



# The Baby Friendly Hospital Initiative and the ten steps for successful breastfeeding. a critical review of the literature

Enrique Gomez-Pomar<sup>1</sup> · Robert Blubaugh<sup>2</sup>

Received: 20 October 2017 / Revised: 1 January 2018 / Accepted: 18 January 2018 / Published online: 7 February 2018  
© Nature America, Inc., part of Springer Nature 2018

## Abstract

There is no doubt regarding the multiple benefits of breastfeeding for infants and society in general. Therefore, the World Health Organization (WHO) in a conjoint effort with United Nations International Children's Emergency Fund (UNICEF) developed the "Ten Steps to Successful Breastfeeding" in 1992, which became the backbone of the Baby Friendly Hospital Initiative (BFHI). Following this development, many hospitals and countries intensified their position towards creating a "breastfeeding oriented" practice. Over the past two decades, the interest increased in the BFHI and the Ten Steps. However, alongside the implementation of the initiative, extensive research continues to evaluate the benefits and dangers of the suggested practices. Hence, it is our intention to make a critical evaluation of the current BFHI and the Ten Steps recommendations in consideration of the importance of providing an evidence-based breastfeeding supported environment for our mothers and infants.

To state that breastfeeding is best for infants is an understatement as its benefits are countless [1]. However, for many years, the declining rate of breastfeeding is attributable in part to a lack of appropriate support by many medical providers. Consequently, mothers did not receive consistent, timely, and adequate advice and assistance regarding breastfeeding [2, 3]. The Baby Friendly Hospital Initiative (BFHI) was a response to the Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding call for action proposal, which was adopted by the forty-fifth World Health Assembly in May 1992 [4, 5]. Since then, hospitals in many countries implemented the initiative, which gained an increased support in the US [6–9]. In the recent years, however, controversy emerged regarding its efficacy and safety [10–12].

Table 1 presents the Ten Steps for Successful Breastfeeding, the main foundation of the BFHI. [13].

We will critically evaluate each of the Ten Steps to understand not only the clinical evidence for inclusion and effectiveness of each step, but also the possible associated risks.

## Step 1: Have a written breastfeeding policy that is routinely communicated to all health care staff

The BFHI and the Ten Steps resulted from a lack of a much needed national breastfeeding policies and guidelines [4, 13]. Implementing public practices at a national level was demonstrated to be an effective way in increasing breastfeeding initiation rates and duration [3, 14–16]. Therefore, in 1989, the US Surgeon General gave the first public endorsement of the benefits of breastfeeding and then reaffirmed in 2011 through the Surgeon General's Call to support breastfeeding [3, 17, 18]. Outside the US, another initiative was the Promotion of Breastfeeding Intervention Trial (PROBIT) which compared the implementation of the BFHI practices against the common practices in hospitals in the Republic of Belarus [19]. The PROBIT trial showed that implementation of the BFHI led to increased rate and the duration of breastfeeding [19].

Australia and Switzerland also implemented the BFHI [2, 20, 21]. Australia began implementing the BFHI in 1992,

✉ Enrique Gomez-Pomar  
Enrique.gomez@uky.edu

<sup>1</sup> Division of Neonatology, Department of Pediatrics, University of Kentucky, Lexington, KY 40506, USA

<sup>2</sup> Neonatal Intensive Care Unit Medical Director, Rush Foundation Hospital, Meridian, MS 39301, USA

**Table 1** Ten steps for successful breastfeeding

Every facility providing maternity services and care for newborn infants should:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within a half-hour of birth.
5. Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breastmilk unless medically indicated.
7. Practice rooming-in—allow mothers and infants to remain together—24 h a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

shortly after the guidelines were released [2]. Although having a universal health care system, Australia faced unique difficulties in adopting the BFHI universally, because the health system for each region functioned independent of each other [2, 20, 22, 23]. However, some progress became evident with having the BFHI initiative based on the 2010 National survey that showed a 96% breastfeeding initiation rate. However, only 39 and 15% of mothers breastfed their infants exclusively until 4 and 6 months of age respectively [20].

Switzerland introduced the BFHI in 1993 and the success of the initiative was evaluated by a national survey in 1994 and in 2003 [21]. Results showed that the median duration of breastfeeding increased along with the duration of exclusive breastfeeding. Infants born in hospitals where the Ten Steps were implemented were more likely to be breastfed for a longer time compared to those born in non-BF facilities [21]. However, a critical review of the results questioned to what extent BFHI influenced the rates and duration of breastfeeding amidst the country's generalized change in culture or attitude toward breastfeeding [21].

Working mothers who choose to breastfeed are faced with many challenges once returning to the workplace, the most common reason for discontinuing breastfeeding [16, 24–26]. Heymann et al. in 2013 reviewed the national policies which intended to guarantee breastfeeding breaks in the workplace in an attempt to increase duration and frequency of breastfeeding [24]. Breastfeeding breaks with pay were guaranteed in 71% of countries compared

to 25% that did not have a policy in place. After controlling for national gross domestic product, the female literacy rate, and the percentage of the population living in urban areas, exclusive breastfeeding rates were significantly higher in countries that guaranteed breastfeeding breaks [24].

There is no doubt that a national and local engagement in promoting breastfeeding is necessary [1, 15]. However, breastfeeding policies need to take in consideration different factors within a state or locality that can influence the success of breastfeeding initiatives [27]. Breastfeeding rates vary by state or by city. Further, rates differ because of factors such as income, educational level, prevalence of obesity, and smoking rate; these are risks that may be accountable for low breastfeeding rates [27]. As stated in the Ten Steps: “Ideally policies should also come as a commitment from parents, health professionals, the mass media, and other community groups.” [13]

## Step 2: Train all health care staff in the skills necessary to implement this policy

Health care providers should not only know the policy but understand the reasoning for such policy [28]. However, there is controversy with regard to what education or training would be appropriate, who would provide the education or training, and the outlays or fees associated with such training as a requisite from the certifying agencies. Health providers have the knowledge and experience in various medical areas and should have a significant input in evaluating the personnel and the course content for training of personnel. Certified lactation nurses are an essential part of any program that aims to improve breastfeeding in a community; these lactation specialists are proficient in both theory and techniques related to breastfeeding. Therefore, education and training do not have to be necessarily obtained outside one's institution.

It is undeniable that improvement in education content and training methods are needed. Pediatric residents usually receive little breastfeeding education during their training resulting in being non-active breastfeeding promoters [1, 16, 29–32]. On the other hand, there is little evidence that shows an improvement in the breastfeeding rates and duration after completion of training of health care providers [33]. But if the goal is to develop a national breastfeeding culture or environment, education of pediatric residents, nurses and practitioners should be enhanced as part of their curriculum toward attaining their respective degree [1].

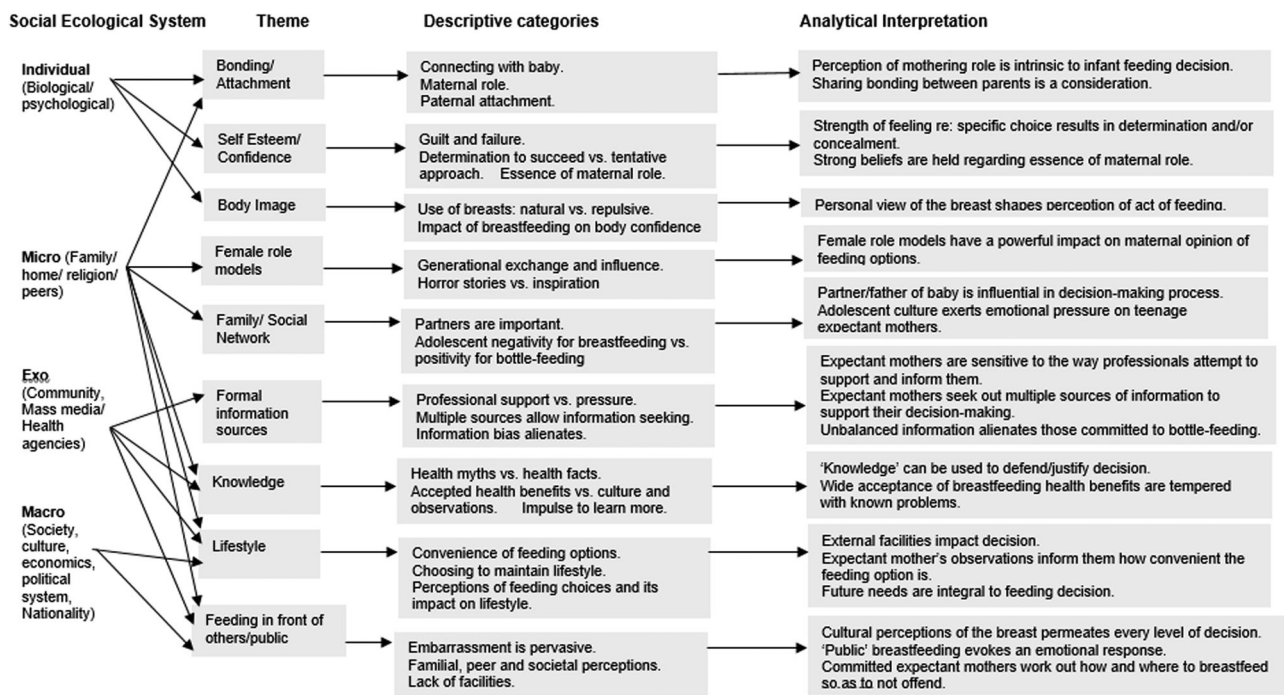


Fig. 1 Social Ecological Model of the influences that affects the maternal decision of breastfeeding. Reproduce with permission from ref. [43]

**Step 3, 5, and 10. Inform all pregnant women about the benefits and management of breastfeeding; show mothers how to breastfeed and how to maintain lactation, even if they are separated from their infants and; foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or birth center**

There is substantial evidence that clearly shows the importance of prenatal and postnatal education and support in the improvement of breastfeeding initiation and duration [16, 34–40]. Primiparous mothers perceive breastfeeding as a natural phenomenon that will happen without problems. Therefore, when difficulties arise, the easier solution is to switch to artificial milk [41]. Mothers who delivered by C-section are astounded when they are expected to immediately start breastfeeding without any regard to postsurgical recovery and giving rise to complaints that breastfeeding is tiring and painful [42]. Roll et al. did a systematic review analyzing the factors that are related to a mother's choice on how she will feed her infant [43]. Researchers have proposed a model representing how maternal and external factors influence the decision on breastfeeding (Fig. 1) [43].

Robert et al. in 2014 evaluated more than 1000 mothers in Belgium to assess their reasons for stopping breastfeeding [26]. At birth, a third of the mothers already decided not to breastfeed for personal reasons; however, introduction of

breastfeeding substitutes was most likely due to intrinsic problems related to breastfeeding. One primary reason for breastfeeding cessation was the mothers' perception of insufficient milk [26], in spite of the low incidence of this problem [25]. These findings further support the necessity of efficient and effective education for mothers.

A review in 2000 by Fairbank et al. in the United Kingdom found that breastfeeding information through printed material alone or delivered via a non-interactive or impersonal method of education has limited impact on breastfeeding initiation rates [33]. However, if the information is provided in small, informal groups, this format of information dissemination influenced the breastfeeding rates and duration; therefore, supporting the use of peer support programs [33].

Labarere et al. evaluated 231 mother-infant pairs in France and applied an intervention that included one extra visit postnatally to provide breastfeeding support [44]. The study reported an increase in the rate of breastfeeding at 4 weeks from 81.6% to 89.3%; the median duration of breastfeeding also increased from 13 weeks to 18 weeks [44]. There was also a decrease in the reporting of breastfeeding difficulties and an increase in breastfeeding satisfaction [44].

Enrollment in the Women, Infants and Children program (WIC) has been historically associated with lower rates of breastfeeding initiation compared to mothers who were not enrolled [45, 46]. Factors identified to influence these low rates were: lack of support inside/outside the hospital,

**Table 2** Proposed guidelines for safe implementation of early skin to skin and rooming-in

1. Infants 38wk and greater with PNC, vigorous and without risk factors can be placed skin to skin with mother after birth.
2. Infants 37, 38 wks or 38 wks and greater with the following risk factors:
  - No prenatal care.
  - Maternal fever ( $T \geq 100.4$ ).
  - History of drug exposure.
  - Prolonged Rupture of Membranes.
  - Suspicion for chorioamnionitis.
  - Meconium staining.
  - Decrease perfusion / dusky color.

Will be assessed on the warmer by a Nursery Nurse and if infant is stable (normal VS, O<sub>2</sub> Sats > 93%, vigorous and no respiratory distress), skin to skin will be provided, otherwise infant will be brought to the nursery.
3. Infants that are less than 37 weeks will go to the nursery for evaluation.
4. The following infants should be brought immediately to the Well Baby Nursery for evaluation:
  - If 1 min Apgar is  $\leq 6$  or 5 min Apgar is  $\leq 8$ .
  - If respiratory assistance is needed at delivery (PPV, bag and mask, oxygen).
  - Need of any medication during resuscitation.
  - Visible or suspected congenital anomalies.
  - Babies  $\leq 2500$  gms.
  - Any respiratory distress signs.
  - Nursing concern.
5. If infant is placed skin to skin, a nursery nurse needs to be with mother continuously.
6. Skin to skin care by mother should not be done in cases of maternal (or paternal) skin lesions that may be contagious. Absolute or partial breastfeeding contraindications (as defined by the CDC) should be reviewed along with other factors that may affect breastfeeding.
7. Procedure for immediate skin to skin care:
  - Delivery of newborn.
  - Dry and stimulate for first breath/cry, and assess newborn.
  - If the newborn is stable, place skin to skin with cord attached (with option to milk cord), clamp cord after 1 min or after placenta delivered, and reassess newborn to permit physiological circulatory transition.
  - Continue to dry entire newborn except hands to allow the infant to suckle hands bathed in amniotic fluid (which smells and tastes similar to colostrum), which facilitates rooting and first breastfeeding.
  - Cover head with cap and place prewarmed blankets to cover body of newborn on mother's chest, leaving face exposed.
  - Assess Apgar scores at 1 and 5 min.
  - Replace wet blankets and cap with dry warm blankets and cap.
  - Assist and support to breastfeed.
8. Components of safe positioning for the newborn while skin to skin
  - Infant's face can be seen.

**Table 2** (continued)

- Infant's head is in "sniffing" position.
  - Infant's nose and mouth are not covered.
  - Infant's head is turned to one side.
  - Infant's neck is straight, not bent.
  - Infant's shoulders and chest face mother.
  - Infant's legs are flexed.
  - Infant's back is covered with blankets.
- Mother-infant dyad is monitored continuously by staff in the delivery environment and regularly on the postpartum unit.
- When mother wants to sleep, infant is placed in bassinet or with another support person who is awake and alert.
9. If infant is going through skin to skin care, the following should be monitor every 10 min during the first hour of life and then every 15 min for the second hour of life:
    - Infant positioned with visible and unobstructed mouth and nose (Yes/No)
      - Pink color (skin and/or mucous membranes) (Yes/No)
      - Normal breathing (no retractions or grunting or flaring of the nares) (Yes/No)
      - Normal respiratory rate: 30–60 breaths/min (Yes/No)
      - Normal SpO<sub>2</sub>: > 93% (if deemed necessary) (Yes/No)
      - Mother never left alone with her infant (Yes/No)
      - Subaxillary temperature at 60 min and then follow wellborn protocol (every 30 min until stable) (Normal range: 36.5–37.5 °C)
  10. The infant should be taken to the nursery if:
    - Mother is lethargic or asleep and there are no other family members to complete the skin to skin care.
    - Mother requests.
    - Any maternal complications that may interfere with skin to skin care.
    - Nursing concern.
  11. Formula feeds will be provided by medical indication or by maternal request.
  12. We strongly recommend that pacifiers may be provided at mother's request.

returning to work, practical issues, WIC-related issues, and social/cultural barriers [47, 48]. However, Ahluwalia et al. reported in 2000 that, implementing 5 strategies to the WIC program in Georgia increased the breastfeeding initiation rate by almost 10% [49]. These strategies included: enhanced breastfeeding education, breast pump loans, hospital-based programs, peer counseling, and community coalitions [49]. This was later supported by a review by Hedberg et al. who found that interventions resulting in positive outcomes included peer counseling, better communication between hospital lactation consultants and WIC staff, breast-pump programs, and discouraging routine formula provision in the hospital and by WIC [47].

In 2009, the WIC program made an extensive revision of the package policies to comply with the recommendations



of the Institute of Medicine [50]. After the 2009 WIC food package revisions, mixed results were published regarding the effect of program revision on breastfeeding. Overall the breastfeeding rate and duration increased among WIC participants. However, these rates are still lower than those who are not in need of accessing WIC services. Efforts must be directed to enhance access to peer-counseling programs that support breastfeeding made possible through increase in funding for the program [50].

A 2016 Cochrane review reported that education by health care, non-health care professionals and peer support interventions can result in improvement in the number of women initiating breastfeeding [51]. A 2017 systematic review of the step three by Wouk et al. found that prenatal and postnatal education are associated with better rates of initiation, duration and exclusivity of breastfeeding especially when given in conjunction with interpersonal support [35].

### **Steps 4, 7 and 8. Help mothers initiate breastfeeding within one hour of birth; practice rooming-in—allow mothers and infants to remain together 24 h a day, and encourage breastfeeding on demand**

Skin to skin care has been reported in the literature since 1976 and was introduced after the positive results from the Kangaroo Care program. Women who experience early skin to skin are more likely to breastfeed longer and effectively, have decreased maternal stress and postpartum hemorrhage [52–54]. Infants experience better stability of their cardiorespiratory system and have higher glucose and better temperature control [52–55]. Early breastfeeding is related to a better breastfeeding method with a more organized breastfeeding pattern and improved overall success [53].

Likewise, rooming-in is suggested to benefit the initiation and length of breastfeeding [54]. Infants who room-in cry less, get soothed quicker and take more breastmilk [54]. However, a 2016 Cochrane review did not encounter conclusive evidence of better breastfeeding initiation and longer duration, or increase in the frequency of breastfeeding among infants rooming-in with their parents [56].

Conversely, the practices of early skin to skin care and rooming-in have associated risks. There are multiple reports on cases of sudden unexpected postnatal collapse in the neonate (SUPC) since 1994 [55, 57–69]. Sudden Infant Death Syndrome (SIDS) [70] differs from SUPC as the latter tends to occur in term or near-term infants who were well at birth and collapses unexpectedly in a state of cardiorespiratory compromise within the first 7 days of life [53]. As the BFHI expands in the US, there is also a growing concern of the associated risks because of the increase in the reported cases of SUPC [10, 11].

Risk factors identified to be associated with SUPC include primiparous delivery, parents being alone, maternal fatigue, and the infant being in a potentially asphyxiating position (prone position) [60, 62–64]. The high risk situations that may predispose infants to SUPC include extensive resuscitation (and the use of positive pressure ventilation), low Apgar scores, late preterm and early term infants (37 to 39 weeks), difficult delivery, mother receiving codeine or other medications (general anesthesia and magnesium sulfate) that may affect the neonate, and sedated mothers or sleepy mothers and newborns [53]. Therefore, recommendations were made for a safe skin to skin care [53, 55]. In Table 2 we present a suggested order set to help the personnel identify those neonates at risk of SUPC and provide a safe skin to skin care. This order set is based on the recommendations provided by the AAP [53] and Davanzo et al. [55].

### **Step 6. Give infants no food or drink other than breast-milk, unless medically indicated**

Exclusive breastfeeding for the first six months of life represents the gold standard in infant nutrition [1, 71]. However, at the time of the Ten Steps implementation, health or medical centers had the liberal practice to give formula, glucose, or plain water which affected breastfeeding rates [13]. As the BFHI was implemented, health care facilities started to restrict the access to feeding supplements. Conversely, the lack of adequate feeding supplementation may result in excessive weight loss and hyperbilirubinemia among other medical conditions. Therefore, this generated a controversy regarding the safe use of supplemental formula while at the same time focusing on increasing breastfeeding rates.

Flaherman et al. performed a randomized control trial (RCT) in 2013 which gave limited formula feedings to 40 term infants with  $\geq 5\%$  of weight loss at 24 to 48 h of age by using a syringe [72]. They found that these infants had decreased formula intake at 1 week of life and continued breastfeeding for longer duration to 3 months of age. A similar trial in 2016 by Stranak et al. with 100 infants, found no differences in the rate of breast feeding initiation and its duration. [73]. Schbiger et al. randomized 602 infants to either restrictive supplement or pacifiers vs. conventional feeding practices during the first 5 days of life (supplementation after breastfeeding and pacifiers were offered without restriction) [74]. When comparing the groups, the study did not find a difference in breastfeeding rates at six months of life [74]. However the RCT that evaluated the use of cup vs bottle supplemental feeding showed a negative impact in the breastfeeding rates at 6 months of age [75]. From the 2016 Cochrane review, formula supplementation during the first few days did not affect breastfeeding rates at discharge and may have increase the rate of

breastfeeding that continued to 3 months of age (low-quality evidence) [76].

### Step 9. Give no pacifiers or artificial nipples to breastfeeding infants

How breastfeeding is influenced by the use of pacifiers or artificial nipples remains a topic of controversy [74, 77]. Medical benefits associated with the use of pacifiers include providing comfort, contributing towards neurobehavioral organization, and reducing the risk of SIDS [78, 79]. In the context of BFHI, the use of pacifiers is justified in low-birth weight, prematurity, and infants at risk for hypoglycemia [79]. Pacifiers are recommended to be offered to term infants when breastfeeding has been established [1, 78]. However, there is not an adequate, evidence-based definition of when breastfeeding is established. Therefore, controversy has evolved regarding the current recommendation that a pacifier can be introduced after 3 to 4 weeks of life [1].

Howard et al. reported that early use of pacifiers had a negative effect on any breastfeeding in a randomized study of 700 infants [75]. Jenik et al. evaluated the use of pacifiers on 1021 infants of mothers who were highly motivated to breastfeed and noted that offering pacifiers to 15 day-old infants (who regained their birth weight) was not detrimental [80]. The study of Schbiger et al. did not find differences in breastfeeding rates when comparing infants who used pacifiers vs. those that did not during the first 5 days of life [74]. Pincombe et al. analyzed 317 women who gave birth at a hospital that complied with the BFHI and explored the adherence of mothers to Steps 4 to 9<sup>81</sup>. They initially found detrimental effects in the use of a bottle, pacifier, dummy, or a nipple shield during their postnatal stay; however, this became insignificant after adjusting for socio-demographic factors, intended duration of breastfeeding and method of delivery of the infant [81].

Systematic reviews by Karabulut et al. [82] and Nelson et al. [77] found detrimental effects in the use of pacifiers for the duration of any breastfeeding. However, a review by O'Connor et al. in 2009 indicated that the use of pacifiers did not influence breastfeeding duration or exclusivity [83]. A 2016 Cochrane analysis of two trials involving 1302 infants found no significant effect of pacifier use in healthy term breastfeeding infants either started from birth or after lactation was established [84].

### Effectiveness of the BFHI

A landmark study being referred to as the example of a successful BFHI program is the Belarus intervention which was a cluster randomized study with a long-term follow-up

[19, 85]. The study enrolled more than 8000 mother-infant pairs with the objective of assessing the effects of breastfeeding promotion on duration and exclusivity of breastfeeding. The study demonstrated a positive influence of the BFHI in rates of breastfeeding initiation and duration [19]. However, a criticism to the study is that only breastfeeding pairs were enrolled, making it difficult to evaluate the effect on breastfeeding initiation rates [20, 86]. Mothers came from a high educational background with low cesarean section and smoking rates [19]. Also mothers were discharged after vaginal delivery on day 6 to 7 of the infant's life allowing for an adequate establishment of breastfeeding. This discharge practice is not consistent with Western standards of early discharge [19, 20]. Moreover, the Belarus intervention had a rapid implementation in an under-developed health care system which encountered little resistance to the policy change. This scenario is quite different from settings and population in developed countries [20].

The systematic review by Fairbank et al. showed that institutional changes in hospitals using initiatives like the BFHI can be effective in increasing breastfeeding initiation and duration rates [33]. Merewood et al. surveyed 29 hospitals that earned a BFHI certification and reported increased rates of breastfeeding initiation and exclusivity [87]. These results were supported by a review in 2016 by Munn et al. [37] However, these studies failed to report length or duration of exclusive breastfeeding [37, 87, 88]. Yotebieng et al. reported the results of the implementation of the BFHI in Congo and found an increase in long-term exclusive breastfeeding rates after the implementation [89]. A retrospective analysis of the implementation of the BFHI in a hospital in Boston showed that the breastfeeding initiation rates remarkably improved after the implementation [88]. A major pitfall in getting BF certified is that the hospital must pay for all infant formula and ancillary items resulting in extra expenses that could be as high as \$70,000 [88] and as low as \$20,000. A cost analysis study in 2011 found that hospitals that adopted BF status had 1.6 to 5% higher expenses per delivery, compared to those that did not [90].

Contrary to the reported advantages of BFHI, Robert et al. in Belgium reported their experience with over a thousand infants and observed that being born in a BFHI facility did not influence the breastfeeding rates and duration [26]. A survey from 6752 women in Australia showed that infants born at a BFHI hospital had lower odds of breastfeeding at 1 and 4 months of age [91]. The conclusion conveyed was that in places where breastfeeding rates are high and evidence-based practices that support breastfeeding are in place, the BFHI accreditation does not have an influence on breastfeeding rates [91]. This finding was also supported by the study of Yotebieng et al [89].

Hawkins et al. analyzed the data from the Pregnancy Risk Assessment Monitoring System of 11723 mothers in five US states and compared the breastfeeding initiation rates of BF hospitals vs. non-BF hospital [92]. Breastfeeding initiation and duration rates were not different; however, among women with lower education there was a positive influence on rate of breastfeeding initiation and duration [92]. Another analysis from the same group compared the compliance with the Ten Steps among the BF accredited and non-accredited institutions [93]. Contrary to expectation, half of the mothers reported compliance with 6–7 steps regardless of the BF accreditation status. Findings of the study suggest that compliance rather than accreditation would increase breastfeeding rates [93].

Howe-Heyman et al. did an extensive review of the literature in 2016 and reported that the majority of studies reach a conclusion that BFHI is an intervention to increase initiation, long-term duration, and exclusivity rates of breastfeeding [94]. However, study design, setting and disparate methods were limitations that challenge the conclusion from the many studies. The review concluded that there is no clear evidence to support the positive influence of the BFHI to improve breastfeeding [94]. Clinicians should focus on evidence-based practices that have shown a significant influence on initiation, duration and exclusivity of breastfeeding [94].

## Discussion

Breastfeeding should be the default choice for infants' nutrition. However, the decision to breastfeed is individualized and it is made by the parents usually in the prenatal period [39]. Maternal factors predisposing to lower breastfeeding rates include low-income, non-Hispanic ethnicity, obesity, depression, younger maternal age, and or less than high school education [47, 95]. These factors need consideration in prenatal education if programs were to have a positive influence in improving initiation and duration of breastfeeding. In addition to accounting for the socio-demographic population characteristics, each institution must adapt its program according to the geographic area being served, as well as the current breastfeeding rates, practices, and perceptions [30, 32, 95]. Health care facilities need to identify champions and educate the health and non-health care personnel in the implementation of its policy.

The WIC program has demonstrated to be an effective way of improving overall nutrition and increasing breastfeeding initiation in the participating women whose socio-economic characteristics would otherwise predispose them not to breastfeed. For continued and further success, there is a need for improvement in peer-counseling to support breastfeeding in the WIC program.

Health care facilities need to evaluate current prenatal and postnatal educational programs to improve and expand BFHI. As part of the prenatal education, determination is made of the mother's choices for skin to skin practices, rooming-in, and type of feeding. Maternal confidence in achieving exclusive breastfeeding, established as early as 32 weeks of gestation, is predictive of breastfeeding at 6 months of age [39]. Mothers need to understand that breastfeeding is not an easy task and that they may encounter problems especially during the early days postpartum when the goal is to establish successful breastfeeding [39, 42, 43]. In addition, during the postnatal period, providing peer support and education from health care providers comprise a proven and effective intervention [34, 40].

There is little evidence to support the practice of rooming-in [56]. However, we believe that rooming-in should be encouraged in a safe environment [10, 53]. A common objection from mothers to the BFHI is that they are made to feel guilty when not choosing to rooming-in. Also, this requirement has encouraged certain health care facilities to close their nurseries. However, we question that this practice may lead to increased NICU admissions for conditions that may appear to be concerning but may merely be a part of an infant's postnatal transition period and be safely monitored in the newborn nursery.

Strong evidence exists in support of the benefits of the skin to skin care practice [52, 53]. The desire for skin to skin care as well as for rooming-in should be decided in the prenatal period and parental decisions must be respected. However, mothers need to be informed of what to expect and the pros and cons of skin to skin care. Skin to skin care should be safely promoted with mother and infant who are constantly supervised by a trained nurse. The risks associated with skin to skin care and rooming-in must be recognized and preventive measures have to be in place [10, 11, 53, 55]. Formulating policies will help to assure safe practices.

Exclusive breastfeeding is difficult to establish especially for primiparous women and evidence suggests that supplemental feedings are not related to decrease exclusive breastfeeding rates [18, 72, 73]. Term infants with weight loss  $\geq 5\%$  from birth weight, are at special risk and supplemental feedings should be considered [72, 73]. Currently, supplementation of feeding is still controversial. If a mother chooses to formula feed, health care personnel should explore the reasons for this decision. However, this should be done preferably during prenatal education; otherwise there is the risk of discomfort or guilt that as mothers they are providing suboptimal care to their infants.

The restrictive use of pacifiers is being challenged with the recent evidence indicating that its use is not related to decreased breastfeeding rates [18, 74, 83, 84]. Presently,

there is no evidence as to when it is appropriate to offer pacifiers; therefore, each case should be evaluated individually. However, early pacifier use may actually benefit the infants if mothers are experienced and committed to breastfeeding.

The Ten Steps for Successful Breastfeeding and the BFHI were developed at a time where breastfeeding rates were historically low. Since then, there has been an enormous amount of research published of factors to be taken into consideration for a successful breastfeeding program. We do agree with the statement that the Ten Steps are in urgent need of an update [12]. Moreover, evidence is non-conclusive and not in full support of the BFHI as a program that can successfully increase initiation and long-term breastfeeding rates. Therefore, using the increase of breastfeeding initiation rates does not serve as a suitable or appropriate outcome to reflect the success of the BFHI [94]. Consequently, it would be problematic to regard the BFHI as best practice for the improvement of breastfeeding initiation rates and duration.

Certification of a hospital or health center as BF is by no means the only option for a successful breastfeeding program or to be designated as a BF institution [12, 18]. However, its structure can be carefully considered by health care facilities as a means to improve their policies on breastfeeding practices. A suitable approach to improve breastfeeding rates addresses geographic and population factors, early prenatal education, and postnatal support as the main components of an ideal program. A breastfeeding culture requires local, state and national interventions for optimal success.

**Acknowledgements** We sincerely thank the comments and critical review of the manuscript done by Dr. Henrietta Bada.

## Compliance with ethical standards

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

## References

1. Section on B. Breastfeeding and the use of human milk. *Pediatrics*. 2012;129:e827–41.
2. Atchan M, Davis D, Foureur M. An historical document analysis of the introduction of the Baby Friendly Hospital Initiative into the Australian setting. *Women Birth*. 2017;30:51–62.
3. Wright A, Schanler R. The resurgence of breastfeeding at the end of the second millennium. *J Nutr*. 2001;131:421S–5.
4. WHO Guidelines Approved by the Guidelines Review Committee. Baby-Friendly Hospital initiative: revised, updated and expanded for integrated care. Geneva: World Health Organization and UNICEF; 2009.
5. USA. B-F. Guidelines and evaluation criteria for facilities seeking baby-friendly designation. 2016. <https://d14abeop4cfxkt.cloudfront.net/cms/files/386/files/original/GEC2016.pdf>. Accessed 30 Sept 2017.
6. Saadeh RJ. The Baby-Friendly Hospital Initiative 20 years on: facts, progress, and the way forward. *J Hum Lact*. 2012;28:272–275.
7. Feldman-Winter L, Ustianov J, Anastasio J, Butts-Dion S, Heinrich P, Merewood A, et al. Best fed Beginnings: a nationwide quality improvement initiative to increase breastfeeding. *Pediatrics*. 2017;140:3121.
8. Labbok MH. Global baby-friendly hospital initiative monitoring data: update and discussion. *Breastfeed Med*. 2012;7:210–22.
9. Meek JY, Noble L. Implementation of the Ten steps to successful breastfeeding saves lives. *JAMA Pediatr*. 2016;170:925–6.
10. Bass JL, Gartley T, Kleinman R. Unintended consequences of current breastfeeding initiatives. *JAMA Pediatr*. 2016;170:923–924.
11. Goldsmith JP. Hospitals should balance skin-to-skin contact with safe sleep policies. *AAP News*. 2013;34.
12. Flaherman V, Von Kohorn I. Interventions intended to support breastfeeding: updated assessment of benefits and harms. *JAMA*. 2016;316:1685–1687.
13. Vallenás C, Savage F. Evidence for the ten steps to successful breastfeeding. 1998. [http://apps.who.int/iris/bitstream/10665/43633/1/9241591544\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/43633/1/9241591544_eng.pdf). Accessed 30 Sept 2017.
14. Semenic S, Childerhose JE, Lauziere J, Groleau D. Barriers, facilitators, and recommendations related to implementing the Baby-Friendly Initiative (BFI): an integrative review. *J Hum Lact*. 2012;28:317–34.
15. Lubold AM. The effect of family policies and public health initiatives on breastfeeding initiation among 18 high-income countries: a qualitative comparative analysis research design. *Int Breastfeed J*. 2017;12:34.
16. Feldman-Winter L. Evidence-based interventions to support breastfeeding. *Pediatr Clin North Am*. 2013;60:169–87.
17. U.S. Department of Health and Human Services. The surgeon general's call to action to support breastfeeding. In: Office of the Surgeon General, editor. Rockville, MD, 2011.
18. Patnode CD, Henninger ML, Senger CA, Perdue LA, Whitlock EP. Primary care interventions to support breastfeeding: updated evidence report and systematic review for the us preventive services task force. *JAMA*. 2016;316:1694–705.
19. Kramer MS, Chalmers B, Hodnett ED, Sevkovskaya Z, Dzikovich I, Shapiro S, et al. Promotion of Breastfeeding Intervention Trial (PROBIT): a randomized trial in the Republic of Belarus. *JAMA*. 2001;285:413–20.
20. Atchan M, Davis D, Foureur M. The impact of the Baby Friendly Health Initiative in the Australian health care system: a critical narrative review of the evidence. *Breastfeed Rev*. 2013;21:15–22.
21. Merten S, Dratva J, Ackermann-Liebrich U. Do baby-friendly hospitals influence breastfeeding duration on a national level? *Pediatrics*. 2005;116:e702–8.
22. Schmied V, Gribble K, Sheehan A, Taylor C, Dykes FC. Ten steps or climbing a mountain: a study of Australian health professionals' perceptions of implementing the baby friendly health initiative to protect, promote and support breastfeeding. *BMC Health Serv Res*. 2011;11:208.
23. Walsh AD, Pincombe J, Henderson A. An examination of maternity staff attitudes towards implementing Baby Friendly Health Initiative (BFHI) accreditation in Australia. *Matern Child Health J*. 2011;15:597–609.
24. Heymann J, Raub A, Earle A. Breastfeeding policy: a globally comparative analysis. *Bull World Health Organ*. 2013;91:398–406.
25. Gatti L. Maternal perceptions of insufficient milk supply in breastfeeding. *J Nurs Scholarsh*. 2008;40:355–63.
26. Robert E, Coppieters Y, Swennen B, Dramaix M. The reasons for early weaning, perceived insufficient breast milk, and maternal



- dissatisfaction: comparative studies in two belgian regions. *Int Sch Res Not*. 2014;2014:678564.
27. Anstey EH, Chen J, Elam-Evans LD, Perrine CG. Racial and geographic differences in breastfeeding - united states, 2011-2015. *MMWR Morb Mortal Wkly Rep*. 2017;66:723-7.
  28. Hawke BA, Dennison BA, Hisgen S. Improving hospital breastfeeding policies in New York State: development of the model hospital breastfeeding policy. *Breastfeed Med*. 2013;8:3-7.
  29. Schanler RJ, O'Connor KG, Lawrence RA. Pediatricians' practices and attitudes regarding breastfeeding promotion. *Pediatrics*. 1999;103:E35.
  30. Feldman-Winter LB, Schanler RJ, O'Connor KG, Lawrence RA. Pediatricians and the promotion and support of breastfeeding. *Arch Pediatr & Adolesc Med*. 2008;162:1142-9.
  31. Feldman-Winter L, Szucs K, Milano A, Gottschlich E, Sisk B, Schanler RJ. National trends in pediatricians' practices and attitudes about breastfeeding: 1995 to 2014. *Pediatrics*. 2017;140:1229.
  32. Meek JY. Pediatrician competency in breastfeeding support has room for improvement. *Pediatrics*. 2017;140:2509.
  33. Fairbank L, O'Meara S, Renfrew MJ, Woolridge M, Sowden AJ, Lister-Sharp D. A systematic review to evaluate the effectiveness of interventions to promote the initiation of breastfeeding. *Health Technol Assess*. 2000;4:1-171.
  34. Meedya S, Fernandez R, Fahy K. Effect of educational and support interventions on long-term breastfeeding rates in primiparous women: a systematic review and meta-analysis. *JBIM Database Syst Rev Implement Rep*. 2017;15:2307-2332.
  35. Wouk K, Tully KP, Labbok MH. Systematic review of evidence for baby-friendly hospital initiative step 3. *J Hum Lact*. 2017;33:50-82.
  36. Lumbiganon P, Martis R, Laopaiboon M, Festin MR, Ho JJ, Hakimi M. Antenatal breastfeeding education for increasing breastfeeding duration. *Cochrane Database Syst Rev*. 2016;12:CD006425.
  37. Munn AC, Newman SD, Mueller M, Phillips SM, Taylor SN. The impact in the united states of the baby-friendly hospital initiative on early infant health and breastfeeding outcomes. *Breastfeed Med*. 2016;11:222-30.
  38. Chung M, Raman G, Trikalinos T, Lau J, Ip S. Interventions in primary care to promote breastfeeding: an evidence review for the U.S. Preventive Services Task Force. *Ann Intern Med*. 2008;149:565-82.
  39. de Jager E, Broadbent J, Fuller-Tyszkiewicz M, Nagle C, McPhie S, Skouteris H. A longitudinal study of the effect of psychosocial factors on exclusive breastfeeding duration. *Midwifery*. 2015;31:103-11.
  40. McFadden A, Gavine A, Renfrew MJ, Wade A, Buchanan P, Taylor JL, et al. Support for healthy breastfeeding mothers with healthy term babies. *Cochrane Database Syst Rev*. 2017;2:CD001141.
  41. Hinsliff-Smith K, Spencer R, Walsh D. Realities, difficulties, and outcomes for mothers choosing to breastfeed: primigravid mothers experiences in the early postpartum period (6-8 weeks). *Midwifery*. 2014;30:e14-9.
  42. Tully KP, Ball HL. Maternal accounts of their breast-feeding intent and early challenges after caesarean childbirth. *Midwifery*. 2014;30:712-9.
  43. Roll CL, Cheater F. Expectant parents' views of factors influencing infant feeding decisions in the antenatal period: a systematic review. *Int J Nurs Stud*. 2016;60:145-55.
  44. Labarere J, Gelbert-Baudino N, Ayril AS, Duc C, Berchotteau M, Bouchon N, et al. Efficacy of breastfeeding support provided by trained clinicians during an early, routine, preventive visit: a prospective, randomized, open trial of 226 mother-infant pairs. *Pediatrics*. 2005;115:e139-46.
  45. Ryan AS, Zhou W. Lower breastfeeding rates persist among the special supplemental nutrition program for women, infants, and children participants, 1978-2003. *Pediatrics*. 2006;117:1136-46.
  46. Francescon J, Haile ZT, Kling D, Chertok I. Association between wic enrollment and exclusive breastfeeding at 3 months postpartum among low-income mothers. *J Am Osteopath Assoc*. 2016;116:770-9.
  47. Hedberg IC. Barriers to breastfeeding in the WIC population. *MCN Am J Matern Child Nurs*. 2013;38:244-9.
  48. Jacobson LT, Twumasi-Ankrah P, Redmond ML, Ablah E, Hines RB, Johnston J, et al. Characteristics associated with breastfeeding behaviors among urban versus rural women enrolled in the Kansas WIC program. *Matern Child Health J*. 2015;19:828-39.
  49. Ahluwalia IB, Tessaro I, Grummer-Strawn LM, MacGowan C, Benton-Davis S. Georgia's breastfeeding promotion program for low-income women. *Pediatrics*. 2000;105:E85.
  50. Schultz DJ, Byker Shanks C, Houghtaling B. The impact of the 2009 special supplemental nutrition program for women, infants, and children food package revisions on participants: a systematic review. *J Acad Nutr Diet*. 2015;115:1832-46.
  51. Balogun OO, O'Sullivan EJ, McFadden A, Ota E, Gavine A, Garner CD, et al. Interventions for promoting the initiation of breastfeeding. *Cochrane Database Syst Rev*. 2016;11:CD001688.
  52. Moore ER, Bergman N, Anderson GC, Medley N. Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database Syst Rev*. 2016;11:CD003519.
  53. Feldman-Winter L, Goldsmith JP, Committee On F, Newborn, Task Force On Sudden Infant Death Syndrome. Safe sleep and skin-to-skin care in the neonatal period for healthy term newborns. *Pediatrics*. 2016;138:e20161889.
  54. Crenshaw J. Care practice #6: no separation of mother and baby, with unlimited opportunities for breastfeeding. *J Perinat Educ*. 2007;16:39-43.
  55. Davanzo R, De Cunto A, Paviotti G, Travan L, Inglese S, Brovedani P, et al. Making the first days of life safer: preventing sudden unexpected postnatal collapse while promoting breastfeeding. *J Hum Lact*. 2015;31:47-52.
  56. Jaafar SH, Ho JJ, Lee KS. Rooming-in for new mother and infant versus separate care for increasing the duration of breastfeeding. *Cochrane Database Syst Rev*. 2016;CD006641.
  57. Rodriguez-Alarcon J, Melchor JC, Linares A, Aranguren G, Quintanilla M, Fernandez-Llebrez L, et al. Early neonatal sudden death or near death syndrome. *Epidemiol Study 29 cases Acta Paediatr*. 1994;83:704-8.
  58. Espagne S, Hamon I, Thiebauges O, Hascoet JM. [Sudden death of neonates in the delivery room]. *Arch Pediatr*. 2004;11:436-9.
  59. Branger B, Savagner C, Roze JC, Winer N. *Pediatrics des Maternites des P-d-l-L*. [Eleven cases of early neonatal sudden death ou near death of full term and healthy neonates in maternity wards]. *J Gynecol Obstet Biol Reprod*. 2007;36:671-9.
  60. Dageville C, Pignol J, De Smet S. Very early neonatal apparent life-threatening events and sudden unexpected deaths: incidence and risk factors. *Acta Paediatr*. 2008;97:866-9.
  61. Ottaviani G. Sudden infant and perinatal unexplained death: are we moving forward yet? *Cardiovasc Pathol*. 2011;20:302-6.
  62. Poets A, Steinfeldt R, Poets CF. Sudden deaths and severe apparent life-threatening events in term infants within 24 h of birth. *Pediatrics*. 2011;127:e869-73.
  63. Becher JC, Bhushan SS, Lyon AJ. Unexpected collapse in apparently healthy newborns--a prospective national study of a missing cohort of neonatal deaths and near-death events. *Arch Dis Child Fetal Neonatal Ed*. 2012;97:F30-4.
  64. Poets A, Urschitz MS, Steinfeldt R, Poets CF. Risk factors for early sudden deaths and severe apparent life-threatening events. *Arch Dis Child Fetal Neonatal Ed*. 2012;97:F395-7.

65. Feldman K. The unexpected: sudden infant death in the postnatal period. *Paediatr Child Health*. 2013;18:360.
66. Lutz TL, Elliott EJ, Jeffery HE. Sudden unexplained early neonatal death or collapse: a national surveillance study. *Pediatr Res*. 2016;80:493–8.
67. Andres V, Garcia P, Rimet Y, Nicaise C, Simeoni U. Apparent life-threatening events in presumably healthy newborns during early skin-to-skin contact. *Pediatrics*. 2011;127:e1073–6.
68. Ferrarello D, Carmichael T. Sudden unexpected postnatal collapse of the newborn. *Nurs Women's Health*. 2016;20:268–75.
69. Hays S, Feit P, Barre P, Cottin X, Huin N, Fichtner C, et al. [Respiratory arrest in the delivery room while lying in the prone position on the mothers' chest in 11 full term healthy neonates]. *Arch Pediatr*. 2006;13:1067–8.
70. Task Force On Sudden Infant Death Syndrome. SIDS and other sleep-related infant deaths: updated 2016 recommendations for a safe infant sleeping environment. *Pediatrics*. 2016;138:e20162938.
71. Kramer MS, Kakuma R. Optimal duration of exclusive breastfeeding. *Cochrane Database Syst Rev*. 2012;CD003517.
72. Flaherman VJ, Aby J, Burgos AE, Lee KA, Cabana MD, Newman TB. Effect of early limited formula on duration and exclusivity of breastfeeding in at-risk infants: an RCT. *Pediatrics*. 2013;131:1059–65.
73. Stranak Z, Feyereislova S, Cerna M, Kollarova J, Feyereisl J. Limited Amount of formula may facilitate breastfeeding: randomized, controlled trial to compare standard clinical practice versus limited supplemental Feeding. *PLoS ONE*. 2016;11:e0150053.
74. Schubiger G, Schwarz U, Tönz O. UNICEF/WHO baby-friendly hospital initiative: does the use of bottles and pacifiers in the neonatal nursery prevent successful breastfeeding? *Eur J Pediatr*. 2012;156:874–7.
75. Howard CR, Howard FM, Lanphear B, Eberly S, deBlieck EA, Oakes D, et al. Randomized clinical trial of pacifier use and bottle-feeding or cupfeeding and their effect on breastfeeding. *Pediatrics*. 2003;111:511–8.
76. Smith HA, Becker GE. Early additional food and fluids for healthy breastfed full-term infants. *Cochrane Database Syst Rev*. 2016;CD006462.
77. Nelson EA, Yu LM, Williams S, International Child Care Practices Study Group M. International Child Care Practices study: breastfeeding and pacifier use. *J Hum Lact*. 2005;21:289–95.
78. Hauck FR, Omojokun OO, Siadaty MS. Do pacifiers reduce the risk of sudden infant death syndrome? A meta-analysis. *Pediatrics*. 2005;116:e716–23.
79. Lubbe W, Ten Ham-Baloyi W. When is the use of pacifiers justifiable in the baby-friendly hospital initiative context? A clinician's guide. *BMC Pregnancy Childbirth*. 2017;17:130.
80. Jenik AG, Vain NE, Gorestein AN, Jacobi NE. Pacifier, Breast-feeding Trial G. Does the recommendation to use a pacifier influence the prevalence of breastfeeding? *J Pediatr*. 2009;155:350–354. e351
81. Pincombe J, Baghurst P, Antoniou G, Peat B, Henderson A, Reddin E. Baby Friendly Hospital Initiative practices and breast feeding duration in a cohort of first-time mothers in Adelaide, Australia. *Midwifery*. 2008;24:55–61.
82. Karabulut E, Yalcin SS, Ozdemir-Geyik P, Karaagaoglu E. Effect of pacifier use on exclusive and any breastfeeding: a meta-analysis. *Turk J Pediatr*. 2009;51:35–43.
83. O'Connor NR, Tanabe KO, Siadaty MS, Hauck FR. Pacifiers and breastfeeding: a systematic review. *Arch Pediatr & Adolesc Med*. 2009;163:378–82.
84. Jaafar SH, Ho JJ, Jahanfar S, Angolkar M. Effect of restricted pacifier use in breastfeeding term infants for increasing duration of breastfeeding. *Cochrane Database Syst Rev*. 2016;CD007202.
85. Bartick MC, Nickel NC, Hanley LE. Evidence for the baby-friendly hospital initiative to support breastfeeding. *JAMA*. 2017;317:770–1.
86. Martens PJ. What do Kramer's Baby-Friendly Hospital Initiative PROBIT studies tell us? A review of a decade of research. *J Hum Lact*. 2012;28:335–42.
87. Merewood A, Mehta SD, Chamberlain LB, Philipp BL, Bauchner H. Breastfeeding rates in US Baby-Friendly hospitals: results of a national survey. *Pediatrics*. 2005;116:628–34.
88. Philipp BL, Merewood A, Miller LW, Chawla N, Murphy-Smith MM, Gomes JS, et al. Baby-Friendly Hospital initiative improves breastfeeding initiation rates in a US hospital setting. *Pediatrics*. 2001;108:677–81.
89. Yotebieng M, Labbok M, Soeters HM, Chalachala JL, Lapika B, Vitta BS, et al. Ten steps to successful breastfeeding programme to promote early initiation and exclusive breastfeeding in DR Congo: a cluster-randomised controlled trial. *Lancet Glob Health*. 2015;3:e546–55.
90. DelliFraine J, Langabeer J 2nd, Williams JF, Gong AK, Delgado RI, Gill SL. Cost comparison of baby friendly and non-baby friendly hospitals in the United States. *Pediatrics*. 2011;127:e989–94.
91. Brodribb W, Kruske S, Miller YD. Baby-friendly hospital accreditation, in-hospital care practices, and breastfeeding. *Pediatrics*. 2013;131:685–92.
92. Hawkins SS, Stern AD, Baum CF, Gillman MW. Evaluating the impact of the Baby-Friendly Hospital Initiative on breast-feeding rates: a multi-state analysis. *Public Health Nutr*. 2015;18:189–97.
93. Hawkins SS, Stern AD, Baum CF, Gillman MW. Compliance with the Baby-Friendly Hospital Initiative and impact on breast-feeding rates. *Arch Dis Child Fetal Neonatal Ed*. 2014;99:F138–43.
94. Howe-Heyman A, Lutenbacher M. The Baby-Friendly Hospital Initiative as an Intervention to Improve Breastfeeding Rates: A Review of the Literature. *J Midwifery Women's Health*. 2016;61:77–102.
95. Ibanez G, de Reynal de Saint Michel C, Denantes M, Saurel-Cubizolles MJ, Ringa V, Magnier AM. Systematic review and meta-analysis of randomized controlled trials evaluating primary care-based interventions to promote breastfeeding in low-income women. *Fam Pract*. 2012;29:245–54.