



Maternal perceptions of breastfeeding support in a birth hospital before and after designation to the Baby-Friendly Hospital Initiative: A quasi-experimental study

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ABSTRACT

Objective: The purpose of this study was to examine maternal perceptions of postnatal breastfeeding support in the hospital before and after designation to the Baby-Friendly Hospital Initiative (BFHI). Further maternal and infant characteristics associated with the maternal perception of breastfeeding support were investigated. Our hypothesis was that mothers would perceive breastfeeding support more adherent to the standards of the BFHI after the hospital was designated to the BFHI compared with before.

Design: The study had a quasi-experimental non-equivalent two-group design.

Setting: The study was conducted in one postnatal ward and one neonatal intensive care unit in a public birth hospital in Finland.

Participants: Postpartum mothers giving birth in the hospital before (pre-test group, $n = 162$) and after (post-test group, $n = 163$) designation to the BFHI participated.

Intervention: The aim of the BFHI is to support and promote breastfeeding by implementing the *Ten Steps to Successful Breastfeeding* into routine care. Implementation in the study hospital required staff training and revision of current hospital practices, which took place during 2017–2018. The postnatal ward and neonatal intensive care unit were designated to the Baby-Friendly Hospital in February 2019.

Measurements: Maternal perceptions of postnatal breastfeeding support were measured with a 20-item questionnaire developed for this study. Items were based on maternal self-report of the breastfeeding support in the hospital. A sum variable was created to measure the maternal perception of the support (scale 1–7), and higher scores indicated perception of breastfeeding support that is more adherent to the standards of the BFHI. Descriptive statistics, nonparametric statistical tests, and multiple linear regression analysis were used to analyse data.

Findings: Mothers in the post-test group (median 6.1, IQR 5.4–6.4) perceived breastfeeding support more adherent to the standards of the BFHI compared with mothers in the pre-test group (median 5.0, IQR 4.2–5.8) ($p < 0.001$). Fifteen of 20 of the measured breastfeeding support practices improved after the hospital's designation to the BFHI. The largest difference between groups was observed for multipara mothers (median 4.6 vs 6.0, $p < 0.001$), older mothers (> 35 years) (median 4.4 vs 5.8, $p < 0.001$), and mothers with a longer history of breastfeeding (6–12 months) (median 4.4 vs 6.2, $p < 0.001$). Before the BFHI designation, multipara mothers and mothers who gave birth to an infant with low Apgar scores (< 7) perceived breastfeeding support less adherent to the BFHI standards than did primiparas or mothers of an infant with high Apgar scores (≥ 7). After the BFHI designation, mothers who experienced preterm birth ($GA < 37$ weeks) perceived breastfeeding support less adherent to the BFHI standards compared with mothers who experienced a full-term birth.

Key conclusions: Designation to the BFHI had a positive impact on breastfeeding support from the maternal perspective. Designation improved particularly multiparas' perceptions of receiving breastfeeding support that is in adherence with the standards of the BFHI. However, more emphasis should be placed, and further research should be conducted to ensure that mothers giving birth to a preterm infant receive breastfeeding support that is adherent to the BFHI standards.

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Implications for practice: Birth hospitals are recommended to implement the BFHI as it improves breastfeeding support in the hospital and provides mothers with a good basis and continuation for breastfeeding, even after hospital discharge. Maternal perceptions about the impact of BFHI designation are important to consider because mother – infant dyads are at the centre of that support, and their viewpoint may help to assess whether the designation to the BFHI in the unit is successful. Results of this study indicate that designation to BFHI improves breastfeeding support from the maternal perspective.

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Introduction

Effective and evidence-based breastfeeding promotion is an imperative for achieving the global recommendations for breastfeeding (Victora et al. 2016). However, promotion and support for breastfeeding remains globally below its potential, and societies should contribute more to support breastfeeding (Rollins et al. 2016). The Baby-Friendly Hospital Initiative (BFHI) by WHO/UNICEF aims to protect, promote, and support breastfeeding in facilities providing care for mothers and newborns by emphasizing the *Ten Steps to Successful Breastfeeding* (*Ten Steps*) hospital practices as part of routine care. In addition, the BFHI is expanded to neonatal intensive care units (NICUs) with modified *Ten Steps* hospital practices (neo-BFHI) and units' commitment to the International Code of Marketing of Breast-Milk Substitutes (Nyqvist et al. 2013).

Breastfeeding support and practices in birth hospitals are significant interventions to support mothers to initiate and continue breastfeeding according to the recommendations (Louis-Jacques & Stuebe 2020). Breastfeeding support in BFHI-designated units complies with evidence-based breastfeeding support practices such as enabling early skin-to-skin contact and initiation of breastfeeding, continuous rooming-in together, and counselling on lactation management and possible problems, such as insufficient milk supply (WHO 2018). Successful implementation of the *Ten Steps* has a positive impact on breastfeeding outcomes, as it increases duration of all breastfeeding (Pérez-Escamilla et al. 2016), helps mothers to meet their breastfeeding intentions (Perrine et al. 2012), and increases maternal breastfeeding satisfaction (Hongo et al. 2015). In addition, incorporation of the *Ten Steps* into care may result in improved breastfeeding outcomes for sick and preterm infants cared for in NICUs (Maastrup et al. 2019).

Research on the maternal perspective on the impact of BFHI designation on breastfeeding support in birth hospitals is scarce. Maternal perceptions of breastfeeding support are important to consider as they may be contradictory to those of hospital staff (Chien et al. 2007). Previous studies suggest that hospital staff, compared with mothers, perceives breastfeeding support to be more adherent to the *Ten Steps* (Haeik et al. 2012, Mosher et al. 2016, Hakala et al. 2017). One study, however, indicated that designation to the BFHI improved breastfeeding support in the hospital from the maternal perspective even though overall compliance with WHO/UNICEF standards remained low (Zakarija-Grković et al. 2018). Moreover, little is known about maternal and infant characteristics associated with the breastfeeding support in a BFHI setting. In previous studies, mothers have reported experiencing less early skin-to-skin contact with infants and early initiation of breastfeeding after a caesarean birth in BFHI-designated hospitals compared with mothers who experienced vaginal birth (Rocha-Sampaio et al. 2016, Rowe-Murray & Fisher 2002).

The aim of this study was to examine maternal perceptions of postnatal breastfeeding support in the hospital before and after the BFHI designation. Furthermore, maternal, and infant characteristics associated with the maternal perception of breastfeeding support were investigated.

We hypothesized that breastfeeding support practices in the hospital would better follow the evidence-based standards of the BFHI after BFHI designation compared with before, from the perspective of postpartum mothers.

Methods

Design

This study had a quasi-experimental non-equivalent two-group design (Grove et al. 2013). This quantitative, non-randomized, design was required to answer the research questions and to test hypothesis we had set regarding maternal perceptions of breastfeeding support in the study hospital before and after hospital's designation to the BFHI. Having a control group was not possible as the BFHI was implemented in all maternity and neonatal wards in the study hospital.

Setting and sample

The study was conducted in one postnatal and one neonatal intensive care unit (level II) in a public, central hospital in Finland. In 2017, the hospital had 1700 births, and in 2019 it had 1400 births. The postnatal ward is a 30-bed ward providing postnatal care for healthy mother – infant dyads. Admission to the postnatal ward takes place an average of 2 hours after the birth. The NICU has 12 family rooms and provides intensive care for premature infants (> 32 weeks gestational age) and term infants requiring intensive care. Mother – infant dyads room-in in both wards. Mothers stay an average 2–3 days in the hospital after birth: 2 days after vaginal birth and 3 days after caesarean birth. Breastfeeding support policy prior to the BFHI designation was not standardized, however, practices such as immediate skin-to-skin contact, early initiation of breastfeeding, mother rooming-in together with infant, and counselling mothers on the use of pacifier, were used. (Mäkelä et al. 2021.)

Convenience sampling was used to select mothers for the pre- and post-test groups. Power analysis was not conducted to determine the required sample size. Instead, we aimed to recruit approximately 10 % of the mothers giving birth annually in the study hospital, as this was estimated to be a representative sample of all the mothers giving birth in the hospital. Further, the estimated sample was considered sufficient to show possible changes in the outcome variable. To be able to investigate the impact of the BFHI designation on postnatal breastfeeding support in different groups of mothers, both primiparous and multiparous mothers with singleton or multiple births, regardless of the birth mode, were included in the study. Mothers with insufficient Finnish language skills, and mothers of infants with admission to a higher level NICU (level III) were excluded from the study. The same inclusion and exclusion criteria were applied for pre- and post-test groups. The sample consisted of two groups of postpartum mothers who gave birth in the hospital: the pre-test group in 2017 (n = 162) and post-test group in 2019 (n = 163) (Fig.Fig. 1).

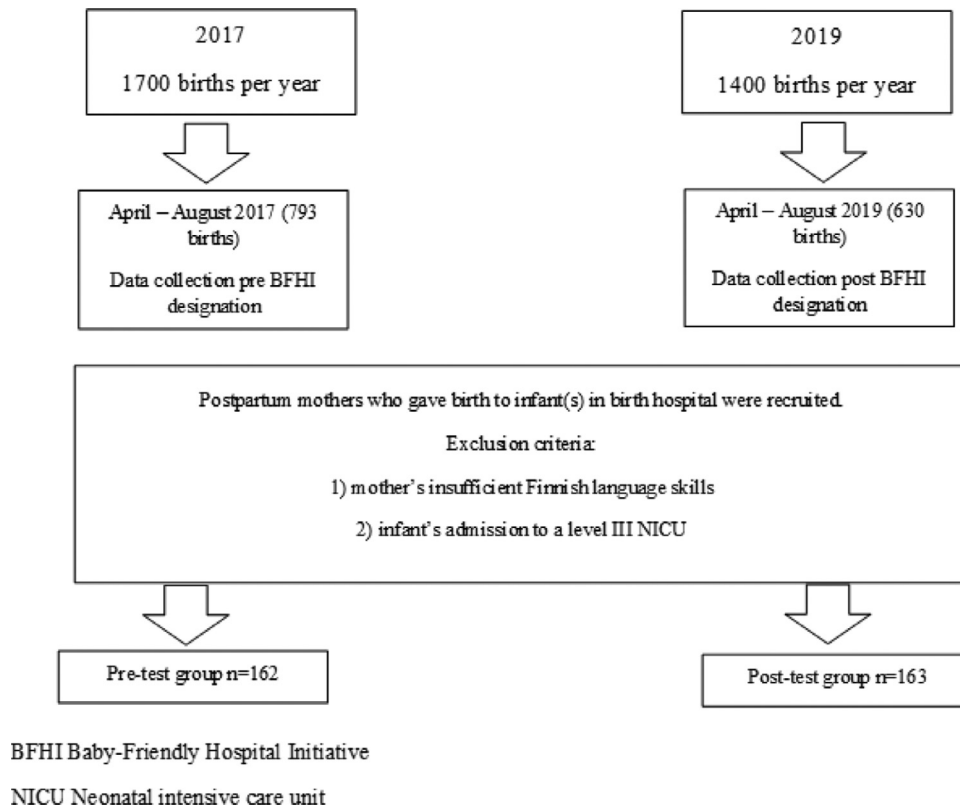


Fig. 1. Participant flow

Intervention

In this study, intervention refers to the implementation of the BFHI in the birth hospital. Implementation of the BFHI in the hospital began in fall 2017. Staff (n = 131) in the maternity ward and in the NICU were trained according to the WHO/UNICEF BFHI standards and guidelines during 2017-2018. After the full implementation of the BFHI and adherence to the Code of Marketing of Breastmilk Substitutes, an external audit was completed by the Finnish Institute for Health and Welfare. The hospital received BFHI and neo-BFHI certificates in February 2019.

Data collection

Pre-test data were collected in 2017 (April-August), prior to the implementation process of the BFHI (pre-test group), and post-test data were collected in 2019 (April-August), two months after the hospital's designation to the BFHI (post-test group) using questionnaires. Postpartum mothers in the postnatal ward and NICU were recruited for the study by midwives working in the wards. Eligible participants were informed orally about the study. Mothers willing to participate were given an envelope including the consent form and questionnaires. The written informed consent was returned in the closed envelope with the completed questionnaire to a designated box located in the ward before hospital discharge. Recruitment continued until at least 160 mothers for both groups had entered the study.

Questionnaire

Data were collected via a questionnaire developed for this study. The questionnaire measured maternal perception of breastfeeding support during the postnatal hospital stay. The questionnaire included 20 items and 10 background questions regarding

mothers' age, education, marital status, parity, total duration of all previous breastfeeding, planned duration of breastfeeding, infant's gestational age, mode of birth, self-rated birth experience, and hospital ward.

Sixteen items of the questionnaire corresponded to Steps 3-10 of the *Ten Steps for Successful Breastfeeding*. One item corresponded to Step 3 (informing about benefits of breastfeeding), two items to Step 4 (early skin-to-skin contact and initiation of breastfeeding), six items to Step 5 (practical support for managing breastfeeding and possible difficulties), one to Step 6 (staff told mother why baby needed supplementary milk), one to Step 7 (remaining together/rooming-in), two to Step 8 (cue-based feeding), one to Step 9 (use of pacifier), and two items to Step 10 (ensuring continuity of support at hospital discharge). The remaining four items were "I was asked about my personal wishes regarding breastfeeding", "Role of the partner was taken into account", "Breastfeeding support provided by the hospital staff was professional", and "Breastfeeding support provided by the hospital staff was congruent". These items were considered to measure breastfeeding support that is adherent to the standards of the BFHI. Items 1-15 had 7-point Likert scale response options (1 = strongly disagree, 7 = strongly agree), and items 16-20 had a dichotomous (yes/no) scale. Item 18 was a reverse, negatively worded item.

Medical data of the mothers and infants

Medical data regarding mothers' pain relief method during labour and infant's birth weight, and one-minute Apgar scores were collected from the patient records.

Data analysis

Data were analysed statistically with IBM SPSS Statistics for Windows, Version 26.0. (Armonk, NY: IBM Corp). The negatively

worded item in the questionnaire (item 18) was recoded. Dichotomous items were coded as either 1 (no) or 7 (yes) to allow for creation of a sum variable including all 20 items of the questionnaire. The sum variable was created to represent the outcome variable (breastfeeding support as perceived by postpartum mothers) by summing the scores of all items and dividing by the number of items. Higher scores indicated mothers' perception of breastfeeding support being more adherent to the BFHI standards.

Descriptive statistics were presented as frequencies, percentages, means and standard deviations (SDs), medians, and interquartile ranges (IQR) and ranges. T-test, Pearson's chi-square (X^2) or Mann-Whitney U-test were applied to compare maternal and infant characteristics between the pre- and post-test groups. Distribution of each continuous variable was determined to select the appropriate statistical test. Normally distributed variables were mother's age, total duration of all previous breastfeeding (months in total), and infant's birth weight. The sum variable for the post-test group was not normally distributed; thus, non-parametrical tests (Mann-Whitney U-test and Kruskal-Wallis F-test) were applied to compare differences within and between the pre- and post-test groups. Nonparametric Spearman's correlation was used to measure the degree of association of continuous and ordinal-scale background variables with the outcome variable.

Multiple linear regression analysis was conducted to identify which maternal or infant characteristics were statistically significantly associated to the outcome variable in the pre- and post-test groups, as well as for combined data when adjusted for potential confounders. Continuous variables and dichotomous dummy background variables were included in the regression model of the pre-test group if a statistically significant ($p < 0.05$) association with the outcome was detected in univariate analysis. One background variable (mode of birth) was included in the model based on previous literature. Regression analysis for combined data (all mothers from the pre- and post-test groups) was conducted to identify the significance of the group (pre-test vs post-test) when adjusted for potential confounding variables in the model. All tests were two-tailed, and p values <0.05 were considered statistically significant.

Ethical considerations

Ethical approval for the study was obtained from the Research Ethics Committee at the University of Turku (statement 18/2017) and was approved by the hospital administration. Verbal and written information was provided for the study participants, and written informed consent was obtained before they entered the study. Participation was voluntary, and mothers were able to withdraw their participation at any time.

Findings

Participants

In the pre-test group ($n = 162$), the mean age of the participating mothers was 29.6 years (SD 4.9), and in the post-test group ($n = 163$), it was 30.0 (SD 4.7). The background characteristics are presented in **Tables 1** and **2**.

Groups were similar in terms of all characteristics except for birth mode and maternal education. The pre-test group consisted of mothers with less education compared with the mothers in the post-test group ($p = 0.016$) (**Table 1**) and had a smaller caesarean birth rate (7% vs 19%) compared with the post-test group ($p < 0.001$) (**Table 2**).

Table 1
Characteristics of the participating mothers in the pre- and post-test groups

Variable	Pre-test group (n = 162)	Post-test group (n=163)	p
Mother's age			
Mean (SD), years	29.6 (4.9)	30.0 (4.7)	0.471 ¹⁾
Education			
n (%)			
Upper secondary	81 (54.4)	61 (40.4)	0.016 ²⁾
Bachelor's degree or higher	68 (45.6)	90 (59.6)	
Marital status			
n (%)			
Married/partner	154 (95.1)	158 (96.9)	0.343 ²⁾
Total duration of all previous breastfeeding, Mean (SD), months	6.7 (9)	7.6 (11)	0.561 ¹⁾
Mother had planned duration of breastfeeding during pregnancy n (%)			
Yes	99 (61.5)	112 (68.7)	0.173 ²⁾

¹⁾ T-test applied

²⁾ Pearson's chi-square (X^2) applied

Table 2
Obstetric and infant characteristics in the pre- and post-test groups

Variable	Pre-test group(n = 162)	Post-test group(n=163)	p
Parity			
n (%)			
Primiparas	72 (44.4)	68 (41.7)	0.713 ²⁾
Mode of birth			
n (%)			
Vaginal	149 (93.1)	132 (81.0)	0.001 ²⁾
Regional anesthesia during labor			
n (%)			
Yes	83 (52.2)	80 (48.8)	0.539 ²⁾
Birth experience*			
Median [IQR]	4 [4-5]	4 [4-5]	0.641 ³⁾
n (%)			
<3	9 (5.6)	7 (4.3)	0.599 ²⁾
3 - 5	151 (94.4)	154 (95.7)	
Gestational age, weeks			
Median [IQR]	40 [39-41]	40 [39-41]	0.514 ³⁾
n (%)			
>37	156 (96)	157 (95)	0.794 ²⁾
Apgar 1 minute			
Median [IQR]	9 [9-9]	9 [9-9]	0.889 ³⁾
n (%)			
>7	148 (92.5)	155 (93.9)	0.606 ²⁾
Birth weight, g			
Mean (SD)	3561 (519)	3621 (518)	0.298 ¹⁾
Ward			
n (%)			
Postnatal	136 (85.1)	143 (88.3)	0.388 ²⁾
Neonatal	24 (15.9)	19 (11.7)	

*Self-rated birth experience, scale 1 - 5 (negative - positive birth experience)

¹⁾ T-test applied

²⁾ Pearson's chi-square (X^2) applied

³⁾ Mann-Whitney U-test applied

Maternal perceptions of breastfeeding support before and after the BFHI designation

In the pre-test group, the median score for maternal perception of breastfeeding support was 5.0 (IQR 4.2-5.8), and in post-test group it was 6.1 (IQR 5.4-6.4). The difference between the groups was statistically significant ($p < 0.001$).

In particular, multipara mothers (median 4.6 vs 6.0, $p < 0.001$), older mothers (> 35 years) (median 4.4 vs 5.8, $p < 0.001$) and mothers with a longer history of breastfeeding (6-12 months) (median 4.4 vs 6.2, $p < 0.001$) in the post-test group perceived breastfeeding support to be more adherent to the Baby-Friendly stan-

Table 3
Maternal perceptions of breastfeeding support in pre-test and post-test groups

Items 1 – 15	Pre-test group Median/IQR	Post-test group Median/IQR	p ¹⁾
My baby was let to crawl to breast after the birth (Step 4)	7/6-7	7/6-7	0.021
I was encouraged to keep my baby next to me all the time (Step 7)	7/6-7	7/6-7	0.140
I was asked about my personal wishes regarding breastfeeding	4/3-6	7/6-7	<0.001
I was encouraged to breastfeed on demand (Step 8)	6/5-7	7/6-7	<0.001
I was told why my baby needed supplementary milk (Step 6)	6/4-7	7/4-7	0.191
Staff made sure that my baby latched well (Step 5)	7/6-7	7/6-7	0.059
I was showed how to breastfeed in different positions (Step 5)	5/2.5-7	6/4.5-7	<0.001
I was showed how to maintain and increase lactation (Step 5)	5/3-6	6/5-7	<0.001
I was told about signs of insufficient milk supply (Step 8)	5/2-6	7/5-7	<0.001
I was told about possible problems in breastfeeding (Step 5)	5/2-6	6/5-7	<0.001
I was taught how to take care of my breasts and to prevent mastitis (Step 5)	5/2-7	6/5-7	<0.001
Role of the partner was taken into account	4/2-6	5/3-6	0.002
I was told adequately about the benefits of breastfeeding (Step 3)	5/3-6	6/5-7	<0.001
Breastfeeding support provided by the hospital staff was professional	6/5-7	7/6-7	<0.001
Breastfeeding support provided by the hospital staff was congruent	6/4-7	6/5-7	<0.001
Items 16 – 20	Pre-test group n (%)	Post-test group n (%)	p²⁾
Early initiation of breastfeeding took place within 1,5 hours from the birth (Step 4)			0.882
Yes	134 (82.7)	135 (83.3)	
No	28 (17.3)	27 (16.7)	
I was taught how to hand-express milk (Step 5)			<0.001
Yes	60 (37.3)	121 (75.6)	
No	101 (62.7)	39 (24.4)	
Baby used a pacifier (Step 9)			0.136
Yes	42 (25.9)	31 (19.0)	
No	120 (74.1)	132 (81.0)	
I was told where to contact in case I needed help with breastfeeding after hospital discharge (Step 10)			<0.001
Yes	101 (62.7)	139 (87.4)	
No	60 (37.3)	20 (12.6)	
I was told about breastfeeding support groups (Step 10)			<0.001
Yes	59 (37.1)	102 (65.0)	
No	100 (62.9)	55 (35.0)	

¹⁾ Mann-Whitney U-test applied

²⁾ Pearson's chi-square (X²) applied

dards compared with the pre-test group. No difference between the pre- and post-test groups was observed for mothers experiencing a caesarean birth (median 5.2 vs 5.9, p = 0.381) and pre-term birth (GA < 37 weeks) (median 4.9 vs 4.7, p = 0.818).

Based on maternal perceptions, 15 of the 20 practices measured improved after the BFHI designation (Table 3). The greatest improvement was observed for “I was asked about my personal wishes for breastfeeding” (median 4 vs 7, p < 0.001) and “Staff taught me how to hand-express milk” (yes 37 % vs 76 %, p < 0.001). No improvement was observed for “I was told why my baby needed supplementary milk” (median 7 vs 7, p = 0.191), “I was encouraged to keep my baby next to me all the time” (median 7 vs 7, p = 0.140), “Staff made sure that my baby latched well” (median 7 vs 7, p = 0.059), “Early initiation of breastfeeding took place within 1.5 hours from the birth” (yes 83 % vs 83 %, p=0.882), and “Baby used a pacifier” (yes 26 % vs 19 %, p=0.136). The practice with the lowest median score in both groups was “Role of the partner was taken into account” (median 4 vs 5, p = 0.002) (Table 3).

Maternal and infant characteristics associated with maternal perceptions of breastfeeding support before and after the Baby-Friendly Hospital Initiative designation

In the pre-test group, parity (p = 0.016) and Apgar scores (p = 0.003) were the significant variables when adjusted for potential confounding variables that were included in the multivariable model (Table 4). Multipara mothers (B -0.815, 95 % confidence interval [CI] -1.475 – -0.155) perceived breastfeeding support less ad-

herent to the Baby-Friendly standards than did primiparas. Moreover, mothers who gave birth to an infant with high (≥ 7) Apgar scores (B 0.958, CI 0.338 – 1.557), perceived breastfeeding support more adherent to the Baby-Friendly standards than did mothers of an infant with low Apgar scores (< 7) (Table 4).

In the post-test group, infant’s gestational age (p = 0.002) was the significant variable when adjusted for potential confounding variables that were included in the multivariable model (Table 4). Mothers who experienced a term birth (≥ 37 weeks) (B 1.165, CI 0.432 – 1.898) perceived breastfeeding support more adherent to the Baby-Friendly standards compared with mothers who experienced a pre-term birth (< 37 weeks) (Table 4).

Multivariable analysis conducted for combined data, including all mothers from the pre- and post-test groups, showed that statistically significant indicators of maternal perceptions of breastfeeding support were group (pre-test vs post-test) (p < 0.001), parity (p < 0.001), and infant’s Apgar scores (p = 0.003) and when adjusted for potential confounding variables that were included in the model (Table 4). Mothers in the post-test group (B 0.931, CI 0.716 – 1.146), and mothers of an infant with high Apgar scores (≥ 7) (B 0.654, CI 0.227 – 1.082) perceived breastfeeding support which was more adherent to the Baby-Friendly standards than did mothers in the pre-test group, and mothers of an infant with low (< 7) Apgar scores. In addition, multipara mothers (B -0.397, CI -0.619 – -0.175) perceived support less adherent to the Baby-Friendly standards than did primiparas (Table 4). By adding the group in the model, the R² of the model increased from 6.4% to 23.7%, indicating that group was a significant variable in the model.

Table 4
Regression models for the pre- and post-test groups and for all mothers.

Maternal/infant characteristic	Regression coefficient (95 % CI)	p-value
Pre-test group		
Maternal age ¹⁾	-0.022 (-0.058 – 0.013)	0.217
Duration of previous breastfeeding ²⁾	0.021 (-0.005 – 0.047)	0.107
Number of children	-0.095 (-0.532 – 0.342)	0.668
Parity ³⁾	-0.815 (-1.475 – -0.155)	0.016
Mode of birth ⁴⁾	0.612 (-0.027 – 1.251)	0.060
Apgar scores 1 minute ⁵⁾	0.958 (0.338 – 1.557)	0.003
<i>R² for the model 16.2 %</i>		
Post-test group		
Maternal age	-0.003 (-0.035 – 0.029)	0.849
Duration of previous breastfeeding	0.000 (-0.018 – 0.017)	0.957
Number of children	-0.030 (-0.203 – 0.143)	0.732
Parity	-0.080 (-0.471 – 0.311)	0.685
Mode of birth	-0.273 (-0.621 – 0.074)	0.123
Apgar scores 1 minute	0.344 (-0.251 – 0.939)	0.256
Gestational age ⁶⁾	1.165 (0.432 – 1.898)	0.002
<i>R² for the model 5.9 %</i>		
All mothers (pre- and post-test groups)		
Group ⁷⁾	0.931 (0.716 – 1.146)	<0.001
Maternal age	-0.16 (-0.039 – 0.007)	0.173
Parity	-0.397 (-0.619 – -0.175)	<0.001
Mode of birth	-0.097 (-0.417 – 0.223)	0.550
Apgar scores 1 minute	0.654 (0.227 – 1.082)	0.003
Gestational age	0.696 (0.132 – 1.261)	0.016
<i>R² for the model 23.7 %</i>		

¹⁾ years ²⁾ months ³⁾ primipara (ref.) vs multipara ⁴⁾ vaginal birth (ref.) vs caesarean ⁵⁾ < 7 (ref.) vs ≥ 7 ⁶⁾ < 37 weeks (ref.) vs ≥ 37 weeks

⁷⁾ pre-test group (ref.) vs post-test group

Discussion

The main finding of the present study is that hospital's designation to the BFHI improved breastfeeding support from a maternal perspective. Mothers in the post-test group perceived breastfeeding support that was more adherent to the evidence-based standards of the BFHI compared with mothers in the pre-test group. In the pre-test group, multiparity was associated with a more negative perception of breastfeeding support which was not detected in the post-test group.

Implementation of the Ten Steps improves breastfeeding support by providing mothers with evidence-based breastfeeding support in the facility (WHO 2020). In this study, we were able to address this positive impact of BFHI designation on breastfeeding support from the maternal point of view, even though breastfeeding support in the study hospital appeared to be at good level already before designation to the BFHI. This result is in line with the previous findings indicating that mothers giving birth in Finnish birth hospitals perceive breastfeeding support as being well in line with the Ten Steps, regardless of the BFHI status (Hakala et al. 2015, 2017). Currently 26 % (n = 6) of Finnish birth hospitals are BFHI designated (Finnish Institute for Health and Welfare 2020a), but all maternity units, regardless of BFHI designation, are encouraged to implement of the Ten Steps (Breastfeeding Promotion in Finland 2017). Moreover, positive results of this study could also be explained by the short follow-up time after the BFHI designation. BFHI designated facilities struggle over maintaining a satisfactory level of compliance post designation, and more emphasis should be placed on monitoring and reassessment of these facilities (WHO 2018, Zakarija-Grković et al. 2018). In relation to clinical practice, the main finding of this study suggests that the hospital's designation to the BFHI did improve breastfeeding support from maternal perspective and therefore designation is recommended. Further research and clinical considerations should be emphasized to confirm the sustainability of improved breastfeeding support post BFHI designation. Furthermore, impact of the BFHI designation on maternal satisfac-

tion with the support should also be examined to understand its impact more comprehensively on mothers.

In this study, the majority of the measured breastfeeding support practices improved after the hospital's designation to the BFHI. Notably, the greatest improvement suggested that maternal wishes regarding breastfeeding were better considered by the staff in the post-test group compared with the pre-test group. This encouraging finding is important to note, as mothers' personal wishes build a valuable basis for all support provided to them. Each mother and family is unique. They should be able to make an independent decision regarding infant feeding, and health care professionals should support this decision (WHO 2018). In addition, practical support for breastfeeding, such as staff showing the mother how to breastfeed in different positions, how to manage common breastfeeding problems, and how to hand-express milk, was also improved post designation. In a previous study, however, practical support requiring staff skills and knowledge appeared to be difficult to sustain after the BFHI designation (Zakarija-Grković et al. 2018). Despite most mothers being informed about sources of breastfeeding support after hospital discharge, only 65 % of mothers reported being informed about breastfeeding support groups (Step 10). Poor compliance with Step 10 – ensuring continuity of support after hospital discharge – in BFHI-designated units has also been recognized in previous studies (Zakarija-Grković et al. 2018, Chien et al. 2007, Mosher et al. 2016). In Finland, public child health clinics provide families with breastfeeding support after hospital discharge (Finnish Institute for Health and Welfare 2020b). This has traditionally been considered sufficient, and other sources of breastfeeding support have been considered additional. Thus, the referral to breastfeeding support groups may be overlooked by the hospital staff and therefore poorly implemented.

Many of the Baby-Friendly practices, such as explaining the use of supplementary milk (Step 6), encouraging closeness to the infant (Step 7), and the early initiation of breastfeeding (Step 4), were well addressed before the BFHI designation, and no improvement was observed. These practices, such as early initiation of breastfeeding, rooming-in and counselling mothers on the use of

pacifiers, were introduced to routine care already before the BFHI implementation and therefore there was only little room for improvement (Mäkelä et al. 2021). Practices that are mainly executed by making concrete changes in ward policies/practices, such as early initiation of breastfeeding, mother and infant rooming-in, and avoiding use of pacifiers, are easy to sustain (Zakarija-Grković et al. 2018).

Interestingly, mothers in both groups perceived a shortcoming with staff not including the partner's role when providing breastfeeding support. Regardless of improvement after the BFHI designation, this finding could indicate that the significance of including the partner in breastfeeding support is yet to be fully understood and implemented in BFHI-designated units. To include the partner in breastfeeding support should be recognized as significant, as it promotes exclusive breastfeeding (Pisacane et al. 2005, Susin & Giugliani 2008). To our knowledge, no studies exist investigating partner participation in breastfeeding support in BFHI settings.

Multipara mothers in this study experienced a significant improvement in breastfeeding support after the designation to BFHI, which might have resulted from the standardization of breastfeeding support in the hospital. This finding might indicate that consistency of breastfeeding support improved after the hospital's designation. To our knowledge, this finding is novel, as the association between parity and BFHI designation has not been studied previously. Mothers with previous breastfeeding experience are more likely to successfully breastfeed compared to those who have not breastfed before. This may also indicate different needs for support: primiparous mothers need more support and counselling to successfully breastfeed their firstborn compared to multipara mothers (Hackman et al. 2015, Kitano et al. 2015). However, parity or previous breastfeeding experience do not exclusively determine the status of current breastfeeding needs and expectations. Each mother, infant, and breastfeeding journey is unique and evidence-based breastfeeding support should be accessible for all mothers regardless of their characteristics, including parity. Mother's previous negative breastfeeding experience could negatively reflect on the subsequent child's breastfeeding and thus, need for evidence-based breastfeeding support for all mothers regardless their parity should be considered pivotal (WHO 2018). Future research should examine the impact of the BFHI designation on breastfeeding duration and exclusivity of parous mothers.

Mothers giving birth to a preterm infant perceived breastfeeding support that was less adherent to the Baby-Friendly standards than did mothers who experienced a full-term birth, and no improvement between pre- and post-test groups was detected. It has been confirmed that NICUs' self-reported compliance with the neo-BFHI guidelines and the Code is globally at a fairly good level, indicating a general preparedness for Baby-Friendly breastfeeding support in NICU settings (Maastrup et al. 2019). NICUs in Finland seem to comply quite well with neo-BFHI guidelines, especially in those units located in a BFHI-certified birth hospital (Niela-Vilén et al. 2020). However, preterm birth and low Apgar scores at birth have previously been identified as barriers to implementation of early skin-to-skin contact and initiation of breastfeeding in Finnish birth hospitals (Hakala et al. 2017). In clinical practice, more intensive collaboration between birth units, NICUs, and surgery units, as well as mutual understanding of the importance of the early postpartum period, is needed to implement hospital practices that enable safe skin-to-skin contact and early initiation of breastfeeding for these vulnerable mother – infant dyads.

No differences in maternal perceptions of breastfeeding support in this study were found between birth modes before or after BFHI designation; mothers experienced breastfeeding support equally regardless of the birth mode. The current overall caesarean birth rate in Finland is 18.4% (Official Statistics of Finland 2020), which is lower than in most European countries

(European Perinatal Health Report 2018), but the highest ever measured in Finland. Caesarean birth poses some challenges to breastfeeding, and mothers experiencing a caesarean birth need special support for breastfeeding (Hobbs et al. 2016, WHO 2018). Only one third of mothers undergoing a caesarean birth experience skin-to-skin contact immediately after birth (Hakala et al. 2015). Caesarean birth seems also to be associated with delayed rooming-in compared with vaginal birth (Hakala et al. 2018). In the present study, maternal perception of breastfeeding support was measured by using a sum variable instead of emphasizing individual practices. Regardless of the interconnectedness of the Ten Step practices (Pérez-Escamilla et al. 2016), possible shortcomings for some practices appeared to have no impact on the main outcome for caesarean mothers in this study.

Strengths and limitations

External validity

The lack of randomization and control group in this study decreases the accuracy and external validity of the results. However, a randomized controlled study design would not have been possible to use for practical and ethical reasons as the BFHI was fully implemented in the study hospital. Statistically significant differences between the pre- and post-test groups should be interpreted with caution, as the clinical significance of the results might not be as great. Further studies with larger sample sizes are needed. In a setting where breastfeeding is a norm and Ten Steps are introduced generally in maternity care, there may be only a little room left for improvement (Brodrigg et al. 2013). In this case, changes in breastfeeding support may remain indistinguishable after the designation to BFHI. In this study, the focus was on the maternal perceptions, thus it was not examined whether the change in perceptions was associated with breastfeeding outcomes or maternal satisfaction with support.

Power analysis was not calculated, but the sample represented 9% (2017) and 11% (2019) of mothers giving birth yearly in the study hospital. One strength is that the characteristics indicate that the sample represented the study population well, except for the pre-test group having a significantly lower caesarean birth rate compared with the general caesarean birth rate in Finland. The study hospital was a central hospital, which might limit the generalization of results to larger, university-level birth hospitals in Finland highlighting the need for future research that examines maternal perceptions in larger birth hospitals with the BFHI designation.

Internal validity

Pre- and post-test groups were similar regarding all maternal and infant characteristics except birth mode and education. Education was not associated with the main outcome in either group; thus, it was excluded from multivariable models. This exclusion of education from confounding factors could limit the interpretation of results. The small number of participants in certain background groups could pose a risk of bias; thus, these findings need confirmation from future research. However, the increase of the R^2 when group variable was added in the multivariable model confirms the main finding of the study and strengthens the internal validity of the study. The questionnaire used in the study was based on maternal self-report and was not a validated instrument to measure the studied phenomenon although it was carefully designed to explicitly measure BFHI adherent breastfeeding support from maternal perspective. We examined the maternal perspective which is a strength when aiming to describe how breastfeeding support is perceived by its end-users before and after hospital's BFHI designation. Even though self-reported data is vulnerable to bias, maternal recall on breastfeeding practices has been confirmed to be accurate

(Li et al. 2005). Furthermore, we did not ask mother's intention to breastfeed or formula feed. It is possible that mainly breastfeeding mothers were willing to participate in the study, and therefore, perceptions of non-breastfeeding mothers might have been excluded. Future research should examine also non-breastfeeding mothers' perceptions of the support they are provided with in Baby-Friendly designated hospitals.

Conclusion

The hospital's BFHI designation had a positive impact on breastfeeding support from a maternal standpoint. According to maternal perceptions, breastfeeding support in the hospital was more adherent to the evidence-based standards of the BFHI after the designation to the BFHI compared with before. Designation to the BFHI improved particularly multiparas' perceptions of breastfeeding support in the hospital. More emphasis should be placed to ensure that BFHI designation also positively impacts mothers giving birth to a preterm infant and that they are equally provided with high-standard breastfeeding support during their postnatal hospital stay.

Ethical Approval

Research Ethics Committee of the Ethics Committee at the University of Turku (statement 18/2017). Study was approved by the hospital administration.

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Clinical Trial Registry and Registration number

0307-0041

Conflict of Interest

None.

CRediT authorship contribution statement

Jaana Lojander: Formal analysis, Data curation, Writing – original draft, Visualization. **Anna Axelin:** Conceptualization, Methodology, Investigation, Writing – review & editing, Supervision, Project administration. **Paula Bergman:** Formal analysis, Writing – review & editing. **Hannakaisa Niela-Vilén:** Conceptualization, Methodology, Investigation, Writing – review & editing, Supervision.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.midw.2022.103350.

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