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Factors Associated with Duration of Breastfeeding in Ireland: Potential Areas for Improvement

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Despite extensive evidence supporting the health benefits of exclusive breastfeeding for both mothers[1,2] and infants[2,3-5] until the recommended 6 months postpartum,[6,7] Ireland, a country with the highest birth rate in Europe,[8] has one of the lowest breastfeeding rates worldwide.[9-11] A 2008 national study reports that only 55% of mothers in Ireland initiated breastfeeding,[9] in comparison with rates of 91% in Italy[12] and 99% in Norway.[13] Even lower exclusive breastfeeding rates at hospital discharge: 44% in 2006[14] and 45% in 2007[8] are reported in National Perinatal Statistics. Early discontinuation rates, by international comparison, are also a concern in the Ireland. Any breastfeeding rates at 12 weeks have been reported as 88% in Norway,[13] 75% in Russia[15] and 51.5% in the USA,[16] in comparison with only 34% of mothers reported to be breastfeeding between 12-17 weeks in Ireland.[9]

Societal embarrassment, perceived social isolation and restricted freedom have been identified as some of the barriers to breastfeeding initiation in Ireland.[17,18] However, the factors influencing early discontinuation after breastfeeding is initiated, require more in-depth study. The importance of social and emotional support from the partner,[19,20] family members and friends[21] on breastfeeding success, is well-documented. Lactating women who receive professional support are known to breastfeed for a longer duration.[22] Implementation of hospital practices including rooming-in,[23] skin-to-skin contact after delivery,[24,25] suckling within the first hour[23,26] and exclusive breastfeeding during the hospital stay,[23,26,27] independent of maternal socio-economic status, has been shown to significantly increase breastfeeding duration. The Baby-Friendly Hospital Initiative (BFHI) and the 10 Steps to Successful Breastfeeding developed by the World Health Organization (WHO)[28] have also been shown to support and improve breastfeeding.[23]

Despite a sharp decline in breastfeeding rates in Ireland during the initial weeks postpartum, however, no published data have examined the independent influences of hospital practice factors on breastfeeding success. There is also a need to identify maternal sources of support associated with continued breastfeeding which may better inform the design of promotional campaigns and targeted interventions aimed at improving Irish breastfeeding rates. The objectives of this study were to determine the factors predicting breastfeeding success at maternity hospital discharge, identify the sources of support that contribute to continued breastfeeding, and explore the reasons for discontinued breastfeeding during the first 6 months.

Methods

Sample Selection and Recruitment

The study methods and sample representativeness of this prospective observational study have been previously described.[18] In summary, an initial sample of 539 low risk pregnant women (at ≥ 24 weeks gestation) was recruited during June 2004-October 2006 from antenatal clinics in the Coombe Women and Infants University Hospital (CWIUH), Dublin (Ireland), which is one of the largest maternity hospitals in the Dublin region. During the study interval, the CWIUH had BFHI membership status. From 491 women who gave signed consent to participate (91%), 450 eligible mothers (83%) who met the study inclusion criteria (delivery of a healthy, term [≥ 37 weeks gestational age] singleton infant weighing ≥ 2.5kg at birth, willingness to participate in study follow-up and reporting residency in Ireland ≥ 6 months postpartum), were followed up by either face-to-face or telephone interview at 6 weeks and 6 months postpartum. Ethical approval for this study was obtained from the CWIUH and Dublin Institute of Technology (DIT) Ethics Committees.

Measures

The main outcome measure of this study was duration of any breastfeeding during the first 6 months. To explore the factors associated with breastfeeding duration, a wide range of parameters related to socio-demographics, hospital practices, reported sources of breastfeeding support, and infant characteristics were considered for analyses.

Data on maternal socio-demographic factors, including highest education level attained, age, marital status, parity, race and country of birth were elicited from the antenatal patient-administered questionnaire. Smoking status during pregnancy, and reported pre-pregnancy weight and height were also recorded, and body mass index (BMI) calculated (weight/height^2, kg/m^2).

The 6 week interviewer-administered survey collected data on breastfeeding initiation, defined as all mothers who 'ever' tried to breastfeed, and details on various postpartum hospital practices, including skin-to-skin contact within the first hour after the birth, first feed type, timing of first breastfeed, exclusive breastfeeding during the first 24 hours after the birth, rooming-in, duration in the maternity hospital, as well as receipt of, and satisfaction with midwife support to establish successful breastfeeding.

Infant characteristics, including type of delivery, birth weight, gender, gestational age at birth and presence of neonatal jaundice (serum bilirubin > 250µmol/L) during the first 4 days postpartum were obtained from the infants' medical notes.

In both the 6 week and 6 month interviewer-administered questionnaires, mothers were asked to specify their infants' feeding status, categorised as: formula feeding ± solid foods, exclusive or partial breastfeeding, from which any breastfeeding (all infants who received 'any' breast milk) was determined, and report on feeding transitions during the intervening period.

In the present study, exclusive breastfeeding was defined using Labbok and Krasovec's[29] guidelines, which state that exclusively breastfed infants consume only breast milk (although vitamin/mineral drops and/or syrups are permitted). Partial breastfeeding was defined as infants who consumed breast milk, in addition to any other food or liquid, including infant formula milk. As a relatively large proportion of mothers who breastfed during the first 6 weeks in this study reported to expressing their breast milk (hence, provided bottled expressed breast milk to their infants), the term 'provided breast milk to their infants' was used to incorporate all mothers who breastfed (*via* skin-to-skin contact) and/or bottle-fed their infants expressed breast milk. Data on frequency of daily breast milk expression episodes were not collected. Where relevant, the timing of breastfeeding discontinuation (week of last breastfeed) and reason(s) for discontinuation (open-ended question; responses were then categorised), were documented. Formula fed infants were those who exclusively consumed infant formula milk.

Information pertaining to mothers' work return plans, source(s) of breastfeeding support (open-ended question; responses were then categorised) and their perception of the adequacy of this support, was also collected. Community-based sources of breastfeeding support available for analysis included the General Practitioner (GP), paediatrician, hospital midwives, public health nurse (PHN) and local breastfeeding support groups including those organised by La Leche League and Cuidiú Ireland. Once a woman is discharged home from the maternity hospital, postnatal care is provided mainly by the GP and PHN (i.e. a role similar to that of a 'health visitor'). In Ireland, PHNs are the only nurses universally available in the community and the public health nursing service is, thus, synonymous with PHNs.[30] Their role has a wide remit encompassing primary, secondary and tertiary care at the level of the individual, family and community; they are geographically/community attached and mandated to provide a nursing service to new mothers and their infants in the community from birth through to the school years.[31,32] The PHN role involves both direct (home visits and attendance at mother and baby clinics) and indirect (phone calls) contact with new mothers, as required. It is

recommended that the first postnatal domiciliary visit takes place within 48 hours from the timing of discharge from the maternity hospital.[33]

Statistical Analysis

Statistics were computed by using Statistical Package for the Social Sciences (SPSS Inc.; Chicago, USA, version 17). Normality of data was checked using the Kolmogorov-Smirnov test. Data are presented using numerical descriptive statistics, including means with standard deviations (SD) or medians with interquartile ranges (IQR: 25th-75th percentile), as appropriate. Where variables were skewed (and non-normally distributed) the median values for central tendency were reported. Comparison between groups was performed using the Student's *t*-test for continuous variables and the χ^2 test for categorical variables; the Fisher's exact test was used in 2x2 tables when the cell content was ≤ 5. Significance levels were set at $P < .05$ criterion.

To explore the independent factors associated with breastfeeding success at discharge from the maternity hospital, only those factors that were significant ($P < .05$) in univariate analysis (included analysis of socio-demographics, hospital practice factors, midwife support, infant characteristics and feeding method encouraged by partner) were entered singly into a binary logistic regression model. The predictors that remained significant ($P < .05$) in the preliminary multivariate models were included in the final model.

Similarly, binary logistic regression analysis was used to assess the relationship between the dependent variable 'any breastfeeding ≥ 6 weeks' (versus < 6 weeks) and socio-demographic variables, work return factors and mothers' reported sources of breastfeeding support during the first 6 weeks postpartum. The fit of the final models was assessed as adequate on the basis of the Hosmer-Lemeshow test. Adjusted odds ratios (OR) and 95% confidence intervals (CI) were calculated for each factor in both of the final models. Since our outcomes were not rare events, OR's were then converted to Relative Risk (RR) using the method suggested by Zhang & Yu.[34]

Results

Demographic Characteristics and Postpartum Infant Feeding Practices

Characteristics of the mother-term infant pairs are presented in Table 1. The majority of mothers (n = 450) were white Caucasian (94.7%), married/cohabitating (90.4%) and non-smokers during pregnancy (79.1%). One third of the mothers (33.1%) were educated to third level degree/postgraduate, and 47.3% were primiparous. The mean maternal age was 29.2 years.

Although 228 mothers (50.7%) initiated breastfeeding postpartum, this dropped to 193 mothers (42.9%) who were providing any breast milk to their infants at hospital discharge and to 131 mothers (29.1%) at 6 weeks. Just over half of the mothers who were breastfeeding at 6 weeks (n = 67) reported that they expressed their breast milk, hence provided bottled expressed breast milk to their infants (data not shown). At 6 months, 62 infants (13.8%) were provided with any breast milk and only one infant was exclusively breastfed (data not shown). The median duration of any breastfeeding for all mothers (n = 228) during the first 6 months was 73.5 days (IQR 14-168).

Discontinuation of Breastfeeding during the Hospital Stay

The median length of stay in the maternity hospital for all mother-infant pairs was 3.5 days (IQR 3-5 days). Almost all of the mothers who initiated breastfeeding reported satisfaction with the duration of hospital stay to enable them establish successful breastfeeding (n = 227; 99.6%) (data not shown).

Table 2 indicates that psychosocial factors (i.e. factors determined, in part, by social influence, attitudes, cultural norms and experiences, that are known to influence a mother's perception of the importance of breastfeeding)[35-37] including tiredness/frequent feeding/lack of freedom (19.7%), as well as the perception of an insufficient breast milk supply (19.7%) and unsuccessful latching (14.2%) were the reported principal reasons for discontinuing breastfeeding during the hospital stay postpartum. Only 2.2% of mothers reported lack of support from the hospital midwives as a reason for discontinuing breastfeeding.

Eighty percent of mothers who discontinued breastfeeding in the hospital (n = 28/35) reported that they received adequate breastfeeding support. Earlier intervention (n = 6), more time (n = 5) and practical support (e.g. latching technique, correct positioning) (n = 5) from the midwives were the principal needs of the mothers who reported inadequate receipt of breastfeeding support (data not shown).

Factors Predicting Breastfeeding Success at Hospital Discharge

Mothers successfully lactating at discharge from the maternity hospital (n = 193) compared with those who discontinued post initiation (n = 35), were significantly more likely to have been older (30.9 years vs 28.9 years; $P < .05$) and educated to third level degree/postgraduate (53.4% vs 17.1%; $P < .001$). Mothers who were providing any breast milk to their infants at discharge also reported positive encouragement from their partners to breastfeed (73.7% vs 39.4%; $P < .001$), receipt of (99.3% vs 92.6%; $P < .05$) and satisfaction with (95.7% vs 81.5%; $P < .05$) midwife support to establish successful

breastfeeding, exclusive breastfeeding during the first 24 hours after the birth (87% vs 68.6%; $P < .05$) and that the infant's first feed was a breastfeed (92.7% vs 77.1%; $P < .01$) (see Table 3). No significant difference in marital status, race, parity, smoking during pregnancy, mothers' pre-pregnancy BMI, type of delivery, rooming-in with infant, duration of hospital stay, skin-to-skin contact during the first hour after birth or timing of first breastfeed was found between the two groups.

Table 4 reports on the independent factors predictive of continued any breastfeeding at discharge from the maternity hospital. After adjustment for other covariates, mothers who were educated to third level/postgraduate and those who reported positive encouragement from the partner to breastfeed postpartum were 2.82 times (95% confidence interval [CI]: 1.82-3.21) and 2.27 times (95% CI: 1.22-3.31) more likely, respectively, to have been successfully breastfeeding at maternity hospital discharge. Other independent positive predictors identified included reporting that the infant's first feed was a breastfeed (relative risk [RR]: 1.46 [95% CI: 1.2-1.54]) and maternal satisfaction with midwife support to establish successful breastfeeding (RR: 1.7 [95% CI: 1.25-1.81]).

Reported Sources of Breastfeeding Support during the First 6 Weeks and at 6 Months

Maternal sources of breastfeeding support during the first 6 weeks, and at 6 months postpartum are detailed in Table 5. Eighty five percent of the mothers who provided any breast milk to their infants at 6 weeks (n = 112/131) reported adequate receipt of breastfeeding support, mainly from their partner (30.9%), family (22.2%) and the PHN (14.7%). If breastfeeding difficulties occurred, the PHN was also reported as the main source of support by 34.4% of mothers (see Table 5). Seventy nine of the 97 mothers (81.4%) who discontinued breastfeeding during the first 6 weeks reported adequate receipt of breastfeeding support, mainly from the hospital midwives (47%) and partner (24.3%) (data not shown).

Among the mothers who provided any breast milk at 6 months (n = 62), the partner (27.7%) and family (30.1%) were reported as mothers' outstanding sources of breastfeeding support.

Factors Associated with Continued and Discontinued Breastfeeding during the First 6 Months

As summarized in Table 2, psychosocial factors[36] including tiredness/no sleep with frequent feeding/lack of freedom were the most frequently reported reasons for breastfeeding discontinuation during the hospital stay (19.7%), during the first 6 weeks

(33.5%) and from 6 weeks to 6 months (51%) in this study. Maternal perception of having an inadequate breast milk supply was the second most frequently reported reason for discontinuation at all stages throughout the first 6 months. Poor latching on/or sucking was identified as a lactational factor specific to the hospital stay (14.2%) and the first 6 weeks (8.3%). Work return (12.2%) and mothers' personal plan to discontinue breastfeeding (11.1%) were reasons for discontinuation specific to the 6 week to 6 month timeframe.

Fewer than 1% of mothers cited lack of breastfeeding support from hospital or community-based health professionals as a reason for breastfeeding discontinuation from hospital discharge to 6 months. Health benefits of breast milk (42%), convenience (18.3%) as well as maternal benefits including bonding and regaining one's figure (18.3%), were the principal reasons reported by mothers for continued breastfeeding to 6 months (data not shown).

Factors Associated with Any Breastfeeding for Duration ≥ 6 Weeks

In the univariate analysis, education to third level/postgraduate and reporting of the PHN as well as the partner as sources of breastfeeding support during the first 6 weeks were significantly associated with any breastfeeding for duration ≥ 6 weeks (n = 137) versus < 6 weeks (n = 91), and these effects persisted in the final binary regression model after adjustment, as shown in Table 6. In particular, a strong positive association between any breastfeeding ≥ 6 weeks and reporting of the PHN as a source of breastfeeding support was demonstrated (RR: 1.57 [95% CI: 1.23-1.73], $P < 0.01$). Trends towards any breastfeeding ≥ 6 weeks and reporting of the family ($P = 0.062$), friends ($P = 0.053$) and local breastfeeding support group ($P = 0.068$) as sources of breastfeeding support were observed in univariate analysis, however, these associations did not reach statistical significance (data not shown).

Discussion

This study has highlighted several novel and potentially modifiable factors associated with breastfeeding duration in Ireland. Relatively unique to an Irish population of mothers, we found that psychosocial factors[36] including tiredness/frequent feeding/lack of freedom commonly featured as the outstanding reason for discontinuation of breastfeeding during the hospital stay (19.7%), the first 6 weeks (33.5%), and from 6 weeks to 6 months (51%). These findings are consistent with results from the 2008 National Infant Feeding Study reporting that 25% of mothers discontinued breastfeeding

between 12-38 weeks owing to a busy lifestyle, and 15.6% of mothers introduced supplementary formula milk feeds because they wanted 'a break' from breastfeeding.[9] Conversely, among the most frequently reported reasons for early discontinuation in studies from the USA[36] and UK[38] include maternal perception of an insufficient milk supply and latching on/sucking issues, respectively. Work return has also been identified as a negative determinant of breastfeeding duration,[39,40] however, this factor did not feature as a major reason for early discontinuation during the first 6 weeks (0.4%), or from 6 weeks to 6 months (12.2%) in the present study. Taken together, it appears that one of the major challenges to increasing Irish breastfeeding duration rates lies in addressing the influence of maternal psychosocial factors, more so than medical, nutritional, lactational, or infant-driven factors.

Mothers who continued breastfeeding to 6 months in this study reported 'health benefits' (42%) as a main reason for continued breastfeeding. It is possible that mothers who discontinue breastfeeding early are unaware of the full infant and maternal health benefits of breastfeeding beyond the initial weeks postpartum, and that such health benefits increase with exclusivity of the practice,[5] for a longer duration.[41] Moreover, Chezem *et al.*[42] showed that maternal breastfeeding knowledge is strongly correlated with actual lactation duration. The fact that mothers in Ireland uniquely rate psychosocial factors (i.e. tiredness/no sleep with frequent feeding/lack of freedom) above other reasons for discontinuation during the first 6 months may also reflect their changing role and expectations. There may be a need for more societal recognition of the normal needs of motherhood, as well as a need to provide more practical assistance to lactating mothers with other children. Nonetheless, greater emphasis and detail of the benefits of longer breastfeeding duration for mothers' and infants' health may be crucial to promotional efforts. An examination of the independent effects of mothers' breastfeeding knowledge, and breastfeeding motivational scores on duration rates during the first 6 months is worthy of investigation in future studies.

In agreement with the literature,[24,43] maternal education to third level/postgraduate was strongly associated with any breastfeeding at hospital discharge (RR: 2.82 [95% CI: 1.82-3.21]), as well as continued breastfeeding ≥ 6 weeks (RR: 1.62 [95% CI: 1.25-1.86]). However, even after adjustment for maternal education, we also found that hospital practices, partner support of breastfeeding and maternal satisfaction with midwife support had a positive impact on continued any breastfeeding at hospital discharge. Arguably, such independent determinants are more modifiable than socio-demographic factors, and

thus, provide valuable information for future breastfeeding support programmes. Our findings also underscore the importance of measuring, not only 'maternal receipt' of breastfeeding support, but also 'mothers satisfaction and perception of the effectiveness of such support' in future studies. Based on the present study, postpartum ward-level breastfeeding interventions that combine support from the partner to breastfeed and ensure mothers' satisfaction with breastfeeding support from midwives, are thus likely to be most effective in maintaining breastfeeding rates.

Consistent with previous investigations,[23,26,27] reporting that the infant's first feed was a breastfeed was independently associated with continued breastfeeding at maternity hospital discharge ($P < .05$). According to the WHO,[28,44] prelacteal feeds are associated with a greater likelihood of not breastfeeding, as well as being a risk factor for poor breastfeeding outcomes, and should not be given to newborns unless medically indicated. Furthermore, Giovannini *et al.*[45] showed that exclusive breastfeeding in the maternity hospital is associated with a longer duration of full breastfeeding, later introduction of formula, and lower rate of introduction of formula within 1 month. Stronger educational messages from midwives during both the ante and postnatal period should emphasise the increased likelihood of breastfeeding success when exclusive breast milk is provided to infants from their very first feed postpartum. In accordance with WHO guidance,[28,44] encouraging mothers to persevere with exclusive breastfeeding after the birth is a potential area for targeted interventions.

A novel and highly noteworthy finding in this study was the positive independent influence of the PHN on longer breastfeeding duration ≥ 6 weeks (RR: 1.57 [95% CI: 1.23-1.73], $P < 0.01$). Furthermore, we found that over one third of breastfeeding mothers reported the PHN as their main source of support in the event of breastfeeding difficulties during the first 6 weeks. The fact that the 2008 National Infant Feeding Study[9] also reported the PHN as the most common support service used by mothers (20%, n = 111) highlights the much valued and unique role of the PHN as regards community breastfeeding support among mothers in Ireland. Professional support is known to significantly extend duration of any breastfeeding[46]; however, it is also acknowledged that data on the specific positive influences of professional breastfeeding support are lacking.[47] Several factors appear associated with health professionals' competence in supporting breastfeeding such as knowledge about breastfeeding, a positive attitude towards breastfeeding, and confidence in coping with breastfeeding problems.[48,49]

The present study was not designed to assess or measure the means by which the PHN specifically influences breastfeeding duration, thus, the aspect of the PHN role associated with breastfeeding success is unknown. The important contribution made by the PHN in Ireland to mothers' 'professional social network' has, however, been highlighted in previous research. In a regional study by Leahy-Warren[50], the PHN compared with the GP and midwives, was rated by the majority of first-time mothers as being an important source of 'informational' (77%) and 'appraisal' (51%) support. Another regional study from Co. Kerry by O'Rourke *et al.*[51] evaluated the effectiveness of PHN facilitation of a weekly peer-professional breastfeeding support group. This PHN-led community initiative concluded that mothers felt more confident in their ability to breastfeed, a factor which was reported to contribute to continued breastfeeding.[51]

Another possible explanation for the positive association of PHN support on breastfeeding duration in our study may be attributed to the frequency of direct/indirect PHN contact with mothers during the postnatal period. It is also possible that an 'early' compared with a 'delayed' first postnatal PHN domiciliary visit (i.e. within the initial 12 hours versus > 48 hours post-maternity hospital discharge) provides a more timely opportunity to assess and assist the breastfeeding mother, build rapport and provide anticipatory breastfeeding guidance during this vulnerable time. According to a review by Britton *et al.,*[46] greater investigation as regards the timing and delivery of support interventions to breastfeeding mothers is required. Nonetheless, our findings highlight the need to increase the impact of the PHN in future breastfeeding promotional strategies. Crucially, however, determining the specific aspects of the PHN role associated with breastfeeding success requires more rigorous evaluation.

There are several limitations to this study. First, as this is a single-site prospective study capturing the infant feeding practices of a convenience sample of women in west Dublin, we cannot generalize the results across the island of Ireland. Second, there may have been other factors (e.g. maternal knowledge of breastfeeding benefits/breastfeeding motivational scores), on which data were not collected, that were confounders of the outcomes of interest. Furthermore, given that the study relied on maternal self-reports of retrospective events, we cannot determine the impact of memory or response bias on our results. Although a positive association was found between any breastfeeding ≥ 6 weeks and the PHN as a postnatal source of breastfeeding support, the specific positive aspect of the PHN role in relation to breastfeeding success was not measured. However, this study represents one of the very few Irish infant feeding studies

reporting such a high follow-up rate (83%) of mother-term infant pairs to 6 months postpartum, spanning over a two year period.

Conclusion

This study has further advanced our understanding of the factors predictive, or associated with breastfeeding duration in Ireland. Based on our data, addressing maternal psychosocial factors in promotional campaigns appears an important first step to increasing Irish breastfeeding duration rates. Future postpartum ward-level breastfeeding interventions that aim to optimize maternal satisfaction with midwife support, in tandem with partner's support of breastfeeding, are likely to be most effective. Encouraging mothers to provide breast milk as the infant's first feed postpartum and promoting exclusive breastfeeding during the hospital stay are hospital practice factors potentially amenable to improvement. The important role of the PHN on increasing breastfeeding duration ≥ 6 weeks should be recognized and further explored. To ensure optimal health outcomes for mothers and infants in Ireland, these findings provide valuable direction for future strategies and interventions aimed at increasing breastfeeding duration rates in Ireland.

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Table 1. Maternal, Infant and Postnatal Infant Feeding Characteristics of the Study Population

Characteristic	*(N = 450)*
Maternal age, $\bar{x}$ ± SD, y	29.2 ± 5.8
Maternal education level, n (%)	
Primary/secondary	177 (39.3)
Vocational/training course	124 (27.6)
Third level degree/postgraduate level	149 (33.1)
Race, n (%)	
White Caucasian	426 (94.7)
Black African	18 (4)
Asian	5 (1.1)
American Indian	1 (0.2)
Marital status, n (%)	
Married/cohabitating	407 (90.4)
Single	43 (9.6)
Smoking during pregnancy, n (%)	94 (20.9)
Primiparous, n (%)	213 (47.3)
Infant	
Male, n (%)	250 (55.6)
Spontaneous vaginal delivery, n (%)	344 (76.4)
Caesarean section delivery, n (%)	106 (23.6)
Infant birth weight, $\bar{x}$ ± SD, kg	3.55 ± 0.52
Infant feeding	
Initiated breastfeeding, n (%)	228 (50.7)
Feeding status at maternity hospital discharge, n (%)	
Exclusive breastfeeding[a]	151 (33.5)
Partial breastfeeding[a]	42 (9.4)
Formula feeding	257 (57.1)
Feeding status at 6 weeks[b], n (%)	
Exclusive breastfeeding[a]	78 (17.3)
Partial breastfeeding[a]	53 (11.8)
Formula feeding	305 (67.8)
Formula feeding + solid foods	14 (3.1)
Duration of any breastfeeding during the first 6 months[c], median (IQR), d	73.5 (14-168)

SD, standard deviation; IQR, interquartile range. Data are expressed as *n* (%), $\bar{x}$ ± SD or median (IQR).

a. For breastfeeding definitions, see Methods Section.

b. Median age of infants at the 6 week follow-up: 6.57 weeks (IQR: 6.1-7).

c. Median age of infants at the 6 month follow-up: 24.7 weeks (IQR: 24.4-25).

Table 2. Primary Reasons Reported for Discontinuing Breastfeeding during the Hospital Stay, the First 6 weeks, and From 6 weeks to 6 Months Postpartum

Reasons Reported for Discontinuation of Breastfeeding	*During the Hospital Stay (n = 35) n (%)*	*First 6 Weeks Postpartum (n = 97) n (%)*	*From 6 Weeks to 6 Months (n = 69) n (%)*
Maternal psychosocial[a] factors (tiredness/no sleep with frequent feeding/lack of freedom)	18 (19.7)	92 (33.5)	87 (51)
Perception of an insufficient breast milk supply	18 (19.7)	51 (18.6)	20 (11.7)
Infant not latching on/or sucking	13 (14.2)	23 (8.3)	0
Traumatic birth (e.g. post C-Section)	9 (9.8)	12 (4.3)	0
Infant[b]/maternal[c] illness	9 (9.8)	27 (9.8)	4 (2.3)
Physical reason (e.g. painful/inverted nipples, mastitis)	8 (8.8)	24 (8.7)	9 (5.3)
Lack of enjoyment of breastfeeding/embarrassment	7 (7.7)	14 (5.1)	6 (3.5)
Stressed with other children to consider/care for	4 (4.4)	18 (6.6)	1 (0.6)
Perception that the infant was not interested in breastfeeding	3 (3.3)	9 (3.3)	0
Lack of support from the midwives on ward ± other health professionals	2 (2.2)	2 (0.7)	1 (0.6)
Work return	0	1 (0.4)	21 (12.2)
Infant had a tongue tie	0	1 (0.4)	0
Partner was not supportive of breastfeeding	0	0	3 (1.7)
Had planned to discontinue	0	0	19 (11.1)
Total[d]	91	274	171

a. 'Psychosocial' factors are determined, in part, by social influence, attitudes, cultural norms and experiences, and are known to influence a mother's perception of the importance of breastfeeding.[35-37]
b. Includes galactosemia risk after birth, dehydration, jaundice-related complications and low infant blood sugars which were reported to necessitate provision of supplementary formula milk feeds.
c. Includes use of anti-biotics ± other medications that were reported to contra-indicate breastfeeding.
d. Mothers could indicate > 1 reason for discontinuing breastfeeding.

Table 3. Comparison of Mothers who were giving Any Breast Milk to their Infants at Discharge from the Maternity Hospital Compared with those who Discontinued Post Initiation

Variable	*Continued Breastfeeding (n = 193)*	*Discontinued Post Initiation (n = 35)*	P *Value*
Positive encouragement from the partner to breastfeed, n (%)	140 (73.7)[a]	13 (39.4)[b]	<.001
Maternal education to third level degree/postgraduate, n (%)	103 (53.4)	6 (17.1)	<.001
Reporting that the infant's first feed was a breastfeed, n (%)	179 (92.7)	27 (77.1)	<.01
Exclusive breastfeeding during the first 24 hrs after birth, n (%)	168 (87)	24 (68.6)	<.05
Maternal receipt of required support from midwives to establish successful breastfeeding postpartum, n (%)	139 (99.3)	25 (92.6)	<.05
Maternal satisfaction with midwife support to establish successful breastfeeding postpartum, n (%)	134 (95.7)	22 (81.5)	<.05
Maternal age, $\bar{x}$ ± SD, y	30.9 ± 5.24	28.9 ± 5.26	<.05
Married, n (%)	188 (97.4)	32 (91.4)	NS[c]
Spontaneous vaginal birth, n (%)	145 (75.1)	27 (77.1)	NS
Primiparous, n (%)	104 (53.9)	24 (68.6)	NS
Smoking during pregnancy, n (%)	12 (6.2)	4 (11.4)	NS
Infant birth weight, $\bar{x}$ ± SD, kg	3.65 ± 0.5	3.62 ± 0.4	NS
Rooming-in with infant postpartum, n (%)	178 (92.2)	31 (88.6)	NS
Duration of hospital stay postpartum, $\bar{x}$ ± SD, d	3.8 ± 1.7	3.8 ± 1.6	NS
Maternal satisfaction with duration in maternity hospital to establish successful breastfeeding postpartum, n (%)	192 (99.5)	35 (100)	NS
Skin-to-skin contact within 1 hour after the birth, n (%)	144 (74.6)	22 (62.9)	NS
Presence of neonatal jaundice within first 4 d after birth, n (%)	25 (13)	4 (11.4)	NS

Values are percentages (absolute numbers) and $\bar{x}$ ± SD. Differences between continued and discontinued breastfeeding were compared by using χ^2 tests for categorical data and the Student's *t*-test for continuous variables; the Fisher's exact test was used in 2x2 tables when the cell content was ≤ 5.

a. Includes 190 partners.

b. Includes 33 partners.

c. NS, non significant.

Table 4. Factors Predictive of Continued Any Breastfeeding at Discharge From the Maternity Hospital (n = 450) Using Binary Logistic Regression[a]

Variable	*Any Breastfeeding at Hospital Discharge (N=450)*		*Adjusted RR (95% CI)*	*P value*
	Any Breastfeeding	*Non-Breastfeeding*		
	n (%)	*n (%)*		
Maternal education level				
Primary/secondary	41 (21.2)	136 (52.9)	1.0[b]	
Vocational/training course	49 (25.4)	75 (29.2)	1.63 (0.75-2.53)	
Third level degree/postgraduate	103 (53.4)	46 (17.9)	2.82 (1.82-3.21)	<.001
Positive encouragement from the partner to breastfeed postpartum				
No	50 (26.3)	178 (78.1)	1.0	
Yes	140 (73.7)	50 (21.9)	2.27 (1.22-3.31)	<.05
Maternal satisfaction with midwife support to establish successful breastfeeding				
Not satisfied	6 (4.3)	5 (13.9)	1.0	
Very satisfied/satisfied	134 (95.7)	31 (86.1)	1.7 (1.25-1.81)	<.05
Reporting that the infant's first feed was a breast feed				
No	14 (7.3)	8 (22.9)	1.0	
Yes	179 (92.7)	27 (77.1)	1.46 (1.2-1.54)	<.05

RR, relative risk; CI, confidence interval.

a. Model controls for maternal age, parity, smoking status during pregnancy and marital status.

Maternal age, parity, smoking status during pregnancy, marital status, pre-pregnancy body mass index, race, type of delivery, infant birth weight, rooming-in with infant postpartum, duration in the maternity hospital postpartum, maternal satisfaction with duration in maternity hospital to establish successful breastfeeding, timing of first breastfeed, skin-to-skin contact within 1 hour after the birth, presence of neonatal jaundice within first 4 days after birth were not significant factors for associated with continued any breastfeeding at discharge from the maternity hospital.

b. 1.0 is the reference category.

Table 5. Maternal Sources of Breastfeeding Support during the First 6 Weeks and at 6 Months Postpartum

Source of Support	*During the First 6 Weeks (n = 112)* [a] *n (%)*	*If Breastfeeding Difficulties Occurred During the First 6 Weeks (n = 131) n (%)*	*At 6 Months (n = 62) n (%)*
Partner	57 (30.9)	0	35 (27.7)
Family (mother/in-law, sister/in-law, grandmother)	41 (22.2)	37 (20.9)	38 (30.1)
Public health nurse	27 (14.7)	61 (34.4)	6 (4.7)
Breastfeeding support group locally/ Cuidiú Ireland/La Leche League of Ireland	22 (11.9)	22 (12.4)	6 (4.7)
Hospital midwives	22 (11.9)	21 (11.8)	2 (1.6)
Friends	14 (7.6)	12 (6.7)	4 (3)
General practitioner/paediatrician	1 (0.5)	23 (12.9)	3 (2.4)
Breastfeeding literature	0	1 (0.6)	0
Other[b]	0	0	32 (25.4)
Total[c]	184	177	126

a. Includes lactating women at 6 weeks whom reported adequate receipt of breastfeeding support.
b. 'Other' includes mother's own determination to breastfeed (no specific source of support reported).
c. Mothers could indicate > 1 reason source of breastfeeding support.

Table 6. Factors Associated with Any Breastfeeding for Duration ≥ 6 weeks Postpartum (*n* = 450) Performed by Binary Logistic Regression Analysis[a]

Variable	*Adjusted Relative Risk*	*95% Confidence Interval*	P *value*
Maternal education to third level degree/postgraduate	1.62	1.25-1.86	<.01
Reporting of the public health nurse as a source of breastfeeding support	1.57	1.23-1.73	<.01
Reporting of the partner as a source of breastfeeding support	1.32	1.03-1.56	<.05

a. Model controls for marital status, maternal age and smoking status during pregnancy. Parity, maternal age marital status, smoking status during pregnancy, plans to return to work outside the home and all other reported sources of breastfeeding support during the first 6 weeks including, family, friends, local breastfeeding support group and midwife support were not significant factors associated with continued breastfeeding for duration ≥ 6 weeks.