



Breastfeeding Education: Where Are We Going? A Systematic Review Article

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Abstract

Background: UNICEF (United Nations International Children's Emergency Fund) and WHO estimate that if all babies were breastfed for at least the first six months of their lives, the rate of morbidity and malnutrition would significantly decrease all over the world. In this view, these two organizations promoted a worldwide campaign for breastfeeding, creating the Baby Friendly Hospital Initiative (BFHI) that encourages good practices for the promotion of breastfeeding in hospitals. The aim of our study was to review the available evidence regarding the positive effects of breastfeeding, in order to suggest to most appropriate strategy to support it.

Methods: The main databases including Scopus, PubMed, MEDLINE, Google scholar and Science Direct were researched to obtain the original papers related to breastfeeding education. The main terms used to literature search were "Breastfeeding education", "Breastfeeding support", and "Breastfeeding healthcare policy". The timeframe included the obtained articles was from 1980 to 2015.

Results: Our analysis confirms that healthcare providers play a pivotal role in education and encouraging mothers to begin and continue breastfeeding. In this view, the adequate training of healthcare providers seems to be mandatory in order to support this practice. Moreover, adequate facilities are needed in order to promote and support breastfeeding.

Conclusion: Considering the available evidence, breastfeeding should be supported among all the mothers. Based on the positive data emerging from the public awareness campaign in different Countries of the world, we strongly encourage an accurate training for doctors and midwives and the implementation of adequate facilities in order to support breastfeeding.

Keywords: Breastfeeding, Education, Strategy

Introduction

After childbirth, lactation should be considered a physiological event for the mother, as well as breastfeeding should be for the mother-baby dyad. Human milk has immunological action on

the newborn considered as the best available option for feeding: on one hand, breastfeeding allows an appropriate relationship between mother and child; on the other hand, human milk con-

tains all the nutrients needed for the child to grow healthy. Indeed, mature milk contains less proteins and more lipids, carbohydrates, enzymes and minerals than the colostrum (1). Furthermore, their high levels of immunoglobulin maintain milk sterile, protect the newborn from neonatal infections and help to prevent mastitis.

Physiologically, the production of colostrum lasts for the first 4-5 days of puerperium. It has higher quantity of lactoglobulin, lactalbumin and immunoglobulins than in mature milk: in particular, lactoglobulin and lactalbumin are easier to digest than the casein, which makes colostrum particularly suitable for the first days of life. Finally yet importantly, colostrum contains large amount of B-lymphocytes which can synthesize IgA and contribute to the humoral immunodefense. Although the positive effects of human breastfeeding were already clearly demonstrated, a survey of Human Relations Area Files (2) showed that in about 50 different cultures colostrum is considered as a dirty substance, poisonous and polluted, so breastfeeding begins after the milk supply and, in the meanwhile, the baby is fed with glucose water or bottled milk. Accumulating evidence suggests that the adoption of policies to minimize interventions during delivery is associated with healthier mother-baby dyads, optimally prepared to breastfeed.

We already know that delivery and childbirth should be considered a consequent dualism, since “mothers and babies form an inseparable biological and social unit; the health and nutrition of one group cannot be divorced from the health and nutrition of the other” (3). Nevertheless, childbirth represents a key moment for the separation of newborn from the mother, so the severance period should be kept as short as possible by healthcare providers. Considering this element, separation of pregnancy from postpartum and separation of mother from the newborn within the medical and nursing training institutions may play a detrimental role on breastfeeding. Although responsibility for the breastfeeding mother-infant dyad is multidisciplinary, the midwife could be identified as the key figure to provide care to the healthy woman and baby during

pregnancy, birth and lactation, considering the obvious biological, social and psychological complexities of the dyad (4). However, very often midwives are supportive of breastfeeding but less aware about specific management strategies. Midwifery education (nursing, obstetric and pediatric education programs) does not necessarily ensure their graduates have received up-to-date and evidence-based knowledge of breastfeeding management. Thus, these significant deficits in breastfeeding knowledge may result in premature supplementation or cessation of breastfeeding during the mother's first few days in hospital. In 1982, a new professional expert in breastfeeding was established in USA: the lactation consultant (LC), a specialist trained to focus on the necessity and concerns of breastfeeding and to prevent, recognize, and solve breastfeeding difficulties.

Basing on the even growing importance of this topic, the aim of our study was to review the available evidence regarding the positive effects of breastfeeding and the international interventions to promote and support it.

Methods

The main databases including Scopus, PubMed, MEDLINE, Google scholar and Science Direct were researched to obtain the original papers related to breastfeeding education. The main terms used to literature search were "Breastfeeding education", "Breastfeeding support", and "Breastfeeding healthcare policy". The timeframe included the obtained articles was from 1980 to 2015.

Results

The global initiatives

UNICEF (United Nations International Children's Emergency Fund) and WHO estimate that if all babies were breastfed for at least the first six months of their lives, the rate of morbidity and malnutrition would significantly decrease all over the world. In this view, these two organizations promoted a worldwide campaign for breastfeed-

ing, creating the Baby Friendly Hospital Initiative (BFHI) that encourages good practices for the promotion of breastfeeding in hospitals. Nevertheless, each single hospital should follow "The Ten UNICEF - WHO Steps for breastfeeding", the "Mother-friendly Childbirth initiative" and

respect the "International Code of marketing of breastfeeding substitutes and relevant World Health Assembly resolutions" (5), in order to be recognized as "Baby Friendly Hospital". Each of the ten steps (Table 1) has its own individual evidence base (6).

Table 1: The ten steps of the Baby-Friendly Hospital initiative to promote successful breastfeeding

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 half an 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 breast milk, unless medically indicated.
7	Practice rooming-in - that is, allow mothers and infants to remain together - 24 hours 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.

Maternity services, which demonstrate implementation and compliance with the ten steps through a rigorous and systematic process, involving the assessment of the knowledge and skills of multi-disciplinary staff and interview with women about their care, are accredited as "baby friendly". To date, more than 20.000 healthcare organizations in the world have achieved full baby-friendly accreditation under the original program. Accumulating evidence (7-9) suggests that this initiative has the potential to influence the duration of breastfeeding: as evidenced by Merten et al. (10) in a Swiss cohort analysis, 42% of children born in a "Baby Friendly Hospital" were breastfed up to 5 months, while for infants born in other clinical setting the percentage was about 34% (10). In some countries, other strategies were planned to promote and help mothers who want to breastfeed their children. In Georgia, for example, the "Special Supplemental Nutrition Program" launched 5 strategies for the promotion of breastfeeding: education, free breast pumps, hospital-based programs, peer counseling and community coalition. According to this last program, breastfeeding education provides access

to a toll free number for women who want to have more information about it and periodic training of healthcare providers; breast pumps are free for mothers who want to use them; peer counseling involves other women who have previously participated in this program and who have successfully breastfeed their children: indeed, these mothers are recruited to provide support and encouragement to current participants; finally, the "coalition" is intended as a community project to cover the shortcomings of the territorial services of breastfeeding. In particular, the results of this program showed a significant increase in the number of women who breastfed, especially in women aged between 19 and 24 years old, unmarried and with a high education (11). Among women who started to breastfeed, the steepest decline in breastfeeding occurs between 2 and 6 weeks. The first 2-3 weeks of breastfeeding constitute the critically important learning period and the time when routine breastfeeding education and support from medical and community sources is most needed (12, 13). Therefore, the BFHI has an important impact on breastfeeding rate, but other interventions are

needed after hospital discharge to meet the recommended targets at 6 months. To overcome this gap, Baby-friendly Community Initiative (BFHI), one of the one of the most challenging

program for community health care service, was established in United Kingdom in 1998. In 2007, the BFHI's recommendations were summarized in the "seven steps" (Table 2).

Table 2: The seven steps of the Baby-Friendly community initiative to promote successful breastfeeding

1	Have a written breastfeeding policy that routinely is communicated to all staff and volunteers.
2	Train all health care providers in the knowledge and skills necessary to implement the breastfeeding policy
3	Inform pregnant women and their families about the benefits and management of breastfeeding.
4	Support mothers to establish and maintain <i>exclusive breastfeeding</i> to six months.
5	Encourage sustained breastfeeding beyond six months to two years or more, alongside the introduction of appropriate, adequate and safe complementary foods.
6	Provide a welcoming atmosphere for breastfeeding families
7	Promote collaboration among health services, and between health services and the local community

Thus, the BFHI and BFHI are 2 separate but complementary initiatives promoted by UNICEF in an integrated way as "Together for breastfeeding: Baby Friendly Hospital and Community-United for protecting, promoting and supporting breastfeeding" using a multistage approach similar to BF-UK (14). Another campaign, started in 2013, is the World Breastfeeding Costing Initiative (WBCI), which tries to raise awareness and encourage breastfeeding, helping also to manage the budget and the priorities for actions, since in many countries, support is inadequate and there is lack of local political attention and funding (15).

Early breastfeeding

During the first postpartum days, healthcare providers' skills, knowledge and attitudes towards breastfeeding, as well as their ability to transfer these skills to new mothers, can significantly influence breastfeeding experience. Considering this perspective, healthcare providers should have been trained according to international standards and periodically monitored and evaluated. Furthermore, several other barriers to early breastfeeding may be present in hospitals: for example, in several setting mothers and newborns are separated after delivery (16), although the importance of rooming-in during the hospital stay is widely documented (12, 13, 17). In addition, the WHO/UNICEF recommend "skin-to-skin" ear-

ly and undisturbed contact between mother and child, in order to increase the outcome and duration of exclusive breastfeeding (18, 19). Early skin-to-skin contact determines better cardiopulmonary stability, reduces infant stress, accelerates the baby's adaptation to extrauterine life, reduces crying, increases the newborn's blood glucose and temperature and so should be recommend also after cesarean section. This evidence was confirmed by a UK-based study, which showed that this close contact between mother and child seems to be an element that promotes and prolongs the duration of breastfeeding (20). In this view, very often a successful long-term breastfeeding depends upon an adequate trained staff.

Staff training

Healthcare providers play a pivotal role in education and encouraging mothers to begin and continue breastfeeding (21). In this view, the adequate training of healthcare providers seems to be mandatory in order to support this practice. In particular, mothers supported by trained WHO/UNICEF members significantly prolong breastfeeding (22). For this reason, the WHO/UNICEF 20-hour course for maternity staff was considered the standard by BFHI. The course consists of 15.5 hours of theory and 4.5 hours of practice about breastfeeding promotion and support. At the time of the assessment to

become BFHI, each hospital/community needs to have minimum 80% of maternity staff with this certification. Unfortunately, most healthcare providers receive minimal (if any) education in breastfeeding, either during their undergraduate or postgraduate training.

Furthermore, during the meetings with pregnant women it is important to involve the fathers, because the knowledge on the benefits of breastfeeding and the fact that this practice is seen by the partners as a matter of course means that the father will encourage and support the mother to start and continue breastfeeding (23). Finally, it was already showed that father's involvement in decision-making might improve mothers' knowledge of breastfeeding and provide emotional support (24, 25).

Breastfeeding and maternal diseases

Several maternal conditions might interfere with breastfeeding, whereas it could be considered safe in other ones. For example, maternal treatment with antiepileptic drugs such as benzodiazepines, lamotrigine and ethosuximide was considered dangerous for breastfeeding in the past; conversely, recent prospective studies have failed to demonstrate any negative effects in children who were exposed to antiepileptic drugs through breast milk. Therefore, mothers with epilepsy should be encouraged to breastfeed, although the newborn should be closely monitored (26). Furthermore, other conditions such as maternal infections can interfere with breastfeeding: although it was showed that breastfeeding is not contraindicated in case of maternal hepatitis C virus infection (27). Human Immunodeficiency Virus (HIV) constitutes a serious worldwide problem since it could be transmitted through breast milk. In Africa more than 95% of children are breastfeed, the average duration is long and varies between 16 and 28 months. However, the epidemic of Acquired Immune Deficiency Syndrome could threaten this practice. In order to prevent mother to child transmission of HIV, the WHO recommends formula feeding only if it is acceptable, feasible, affordable, sustainable and safe. Otherwise, mothers are encouraged to con-

tinue breastfeeding for the first months of life, followed by an early and rapid weaning (28). However, in countries with high child mortality rate breastfeeding is recommended for mothers with HIV, as it was found that mixed feeding increases the risk of contagion more than breastfeeding (29).

Contraception during breastfeeding and family planning

Although breastfeeding has a clear fertility-reducing effect, the nature of this effect is not fully understood. In general, the infant's suckling initiates a cycle of neuroendocrine events that results in the inhibition of ovulation. In the past few decades, demographers have been able to quantify the degree of contraceptive protection that results from breastfeeding. In populations without access to modern methods of family planning, the birth interval depends most on breastfeeding (30).

In 1988, researchers from five continents gathered in Bellagio (Italy) to determine whether their findings about women with very different pattern of breastfeeding behaviors could be synthesized into a statement about how breastfeeding might predict women's recovery of fertility. Among all, the highest pregnancy rate reported in fully breastfeeding amenorrheic women during the first 6 months postpartum was lower than 2% (31, 32). The lactational amenorrhea method (LAM) is a natural birth control technique, based on the fact that breastmilk production causes amenorrhea but its high contraceptive effectiveness (98%) depends on these following conditions (32, 33): exclusively breastfeeding on demand (day and night) and no longer than four hours between feedings during the day and the night; no supplemental feeding; no vaginal bleeding; delivery less than six months before. Controversy exists in the literature regarding hormonal contraceptive effects on milk production and evidence from randomized controlled trials about this topic is still elusive (34).

Until better evidence will be provided, it is prudent to advise women that hormonal contraceptive methods may decrease milk production, es-

pecially in the early postpartum period. Hormonal methods should be discouraged in some circumstances: low milk production or history of lactation failure; history of breast surgery; multiple birth (twins, triplets); preterm birth; maternal-fetal contraindications. Usually, combined hormonal contraception in lactation is not recommended before 6 months after birth, but intrauterine devices and oral progestin can be used starting from the fourth week after delivery (35). Regarding the latter, the gradual release of progesterone efficiently suppresses ovulation and is specifically designed for women who are breastfeeding in the first year after delivery (36). About use of barrier methods of contraception (condom and diaphragm), there are not known adverse effects on breastfeeding. Every woman should be offered full information and support about contraceptive options, so she depends on her individual situation. This discussion should address contraceptive efficacy and possible impact on breastfeeding outcomes, within the context of each woman's desire to breastfeed, risk of breastfeeding difficulties and risk of unplanned pregnancy.

Conclusion

Considering the available evidence, breastfeeding should be supported among all the mothers. Basing on the positive data emerging from the public awareness campaign in different Countries of the world, we strongly encourage an accurate training for all healthcare providers in maternity services and the adoption of adequate facilities in order to support breastfeeding. Our public health mandate, then, is to prevent and reduce excessive and unnecessary formula feeding through promotion, protection, and support of breastfeeding.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission,

redundancy, etc.) have been completely observed by the authors.

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References

1. Rogers NL, Abdi J, Moore D, Nd'iangui S, Smith LJ, Carlson AJ, Carlson D (2011). Colostrum avoidance, prelacteal feeding and late breast-feeding initiation in rural Northern Ethiopia. *Public Health Nutr*, 14 (11): 2029–36.
2. Giusti A (2015). [Breastfeeding: health, prevention, and environment]. *Epidemiol Prev*, 39 (5-6): 386-91.
3. WHO, UNICEF (2003). Global strategy for infant and young child feeding. <http://apps.who.int/iris/bitstream/10665/42590/1/9241562218.pdf>
4. [No authors listed] (1997). Care in normal birth: a practical guide. Technical Working Group, World Health Organization. *Birth*, 24 (2): 121-3.
5. WHO (1981). International Code of Marketing of Breast-milk Substitutes. http://www.who.int/nutrition/publications/code_english.pdf
6. [No authors listed] (2007). Step 10: Strives to Achieve the WHO/UNICEF Ten Steps of the Baby-Friendly Hospital Initiative to Promote Successful Breastfeeding: The Coalition for Improving Maternity Services. *J Perinat Educ*, 16 Suppl 1:79S-80S.
7. Spiby H, McCormick F, Wallace L, Renfrew MJ, D'Souza L, Dyson L (2009). A systematic review of education and evidence-based practice interventions with health professionals and breast feeding counsellors on duration of breast feeding. *Midwifery*, 25 (1): 50–61.

8. Bonuck K, Stuebe A, Barnett J, Labbok MH, Fletcher J, Bernstein PS (2014). Effect of primary care intervention on breastfeeding duration and intensity. *Am J Public Health*, 104 SUPPL 1: 119–28.
9. Taylor EC, Nickel NC, Labbok MH (2012). Implementing the Ten Steps for Successful Breastfeeding in hospitals serving low-wealth patients. *Am J Public Health*, 102 (12): 2262–8.
10. Merten S, Dratva J, Ackermann-Liebrich U (2005) Do baby-friendly hospitals influence breastfeeding duration on a national level? *Pediatrics*, 116 (5): e702–8.
11. Ahluwalia IB, Tessaro I, Grummer-Strawn LM, MacGowan C, Benton-Davis S (2000). Georgia's breastfeeding promotion program for low-income women. *Pediatrics*, 105 (6): E85.
12. Sikorski J, Renfrew MJ, Pindoria S, Wade A (2002). Support for breastfeeding mothers (Cochrane Review). *Cochrane Database Syst Rev*, (1): CD001141.
13. Kramer MS, Kakuma R (2004). The optimal duration of exclusive breastfeeding: a systematic review. *Adv Exp Med Biol*, 2004; 554: 63–77.
14. Bettinelli ME, Chapin EM, Cattaneo A (2012) Establishing the Baby-Friendly Community Initiative in Italy: development, strategy, and implementation. *J Hum Lact*, 28 (3): 297–303.
15. Holla-Bhar R, Iellamo A, Gupta A, Smith JP, Dadhich JP (2015). Investing in breastfeeding - the world breastfeeding costing initiative. *Int Breastfeed J*, 10 (1): 8.
16. Sikorski J, Renfrew MJ, Pindoria S, Wade A (2003). Support for breastfeeding mothers: A systematic review. *Paediatr Perinat Epidemiol*, 17 (4): 407–17.
17. Khanal V, Adhikari M, Sauer K, Zhao Y (2013). Factors associated with the introduction of prelacteal feeds in Nepal: findings from the Nepal Demographic and Health Survey 2011. *Int Breastfeed J*, 8 (1): 9.
18. Dani C, Cecchi A, Commare A, Rapisardi G, Breschi R, Pratesi S (2015). Behavior of the Newborn during Skin-to-Skin. *J Hum Lact*, 31 (3): 452–7.
19. Aghdas K, Talat K, Sepideh B (2014). Effect of immediate and continuous mother-infant skin-to-skin contact on breastfeeding self-efficacy of primiparous women: a randomised control trial. *Women Birth*, 27 (1): 37–40.
20. Renfrew MJ, Craig D, Dyson L, McCormick F, Rice S, King SE, Misso K, Stenhouse E, Williams AF (2009). Breastfeeding promotion for infants in neonatal units: a systematic review and economic analysis. *Health Technol Assess*, 13 (40): 1–146, iii–iv.
21. Spatz DL, Froh EB, Flynn-Roth R, Barton S (2015). Improving Practice at the Point of Care Through the Optimization of the Breastfeeding Resource Nurse Model. *J Obstet Gynecol Neonatal Nurs*, 44 (3): 412–8.
22. Hunter L, Magill-Cuerden J, McCourt C (2015). “Oh no, no, no, we haven't got time to be doing that”: Challenges encountered introducing a breast-feeding support intervention on a postnatal ward. *Midwifery*, 31 (8): 798–804.
23. Palmqvist H, Zäther J, Larsson M (2015). Fathers' and co-mothers' voices about breastfeeding and equality - A Swedish perspective. *Women Birth*, 28 (3) :e63–9.
24. Sherriff N, Hall V, Panton C (2014). Engaging and supporting fathers to promote breast feeding: A concept analysis. *Midwifery*, 30 (6): 667–77.
25. Smith LJ (2007). Impact of Birthing Practices on the Breastfeeding Dyad. *J Midwifery Womens Health*, 52 (6): 621-30.
26. Veiby G, Bjørk M, Engelsen BA, Gilhus NE (2015). Epilepsy and recommendations for breastfeeding. *Seizure*, 28: 57–65.
27. Valladares G, Chacaltana A, Sjogren MH (2010). The management of HCV-infected pregnant women. *Ann Hepatol*, 9 Suppl: 92–7.
28. Dop MC (2002). [Breastfeeding in Africa: will positive trends be challenged by the AIDS epidemic?]. *Sante*, 12 (1): 64–72.

29. Anígilájé EA, Dabit OJ, Olutola A, Ageda B, Aderibigbe SA (2015). HIV-free survival according to the early infant-feeding practices; a retrospective study in an anti-retroviral therapy programme in Makurdi, Nigeria. *BMC Infect Dis*, 15:132.
30. Nargund G (2009). Declining birth rate in Developed Countries: A radical policy rethink is required. *Facts Views Vis Obgyn*, 1(3): 191-3.
31. Holowko N, Jones M, Koupil I, Tooth L, Mishra G (2016). High education and increased parity are associated with breastfeeding initiation and duration among Australian women. *Public Health Nutr*, 21:1-11. [Epub ahead of print].
32. Berglund Scherwitzl E, Gemzell Danielsson K, Sellberg JA, Scherwitzl R (2016). Fertility awareness-based mobile application for contraception. *Eur J Contracept Reprod Health Care*, 22:1-8. [Epub ahead of print].
33. Van der Wijden C, Manion C (2015). Lactational amenorrhoea method for family planning. *Cochrane Database Syst Rev*, 2015;10:CD001329.
34. Truitt ST, Fraser AB, Grimes DA, Gallo MF, Schulz KF (2015). Combined hormonal versus nonhormonal versus progestin-only contraception in lactation. *Cochrane Database Syst Rev*, (2): CD003988.
35. Panzetta S, Shawe J (2013). Lactational amenorrhoea method: the evidence is there, why aren't we using it? *J Fam Plann Reprod Health Care*, 39 (2): 136-8.
36. Carr SL, Gaffield ME, Dragoman M V, Phillips S (2015). Safety of the progesterone-releasing vaginal ring (PVR) among lactating women: A systematic review. *Contraception*, pii: S0010-7824(15)00136-5.