

Are there any benefits to taking part?
There is no direct benefit in participating in this study. However, you may find participation interesting.

Who has reviewed the project?
This study has been reviewed and approved by the Faculty of Health and Medicine Research Ethics Committee at Lancaster University.

Where can I obtain further information about the study if I need it?
If you have any questions about the study, please contact the main researcher:

Nadine Zablith email: n.zablith@lancaster.ac.uk

Nadine Zablith phone: 0096181823627

Complaints
If you wish to make a complaint or raise concerns about any aspect of this study and do not want to speak to the researcher, you can contact:
Bruce Hollingsworth, Head of Department, Professor b.hollingsworth@lancaster.ac.uk +44 (0)1524 594154
Division of Health Research
Lancaster University
Lancaster
LA1 4YG

If you wish to speak to someone outside of the Doctorate Programme, you may also contact:

Professor Roger Pickup Tel: +44 (0)1524 593746
Associate Dean for Research Email: r.pickup@lancaster.ac.uk
Faculty of Health and Medicine
(Division of Biomedical and Life Sciences)
Lancaster University
Lancaster
LA1 4YG

Thank you for taking the time to read this information sheet.

Resources in the event of discomfort
Should you feel discomfort either as a result of taking part, or in the future, the following resources may be of assistance:
-Lactica, a Lebanese NGO which supports breastfeeding:
https://www.facebook.com/LacticaLebanon/
contact@lactica.org
-Or visit a nearby primary heath care center by accessing the following link:
https://www.moph.gov.lb/HealthFacilities/index/3/188/8?facility_type=4&district=&name=

Appendix 12: Consent Form in English

Study Title: Infant feeding in Lebanon

We are asking if you would like to take part in a research project about infant feeding in Lebanon.

Before you consent to participating in the study we ask that you read the participant information sheet and type yes in each box if you agree. If you have any questions or queries before agreeing, please speak to the principal investigator, Nadine Zablith.

	Please type yes in each box
1. I confirm that I have read the information sheet and fully understand what is expected of me within this study	☐
2. I understand that my data and any information I give is anonymous	☐
3. I understand that my participation is voluntary and that once I click on the "Submit" button, my responses will be anonymised and it will not be possible to remove my responses	☐
4. I consent to having my data published, used in reports, conferences and training events	☐
5. I consent to Lancaster University keeping the study data for 10 years after the study has finished	☐
6. I consent to take part in the above study	☐

Appendix 13: Study Questionnaire in English

Below is the questionnaire used in the study

Thank you for agreeing to be part of the research. The following questions will take around 10-15 minutes. If you have more than one child between 6 and 24 months, please fill out the survey for your youngest child.

Please answer the next questions regarding your youngest child

1-Is your youngest child a boy or a girl?
Boy
Girl

2-How old is your youngest child? (in months)
…

3-What was your youngest child's birth weight?
<1,000 g
Between 1,000 g and 1,500 g
Between 1,500g and 2500g
Between 2,500 and 4,000g
Between 4,000 and 4,500g
>4,500g

4-Did your pregnancy reach full term or was your child born early?
Full-term
Born early

5-Did you deliver vaginally or by caesarean section?
Vaginal delivery
Caesarean delivery

6-Was your child born in a hospital?
Yes
No

7-What is the gender of the child's paediatrician?

Male
Female

8- Did your child have a chronic disease (lasting three months or longer) when he/she was between 0 and 6 months old?
Yes (please specify)
No

9-Was your child on medications for chronic diseases when he/she was between 0 and 6 months old?
Yes (please specify)
No

Please answer the next questions regarding you

10-How many children do you have?
…..

11-How old are you? (in years)
….

12-What is your nationality?
Lebanese
Other (please specify):

13-What is your marital status?
Married
Divorced
Widowed
Separated
Single
Other (please specify):

14-What is the highest degree you have received?
Elementary level (grade 6)
Intermediate level (grade 9)
Secondary level (grade 12)
University level (Bachelors)
University level (Masters)
University level (Doctorate)
Other (please specify):

15- Did you have a chronic disease (lasting three months or longer) when your child was between 0 and 6 months old?
Yes (please specify)
No

16-Were you on medications for chronic diseases when your child was between 0 and 6 months old?
Yes (please specify)

No

17-What was your employment status when your child was between 0-6 months old?
Working
Not working

18-If you were working, please specify how many hours per week
….

19-What is your religion?
Christian
Muslim
Other (please specify):

20-In which governorate were you born?
Akkar
Baalbek-Hermel
Beirut
Beqaa
Mount-Lebanon
North
Nabatiye
South
Other-born outside Lebanon

21- In which governorate were you residing when your child was between 0 and 6 months old?
Akkar
Baalbek-Hermel
Beirut
Beqaa
Mount-Lebanon
North
Nabatiye
South

22- Which member of your family was living with you in your home besides your partner and children when your child was between 0 and 6 months old?
My mother
My father
My mother-in-law
My father-in-law
My sibling(s)
My partner's sibling(s)
None
Other (please specify)

23-Was there a live-in housekeeper/cleaner present in your home when your baby was between 0 and 6 months old?
Yes
No

24- How often did this housekeeper/cleaner take care of your child when your child was between 0 and 6 months old ? (Shows up if previous answer is yes)
Never
Seldom
Sometimes
Often
Almost always

25-Was there a live-out housekeeper/cleaner present in your home when your baby was between 0 and 6 months old?
Yes
No

26- How often was this housekeeper/cleaner involved in caring for your child when your child was between 0 and 6 months old? (Shows up if previous answer is yes)
Never
Seldom
Sometimes
Often
Almost always

Please answer the next questions regarding feeding practices of your youngest child

27- Before you got pregnant, how did you intend to feed your child?
Breastfeed only (baby will not be given formula)
Formula feed only
Both breast and formula feed
Had not decided

28- During pregnancy, how did you intend to feed your child?
Breastfeed only (baby will not be given formula)
Formula feed only
Both breast and formula feed
Had not decided

29-If you intended to breastfeed, how old did you think your child will be when he/she will be first given other food or formula:
(age in months):…
N/A

30-Did you ever breastfeed your youngest child?
Yes
No

31-How long did you breastfeed your child?
Duration of breastfeeding (in months):….
My child is still breastfeeding
N/A

32-How long did you exclusively breastfeed your child (baby receiving only breastmilk, no water, no solids or liquids, only medications)?
Duration of exclusive breastfeeding (in months):…..
My child is still being exclusively breastfed
N/A

33-When were you able to initiate breastfeeding?
Within an hour of birth
After an hour of birth
N/A

Please answer the following questions regarding your beliefs/opinions in relation to some postpartum practices

34-How important is initiating breastfeeding within an hour of birth in your opinion?
Not Important
Slightly important
Fairly Important
Important
Very important

35-How important is keeping the baby's crib by your bed side at the hospital in your opinion?
Not Important
Slightly important
Fairly Important
Important
Very important

36-Did you ask for your child's crib to be kept by your bed side at the hospital?
Yes
No

37-Was your child's crib kept by your bed side at the hospital?
Yes
No

38-How important is holding your child skin-to-skin in your opinion?

Not Important
Slightly important
Fairly Important
Important
Very important

39-Did you ask to hold your child skin-to-skin after delivery?
Yes
No

40-Did you hold your child skin-to-skin after delivery?
Yes
No

41-To what extent do you agree or disagree with the following statement: Free formula samples should be distributed to the mothers after delivery at the hospital?
Strongly disagree
Disagree
Undecided
Agree
Strongly agree

42-Did you ask for a free formula sample at the hospital?
Yes

No

43-Were you offered a free formula sample at the hospital?
Yes
No

44-Which of the following best describe your partner's support regarding your breastfeeding?
Very supportive
Supportive
Neither supportive or not supportive
Unsupportive
Very unsupportive
N/A

45-How important is breastfeeding in your partner's opinion?
Not Important
Slightly important
Fairly Important
Important
Very important
N/A

Thank you for participating in the above survey. If you wish to receive a copy of the document reporting the results of this research, please do not hesitate to contact me.

Nadine Zablith

Email: n.zablith@lancaster.ac.uk
Phone: 0096181823627

Complaints
If you wish to make a complaint or raise concerns about any aspect of this study and do not want to speak to the researcher, you can contact:
Bruce Hollingsworth, Head of Department, Professor b.hollingsworth@lancaster.ac.uk +44 (0)1524 594154
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LA1 4YG

If you wish to speak to someone outside of the Doctorate Programme, you may also contact:

Professor Roger Pickup Tel: +44 (0)1524 593746
Associate Dean for Research Email: r.pickup@lancaster.ac.uk
Faculty of Health and Medicine
(Division of Biomedical and Life Sciences)
Lancaster University
Lancaster

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Resources in the event of discomfort
Should you feel discomfort either as a result of taking part, or in the future, the following resources may be of assistance:
-Lactica, a Lebanese NGO which supports breastfeeding:
https://www.facebook.com/LacticaLebanon/
contact@lactica.org
-Or visit a nearby primary heath care center by accessing the following link:
https://www.moph.gov.lb/HealthFacilities/index/3/188/8?facility_type=4&district=&name=

Appendix 14: Participation information sheet in Arabic

تغذية الأطفال في لبنان

ورقة معلومات المشارك

اسمي نادين زبليط وأنا أجري هذا البحث كطالبة في برنامج الدكتوراه في الصحة العامة في جامعة لانكستر، لانكستر، المملكة المتحدة.

عنوان البحث: تغذية الأطفال في لبنان

ما هو موضوع هذه الدراسة؟
الهدف من هذه الدراسة هواستكشاف العوامل المرتبطة بتغذية الأطفال في لبنان في لبنان منذ ولادة الطفل (أو الطفلة) حتى (أو تبلغ) عمره (ها) 6 أشهر.

لماذا دعيت؟
لقد دعيت لأن الدراسة تتطلب معلومات من الأمهات اللواتي لديهن طفل بين 6 و 24 شهرا من العمر.

هل يجب علي المشاركة؟
كلا. قرار المشاركة عائدٌ لك. أنت حرة في الانسحاب في أي لحظة أثناء ملء الاستبيان. أن عدم المشاركة لن يكون له أي تداعيات سلبية فيما يتعلق بأي علاج.

ماذا سيطلب مني أن أفعل إذا شاركت؟
إذا قررت أنك ترغبين في المشاركة، سوف يطلب منك الإجابة على استبيان عبر الإنترنت ويتألف من أربعة أقسام رئيسية، وهو متاح باللغتين العربية والإنجليزية. سيستغرق الاستبيان حوالي 10-15 دقيقة. لديك خيار ترك الاستبيان، وإعادة الوصول إليه حيث توقفت، عن طريق النقر على رابط الاستبيان مرة أخرى.

هل سيتم التعرف على بياناتي؟
المعلومات التي تقدمينها مجهولة ألهوية. سيتم تخزين البيانات التي تم جمعها لهذه الدراسة بشكل آمن.
سيتم تخزين الملفات الموجودة على جهاز الكمبيوتر والكمبيوتر نفسه سيكون محمي بكلمة سر. سيتم الاحتفاظ بالبيانات في مستودع البيانات المؤسسية لجامعة لانكستر لمدة عشر سنوات. وفي نهاية هذه الفترة، سيتم حذفها وتدميرها.

ماذا سيحدث للنتائج؟
سيتم تلخيص النتائج والإبلاغ عنها في أطروحة ويمكن تقديمها للنشر في مجلة أكاديمية. ويمكن تقديم النتائج في المؤتمرات أيضا وتقديمها إلى المنظمات في مجال صحة الأم والطفل.
.إذا كنت ترغبين في الحصول على نسخة من الوثيقة التي تظهر نتائج هذا البحث الرجاء لا تترددي في الاتصال بي .

هل هناك أي مخاطر؟
لا توجد مخاطر متوقعة مع المشاركة في هذه الدراسة. ومع ذلك، إذا واجهت أي إزعاج بعد المشاركة يتم تشجيعك على إبلاغ الباحث والاتصال بالمصادر المقدمة في نهاية هذه الورقة.

هل هناك أي فوائد للمشاركة في الدراسة ؟
ليس هناك فائدة مباشرة في المشاركة في هذه الدراسة. ومع ذلك، قد تجدين المشاركة مثيرة للاهتمام.

من الذي قام بمراجعة المشروع؟
قد تمت مراجعة هذه الدراسة والموافقة عليها من قبل لجنة أخلاقيات البحوث في كلية بحوث الصحة والطب في جامعة لانكستر.

أين يمكنني الحصول على مزيد من المعلومات عن الدراسة إذا كنت بحاجة إليها؟
إذا كان لديك أي أسئلة حول الدراسة، يرجى الاتصال بالباحث الرئيسي:
نادين زبليط

البريد الإلكتروني: n.zablith@lancaster.ac.uk

هاتف: 0096181823627

شكاوى
إذا كنت ترغب في تقديم شكوى أو إثارة مخاوف بشأن أي جانب من جوانب هذه الدراسة ولا تريدين التحدث مع الباحث، يمكنك الاتصال ب:
بروس هولينغسورث، رئيس قسم، أستاذ b.hollingsworth@lancaster.ac.uk +44 (0) 1524 594154
قسم البحوث الصحية
جامعة لانكستر
لانكستر
LA1 4YG

إذا كنت ترغبين في التحدث إلى شخص خارج برنامج الدكتوراه، يمكنك أيضا الاتصال ب:

بروغرام روجر بيكوب هاتف: +44 (0) 1524 593746
مساعد عميد للبريد الإلكتروني للبحوث: r.pickup@lancaster.ac.uk
كلية الصحة والطب
(قسم العلوم الطبية الحيوية وعلوم الحياة)
جامعة لانكستر
لانكستر
LA1 4YG

يمكنك الاتصال بالأساتذة بروس أو روجر باللغة العربية و هما يمكنهما تأمين الترجمة.
نشكرك على تخصيص الوقت لقراءة ورقة المعلومات هذه.

الموارد في حال عدم الراحة
إذا شعرت بعدم الراحة سواء كنتيجة للمشاركة، أو في المستقبل، قد تكون المصادر التالية مساعدة:
منظمة لاكتيكا في لبنان التي تدعم الرضاعة الطبيعية:
/https://www.facebook.com/LacticaLebanon
contact@lactica.org
أو زيارة أقرب مركز الرعاية الصحية الأولية من خلال الضغط على الرابط التالي:
https://www.moph.gov.lb/HealthFacilities/index/3/188/8?facility_type=4&district=&name=

Appendix 15: Consent form in Arabic

موافقة للإشتراك في البحث

عنوان البحث: تغذية الأطفال في لبنان

نسأل إذا كنت ترغبين في المشاركة ببحث علمي عن تغذية الأطفال في لبنان.

.
قبل أن توافقي على المشاركة في الدراسة، نطلب منك قراءة ورقة معلومات المشاركين و كتابة نعم في كل مربع في الأسفل إذا وافقت على ذلك. إذا كان لديك أي أسئلة أو استفسارات قبل الموافقة ، يرجى التحدث إلى الباحثة الرئيسية نادين زبليط.

يرجى كتابة نع في كل مربعم

☐ **1.**أؤكد انني قرأت المعلومات وفهمت تماما ما هو متوقعٌ مني في هذه الدراسة

☐ **2** أفهم أن بياناتي و أي معلومات أقدمها سوف تكون مجهولة ألهوية.

☐ 3 أفهم أن مشاركتي طوعية و أنه بمجرد النقر على الزر "إرسال"، ستكون اجابتي مجهولة الهوية ولن يكون من الممكن إزالة إجاباتي.

☐ 4 أوافق على أن المعلومات المستقاة من استمارتي يمكن نشرها واستخدامها في التقارير والمؤتمرات والمناسبات التدريبية.

☐ 5أوافق على أن جامعة لانكستر تبقي بيانات استمارتي لمدة 10 سنوات بعد انتهاء الدراسة.

☐ 6أوافق على المشاركة في الدراسة المذكورة أعلاه.

Appendix 16: Study questionnaire in Arabic

Lancaster University

استبيان

شكراًعلى موافقتك للمشاركة في البحث . الأسئلة التالية سوف تستغرق حوالي 10-15 دقيقة. إن كان لديك أكثر من طفل بين 6 و 24 شهرا، يرجى ملء الاستبيان للطفل الأصغر سنا.

الرجاء الإجابة على الأسئلة التالية المتعلقة بطفلك أو طفلتك الأصغر سنا.

1-هل طفلك الأصغر فتى أو فتاة؟
فتى
فتاة

2- كم عمر طفلك الأصغر ؟ (في الأشهر)
…

3-ما كان وزن طفلك الأصغر عند الولادة ؟
<1،000 غرام
بين 1000 و 1500 غرام
بين 1500و 2500
بين 2500 و 4000 غرام
بين 4000 و 4،500
> 4،500 غرام

4-هل بلغ الحمل المدة الكاملة أم تمت الولادة مبكرة؟
تمت الولادةعند الأوان
تمت الولادة قبل الأوان

5-هل كانت الولادة ولادة طبيعية أم قيصرية؟
ولادة طبيعية
ولادة قيصرية

6هل ولد طفلك في مستشفى؟
نعم
كلا

7-ما هو جنس طبيب طفلك ؟
ذكر
أنثى

8- هل كان طفلك يعاني من مرض مزمن (دام لمدة ثلاثة أشهر أو أكثر) عندما كان بين 0 و 6 أشهر؟
نعم (يرجى التحديد)
كلا

9-هل كان طفلك يتناول أدوية لأمراض مزمنة عندما كان بين 0 و 6 أشهر؟
نعم (يرجى التحديد)
كلا

يرجى الإجابة على الأسئلة التالية التى تتعلق بك

10-كم طفلاً لديك؟
عدد الاطفال:...

11كم تبلغين من العمر؟ (في السنوات)

12-ما هي جنسيتك؟
لبنانية
أخرى (يرجى التحديد)

13ما هو وضعك العائلي ؟
متزوجة
مطلقة
أرملة
منفصلة
غير مرتبطة
غير ذلك (يرجى التحديد)

14- ما هي أعلى شهادة حصلت عليها؟
المستوى الابتدائي (الصف السادس)
المستوى المتوسط (الصف التاسع)
المستوى الثانوي (الصف الثاني عشر)
المستوى الجامعي (البكالوريوس)
المستوى الجامعي (الماجستير)
المستوى الجامعي (دكتوراه)
غير ذلك (يرجى التحديد)

15- هل كان لديك مرض مزمن(دام لمدة ثلاثة أشهر أو أكثر) عندما كان طفلك بين 0 و 6 أشهر؟
نعم (يرجى التحديد)
كلا

16-هل كنت تتناولين أدوية لأمراض مزمنة عندما كان طفلك بين 0 و 6 أشهر؟
نعم (يرجى التحديد)
كلا

17ما كان وضعك الوظيفي عندما كان طفلك بين 0 و 6 أشهر؟
كنت أعمل
لم أكن أعمل

18- إن كنت تعملين، الرجاء التحديد كم ساعة في الأسبوع
....

-19ما هي ديانتك؟
مسيحية
مسلمة
غير ذلك (يرجى التحديد)

-20في أية محافظة ولدت؟
عكار
بعلبك الهرمل
بيروت
.البقاع
.جبل لبنان
.الشمال
.النبطية
الجنوب
لا ينطبق (ولدت خارج لبنان)

21في أية محافظة كنت تسكنين عندما كان طفلك بين 0 و 6 أشهر؟
عكار
بعلبك الهرمل
بيروت
.البقاع
.جبل لبنان
.الشمال
.النبطية
الجنوب

22- أي فرد من أفراد عائلتك كان يعيش معك إلى جانب شريكك وأطفالك عندما كان طفلك بين 0 و 6 أشهر؟

والدتي
والدي
والدة شريكي
والد شريكي
اشقائي
اشقاء شريكي
لا أحد
أخر (يرجى التحديد)

-23هل كان لديك مدبرة منزل/ عاملة تنظيف تقطن في منزلك عندما كان طفلك بين 0 و 6 أشهر؟
نعم
كلا

24 كم من الوقت كانت هذه المدبرة / عاملة تنظيف تقوم برعاية طفلك عندما كان طفلك بين 0 و 6 أشهر؟
أبدا
نادرا
بعض الأحيان
معظم الوقت
كل الوقت
(يظهرإذا كانت الاجابة نعم)

-25هل كان لديك مدبرة منزل /عاملة تنظيف تقطن خارج منزلك عندما كان طفلك بين 0 و 6 أشهر؟
نعم
كلا

-26 كم من الوقت كانت هذه المدبرة / عاملة تنظيف تقوم برعاية طفلك عندما كان طفلك بين 0 و 6 أشهر؟
أبدا
نادرا
بعض الأحيان
معظم الوقت
كل الوقت
(يظهرإذا كانت الاجابة نعم)

يرجى الإجابة على الأسئلة التالية فيما يتعلق بتغذية طفلك (أو طفلتك) الأصغر سنا

-27 قبل أن أصبحت حامل كيف كنت تنوين تغذية طفلك ؟
الرضاعة الطبيعية فقط (لن يعطى الطفل (أو الطفلة) الحليب المصنع)
الحليب المصنع فقط
كل من الرضاعة الطبيعية و الحليب المصنع
لم أكن قد قررت

-28 خلال الحمل كيف كنت تنوين تغذية طفلك ؟
الرضاعة الطبيعية فقط (لن يعطى الطفل (أو الطفلة) الحليب المصنع)
الحليب المصنع فقط

كل من الرضاعة الطبيعية و الحليب المصنع
لم أكن قد قررت

-29إذا كنت تنوين الرضاعة في أي عمر كنت تعتقدين سيكون طفلك عندما سيتناول أي طعام أو حليب أخر؟
العمر (في الأشهر)
لا ينطبق

-30هل سبق لك أن أرضعت طفلك الأصغر سنا ؟
نعم
كلا

-31ما هي مدة الرضاعة الطبيعية التي أرضعت طفلك بها ؟
مدة الرضاعة الطبيعية (في الأشهر):
لا يزال طفلي (أو طفلتي) يرضع حتى الأن
لا ينطبق

-32ما هي مدة الرضاعة الطبيعية الحصرية (الطفل يتناول حليب الأم فقط. لا ماء، لا مواد صلبة أو سوائل، فقط أدوية) التي أرضعت طفلك بها ؟
مدة الرضاعة الطبيعية الحصرية (الطفل يتناول حليب الأم فقط) (في الأشهر):
لا يزال طفلي يرضع حصرياً حتى الأن
لا ينطبق

-33متى استطعت بدء الرضاعة الطبيعية؟
في غضون ساعة من الولادة
بعد ساعة من الولادة
لا ينطبق

الرجاء الإجابة على الأسئلة التالية المتعلقة بالمعتقدات / الآراء الخاصة بك فيما يتعلق ببعض الممارسات بعد الولادة

34 ما مدى أهمية بدء الرضاعة الطبيعية في غضون ساعة من الولادة باعتقادك؟

غير مهم
مهم قليلا
مهم إلى حد ما
مهم
مهم جدا

35 ما مدى أهمية إبقاء سرير الطفل بجانب سريرك في المستشفى **باعتقادك** ؟

غير مهم
مهم قليلا
مهم إلى حد ما

مهم
مهم جدا

-36 هل طلبت أن يبقى سرير طفلك إلى جانب سريرك في المستشفى؟
نعم
كلا

37 هل كان سرير طفلك إلى جانب سريرك في المستشفى؟
نعم
كلا

38 ما مدى أهمية حمل طفلك الحديث الولادة بطريقة ما يسمى "البشرة على البشرة" باعتقادك (وهذا يعني أنه يتم وضع طفلك على بطنه، مباشرة على صدرك، مباشرة بعد الولادة) ؟
غير مهم
مهم قليلا
مهم إلى حد ما
مهم
مهم جدا

39 هل طلبت أن تحملي طفلك الحديث الولادة بطريقة ما يسمى "البشرة على البشرة" بعد الولادة ؟
نعم
كلا

40-هل حملت طفلك الحديث الولادة بطريقة ما يسمى "البشرة على البشرة" بعد الولادة ؟
نعم
كلا

41إلى أي مدى توافقين أو لا توافقين على العبارة التالية: يجب توزيع حليب الأطفال المصنع المجاني في المستشفى للأمهات بعد الولادة؟
لا أوافق بشدة
لا أوافق
مترددة
أوافق
أوافق بشدة

42هل طلبت حليب الأطفال المصنع المجاني في المستشفى؟
نعم
كلا

-

43- هل عرض عليك حليب الأطفال المصنع مجاناً في المستشفى؟
نعم
كلا

44-أي من التالي يصف أفضل وصف دعم شريكك الرضاعة الطبيعية؟
داعم جدا
داعم
لا داعم أو غير داعم
غير داعم
غير داعم للغاية
لا ينطبق

45 ما مدى أهمية الرضاعة الطبيعية بإعتقاد شريكك؟
غير مهم
مهم قليلا
مهم إلى حد ما
مهم
مهم جدا

نشكرك على المشاركة في الاستطلاع أعلاه. إذا كنت ترغبين في الحصول على نسخة من الوثيقة التي تظهر نتائج هذا البحث لا تترددي في الاتصال بي.
نادين زبليط

البريد الإلكتروني: n.zablith@lancaster.ac.uk

نادين زبليط هاتف: 0096181823627

شكاوى
إذا كنت ترغب في تقديم شكوى أو إثارة مخاوف بشأن أي جانب من جوانب هذه الدراسة ولا تريدين التحدث مع الباحث، يمكنك الاتصال ب:
بروس هولينغسورث، رئيس قسم، أستاذ b.hollingsworth@lancaster.ac.uk +44 (0) 1524 594154
قسم البحوث الصحية
جامعة لانكستر
لانكستر
LA1 4YG

إذا كنت ترغبين في التحدث إلى شخص خارج برنامج الدكتوراه، يمكنك أيضا الاتصال ب:

بروغرام روجر بيكوب هاتف: +44 (0) 1524 593746
مساعد عميد للبحوث. البريد الإلكتروني: r.pickup@lancaster.ac.uk
كلية الصحة والطب
(شعبة العلوم الطبية الحيوية وعلوم الحياة)
جامعة لانكستر
لانكستر
LA1 4YG

يمكنك الاتصال بالأساتذة بروس أو روجر باللغة العربية و هما يمكنهما تأمين الترجمة.

نشكرك على تخصيص الوقت لقراءة ورقة المعلومات هذه.

الموارد في حالة عدم الراحة
إذا شعرت بعدم الراحة سواء كنتيجة للمشاركة، أو في المستقبل، قد تكون المصادر التالية مساعدة:
منظمة لاكتيكا في لبنان التي تدعم الرضاعة الطبيعية:
/https://www.facebook.com/LacticaLebanon
contact@lactica.org
أو زيارة أقرب مركز الرعاية الصحية الأولية من خلال الضغط على الرابط التالي:
https://www.moph.gov.lb/HealthFacilities/index/3/188/8?facility_type=4&district=&name=

Appendix 17: Ethics application

Faculty of Health and Medicine Research Ethics Committee (FHMREC)
Lancaster University

Application for Ethical Approval for Research

for additional advice on completing this form, hover cursor over 'guidance'.

Guidance on completing this form is also available as a word document

Title of Project: Breastfeeding in Lebanon – an online survey.

Name of applicant/researcher: Nadine Zablith

ACP ID number (if applicable)*: **Funding source (if applicable)** N/A

Grant code (if applicable): N/A

***If your project has *not* been costed on ACP, you will also need to complete the Governance Checklist [link].**

Type of study

☐ Involves existing documents/data only, or the evaluation of an existing project with no direct contact with human participants. **Complete sections one, *two* and four of this form**

☒ Includes *direct* involvement by human subjects. **Complete sections one, *three* and four of this form**

SECTION ONE

1. Appointment/position held by applicant and Division within FHM PhD in Public Health Student - Division of Health Research

2. Contact information for applicant:
E-mail: n.zablith@lancaster.ac.uk **Telephone**: 0096181665545 (please give a number on which you can be contacted at short notice)

Address: PoBox 50 Tripoli-Lebanon

3. **Names and appointments of all members of the research team (including degree where applicable)**

Dr. Siobhan Reilly-Dr. Elizabeth McDermott, Lancaster University

3. If this is a student project, please indicate what type of project by marking the relevant box/deleting as appropriate: (please note that UG and taught masters projects should complete **FHMREC form UG-tPG**, following the procedures set out on the FHMREC website

PG Diploma ☐ Masters by research ☐ PhD Thesis ☐ PhD Pall. Care ☐

PhD Pub. Health ☒ PhD Org. Health & Well Being ☐ PhD Mental Health ☐ MD ☐

DClinPsy SRP ☐ [if SRP Service Evaluation, please also indicate here: ☐] DClinPsy Thesis ☐

4. Project supervisor(s), if different from applicant: Dr. Siobhan Reilly-Dr. Elizabeth McDermott

5. **Appointment held by supervisor(s) and institution(s) where based (if applicable)**:
Dr. Siobhan Reilly – 1st supervisor: Senior Lecturer
Dr. Elizabeth McDermott – 2nd supervisor: Senior Lecturer

SECTION TWO
Complete this section if your project involves existing documents/data only, or the evaluation of an existing project with no direct contact with human participants

1. Anticipated project dates (month and year)
Start date: End date:

2. Please state the aims and objectives of the project (no more than 150 words, in lay-person's language):

Data Management
For additional guidance on data management, please go to Research Data Management *webpage, or email the RDM support email:* rdm@lancaster.ac.uk
3. Please describe briefly the data or records to be studied, or the evaluation to be undertaken.

4a. How will any data or records be obtained?

4b. Will you be gathering data from websites, discussion forums and on-line 'chat-rooms' n o
4c. If yes, where relevant has permission / agreement been secured from the website moderator? n o
4d. If you are only using those sites that are open access and do not require registration, have you made your intentions clear to other site users? n o

4e. If no, please give your reasons

5. What plans are in place for the storage, back-up, security and documentation of data (electronic, digital, paper, etc)? Note who will be responsible for deleting the data at the end of the storage period. Please ensure that your plans comply with the Data Protection Act 1998.

6a. Is the secondary data you will be using in the public domain? n o
6b. If NO, please indicate the original purpose for which the data was collected, and comment on whether consent was gathered for additional later use of the data.

Please answer the following question *only* if you have not completed a Data Management Plan for an external funder
7a. How will you share and preserve the data underpinning your publications for at least 10 years e.g. PURE?

7b. Are there any restrictions on sharing your data?

8. Confidentiality and Anonymity
a. Will you take the necessary steps to assure the anonymity of subjects, including in subsequent publications? yes
b. How will the confidentiality and anonymity of participants who provided the original data be maintained?

9. What are the plans for dissemination of findings from the research?

10. What other ethical considerations (if any), not previously noted on this application, do you think there are in the proposed study? How will these issues be addressed?

SECTION THREE
Complete this section if your project includes *direct* involvement by human subjects

1. Summary of research protocol in lay terms (indicative maximum length 150 words):

Breastfeeding is recognized as the ultimate food source for infants. Exclusive breastfeeding is recommended until 6 months postpartum; in Lebanon, the rates breastfeeding are amongst the lowest worldwide. In developing countries, many factors impact the maternal infant feeding process during the 6 months postpartum; however, in Lebanon, these have been rarely investigated. This study will be the first in Lebanon to explore the association between many determinants with exclusive breastfeeding for the 6 months postpartum of mothers residing across Lebanon. This cross-sectional study will consist of an online questionnaire using Qualtrics. Mothers having at least one child between 6 and 24 months old will be recruited mainly via social media. Data analysis consisting of univariate and multiple logistic

regressions will be conducted using SPSS. This research will determine barriers and facilitators of exclusive breastfeeding and expectantly guide public health policies to improve maternal and child health.

2. **Anticipated project dates (month and year only**)

Start date: December 2017 End date: June 2018

Data Collection and Management
For additional guidance on data management, please go to Research Data Management *webpage, or email the RDM support email:* rdm@lancaster.ac.uk

3. Please describe the sample of participants to be studied (including maximum & minimum number, age, gender):

593 mothers having a biological child between 6 and 24 months of age will be recruited for the study.

4. How will participants be recruited and from where? Be as specific as possible. Ensure that you provide the *full versions* of all recruitment materials you intend to use with this application (eg adverts, flyers, posters).

Mothers having a child between 6 and 24 months of age will be invited to the study and recruited via the internet, using social media, in particular Facebook. The recruitment will consist of postings on Facebook pages and groups, a Facebook page. Recruitment announcements will be posted on Facebook groups and pages that deal with maternal and child health or parenting topics in Lebanon. The Facebook page will include the same recruitment announcement. The postings will be posted every two weeks on Facebook groups and pages that deal with maternal and child health and parenting topics in Lebanon. In addition, the research announcements will be sent to health and care organisations such as: health centres, hospitals and day care centers across the Lebanese territory to post on their respective Facebook pages or groups or other internet media communication (whether emails or Whatsapp). In the event that the sample size has not been reached, posters advertising the research may be posted in health centres, hospitals and day care centers premises. The list of primary health care centers , hospitals and day care centers will be retrieved. They will be contacted and their formal written approval sought. The recruitment will not involve fabrication of online identities. The postings to be used on Facebook will comply with the Facebook terms of service.

5. Briefly describe your data collection and analysis methods, and the rationale for their use.

The collection of data will be done using an online survey, Qualtrics. The inclusion criteria will be outlined in the advertisement, and the mothers fulfilling the inclusion criteria and interested in participating will first acknowledge the reading of the participant information sheet and the consent form which will be posted online before accessing the survey. Second, they will either directly click on the link provided online or copy the link into the web browser and then will personally fill-out the questionnaires. The questionnaires will be as short as possible, the questions will be sequential, close-ended; technical, vague terms and complex sentences will be avoided, reference frames will be provided, double-barreled questions will be avoided, and leading language will be avoided. The questionnaires will be translated by the main researcher into Arabic.

Data analysis will be conducted using the SPSS package. Descriptive statistics will be conducted to compare the characteristics of exclusive breastfeeding versus non-exclusive breastfeeding groups. Univariate (chi-square and t-test) and multiple logistic regression analysis will be conducted to explore the determinants that impact the exclusive breastfeeding. For each determinant, univariate and adjusted odds ratios, and 95% confidence intervals will be computed.

6. What plan is in place for the storage, back-up, security and documentation of data (electronic, digital, paper, etc.)? Note who will be responsible for deleting the data at the end of the storage period. Please ensure that your plans comply with the Data Protection Act 1998.

Only electronic data will be used in this study. The data will be anonymised and then stored in password protected hard disks and laptop computer belonging to the researcher and will not be accessible to others. The data will be deposited by the researcher using Pure, and stored and archived for ten years in protected storage on the server of Lancaster University. After that date, the research data management service at Lancaster University library will be responsible for deleting the data.

7. Will audio or video recording take place? ☒ no ☐ audio ☐ video
a. Please confirm that portable devices (laptop, USB drive etc) will be encrypted where they are used for identifiable data. If it is not possible to encrypt your portable devices, please comment on the steps you will take to protect the data. Yes

b What arrangements have been made for audio/video data storage? At what point in the research will tapes/digital recordings/files be destroyed?

N/A
Please answer the following questions *only* if you have not completed a Data Management Plan for an external funder
8a. How will you share and preserve the data underpinning your publications for at least 10 years e.g. PURE?
Data will also be deposited in Lancaster University's institutional data repository and made freely available with an appropriate data license.
8b. Are there any restrictions on sharing your data ?
Data will be deposited inLancaster University's institutional data repository

9. Consent
a. Will you take all necessary steps to obtain the voluntary and informed consent of the prospective participant(s) or, in the case of individual(s) not capable of giving informed consent, the permission of a legally authorised representative in accordance with applicable law? yes

b. Detail the procedure you will use for obtaining consent?
The mothers fulfilling the inclusion criteria and interested in participating will first acknowledge the reading of the participant information sheet and the consent form which will be posted online before accessing the survey. Second, they will either directly click on the link provided online or copy the link into the web browser and then will personally fill-out the questionnaires

10. What discomfort (including psychological eg distressing or sensitive topics), inconvenience or danger could be caused by participation in the project? Please indicate plans to address these potential risks. State the timescales within which participants may withdraw from the study, noting your reasons.

If some questions may cause minimal discomfort to the mothers as they may be of sensitive nature, bring some emotions, or cause remorse and if a mother becomes distressed during the questionnaire study, the survey will be designed with an option for the mother to leave the survey, and re-access it where she left off by clicking on the survey link again. Mothers are free to withdraw from the research at any time during the survey. Mothers will be directed to a local Lebanese NGO that supports breastfeeding, Lactica, or to a nearby primary health care center, if they need any assistance.

11. What potential risks may exist for the researcher(s)? Please indicate plans to address such risks (for example, noting the support available to you; counselling considerations arising from the sensitive or distressing nature of the research/topic; details of the lone worker plan you will follow, and the steps you will take).

There are no expected potential risks to the researcher. The researcher will not conduct the survey personally and will not be physically present with the participants, therefore there is close to no risk of any potential distress or danger arising during the data collection.

12. Whilst we do not generally expect direct benefits to participants as a result of this research, please state here any that result from completion of the study.

There may be no direct benefit to the mothers participating in this study. However, they may find participating interesting.

13. Details of any incentives/payments (including out-of-pocket expenses) made to participants:
No incentives or payments will be offered to participants.

14. Confidentiality and Anonymity
a. Will you take the necessary steps to assure the anonymity of subjects, including in subsequent publications? yes
b. Please include details of how the confidentiality and anonymity of participants will be ensured, and the limits to confidentiality.
Only electronic data will be used in this study. The data will be anonymised and stored in password protected hard disks and laptop computer belonging to the researcher and will not be accessible to others. The data will be stored and archived for ten years in protected storage on the server of Lancaster University.

15. If relevant, describe the involvement of your target participant group in the *design and conduct* of your research.

Participants will not be involved in the design and conduct of the research.

16. What are the plans for dissemination of findings from the research? If you are a student, include here your thesis.

The study results will be disseminated through various ways and channels to specific audiences. These different approaches will comprehend an efficient dissemination plan and all stakeholders will be engaged in the dissemination of the study results.

First of all, the research findings will be covered in the PhD thesis. In addition, the findings will be presented in national and international conferences to relevant institutions working in the field of maternal and child health, such as non-governmental agencies or ministries. Any healthcare institution showing interest in acquiring the results findings will be provided with the findings. The findings will be disseminated in the form of policy brief. Furthermore, the study will be submitted for publication in peer reviewed journals covering medical, health and social issues.

17. What particular ethical considerations, not previously noted on this application, do you think there are in the proposed study? Are there any matters about which you wish to seek guidance from the FHMREC?

Given that this study will be conducted online, further ethical issues may arise. The use of electronic data collection generates some ethical challenges as there is no totally secure communication online, however, the software qualtrics provide high levels of data security and protection.

SECTION FOUR: signature

Applicant electronic signature: ☐ Date ☐

Student applicants: please tick to confirm that you have discussed this application with your supervisor, and that they are happy for the application to proceed to ethical review ☐

Project Supervisor name (if applicable): ☐ Date application discussed ☐

Submission Guidance

1. **Submit your FHMREC application by email to Diane Hopkins (**d.hopkins@lancaster.ac.uk) as two separate documents:

    i. **FHMREC application form.**
    Before submitting, ensure all guidance comments are hidden by going into 'Review' in the menu above then choosing *show markup>balloons>show all revisions in line.*

    ii. **Supporting materials.**
    Collate the **following materials for your study, if relevant, into a single word document:**

        a. **Your full research proposal (background, literature review, methodology/methods, ethical considerations).**
        b. Advertising materials (posters, e-mails)
        c. Letters/emails of invitation to participate
        d. Participant information sheets
        e. Consent forms
        f. Questionnaires, surveys, demographic sheets
        g. Interview schedules, interview question guides, focus group scripts
        h. Debriefing sheets, resource lists

Please note that you DO NOT need to submit pre-existing measures or handbooks which support your work, but which cannot be amended following ethical review. These should simply be referred to in your application form.

2. Submission deadlines:

    i. Projects including direct involvement of human subjects **[section 3 of the form was completed]**. The *electronic* version of your application should be submitted to **Diane Hopkins by the committee deadline date.** Committee meeting dates and application submission dates are listed on the FHMREC website. Prior to the FHMREC meeting you may be contacted by the lead reviewer for further clarification of your application. Please ensure you are available to attend the committee meeting (either in person or via telephone) on the day that your application is considered, if required to do so.

    ii. The following projects will normally be dealt with via chair's action, and may be submitted at any time. **[Section 3 of the form has *not* been completed, and is not required].** Those involving:

        a. existing documents/data only;
        b. the evaluation of an existing project with no direct contact with human participants;
        c. service evaluations.

3. **You must submit this application from your Lancaster University email address, and copy your supervisor in to the email in which you submit this application**

Appendix 18: Organisations approval form

Consent

This letter is to confirm that the announcement of the study research about infant feeding in Lebanon, conducted by Nadine Zablith, a PhD in Public Health candidate at Lancaster University, England, and reviewed and approved by the Faculty of Health and Medicine Research Ethics Committee at Lancaster University, can be posted on the social media/Facebook page of our institution/group (and at a later stage maybe, in our premises).

Name:

Signature:

Name of organisation/group/centre:

Date:

Appendix 19: Study poster in English

Lancaster University

Are you a mother with a child between 6 and 24 months of age living in Lebanon?

You are invited to participate in a survey about infant feeding in Lebanon.
The information you provide is anonymous and there are no risks anticipated with participating in this study.

If you decide to take part, please click on the link below to fill out a questionnaire:
https://healthmotherchild.wordpress.com/

This study has been reviewed and approved by the Faculty of Health and Medicine Research Ethics Committee at Lancaster University.

If you have any questions, please contact the main researcher:
Nadine Zablith
Email: n.zablith@lancaster.ac.uk
Phone: 0096181823627

Thank you!

Appendix 20: Study poster in Arabic

هل أنت أم لطفل (أو طفلة) يتراوح عمره(ها) بين 6 و 24 شهر من العمر في لبنان؟

أنت مدعوة للمشاركة في استطلاع حول تغذية الأطفال في لبنان.

المعلومات التي تقدمينها مجهولة ألهوية ولا توجد مخاطر متوقعة من المشاركة في هذه الدراسة.

إذا قررت المشاركة، يرجى النقر على الرابط أدناه لملء استبيان:
/https://healthmotherchild.wordpress.com

قد تمت مراجعة هذه الدراسة والموافقة عليها من قبل لجنة أخلاقيات البحوث في كلية بحوث الصحة والطب في جامعة لانكستر.

إذا كان لديك أي أسئلة، يرجى الاتصال بالباحثة الرئيسية:
نادين زابليط
البريد الإلكتروني: n.zablith@lancaster.ac.uk
هاتف: 0096181823627

شكرا!

Appendix 21: Organisations which provided an official approval

	Organisation Type	Organisation name which signed the approval letter
1	Day care center	Les coquins
2	Facebook group for mothers and parenting	A7la Sob7ieh
3	Facebook group for mothers and parenting	Maya Ezzeddine- parent coach
4	Facebook group for mothers and parenting	Attachment/gentle parenting in Lebanon
5	Facebook group for mothers and parenting for infant feeding	Baby led weaning Lebanon
6	Day care center	Brin de miel
7	Day care center	La citrouille
8	Day care center	Coco et cinelle
9	Facebook group for mothers and parenting	FEM Lebanon
10	Day care center	Future nursery
11	Day care center	Garderie Nour
12	Day care center	Innocent minds
13	Day care center	Jardin des anges
14	Day care center	Kiddy nursery
15	Facebook group for mothers and parenting	Les apprentis parents
16	Day care center	Les petits bourgeons
17	Health care center	Eat like Nicole
18	Day care center	Little blossom
19	Day care center	Minitoes
20	Whatsapp parenting group	Moms mamas and mothers
21	Facebook group for mothers and parenting	Pack a snack
22	Day care center	Panda playschool
23	Day care center	Petits matelots
24	Day care center	Rossignol garderie
25	Day care center	Sweet hearts nursery
26	Health care center	United Health Care
27	Day care center	Waliby nursery
28	Health care center	Forever Slim
29	Facebook and Whatsapp group for mothers and parenting	Beirut Baby Mama
30	Facebook and Whatsapp group for breastfeeding	Breastfeeding in Lebanon
31	Facebook group for breastfeeding	Human milk for human babies
32	Facebook group for breastfeeding	Lactica
33	Facebook group for breastfeeding and infant nutrition	LAECD support breastfeeding and baby nutrition
34	Facebook group for breastfeeding	Mama to mama breastfeeding support

35	Health care center/maternity	Sophia maternity
36	Facebook group for mothers and parenting	Mother’s support in Lebanon
37	Day care center	Sweet hearts nursery-Nabatieh
38	Day care center	Garderie Tchoupi en famille
39	Day care center	Twinkle star nursery school

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