Determinants of Exclusive Breastfeeding in Lebanon: An Online Survey

Nadine Zablith¹*, Siobhan Reilly²

¹PhD in Public Health, Lancaster University, UK
²Senior Lecturer, Lancaster University, UK

*Corresponding author: Nadine Zablith, PhD in Public Health candidate at Lancaster University Division of Health Research, Health Innovation One, Sir John Fisher Drive, Lancaster University, Lancaster, LA1 4AT, UK
E-mail: n.zablith@lancaster.ac.uk (or) Nadine.zablith@gmail.com

Received: 22 July 2020; Accepted: 30 July 2020; Published: 16 August 2020


Abstract

Background: Breastfeeding is the ultimate food source for infants and exclusive breastfeeding is recommended until six months postpartum. In Lebanon, the exclusive breastfeeding rates until six months postpartum are amongst the lowest worldwide, and the factors affecting exclusive breastfeeding have rarely been investigated.

Objectives: The aim of this study was to explore the association between certain novel demographic, social and cultural factors with exclusive breastfeeding for the six months postpartum across Lebanon.

Methods: 593 mothers recruited via social media completed an online questionnaire. Data analysis consisted of bivariate analysis and multivariate logistic regressions.

Results: The findings show that exclusive breastfeeding 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.

**Conclusions:** This is the first study conducted in low and middle-income countries to explore novel factors and their association with exclusive breastfeeding until six months postpartum. This study shows that ensuring appropriate systems and support for mothers, while applying the social-ecological model, should be a priority to improve maternal and child health.

**Keywords:** Exclusive breastfeeding; Determinants; Middle-Income country; Social-Ecological model

1. **Introduction**

Breastfeeding is recognised as the ultimate food source for babies and is crucial for both the infant’s and mother’s health [1] and has both short-term as well as long-term benefits [2]. For children, some of the advantages of breast milk compared to other nutritional sources, are to reduce the risk of acute illnesses [3], morbidity and mortality [4, 5], and chronic diseases such as obesity [6, 7], type 2 diabetes [8], and cancer [9, 10]. For mothers, breastfeeding has been shown to reduce the risk of maternal hypertension [11, 12], cardiovascular diseases [13-15], type 2 diabetes [16, 17] and cancer [18-21]. In addition, breastfeeding provides psychosocial benefits [22, 23]. Exclusive breastfeeding (EBF) is recommended until six months postpartum [24].

In Lebanon, the rate of EBF until six months (27%) is below the average of developing countries (47%) [25] and worldwide (41%) [26]. Few studies exploring the predictors of breastfeeding behaviour in Lebanon were conducted [27-32]. Reviews exploring the determinants of breastfeeding for the first six months postpartum have shown a gap in the literature addressing the influence of preconception and prenatal breastfeeding plan on EBF [33]. In addition, the following factors were not explored: the physician’s gender, the housekeeper presence, breastfeeding preconception plan and maternal opinions about skin-to-skin, rooming-in, free infant formula.

The aim of this study was to identify the association between certain demographic, social and cultural factors with EBF for the six months postpartum in Lebanon. The theoretical framework adapted for this research was the Socio-Ecological model (SEM) [34]. The SEM used in this study consisted of three levels of influence: Individual, Relationship and Community. Therefore, the factors explored in this study were categorized into these three levels. The individual level covered 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 covered the following variables: the paternal attitude towards breastfeeding reported by the mother. The community level covered the following variables: housekeeper presence, whether the housekeeper is involved in childcare, type of delivery, pediatrician gender, maternal employment, place of residence, religion.
2. Methods

2.1 Design
An online survey was conducted across Lebanon from January to June 2018. The survey was posted on social media platforms. The research followed the ethical guidelines established from the “Nuremberg Code”, the Belmont Report, the Declaration of Helsinki, and the Council for International Organisations of Medical Sciences. All participants provided their informed consent. The study was approved by Lancaster University Faculty of Health and Medicine Research Ethics Committee (FHMREC17020).

2.2 Setting
Lebanon is an upper-middle-income country [35] with a population of 6,184,701 [36]. 80.4% of the Lebanese population are internet users [37]. The young, female, rate of literacy in Lebanon is 99.1% [38]. More than 80% of the female population are enrolled in secondary education, and around 50% of the women are enrolled in tertiary or university education [39]. Lebanon positions first in the region in terms of women in the workplace [40] and the maternity leave consists of 70 days [41]. The necessary equipment for safe maternal and newborn health care is accessible [42]. 96% of deliveries are undertaken in health facilities and the cesarean section constitute 46% of all deliveries [43].

2.3 Sample
Mothers residing across the Lebanese territory and having a child between six and 24 months of age, were invited to the study. They were recruited via the internet, using social media platforms, in particular, Facebook and Whatsapp which are the most frequently used social media platforms in Lebanon [44]. Recruitment was via a study Facebook page, Facebook pages of groups that focus on maternal and child health or parenting topics and from health and care organisations such as health centres, hospitals and day care centres across the Lebanese territory. We were aiming for a sample size of 593 mothers.

2.4 Data collection
An online survey questionnaire was designed using Qualtrics and was available in English and Arabic. The researcher (NZ) pretested the survey. The questionnaire items were developed from previous literature [45, 46], and some questions regarding the housekeeper presence or maternal opinions concerning certain postpartum practices were developed for this study. The questionnaire consisted of 45 questions, in four sections relating to: the child, the mother, child feeding, and opinions about postpartum practices- (Appendix 1).

2.5 Data analysis
Data analysis was conducted using the SPSS package 26. Descriptive statistics were conducted to compare the characteristics of EBF for six months postpartum versus non-EBF groups. Bivariate (chi-square and t-test) and multivariate logistic regression analyses were conducted to explore the factors that impact the exclusive breastfeeding. For small cell sizes, the Fisher test was used instead of Chi-Square. Variables where 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 with odds ratio’s 95% CI that did not include one were deemed to be statistically significant. In the event of small cell sizes, the Firth regression was conducted [47]. The regression analysis was guided by the SEM model and categorized into three regression models: the individual, relationship and community levels.

3. Results

The researcher (NZ) contacted around 140 organisations which used social media outlets to reach their clients, and sought their formal written approval. 39 administrators agreed to sign the approval forms. 52% of the organizations were day care centres, 28% social media groups for mothers and parenting, 10% were health care centres, and 10% were social media groups for infant feeding. After data cleaning, 567 out of 593 surveys collected were included in the analysis.

Section 1: Youngest child demographic characteristics

The child demographic characteristics of the mothers who participated in the study are presented in table 1.1.

<table>
<thead>
<tr>
<th>Youngest child characteristics</th>
<th>n (Percentage %)</th>
<th>Mean (Standard Deviation) *</th>
<th>Median (Interquartile Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>266 (46.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>301 (53.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (months)</td>
<td></td>
<td>13.3 (6)</td>
<td>12 (10)</td>
</tr>
<tr>
<td>Birth weight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1,000 g</td>
<td>4 (0.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between 1,000 g and 1,500 g</td>
<td>15 (2.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between 1,500g and 2500g</td>
<td>64 (11.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between 2,500 and 4,000g</td>
<td>432 (76.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between 4,000 and 4,500g</td>
<td>32 (5.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;4,500g</td>
<td>20 (3.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnancy duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-term</td>
<td>501 (88.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early</td>
<td>66 (11.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of delivery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaginal delivery</td>
<td>296 (52.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cesarean delivery</td>
<td>271 (47.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Born in a hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1.1: Youngest child demographic characteristics. (1) of mothers who responded to the survey included in the analysis (n=567).

Section 2: Maternal demographic characteristics
The characteristics of the mothers who participated are presented in table 1.2.

<table>
<thead>
<tr>
<th>Maternal characteristics</th>
<th>n (Percentage %)</th>
<th>Mean (Standard Deviation)</th>
<th>Median (Interquartile Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of children (N=553)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td>1.6 (0.8)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lebanese</td>
<td>499 (88)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>564 (99.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced, Separated, Single</td>
<td>3 (0.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate level (grade 9)</td>
<td>8 (1.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary level (grade 12)</td>
<td>40 (7.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University level (Bachelors)</td>
<td>253 (44.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University level (Masters)</td>
<td>232 (40.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University level (Doctorate)</td>
<td>34 (6.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother having a chronic disease when the child was between zero and six months</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Yes \ No
#### Mother taking a chronic medication when the child was between zero and six months
<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24 (4.2)</td>
<td>543 (95.8)</td>
</tr>
</tbody>
</table>

### Yes \ No
#### Working status when the child was between zero and six months of age
<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25 (4.4)</td>
<td>542 (95.6)</td>
</tr>
</tbody>
</table>

### Working \ Not working
#### If yes, hours per week
<table>
<thead>
<tr>
<th></th>
<th>Working</th>
<th>Not working</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>292 (51.5)</td>
<td>275 (48.5)</td>
</tr>
</tbody>
</table>

### Mother’s place of residence when the child was between zero and six months old
<table>
<thead>
<tr>
<th>Region</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akkar</td>
<td>6 (1.1)</td>
</tr>
<tr>
<td>Baalbek-Hermel</td>
<td>8 (1.4)</td>
</tr>
<tr>
<td>Beirut</td>
<td>174 (30.7)</td>
</tr>
<tr>
<td>Beqaa</td>
<td>25 (4.4)</td>
</tr>
<tr>
<td>Mount-Lebanon</td>
<td>241 (42.5)</td>
</tr>
<tr>
<td>North</td>
<td>53 (9.3)</td>
</tr>
<tr>
<td>Nabatiye</td>
<td>18 (3.2)</td>
</tr>
<tr>
<td>South</td>
<td>42 (7.4)</td>
</tr>
</tbody>
</table>

### Family member living with the mother besides the partner and the children when the child was between zero and six months
<table>
<thead>
<tr>
<th>Relation to Mother</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s mother</td>
<td>139 (24.5)</td>
</tr>
<tr>
<td>Mother’s father</td>
<td>32 (5.6)</td>
</tr>
<tr>
<td>Partner’s mother</td>
<td>51 (9)</td>
</tr>
<tr>
<td>Partner’s father</td>
<td>16 (2.8)</td>
</tr>
<tr>
<td>Mother’s siblings</td>
<td>34 (6)</td>
</tr>
<tr>
<td>Partner’s siblings</td>
<td>14 (2.5)</td>
</tr>
<tr>
<td>None</td>
<td>363 (54)</td>
</tr>
<tr>
<td>Other</td>
<td>28 (4.9)</td>
</tr>
</tbody>
</table>

### Presence of live-in housekeeper/cleaner when the child was between zero and six months
<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150 (26.5)</td>
</tr>
</tbody>
</table>
No 417 (73.5)

**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-in housekeeper/cleaner in childcare**

Never 68 (45.3)
Seldom 30 (20)
Sometimes 32 (21.3)
Often 13 (8.7)
Almost always 7 (4.7)

**Involvement of live-out housekeeper/cleaner in childcare**

Never 87 (77)
Seldom 11 (9.7)
Sometimes 11 (9.7)
Often 1 (0.9)
Almost always 3 (2.7)

1 The mothers enrolled in the study were from 22 nationalities.

**Table 1.2:** Maternal demographic characteristics.

**Section 3: Feeding practices characteristics**

The feeding practices of the mothers who participated are presented in table 1.3.

<table>
<thead>
<tr>
<th>Feeding practices characteristics</th>
<th>n (Percentage%)</th>
<th>Mean (Standard deviation)</th>
<th>Median (Interquartile Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preconception plans</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeed only</td>
<td>336 (59.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formula feed only</td>
<td>11 (1.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both breast and formula feed</td>
<td>109 (19.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had not decided</td>
<td>111 (19.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Prenatal plans</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeed only</td>
<td>372 (65.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeding Practice</td>
<td>n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>--------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formula feed only</td>
<td>17 (3.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both breast and formula feed</td>
<td>141 (24.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had not decided</td>
<td>37 (6.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>If you intended to breastfeed, how old did you think your child will be when first given food or formula</strong></td>
<td><strong>n (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6.4 (3.4)</strong></td>
<td><strong>6 (0)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>If the mother ever breastfed the child</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>513 (90.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>54 (9.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>How long did the mother breastfeed the child</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of breastfeeding (months)</td>
<td>6.5 (5.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The child is still breastfeeding</td>
<td>210 (37)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not applicable</td>
<td>41 (7.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>How long did the mother exclusively breastfeed the child (in months)</strong></td>
<td><strong>n (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.6 (2.2)</td>
<td>5 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Initiation of breastfeeding</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within an hour of birth</td>
<td>185 (32.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After an hour of birth</td>
<td>277 (48.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exclusively breastfed until six months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>(214) 37.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>(353) 62.3%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 1.3:** Feeding practices characteristics.

**Section 4: Beliefs/opinions regarding some feeding practices**

The mothers’ beliefs/opinions regarding some feeding practices are shown in table 1.4

<table>
<thead>
<tr>
<th>Beliefs/opinions regarding some feeding practices</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Importance of breastfeeding within an hour of birth according to the mother</strong></td>
<td></td>
</tr>
<tr>
<td>Not important</td>
<td>12 (2.1)</td>
</tr>
<tr>
<td>Slightly important</td>
<td>7 (1.2)</td>
</tr>
<tr>
<td>Fairly important</td>
<td>32 (5.6)</td>
</tr>
<tr>
<td>Important</td>
<td>95 (16.8)</td>
</tr>
<tr>
<td>Very important</td>
<td>421 (74.3)</td>
</tr>
<tr>
<td><strong>Importance of keeping the baby’s crib by the mother’s bedside according to the mother</strong></td>
<td></td>
</tr>
<tr>
<td>Not important</td>
<td>11 (1.9)</td>
</tr>
<tr>
<td>Importance of holding the baby skin-to-skin after delivery according to the mother</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Not important</td>
<td>10 (1.8)</td>
</tr>
<tr>
<td>Slightly important</td>
<td>16 (2.8)</td>
</tr>
<tr>
<td>Fairly important</td>
<td>34 (6.0)</td>
</tr>
<tr>
<td>Important</td>
<td>98 (17.3)</td>
</tr>
<tr>
<td>Very important</td>
<td>409 (72.1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Whether the mother asked for holding the baby skin-to-skin after delivery</th>
<th>Yes</th>
<th>351 (61.9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>216 (38.1)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Whether the mother held her baby skin-to-skin after delivery</th>
<th>Yes</th>
<th>323 (57.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>244 (43.0)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>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?</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>247 (43.6)</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>139 (24.5)</td>
<td></td>
</tr>
<tr>
<td>Undecided</td>
<td>91 (16.0)</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>73 (12.9)</td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>17 (3.0)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Whether the mother asked for a free formula sample at the hospital</th>
<th>Yes</th>
<th>29 (5.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>358 (94.9)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Whether the mother was offered a free formula sample at the hospital</th>
<th>Yes</th>
<th>180 (31.7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>387 (68.3)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Best description of the partner’s support regarding the mother’s breastfeeding</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Slightly important</td>
<td>12 (2.1)</td>
<td></td>
</tr>
<tr>
<td>Fairly important</td>
<td>51 (9.0)</td>
<td></td>
</tr>
<tr>
<td>Important</td>
<td>114 (20.1)</td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>379 (66.8)</td>
<td></td>
</tr>
</tbody>
</table>
How important is breastfeeding in the partner’s opinion according to the mother

Table 1.4: Beliefs

<table>
<thead>
<tr>
<th>Mothers’ beliefs/opinions regarding some feeding practices.</th>
</tr>
</thead>
</table>

Determinants of EBF until six months postpartum

The odds of EBF until six months postpartum are reduced by 31.8% when mothers do not plan to breastfeed while they are pregnant (Table 2.1). Besides, the odds of EBF 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 (Table 2.1). Furthermore, the odds of EBF 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 (Table 2.2). Moreover, the odds of EBF 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 (Table 2.3). In addition, the odds of EBF until six months postpartum are reduced by 60.8% when mothers have Lebanese nationality (Table 2.3). On the other hand, mothers whose partners perceive breastfeeding as very important are 41% more likely to EBF until six months postpartum (Table 2.2). Besides, the mother not being offered a free formula sample at the hospital was 47% more likely to EBF until six months postpartum (Table 2.3).

Table 2.1

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Adjusted Odds ratio (according to each level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preconception plans</td>
<td>0.97 (0.81; 1.14)</td>
</tr>
<tr>
<td>Prenatal plans</td>
<td>0.68 (0.54; 0.86)</td>
</tr>
<tr>
<td>Importance of breastfeeding within an hour of birth according to the mother</td>
<td>1.18 (0.92; 1.54)</td>
</tr>
</tbody>
</table>

Table 2.2

<table>
<thead>
<tr>
<th>Multivariate Model 1</th>
<th>Independent variable</th>
<th>Adjusted Odds ratio (according to each level)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>P-value</td>
</tr>
<tr>
<td>Model 1</td>
<td>Preconception plans</td>
<td>0.684</td>
</tr>
<tr>
<td>Model 1</td>
<td>Prenatal plans</td>
<td>0.001*</td>
</tr>
<tr>
<td>Model 1</td>
<td>Importance of breastfeeding within an hour of birth according to the mother</td>
<td>0.194</td>
</tr>
</tbody>
</table>
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 crib to be kept by her bedside at the hospital | 0.210 | -0.28 | [-0.72; 0.16] | 0.76 | [0.49; 1.17] |

Table 2.1: Multivariate logistic regressions: Model 1-Individual level.

<table>
<thead>
<tr>
<th>Multivariate Model 2</th>
<th>Independent variable</th>
<th>Adjusted Odds ratio (according to each level)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>P-value</td>
</tr>
<tr>
<td>Model 2</td>
<td>Best description of the partner’s support regarding the mother’s breastfeeding according to the mother</td>
<td>0.454</td>
</tr>
<tr>
<td>Model 2</td>
<td>How important is breastfeeding in the partner’s opinion according to the mother</td>
<td>0.005*</td>
</tr>
<tr>
<td>Model 2</td>
<td>Presence of mother’s father in the household besides the partner and children when the child was between zero and six months</td>
<td>0.049*</td>
</tr>
<tr>
<td>Model 2</td>
<td>None present at home besides the partner and children when the child was between zero and six months</td>
<td>0.268</td>
</tr>
</tbody>
</table>

Table 2.2: Multivariate logistic regressions: Model 2-Relationship level.
Table 2.3: Multivariate logistic regressions: Model 3-Community level.

4. Discussion

This study has reported novel findings that have not been previously reported. The determinants of EBF until six months postpartum encompassed the three levels of the SEM. At the individual level, the determinants were the mother having prenatal plans and having an opinion regarding the distribution of free formula samples at the hospitals, the latter being a novel finding, because no other study has looked at this. Other researchers have also noted that having the intention to breastfeed during pregnancy is associated with EBF until six months postpartum [48, 49]. At the relationship level, the determinants were the importance of breastfeeding in the partner’s opinion according to the mother and the mother’s father living in the same household when the child was between zero and six months, the latter being a novel finding. The first determinant is consistent with previous research which has found that being in nuclear families and the partner’s appreciation of BF [50] and support [49], are determinants of EBF until six months postpartum. However, the second determinant has not been previously explored or determined to be associated with EBF until six months postpartum in developing countries. The superior role of the male gender and the patriarchal structure of the Lebanese society [51] may explain how women’s behaviours are influenced by the men in her family. 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 [52]. The father is the central figure of a family, and in some regions, if the woman is assumed to impair an honor, her father can kill her [53]. Women traditionally married in order to bear sons as a protection for their own future, and if she does not bear any children, particularly sons, she can be threatened with divorce [53]. In the event of a divorce, a Lebanese mother does not maintain the custody of her children [54]. At the community level, the determinants were i) keeping the baby’s crib by the mother’s bedside, ii) the mother being offered a free formula sample and iii) the nationality. The first two determinants are consistent with the WHO recommendations to attain successful breastfeeding [55], where practicing rooming-in, respecting the “International Code of Marketing of Breast-Milk Substitutes” and refraining from offering milk substitutes at the hospitals [56] should be implemented. The third
determinant, having a Lebanese nationality, was novel to this study. This finding supports the work of other studies in this area, linking racial and ethnic disparities with differences in breastfeeding practices [57]. Lebanon has been lagging in the rates of EBF compared to other countries [25]. Moreover, the laws that 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”, have not been properly implemented in Lebanon [58]. In Lebanon, endorsing the breastfeeding policies and applying them are not always in line [59]. This, in turn, impacts the mothers living in Lebanon decisions and behaviours in relation to breastfeeding. We did not find any statistically significant association between EBF until six months postpartum and the presence of a housekeeper or with whether the housekeeper was involved in childcare. However, this may be due to the small number of participants who had housekeepers. Female migrant workers relocate to the Arab countries to gain their living and provide for their families [60]. In Lebanon, there are around 250,000 women migrant domestic workers [61]. This is a considerable number given that the Lebanese population was about 4,000,000 [62] before reaching recently around 6,000,000 [36], where more than 1,300,000 refugees were expected [63]. Many of the women migrant domestic workers living in Lebanon are housekeepers [60]. Very few studies have explored the presence of housekeepers’ relation with breastfeeding, such as in the Arabic gulf regions [64] and Singapore [65]. The mean EBF rate reported was 37.7%, which is higher than the national 27% rate in 2015 [25]. This may be due to the fact that the women who decided to partake in this survey were interested in maternal and child health, or that certain initiatives and organizations in the country have recently contributed to raising awareness about breastfeeding, such as the campaign initiated by the Ministry of Public Health [39], or pro-breastfeeding Non-Governmental Organizations and Facebook groups.

5. Conclusions

This is the first study exploring breastfeeding conducted using an online methodology, covering all the Lebanese territory, and using social media as a recruitment channel. 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. This research provides health care professionals, policy-makers and advocates with the necessary information to guide public health policies and ensure appropriate systems, services and support for breastfeeding, in particular targeting mothers and their families.

Recommendations

A natural progression of this work would be to explore raising the awareness of breastfeeding to the fathers of the mothers on EBF. Furthermore, given that most of the housekeepers were involved in child care raises important issues and could be usefully explored in further research. Considering the high rate of c-section performed in Lebanon, it would be interesting to investigate the impact of the c-section on the skin-to-skin practice. Moreover, given the recent increase in breastfeeding support groups in Lebanon, further research could be conducted to determine their impact on the breastfeeding practices. This study has shown that the government and healthcare policy-makers should reinforce the implementation of the existing law that prohibits offering the formula for the mothers in the hospitals after delivery. Hospitals should abide by, and reinforce, the baby-friendly practices. The
mother and her family should be provided with the proper breastfeeding information which will lead to her empowerment and taking the right decisions. Adopting the social-ecological model by targeting the family, and using the breastfeeding social marketing, such as awareness mass media campaigns could be conducted as these have contributed to a positive change in various health practices and behaviours [40].

Limitations
The sample of the participants may be limited in representativeness and biased to excluding people not having access to the internet. 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 certain factors.

Conflict of Interest
The authors declare that they have no conflict of interest.

Funding
This study was conducted as a self-funded Public Health PhD candidate at DHR, Lancaster University, UK.

Acknowledgements
We would like to thank all who contributed insights through their participation in our research in particular Dr. Elizabeth McDermott, the administrators of the organizations, and the mothers who participated in the study.

References
1. UNICEF. Infant and young child feeding (2012).
23. Strathearn L, Mamun A A, Najman J M, O'callaghan M J. Does breastfeeding protect against substantiated


36. CIA. The world factbook (2016).

37. IWS. Lebanon (2015).

38. UNICEF. At a glance: Lebanon (2013).


44. NorthWestern University In Qatar. SOCIAL MEDIA Sharing information and connecting online nearly universal (2015).

45. CDC. Breastfeeding - The questionnaires (2014).

58. WHO. Laws to protect breastfeeding inadequate in most countries (2016).
60. ILO. "Maid in Lebanon": protecting the rights of migrant domestic workers (2019).
61. ILO. Lebanon (2016).
63. UNHCR. Lebanon (2016).

Appendix 1
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: XXXXXX

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

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: XXXXXX