

# The influence of type of delivery, skin-to-skin contact and maternal nationality on breastfeeding rates at hospital discharge in a baby-friendly hospital in Italy

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## Abstract

The aim of this epidemiological study is to evaluate how type of delivery, skin-to-skin contact and maternal nationality influence breastfeeding practices of newborns at discharge in a large population of babies born in the Baby-Friendly Hospital of San Bonifacio, Verona, Italy.

Data were collected for all healthy newborns consecutively born over a period of three years, regarding type of delivery, feeding at hospital discharge, skin-to-skin procedure, and for a smaller group maternal nationality was recorded as well.

The rate of exclusive breastfeeding in a group of 6017 newborns was 82.1%, higher among babies born by vaginal delivery than in those born by cesarean section (84.9% vs 65%;  $P < 0.001$ ). It was higher in those who had skin-to-skin contact than in those who did not, in both vaginal delivery (85.3% vs 69.2%;  $P < 0.001$ ) and cesarean section (67.7% vs 55.1%;  $P = 0.009$ ). Also, it was found to be higher in babies born to immigrant mothers than in those born to Italian mothers (89.9% vs 79.5%).

Vaginal delivery, skin-to-skin contact and maternal foreign nationality have a positive association with breastfeeding at hospital discharge.

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## Introduction

World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) indicate breast milk as the only appropriate food for healthy babies until six months after birth.<sup>1</sup> They also recommend that mothers should start breastfeeding within one hour after delivery and should continue exclusive breastfeeding over the first six months.<sup>1</sup> To promote breastfeeding, WHO and UNICEF have established a series of procedures which are collected in the *Ten steps to successful breastfeeding*<sup>1,2</sup> and have supported the spreading of Baby Friendly Hospitals since 1992. According to the International Code of Marketing of Breast-milk Substitutes, to achieve a baby-friendly status a hospital must refuse free or low-cost breast milk substitutes, as well as feeding bottles or teats. Furthermore, it must assure the *Ten steps* to support successful breastfeeding, for example helping mothers breastfeeding within one hour from birth and practicing rooming-in.<sup>1,2</sup>

In Italy the very first Baby Friendly Hospital was certified in 2001, now one can count 25 of them. The overall percentage of breastfeeding mothers in Italy has increased from 81.1% in 2005 to 85.5% in 2013.<sup>3</sup>

According to Italian official public data the number of foreigners living in Italy has also increased, from about 4,052 millions in 2012 to about 5,014 millions in 2015, with about 19.4% of newborns having foreign mothers.<sup>4</sup>

Only a few studies are available that take into account the effects that variables such as type of delivery, skin-to-skin contact (STSC) and maternal nationality have on breastfeeding rates, and those studies have only been conducted on small sample groups.<sup>5-8</sup> The aim of this study is to evaluate how type of delivery, STSC and maternal nationality influence breastfeeding practices of newborns at discharge from the hospital by observing a large population of

healthy newborns who were born in the Birth Centre of the G. Fracastoro Baby-Friendly Hospital of San Bonifacio, Verona, Italy.

## Materials and Methods

This is a retrospective observational study. The study population includes all healthy babies consecutively born over a period of 36 months in the Maternal-Infant Department of the G. Fracastoro Baby-Friendly Hospital of the Local Health Unit of Verona, Italy. This hospital provides care to a population estimated of about 160000 inhabitants including a portion of recently immigrated people accounting for approximately 13% of the inhabitants.<sup>9</sup> About 1800 babies are born every year in this Baby-Friendly Hospital. In 2001, the Birth Centre of this area received accreditation as Baby-Friendly, which has been confirmed over the years until now.

Only data regarding three variables are available for the entire period, and this is a bias of our study. Such variables are: type of delivery (vaginal delivery or cesarean section); STSC procedure carried out within one hour from delivery and lasting one hour or more; type of breastfeeding for every newborn at discharge from the hospital, which is classified according to WHO standards: exclusive breastfeeding (EBF) is used for newborns who have only received mother's milk; predominant breastfeeding (PBF) indicates babies who have been given one or more meals of glucose solution; mixed breastfeeding (MBF) refers to babies who have received artificial milk at least once; formula feeding (FF) describes newborns who have been fed only formula milk.

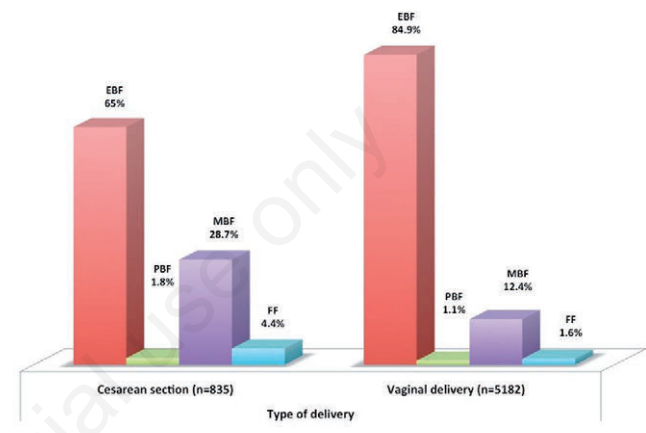
Another variable, maternal nationality, is available only for those babies born during the last 18 months considered in the study.

Information was recorded in the Pediatric Unit Register of Neonatal Feeding, which is filled with data taken from the medical records. A consent form to data release was signed by the babies' parents after birth. To avoid bias all babies that spent any time in the Neonatal Pathology Unit were excluded from the study. Statistical analyses of the present study were performed using STATA software

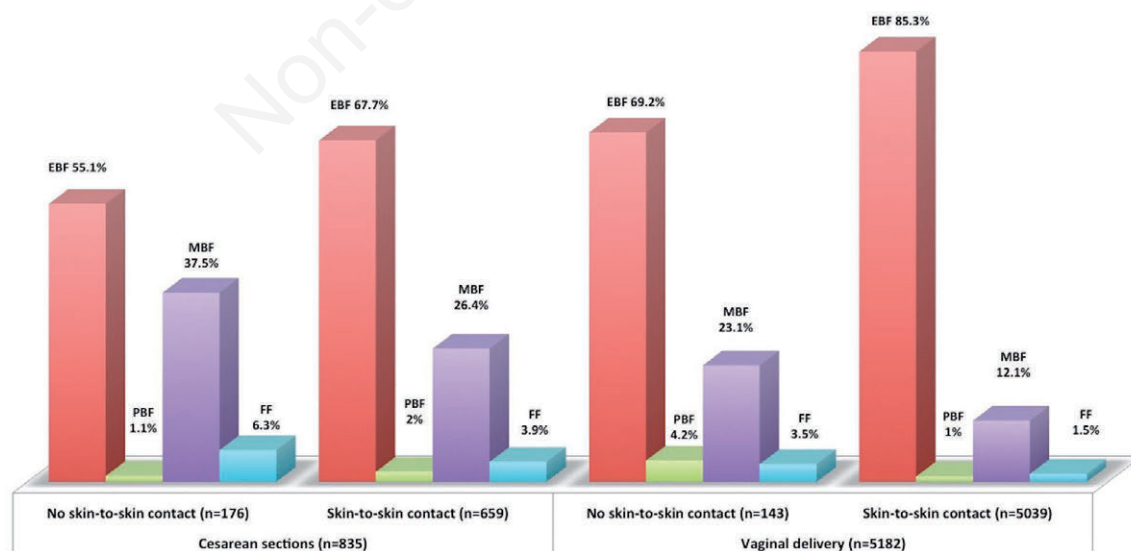
version 14 (StataCorp, Texas, USA). Data were analyzed using Chi-square test to evaluate whether there was a significant association between type of feeding at hospital discharge and the single variables considered (type of delivery, STSC procedure, and maternal nationality). Statistical significance was set at  $P < 0.05$ .

## Results

Over a period of 36 months 6017 healthy babies were born in the Maternal-Infant Department of the G. Fracastoro Baby Friendly Hospital: 5182 babies were born by natural delivery, 835 (13.8%)



**Figure 1. Breastfeeding rates at hospital discharge in babies born by cesarean and vaginal delivery. The rate of exclusive breastfeeding was higher in babies born by vaginal delivery than in babies born by cesarean section ( $P < 0.001$ ). EBF, exclusive breastfeeding; PBF, prevalent breastfeeding; MBF, mixed breastfeeding; FF, formula feeding.**



**Figure 2. Breastfeeding rates in skin-to-skin and non-skin-to-skin babies after cesarean section and after vaginal delivery. The rate of exclusive breastfeeding was higher in babies who experienced skin-to-skin contact in both babies born by vaginal delivery ( $P < 0.001$ ) and in babies born by cesarean-section ( $P = 0.009$ ). EBF, exclusive breastfeeding; PBF, prevalent breastfeeding; MBF, mixed breastfeeding; FF, formula feeding.**

babies were born by cesarean section. 5698 newborns experienced STSC within an hour from delivery for at least one hour.

At hospital discharge 82.1% of newborns presented with EBF, 14.7% of babies showed MBF, 1.2% of babies presented with PBF, 2% had FF. The rate of EBF at discharge was significantly higher in babies born by vaginal delivery than in babies born by cesarean section (84.9% vs 65%;  $P<0.001$ ) (Figure 1).

Newborns who experienced STSC had a significantly higher rate of EBF than newborns who did not. This was observed among babies born by vaginal delivery (85.3% vs 69.2%;  $P<0.001$ ) as well as among those born by cesarean section (67.7% vs 55.1%;  $P=0.009$ ) (Figure 2).

STSC was carried out significantly less frequently in newborns who were delivered by cesarean section than in newborns who had a vaginal delivery (78.9% vs 97.2%;  $P<0.001$ ) (Table 1). Maternal health problems, dystocic delivery, newborn's temporary health problems and mother's choice were the recorded reasons for missed STSC.

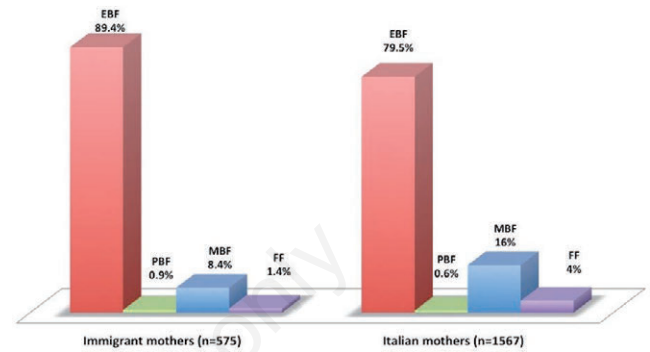
Regarding the last 18 months of our study information about maternal nationality was available. During that period 2142 healthy babies were born in the Maternal-Infant Department of the G. Fracastoro Baby Friendly Hospital: 1567 (73%) had Italian mothers, 575 (27%) had immigrant mothers (more precisely from Africa 10.3%, South America 1.1%, Asia 4.9%, Eastern Europe 10.6%).

The rate of cesarean section in the group of babies born to immigrant mothers and in the group of babies born to Italian mothers was similar (13.6% vs 15.7%;  $P=0.222$ ).

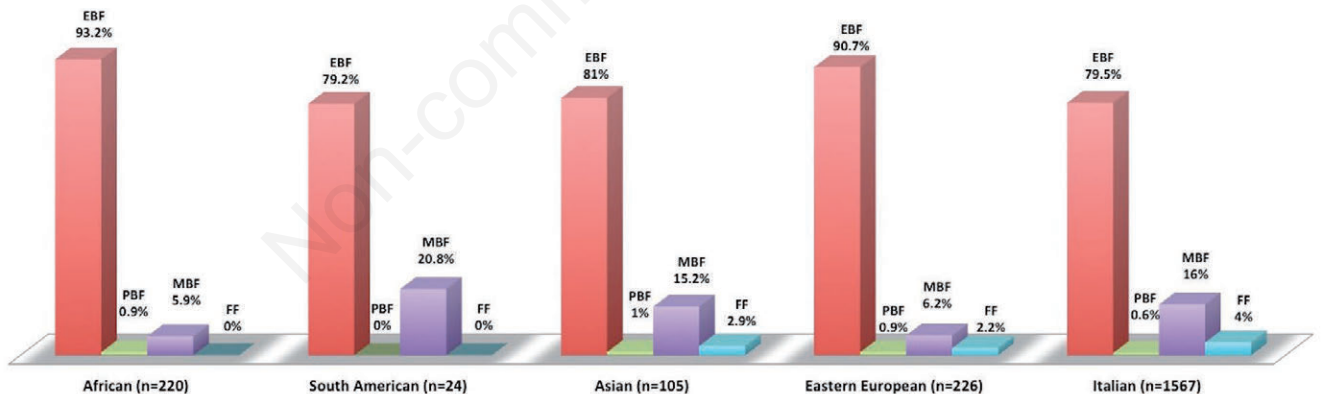
Similarly, there was no significant difference for the rate of cesarean section in mothers coming from Italy (15.7%), Africa (14.5%), South America (12.5%), Asia (15.2%), Eastern Europe (11.9%) ( $P=0.669$ ).

STSC was carried out with similar rates for the group of babies

born to immigrant mothers and for the group of babies born to Italian mothers (93.6% vs 94.2%;  $P=0.587$ ). Likewise, dividing newborns in five groups according to the mothers' nationality, it showed that the rate of STSC was similar between the five groups, with STSC being carried out by 93.2% of mothers coming from Africa, 100% of mothers coming from South America, 94.3% of



**Figure 3. Breastfeeding rates in immigrant mothers and in Italian mothers. The rate of exclusive breastfeeding was higher in immigrant mothers than in Italian mothers ( $P<0.001$ ). The combined rate of exclusive breastfeeding, prevalent breastfeeding was 90.3% in babies born to immigrant mothers, 80.9% in babies born to Italian mothers. EBF, exclusive breastfeeding; PBF, prevalent breastfeeding; MBF, mixed breastfeeding; FF, formula feeding.**



**Figure 4. Breastfeeding rates in groups of babies with mothers with different nationalities. The rate of exclusive breastfeeding was significantly different between babies with African, South American, Asian, Eastern European and Italian mothers ( $P<0.001$ ). EBF, exclusive breastfeeding; PBF, prevalent breastfeeding; MBF, mixed breastfeeding; FF, formula feeding.**

**Table 1. Deviance between type of delivery and skin-to-skin contact.**

Type of delivery	No skin-to-skin contact		Skin-to-skin contact	
	n.	%	n.	%
Cesarean section (n=835)	176	21.1	659	78.9
Vaginal delivery (n=5182)	143	2.8	5039	97.2

$P<0.001$ .

mothers from Asia, 92.9% of those from Eastern Europe, 94.2% of Italian mothers ( $P=0.665$ ).

Despite that, immigrant mothers altogether had significantly higher rates of EBF compared to Italian mothers (89.4% vs 79.5%;  $P<0.001$ ) (Figure 3). Similarly, there were significant differences between the single groups with different maternal nationality ( $P<0.001$ ), with the rate of EBF being higher in babies born to mothers coming from Africa (93.2%) and in babies born to mothers coming from Eastern Europe (90.7%) (Figure 4).

Overall the combined rate of EBF, PBF and MBF was 98.6% in babies born to immigrant mothers, 96% in babies born to Italian mothers.

## Discussion

This epidemiological study showed how type of delivery, STSC and maternal nationality are associated with breastfeeding practices at discharge from a Baby Friendly Hospital in Verona, Italy.

The G. Fracastoro Baby Friendly Hospital data regarding healthy babies born over a period of 36 months showed that the rate of EBF at hospital discharge is 82.1%. Such rate is altogether satisfying, considering that so far a 75% rate of EBF at discharge is the minimum required by UNICEF for the certification of new Baby-Friendly Hospitals.

On a deeper analysis of the data, the rate of EBF was significantly higher in the group of babies born by vaginal delivery (84.9%) than in the group of babies born by cesarean section (65%) (Figure 1). This aspect was also shown in an observational study conducted at the University of Padova on a smaller cohort of babies, about 2100.<sup>7</sup> Our data, resulting from a much wider population, 6017 babies, allow us to show a similar negative association between cesarean delivery and EBF at discharge from the hospital.

Among the reasons to explain this it is important to point out that after a cesarean section, and especially an elective one, the mother lacks the physiological hormonal changes that should ready her to start lactating as soon as possible after delivery.<sup>10</sup> Moreover, cesarean section undoubtedly brings the mother a greater discomfort, so that she can find it harder to keep a close contact with her baby in the earliest hours and days after the delivery as recommended to promote breastfeeding.

Every mother delivering in our hospital benefits from the *rooming-in* care, consisting of sharing the room with her baby thus being together at all times as recommended by WHO and UNICEF.<sup>1</sup> The rooming-in seems to be overall a less consolidated practice in mothers who gave birth by cesarean delivery, often due to maternal request to be relieved from the management of the baby totally on her own right after giving birth. Therefore, we are inclined to believe that the evidences described above should be the subject of training for nurses of Birth Centres. Nevertheless, we feel that mothers delivering by cesarean section should receive care with an exceptional emphasis to the closeness and physical contact between mother and baby to enhance the early start of breastfeeding.

STSC is another procedure known to be of relevance to promote breastfeeding, consisting of placing the naked and dried baby on the mother's torso or abdomen, with direct contact between the mother's and baby's skin, immediately after birth and for at least one hour. This enhances the oxytocin reflex and the baby's early attachment to the breast, also it promotes the bonding between mother and newborn.<sup>1,5,11</sup> All these arrangements have a positive influence on the initiation of breastfeeding.<sup>12,13</sup>

In addition, it is known that early STSC stimulates the stabi-

lization of the baby's temperature,<sup>5,11,13-16</sup> it reduces the baby's stress response from birth,<sup>17</sup> and the infant crying.<sup>18</sup>

STSC is a procedure included into the *Ten steps to successfully breastfeed* defined by WHO and UNICEF and it's a necessary requirement for the accreditation of Baby-Friendly Hospitals like ours, where it is routinely carried out within an hour after all deliveries.

The documented causes for missed implementation of STSC include mother's health problems, dystocic delivery, baby's transitory health problems and mother's choice.

Our data showed that the rate of EBF is significantly higher in babies who experienced STSC compared to those who did not. This was observed in both types of delivery, even though EBF rates showed a gap, between babies who did experience STSC and babies who didn't, that was much higher in the group of babies delivered by vaginal birth (85.3% vs 69.2%) than in the group of babies delivered by cesarean section (67.7% vs 55.1%) (Figure 2). The analysis of these data from such a wide population reinforces the results of previous reviews of the literature that examined studies conducted on a number of small cohorts<sup>5,6</sup> which showed that STSC is significantly helpful to increase breastfeeding. In our experience STSC showed a strong association with breastfeeding in the first few days after both vaginal and cesarean delivery, even though its benefit appeared to be greater after vaginal delivery.

However, our data showed that STSC is executed significantly less frequently in cesarean deliveries compared with vaginal deliveries (78.9% vs 97.2%;  $P<0.001$ ) (Table 1).

In the light of the evidence above we believe that to promote EBF it is helpful to encourage the execution of STSC in all mother-baby couples, and especially in those couples having a cesarean delivery since, as shown, that type of delivery itself constitutes an obstacle to early initiation of breastfeeding.

Information about maternal nationality is available for babies born in the last 18 months of the period we studied. The data analysis regarding maternal nationality showed that more than one fourth of healthy babies discharged from our Birth Centre had immigrant mothers, mostly from Africa and Eastern Europe.

These findings match the local epidemiological data.<sup>9</sup>

The group of babies with immigrant mothers and the group of babies with Italian mothers were homogeneous with respect to type of delivery and STSC. However, the rate of EBF at discharge was significantly higher in babies with immigrant mothers than in those with Italian mothers (Figure 3). Similarly, the five groups of mothers with different nationality showed similar rates of cesarean section and STSC. By comparing the five groups it appears that the highest rates of EBF were recorded for mothers coming from Africa and Eastern Europe: respectively 93.2% and 90.7% (Figure 4). On the other hand mothers coming from Asia, Italy and South America had much lower and similar rates: respectively 81%, 79.5% and 79.2% (Figure 4).

Italian mothers are, therefore, extremely less likely to exclusively breastfeed than mothers coming from Africa and Eastern Europe, whereas their likelihood to exclusively breastfeed is similar to that of mothers coming from Asia and South America.

Another study was conducted by Zuppa *et al.*<sup>8</sup> in 2005 at the A. Gemelli Hospital in Rome including about 2400 consecutively born babies: 20% of babies had immigrant mothers, mostly from Eastern Europe (about 40%) and Latin America (about 20%). Zuppa *et al.* compared the combined rate of EBF and PBF at discharge in a group of Italian mothers with that in a group of immigrant mothers.<sup>8</sup> The result was that the rate of EBF and PBF altogether was 46.3% in Italian mothers and 54.8% in immigrant mothers. In our experience the combined rate of EBF and PBF was 80.9% in Italian mothers and 90.3% in immigrant mothers (Figure 3). Hence, our data

showed the same tendency found by Zuppa *et al.*,<sup>8</sup> with EBF and PBF rates being higher in immigrant mothers than in Italian mothers. On the other hand, for both Italian and immigrant mothers, the rates of combined EBF and PBF in our study were considerably higher than those observed by Zuppa *et al.*<sup>8</sup> This is likely due to the fact that ours is a Baby-Friendly Hospital while the A. Gemelli Hospital was not, other than the fact that we only accounted for healthy newborns while Zuppa *et al.* accounted for unhealthy ones as well.

It is complex to understand the reasons for the great difference between the rate of EBF in Italian mothers and the rate of EBF in immigrant mothers. We believe that mostly cultural and religious other than economic factors may be involved. One possible explanation for this phenomenon is that in places such as African and Eastern European Countries breastfeeding is the norm. Immigrants from these Countries are organized in matriarchal communities in which a close contact is kept with the homelands, and traditional and established practices like breastfeeding are passed on. A support network is built around the mothers, so that they are encouraged to breastfeed their babies as their mothers did. Religious belief probably contributes too to promote breastfeeding, especially among Muslim mothers as the Corano states that every baby deserves to be breastfed and recommends for mothers to breastfeed children for the first two years of age if possible.

Several other variables may have an influence on breastfeeding rates, such as previous breastfeeding experience, economic background and mothers' educational level.

Further studies are needed to better understand the factors involved in breastfeeding practices.

## Conclusions

The rate of EBF at discharge from our Birth Centre is overall satisfying (82.1%).

There is a positive association between vaginal delivery and breastfeeding at hospital discharge. The STSC procedure is positively associated with EBF at discharge in both babies born by vaginal and by cesarean delivery. Maternal nationality affects type of breastfeeding at discharge: the rate of EBF is higher in immigrant mothers (89.4%) than in Italian mothers (79.5%).

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