

Baby Friendly Hospital Initiative Breastfeeding Outcomes in Mothers with COVID-19 Infection During the First Weeks of the Pandemic in Spain

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Abstract

Background: Adherence to the Ten Steps of the Baby-Friendly Hospital Initiative has been shown to have a protective role for the initiation and maintenance of breastfeeding.

Research Aims: (1) To determine the breastfeeding rate during the first 6 months of life in children of mothers diagnosed with COVID-19 infection at the time of birth; and (2) to assess the possible influence of being born in a center with Baby-Friendly Hospital Initiative accreditation.

Methods: This was a two-group comparative longitudinal observational study of infants born to mothers with COVID-19 at the time of birth, between March 13–May 31, 2020 (the first wave of the pandemic) in Spain. Fourteen Spanish hospitals participated, five (35.7%) were Baby-Friendly Hospital Initiative accredited. Type of feeding was assessed prospectively at discharge, 1, 3, and 6 months of age. A total of 248 newborns were included in the study.

Results: A total of 117 (47.3%) newborns were born in Baby-Friendly Hospital Initiative (BFHI) accredited centers. These centers applied skin-to-skin contact with greater probability ($OR = 1.9$; 95% CI [1.18, 3.29]) and separated the newborns from their mothers less frequently ($OR = 0.46$; 95% CI [0.26, 0.81]) than non-accredited centers. No differences were observed in relation to the presence of a companion at the time of birth. At discharge, 49.1% ($n = 57$) of newborns born in BFHI-accredited centers received exclusive breastfeeding versus 35.3% ($n = 46$) in non-accredited centers ($p = .03$). No differences were observed in breastfeeding rates throughout follow-up.

Conclusions: The exclusive breastfeeding rate at discharge in children of mothers with COVID-19 infection at birth was higher in Baby-Friendly Hospital Initiative accredited centers, which most frequently applied skin-to-skin contact at birth as well as rooming-in.

Resumen

Introducción: Se ha demostrado que el cumplimiento de los diez pasos de la BFHI (Baby-Friendly Hospital Initiative) tiene un papel protector para el inicio y mantenimiento de la lactancia materna.

Objetivos: (1) Determinar la tasa de lactancia materna durante los primeros seis meses de vida en recién nacidos de madres diagnosticadas con infección por COVID-19 en el momento del nacimiento; y (2) Valorar la posible influencia de haber nacido en un centro con acreditación BFHI.

Métodos: Estudio observacional longitudinal comparativo de dos grupos de lactantes nacidos de madres con COVID-19 en el momento del nacimiento entre el 13 de marzo y el 31 de mayo de 2020 (primera oleada) en España. Participaron 14 hospitales españoles, cinco (35.7%) acreditados BFHI. El tipo de alimentación se evaluó de forma prospectiva al alta, al mes y a los 3 y 6 meses. Se incluyeron en el estudio 248 recién nacidos.

Resultados: Un total de 117 (47.3%) recién nacidos nacieron en centros acreditados BFHI. Estos centros aplicaron el contacto piel con piel con mayor probabilidad ($OR = 1.9$; 95% IC [1.18, 3.29]) y separaron a los recién nacidos de sus madres con menor frecuencia ($OR = 0.46$; 95% IC [0.26, 0.81]) que los centros no acreditados. No se observaron diferencias en

relación a la presencia de un acompañante en el momento del nacimiento. Al alta, el 49.1% ($n = 57$) de los recién nacidos en centros acreditados BFHI recibieron lactancia materna exclusiva frente al 35.3% ($n = 46$) en centros no acreditados ($p = .03$). No se observaron diferencias en las tasas de lactancia materna durante el seguimiento.

Conclusiones: La tasa de lactancia materna exclusiva en el momento del alta en los recién nacidos de madres con infección por COVID-19 al nacimiento, fue mayor en los centros acreditados BFHI, que a su vez aplicaron con mayor frecuencia el contacto piel con piel al nacimiento y el alojamiento conjunto.

Keywords

Baby-Friendly Hospital Initiative, breastfeeding, breastfeeding initiation, breastfeeding practices, breastfeeding rates, COVID-19, exclusive breastfeeding, Novel Coronavirus, SAR-CoV2

Key Messages

- Adherence to the Ten Steps of the Baby-Friendly Hospital Initiative has traditionally been shown to have a protective role for the initiation and continuation of breastfeeding.
- At the time of discharge, the percentage of breastfeeding in children of mothers with COVID-19 infection diagnosed at birth was higher (although far from the desired rates) in Baby-Friendly Hospital Initiative accredited centers.
- No differences were observed in the percentage of breastfeeding in the various follow-up periods (1, 3, and 6 months) between the Baby-Friendly Hospital Initiative accredited centers and the rest of the hospitals.

Background

The COVID-19 pandemic has presented us with numerous challenges in many areas, especially in the care of infected

mothers and their newborns. Although it is currently known that infection transmission is unlikely, both vertically (Altendahl et al., 2020; Figueiro-Filho et al., 2020; Marín, Reyne et al., 2020) and through human milk (Groß et al., 2020; Marín, Malalana et al., 2020), the uncertainties which existed during the first months of the pandemic led to decisions regarding the management of these newborns and their mothers, which could have negatively influenced breastfeeding rates. The early publications on the management of pregnant women infected by COVID-19 at the time of birth, which were identified by our research group, recommended early post-birth separation of the mother–child dyad during their hospital stay, as well as avoiding breastfeeding, with the aim of minimizing the risk of infection transmission (Zeng et al., 2020). More recently, several international organizations have made statements advocating for maintaining early mother-baby contact, avoiding separation, and in favor of providing support for breastfeeding mothers infected with COVID-19 while ensuring hygienic measures and the use of face masks (World Health Organization [WHO], 2020; United Nations Children’s Fund [UNICEF], 2020; United States Center for Disease Control and Prevention [CDC], 2020). In Spain, the Ministry of Health published several

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technical documents about this aspect, which were updated several times during this period. (Ministerio de Sanidad, Consumo y Bienestar Social, 2020). However, in many cases, the pressure on healthcare providers for example, the reorganization of hospital-related activity or limitations in the available spaces, has made it difficult to maintain the usual newborns protocols.

Adherence to the Ten Steps of the Baby-Friendly Hospital Initiative (BFHI) has traditionally been shown to have a protective role for the initiation and continuation of breastfeeding (Howe-Heyman & Lutenbacher, 2016; Kim et al., 2018; Pérez-Escamilla et al., 2016). It remains to be seen whether compliance with the Ten Steps was maintained during the first wave of the pandemic, and if this could have influenced breastfeeding rates.

In a previous publication by our research group (Neo-COVID-19 Research Group), a reduction in the breastfeeding rate at discharge was observed in the children of mothers with COVID-19 infection at the time of birth (Marín, Reyne et al., 2020). Our study aims were: (1) to determine the breastfeeding rate during the first 6 months of life in children of mothers diagnosed with COVID-19 infection at the time of birth; and (2) to assess the possible influence of being born in a center with BFHI accreditation.

Methods

Research Design

This was a two-group comparative longitudinal observational study of infants born to mothers with COVID-19 infection, to evaluate the potential influence the pandemic has had on breastfeeding. This study was reviewed and approved by the local Research Ethics Committee (REC; approval number CP 01-20) and endorsed by the RECs of the participating hospitals.

Setting and Relevant Context

Spain was the second European country, after Italy, in which the first cases of SARS-CoV2 infection were documented. In relation to the neonatal practices carried out in the newborns of mothers with COVID-19 infection, action was taken according to the technical documents established by the Spanish Ministry of Health, which were updated on various occasions. Initially, these measures were more restrictive (e.g., mother-child separation, no skin-to-skin contact), although they were progressively modified based on the existing evidence. Although breastfeeding was initially discouraged, by mid-March the technical documents recommended its administration in newborns of mothers with COVID-19 infection. Despite this, and due to the reorganization of hospital activity, it was not always possible to carry out the recommendations established later (e.g., rooming-in), which made it difficult, even in BFHI accredited

hospitals in which rates of exclusive breastfeeding at discharge were greater than 75%, the beginning and maintenance of breastfeeding.

Sample

A total of 14 Spanish hospitals participated, all of which were members of the Neo-COVID-19 Research Group (a research group that was established to study the influence of COVID-19 on newborns in Spain). Of these hospitals, five (35.7%) were BFHI accredited by UNICEF.

Two hundred and forty women with COVID-19 infection at the time of birth were invited to participate, 234 (97.5%) of whom accepted. Their respective 248 newborns were included in the study. One hundred and ten (47%) women gave birth in BFHI accredited hospitals, resulting in the birth of 117 (47.3%) newborns.

The inclusion criteria were the following: newborns of mothers with COVID-19 infection at the time of birth, confirmed by real-time reverse transcriptase-polymerase chain reaction (RT-PCR) or serological tests, and the granting of informed consent. Women who, despite having compatible symptoms, did not have positive RT-PCR or serological test results were excluded from the study.

A positive diagnosis was established according to official guidelines, as issued by the Spanish Government (Ministerio de Sanidad, Consumo y Bienestar Social, 2020). SARS Coronavirus-2 RT-PCR were done on nasopharyngeal and/or oropharyngeal swab samples from the mothers and their newborn infants. Serological testing in pregnant women was performed by enzyme-linked immunosorbent assay. Although a power analysis was not done, we deemed the sample size was adequate for the aims of the study.

Measurement

Hospitals were categorized based on their accreditation status as BFHI. We prospectively reviewed the initial clinical data on both the mothers and the newborn infants, and then we described the newborn infants' follow-up during their first 6 months of life.

Immediate skin-to-skin implementation after birth was defined as early and uninterrupted skin-to-skin contact with the mother after birth, offering help for the initiation of breastfeeding as soon as possible. Rooming-in was considered as implemented when mothers and their infants were allowed to remain together 24 hr a day. Companionship was defined as the uninterrupted presence of a companion throughout the birth process.

Exclusive breastfeeding (EBF) was defined as current feeding of the infant with human milk without supplementation (e.g., infant formula or other human milk replacements); breastfeeding when current feeding with human milk was combined with formula; and formula feeding when infants were fed exclusively with formula milk.

Table 1. Characteristics of the Participants Grouped by BFHI Status.

Characteristic	BFHI-hospital M (SD)	Non BFHI- hospital M (SD)	t	U-test	p
Maternal	n=110	n=124			
Age (years)	31.7 (6.2)	32.5 (6.2)	-1.04		0.85
Number of days from start of symptoms to delivery ^a	5 (0-21) ^a	1 (0-15) ^a		1.59	0.11
Newborn	n=117	n=131			
Gestational age (weeks)	39 (38-40)	39 (38-40)	-1.24		0.779
Weight (g)	3061.9 (665.7)	3104.8 (549.0)	-0.55		0.580

Note. BFHI = Baby-Friendly Hospital Initiative.

^aMedian (IQR).

The variables related to mothers included in the study were maternal age, presence of symptoms, number of days from the onset of symptoms to birth, need for hospital admission due to COVID-19 pathology, need for treatment due to COVID-19 pathology, presence of a companion at birth, and type of birth. With regards to newborns, the variables were gestational age, birth weight, sex, twinning, need for admission to the Intensive Care Unit and its duration, implementation of immediate skin-to-skin contact, rooming-in, and type of feeding at discharge, and at 1, 3, and 6 months (see supplementary materials).

Data Collection

Infants born to mothers with COVID-19 infection, between March 13–May 31, 2020, were evaluated. Eligible mothers were informed about the study and gave informed consent while they were in the maternity ward.

Clinical and laboratory data were obtained from medical data reviews during the hospital stay. Follow up with participants was performed by a telephone questionnaire to assess feeding type at 1, 3, and 6 months of age. A physician from each of the hospitals included in the study was in charge of collecting the data as well as the telephone follow up. Patient confidentiality was maintained by a numerical code assigned by the study coordinator. All aspects of this study were performed in accordance with the ethical standards of the Declaration of Helsinki.

Data Analysis

Demographic numerical variables were expressed as means and standard deviations or medians and interquartile ranges, according to their distribution. Demographic categorical variables were expressed as absolute frequencies and percentages. Association between mothers' and infants' variables were tested by chi-squared, Student-*t* or Mann-Whitney U tests. Three univariable logistic regression analyses were performed to test the association between BFHI and skin-to-skin, companionship, and rooming-in. The odds ratio (OR) and their corresponding 95% CI are shown.

Breastfeeding rates were expressed as absolute frequencies and percentages. Association between breastfeeding rates and BFHI accreditation were tested by chi-squared tests. Statistical analyses were performed using Stata Version 16 software.

Results

Characteristics of the Sample

The clinical characteristics of the participants are shown in Tables 1 and 2. No differences were observed between the centers (BFHI vs. non-BFHI), except admission to the NICU, which was more frequent in BFHI centers than non-BFHI centers. In cases in which the newborn was hospitalized/separated, the median hospital stay was 3 (2–10) days, in both types of hospitals. No cases of vertical transmission of COVID-19 were detected and no newborns died.

Some of the routine measures carried out in the BFHI hospitals were analyzed, for example, immediate skin-to-skin contact after birth, the continuation of the same-room accommodation of the mother–newborn dyad (rooming-in), or the presence of a companion at the time of birth. Figure 1 shows the temporal evolution of the implementation of these recommendations, depending on the type of center (BFHI vs. non-BFHI). The BFHI-accredited centers applied skin-to-skin contact at birth with greater probability than the non-accredited centers (OR = 1.9; 95% CI [1.18, 3.29]). Newborns from BFHI centers were less likely to be separated from their mother without a medical reason than newborns from non-BFHI centers (OR = 0.46; 95% CI [0.26, 0.81]). Finally, no differences were observed in relation to the presence of a companion at the time of birth (presence of companion in the BFHI center; OR = 0.88; 95% CI [0.52, 1.48]).

Aim 1: Breastfeeding Rate During the First 6 Months of Life

Regarding the telephone follow-up carried out after discharge to determine type of feeding, 11 (8.4%) participants

Table 2. Characteristics of the Participants Grouped by Hospital BFHI Status.

Characteristics	BFHI <i>n</i> (%)	Non BFHI <i>n</i> (%)	χ^2	<i>p</i>
Mothers	<i>n</i> =110	<i>n</i> =124		
Maternal symptoms				
Asymptomatic	40 (36.3%)	58 (46.7%)	2.59	0.10
Coughing	37 (33.6%)	41 (33%)	0.008	0.92
Fever	37 (33.6%)	33 (26.6%)	1.37	0.24
Anosmia	15 (13.6%)	19 (15.3%)	0.13	0.71
Dyspnea	9 (8.1%)	10 (8%)	0.15	0.69
Admitted to hospital due to COVID-19 related illness	21 (19%)	24 (19.3%)	0.002	0.95
Admitted to Intensive Care Unit due to COVID-19 related deterioration	4 (3.6%)	3 (2.4%)	0.29	0.58
No maternal treatment during pregnancy	90 (81.8%)	100 (80.6%)	0.05	0.81
Vaginal birth	88 (75.2%)	93 (71.5%)	0.42	0.515
Newborn	<i>n</i> =117	<i>n</i> =131		
Weight percentile <p10	18 (15.3%)	11 (8.4%)	2.84	0.09
Gender (male)	58 (49.5%)	70 (53.8%)	0.45	0.50
Twins	7 (5.9%)	6 (4.6%)	0.23	0.63
Subsequent admission to Intensive Care Unit	19 (16.2%)	9 (6.9%)	12.64	0.002

Note. BFHI = Baby-Friendly Hospital Initiative.

could not be located at 1 month of age, all of whom pertained to the group of non-accredited BFHI centers ($p = .001$); and at 3 months, six (5.1%) infants from BFHI centers versus 14 (10.7%) from non-BFHI centers could not be located ($p = .10$). At 6 months, 16 (13.6%) infants were not locatable in BFHI centers versus 13 (10%) in non-BFHI centers ($p = .37$). Rates of exclusive breastfeeding were 41.8% ($n = 103$) at discharge, 41.1% ($n = 97$) at 1 month, 39.6% ($n = 90$) at 3 months, and 24.7% ($n = 54$) at 6 months.

Aim 2: Breastfeeding Rate According to BFHI Accreditation

Figure 2 shows the type of breastfeeding performed at the following time points of follow-up: at discharge (Figure 2a), at 1 month (Figure 2b), at 3 months (Figure 2c), and at 6 months (Figure 2d). Differences were observed in feeding type received at discharge between BFHI centers and non-BFHI centers, with no significant differences in the rest of the time points of the follow-up.

Discussion

The exclusive breastfeeding rate at discharge for children of COVID-19 infected participants was higher in BFHI-accredited centers, with no differences observed throughout the follow-up period; however, the observed rates were far from being what is considered desirable for accredited BFHI centers. Given the immunological advantages and protection against infectious disorders attributed to human milk, it is necessary to consider the scientific evidence available to avoid making inappropriate decisions in this regard, for example, the contraindication of breastfeeding in future pandemics.

Immediate skin-to-skin contact after birth was shown to be an effective measure for increasing the proportion of newborns who were exclusively breastfed, both at the time of hospital discharge and over time (Cleveland et al., 2017; Karimi et al., 2019; Moore et al. 2012; Widström et al., 2019). During the first weeks of the first wave of the pandemic, and as consequence of the lack of evidence regarding the possibility of contagion during the practice of post-delivery skin-to-skin contact, it was recommended that, after birth, newborns should be immediately separated from their mothers (Griffin et al., 2020; Yang et al., 2020). However, as the transmission mechanism of COVID-19 became better known, it was determined that maintaining certain preventive measures, for example, the use of a mask by the mother, or hand hygiene, did not increase the risk of horizontal transmission during the practice of immediate skin-to-skin contact (Mejía et al., 2021; Salvatore et al., 2020; Sánchez-Luna et al., 2021). Nevertheless, implementation of international recommendations to recover this practice have not been homogeneous across all countries or even in all hospital centers (Lavizzari et al., 2021). In our study we did not observe an increase in the rate of immediate skin-to-skin contact implementation until several weeks after the publication of the recommendations made by international organizations (WHO, 2020; UNICEF, 2020).

The practice of rooming-in is another of the steps established by the BFHI, which has demonstrated its beneficial influences in achieving more satisfactory and lasting breastfeeding (Alzaheb et al., 2017; Beake et al., 2017; Jaafar et al., 2016). The practice of rooming-in was initially eliminated from the usual post-birth care recommendations for both vaginal deliveries and cesarean sections (Chandrasekharan et al., 2020; Griffin et al., 2020). However, the realization of post-delivery

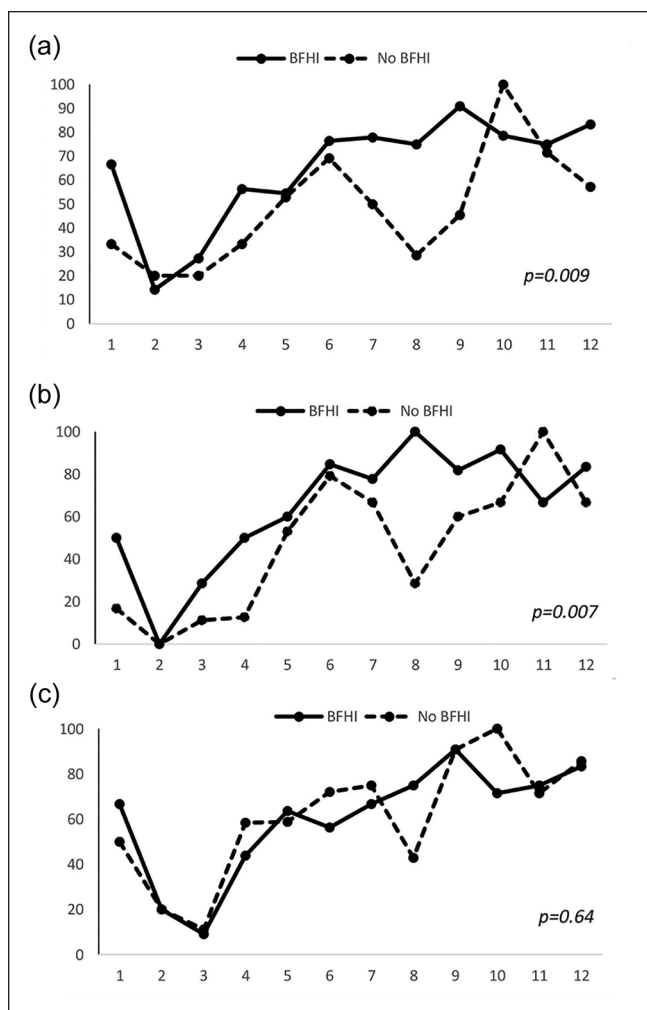


Figure 1. Comparison of the Evolution (%) of Immediate Skin-to-Skin Contact After Birth (Figure 1a); Rooming-in Figure 1b); and the Presence of a Companion During the Time of Childbirth (Figure 1c) Between BFHI Versus Non-BFHI Hospitals During the Weeks of the Study.

rooming-in has been progressively implemented, albeit with a variable adaptation in different countries (Genoni et al., 2020; Lavizzari et al., 2021), in cases where the mother with COVID-19 infection, while complying with certain preventive measures (e.g., mask use or distancing from the newborn except in necessary moments for example breastfeeding or changing diapers), was stable enough to ensure adequate care of her newborn without posing an increased risk of presenting disease in the same (Marin, Reyne et al., 2020). In our study, we observed that BFHI-accredited centers applied postnatal rooming-in with greater probability than non-accredited centers. However, due to the difficulties in adapting hospital infrastructures throughout the first wave of the pandemic, the admission of healthy newborns to neonatal units was not exceptional.

Regarding the presence of the partner at the time of birth, although there is some controversy about the possible

influence that this may have on the initiation or continuation of breastfeeding (Aguiar et al., 2015), in most cases women want a companion to be present, as this generates a greater sense of security and less stress (Ladfors et al., 2001; Prabhu et al., 2009). Given the risk that exposure to the partner of the woman who came to the delivery could pose to health care personnel, the limited resources to carry out diagnostic tests and the lack of individual protection equipment during the first wave of the pandemic, in most hospital the presence of a companion in the delivery room was not initially allowed (Chandrasekharan et al., 2020; Lavizzari et al., 2020). This measure was progressively eliminated, and we observed that the reincorporation of the companion was done in a similar manner in BFHI-accredited centers when compared to non-accredited ones. It remains to be seen whether the deliveries where the presence of the companion was not allowed had an influence on the maternal emotional state or on the couple's ability to bond with the newborn.

Hospitals that comply with the BFHI accreditation present figures for exclusive breastfeeding at discharge, which were higher than those of hospitals that do not carry out the Ten Steps (Feltner et al., 2018; Hannula et al., 2008; Howe-Heyman et al., 2016; Yotebieng et al., 2015). Throughout the pandemic, we have observed significant variability in the recommendations established regarding how to feed the newborn children of mothers with COVID-19 infection, from the recommendation to avoid breastfeeding (Ng et al., 2020), to providing it through various methods (i.e., manual extraction, the use of extractors, or direct contact with the breast; Marinelli et al., 2020; UNICEF, 2020; WHO, 2020) while ensuring compliance with strict hygiene measures meant to prevent infection in the newborn.

Currently, one of the requirements needed to be accredited by BFHI is to have an exclusive breastfeeding rate greater than 75% in full-term children at discharge. There are few publications that refer to the influence that the various measures employed with these dyads may have had on breastfeeding rates. Thus, in the study performed by Popofsky et al. (2020) in three BFHI-accredited hospitals with a population having characteristics similar to ours but applying a lower percentage of rooming-in during hospital admission, the percentage of newborns who received some type of breastfeeding during their hospital stay was 41%, which increased to 76% once both were at home. In our study, we observed that the proportion of newborns who were born in the BFHI centers received some type of breastfeeding at hospital discharge was higher, obtaining similar results at 1 month of age while the percentage of exclusive breastfeeding at discharge was very low. Likewise, Zanardo et al. (2021) observed that during the first wave of the pandemic, the rate of exclusive breastfeeding at discharge in a group of full-term newborns was 70.3%, compared to 86.3% in a control group obtained a year earlier.

Undoubtedly, the measures established throughout the first weeks of the pandemic, as well as the various limitations

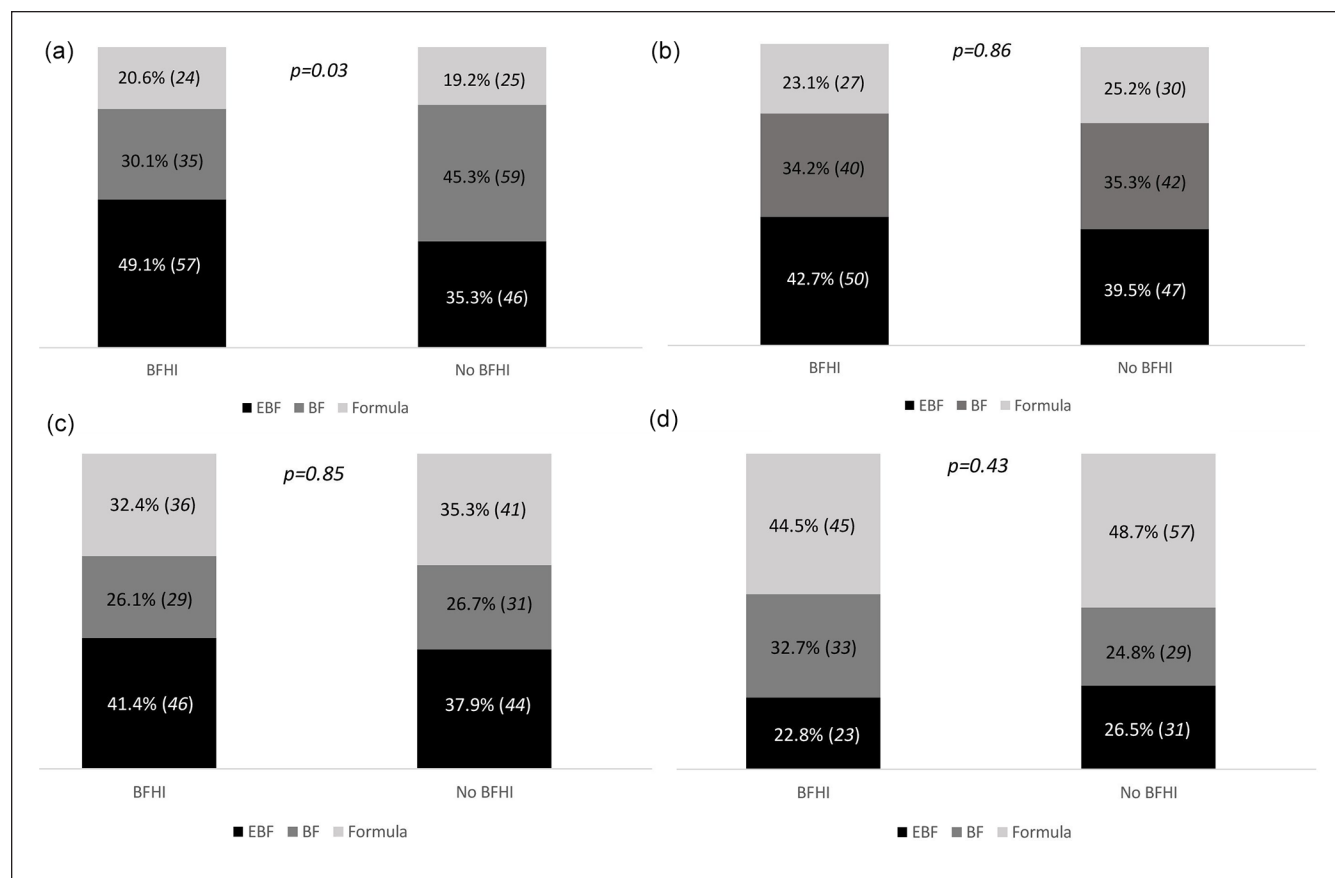


Figure 2. Type of Reeding at Different Times of Follow-Up: At Discharge (Figure 2a), at 1 month (Figure 2b), at 3 months (Figure 2c), and at 6 months (Figure 2d).

Note. EBF = exclusive breastfeeding; BF = breastfeeding.

that occurred in this period, had undesirable influences on breastfeeding rates over varying periods of time, including in centers specially committed to promoting it. It remains to be seen how these results will affect the physical and emotional health of newborns and their mothers in the medium and long term.

Limitations

The number of newborns who required admission to the Neonatal Intensive Care Unit for reasons other than maternal COVID-19 infection was higher in BFHI-accredited centers, which may have resulted in the underestimation of the breastfeeding rate in different periods of the study (at discharge, and at 1, 3, and 6 months of age) in these hospitals. The percentage of losses to follow-up at 1 month was higher in centers not accredited as BFHI. However, we do not consider that this affected the established conclusions, since in the rest of the study periods there were no differences between the groups, and we also observed in them a reduced percentage of losses to follow-up. Other possible factors that may have influenced the observed results (attendance at breastfeeding

support groups, parity, previous experience in breastfeeding, or influence of knowing the positive COVID-19 diagnosis in the delivery room on the decision to breastfeed), have not been considered. However, we did not consider that this would modify the meaning of the results given that, in our setting, and during the first wave, most of the support groups did not provide face-to-face assistance. Another limitation was those criteria for studying mothers with RT-PCR varied throughout the study period, so we cannot rule out the possibility that asymptomatic infected mothers were not detected in the first weeks. Likewise, the sensitivity of the diagnostic test has proven to be limited. Finally, although it is not an aim of this study, we consider that it would be interesting to assess the influence that the pandemic has had on the usual practices of hospitals by comparing the results obtained with those observed in the pre-pandemic period.

Conclusions

Exclusive breastfeeding rates at discharge in children of mothers with COVID-19 infection at the time of birth was higher in BFHI-accredited centers. These figures are clearly

lower than desired and reflect how certain measures applied at the beginning of the pandemic have had an influence on this aspect.

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Supplemental Material

Supplementary Material may be found in the "Supplemental material" tab in the online version of this article.

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