



Developing the Preterm Breastfeeding Attitudes Instrument: A tool for describing attitudes to breastfeeding among health care professionals in neonatal intensive care

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ABSTRACT

Objective: The aim of this study was to develop an instrument that measures health care professionals' (HCPs) attitudes to breastfeeding and skin-to-skin contact in relation to the Baby-Friendly Hospital Initiative for neonatal intensive care.

Design: The study was part of a larger project aiming to revise the Ten Steps to Successful Breastfeeding for both full-term and preterm infants. The study had a pre-test/post-test design using online questionnaires distributed by email before and after a training programme.

Setting and participants: A total of 70 specialist registered nurses, registered nurses, assistant nurses and physicians working at a Swedish neonatal intensive care unit answered 55 breastfeeding attitudes questions online before the training. The Preterm Breastfeeding Attitudes Instrument (PreBAI) consists of twelve of these 55 items/questions, selected using exploratory factor analysis.

Measurements and findings: Higher scores indicated more positive attitudes and the median total PreBAI score was 42 points (out of 48), on both the pre- and the post-test questionnaires, showing no significant difference. In the pre-test questionnaire, the majority of HCPs (84%) stated that they needed further breastfeeding training. They also stated that they perceived breastfeeding as very important, scoring a median of 10 (range 5-10) points on a 10-point scale. Three separate underlying dimensions were identified in the questionnaire, indicating different attitudes: Facilitating (five items), Regulating (four items), and Breastfeeding- and skin-to-skin contact-friendly (three items). A positive correlation was found between how many years the HCPs had worked in neonatal care, and their PreBAI score ($r_s = 0.383$, $p = 0.001$). Those who had previously received extra breastfeeding education scored higher on the instrument.

Key conclusions and implications for practice: Neonatal intensive care units need to increase their efforts to support breastfeeding. An important factor for mothers when establishing breastfeeding is support from well-trained professionals with a positive attitude to breastfeeding. The PreBAI could be a useful tool for identifying attitudes among HCPs before and after attending a breastfeeding training programme.

Introduction

It is well documented that breast milk is especially important for infants born preterm (< 37+0 weeks of gestation) (American Academy of Pediatrics, 2012; Mosca and Gianni, 2017) and also, that preterm infants are breastfed less than full-term infants (Ericson et al., 2016). One of the main factors for establishing breastfeeding is support from well-trained health care professionals (HCPs) with a positive attitude to breastfeeding (Shattnawi, 2017) and with the ability to create good relationships with the mothers (Gianni et al., 2018). Health care profes-

sionals need to be able to strengthen mothers' self-efficacy in breastfeeding (Gerhardsson et al., 2018) and help them to adapt to their infants (Gerhardsson et al., 2020a). Mothers have described a facilitating approach from HCPs as consisting of giving information about how to latch on properly and about infants' hunger cues (Lau, 2018), but a facilitating approach can also include helping mothers to maintain skin-to-skin contact (SSC) with their infant (Cartwright et al., 2017; Oras et al., 2016). HCPs often agree that breastfeeding is beneficial for preterm infants, but implementation of a breastfeeding policy is often problematic and there is a risk that HCPs at a neonatal intensive care unit (NICU) spend most of their time in technical and medical care routines and, further,

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Table 1a

The Ten Steps to Successful Breastfeeding of the Baby-Friendly Hospital Initiative for Neonatal Intensive Care.

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Educate and train all staff in the specific knowledge and skills necessary to implement this policy.
3. Inform all hospitalized pregnant women at risk for preterm delivery or birth of a sick infant about the management of lactation and breastfeeding and benefits of breastfeeding.
4. Encourage early, continuous, and prolonged mother–infant skin-to-skin contact (kangaroo mother care) without unjustified restrictions. Place babies in skin-to-skin contact with their mothers immediately following birth for at least an hour. Encourage mothers to recognize when their babies are ready to breastfeed and offer help if needed.
5. Show mothers how to initiate and maintain lactation and establish early breastfeeding, with infant stability as the only criterion.
6. Give newborn infants no food or drink other than breast milk, unless medically indicated.
7. Enable mothers and infants to remain together 24 h a day.
8. Encourage demand feeding or, when needed, semi-demand feeding as a transitional strategy for preterm and sick infants.
9. Use alternatives to bottle -feeding at least until breastfeeding is well established and use pacifiers and nipple shields only for justifiable reasons.
10. Prepare parents for continued breastfeeding and ensure access to support services/groups after hospital discharge.

Table 1b

The three guiding principles of the BFHI for Neonatal Intensive Care.

1. The staff attitude toward the mother must focus on the individual mother and her situation.
2. The facility must provide family-centered care, supported by the environment.
3. The health care system must ensure continuity of care, that is, continuity of pre-, peri-, and postnatal and post-discharge care.

prefer routines that keep them in control (Cescutti-Butler et al., 2019; Shattnawi, 2017).

The Baby-Friendly Hospital Initiative (BFHI) was launched by UNICEF and the World Health Organization (WHO) in 1991 (Aryeetey and Dykes, 2018). In 2012 the Baby-Friendly Hospital Initiative for Neonatal Intensive Care (Neo-BFHI) was articulated (Table 1a) and the UNICEF/WHO's original *Ten Steps to Successful Breastfeeding* (Appendix 1) were expanded (Nyqvist et al., 2012), with three new guidelines added to the ten-step strategy (Table 1b) (Nyqvist et al., 2013). These highlight the importance of family-centred care and that the health care system should ensure continuity regarding the infant's care before, during and after the infant's birth as well as when the family is discharged from hospital.

Health care professionals' attitudes to breastfeeding have been reported to be a key issue in providing breastfeeding support to new mothers (Bernaix et al., 2008). Research has shown that even a neutral attitude from support persons is associated with early discontinuation of breastfeeding (DiGirolamo et al., 2003). Breastfeeding attitudes are largely shaped by a person's own experiences and can therefore be deeply rooted in HCPs' beliefs (Ekstrom et al., 2005a). Negative experiences of breastfeeding could therefore increase the risk of not giving supportive advice on breastfeeding in accordance with evidence-based guidelines (Hellings and Howe, 2000). Breastfeeding support can be daunting for HCPs with negative experiences and can lead to them responding with defensive behaviour and not persisting in providing support (Bandura, 1977).

A previous study found that the Neo-BFHI has been partly implemented in many countries, but reports that neonatal wards need to increase their efforts to support breastfeeding (Maastrup et al., 2019). Step 2 reads "Educate and train all staff in the specific knowledge and skills necessary to implement this policy" (Table 1a) and this step can be regarded as a key issue for the introduction of Neo-BFHI. Adherence to step 2 has been reported to have a positive impact on HCPs' attitudes to breastfeeding and may help to improve compliance with the BFHI (Balogun et al., 2017). However, core outcomes are lacking to provide a robust evidence base for how step 2 should be realized.

Methods

This study is part of *The Breastfeeding Study* aiming to develop and implement a complex intervention in order to increase the rates of successful breastfeeding. The research group consists of paediatric nurses, midwives, paediatricians and psychiatrists and is active at Uppsala University and at the University Hospital in Uppsala. The implementation programme for both HCPs and parents in neonatal intensive care will be de-

scribed in a forthcoming article (Gerhardsson et al., 2020b). The project aims to review the *Ten Steps to Successful Breastfeeding* for both full-term and preterm infants. The aim of the present study was to develop an instrument that measures HCPs' attitudes to breastfeeding and SSC in relation to the Neo-BFHI. The study had a pre-test/post-test design using online questionnaires distributed both before and after a training programme. The online questionnaire was formatted and administered on SurveyMonkey® and was distributed via a web link between November 2018 and January 2019. Two reminders were sent out during this time. The first part of the questionnaire contained information about the study, the voluntary nature of participation, and how to contact the researchers if any questions arose. Moreover, it stated that completion of the questionnaire would be considered to constitute informed consent.

Sample

An invitation to complete the online questionnaire was emailed to all 169 HCPs, which consisted of specialist registered nurses (SRNs) ($n = 43$), registered nurses (RNs) ($n = 27$), assistant nurses ($n = 79$) and physicians ($n = 20$) working at the studied NICU. Of the HCPs 18 (42%) SRNs, 14 (52%) RNs, 50 (63%) assistant nurses and 17 (85%) physicians did not respond the questionnaire. The HCPs that responded can be found in Table 3. Forty-eight of the NICU's HCPs attended the breastfeeding training programme. Those who attended the training were mainly working with infants and families staying in the single-family rooms. A total of 70 (41%) of the 169 HCPs answered the pre-test questionnaire and 28 of these attended the training programme. Twenty-six (37%) of the 70 HCPs answered the post-test questionnaire between April and May 2019 and two of these 26 had attended in the training programme (Gerhardsson et al., 2020b).

Context

The NICU where this study was performed is a Swedish level IIIB regional referral centre serving a population with approximately 23,000 births per year. Level IIIB units can provide comprehensive care for extremely low birth weight infants with less than 28 weeks' gestation. The unit consists of three open-bay intensive care rooms, with four infant care spaces each. Each infant's care space includes at least one parent bed, allowing parents to stay with their infant around the clock and to have the opportunity to perform SSC 24 h/day.

The NICU also has nine single-family rooms where infants stay around the clock with their parents and siblings, and where the infants' care is provided by the parents with support from HCPs. Visits from siblings and relatives are unrestricted at both the intensive care and the

Table 2

Results of exploratory factor analysis of the Preterm Breastfeeding Attitudes Instrument, the largest factor loading for each item is given in **bold** and Questions 1, 3, 6, 7, 8, 9, 10 and 12 were reverse-scored.

Item	Question/statement	Domain*	F1	F2	F3
1.	Infants cannot breastfeed before 34 weeks of gestational age.	A	0.569	0.314	0.032
2.	I inform all mothers that it is very good if they can pump.	A	0.771	-0.065	0.096
3.	You can wait a few days before informing the mothers about pumping.	A	0.761	-0.066	-0.049
4.	I inform parents to care for their infant skin-to-skin as much as possible.	A	0.643	-0.073	0.322
5.	I encourage mothers to breastfeed soon after birth.	A	0.650	0.300	-0.047
6.	Breastfeeding can tire preterm-born infants.	B	0.058	0.739	0.088
7.	Breastfeeding can tire the mother out.	B	-0.091	0.716	0.043
8.	The infant's attachment to the partner is strengthened if the partner is also allowed to feed the infant with a bottle.	B	0.028	0.664	0.180
9.	Health care professionals must be able to accept that separation between parents and infants is sometimes necessary.	B	0.245	0.773	0.021
10.	The benefits of breastfeeding are exaggerated.	C	-0.001	0.199	0.834
11.	Contact between mother and infant benefits from breastfeeding.	C	0.068	0.149	0.616
12.	The benefits of skin-to-skin care are exaggerated.	C	0.095	-0.051	0.853

* A = Facilitating, B = Regulating, C = Breastfeeding- and skin-to-skin contact-friendly.

single-family rooms. In Sweden, parents are entitled to a total of 480 days of paid parental leave. If a newborn infant is admitted to a NICU, both parents are entitled to additional paid temporary parental leave to cover the infant's entire NICU stay ((The Swedish Social Insurance Agency 2020)..

The preterm breastfeeding attitudes instrument

The Preterm Breastfeeding Attitudes Instrument (PreBAI) consists of twelve questions selected using exploratory factor analysis (EFA) from a set of 55 items/questions about attitudes of HCPs to breastfeeding and SSC (Appendix 2). The 55 questions were based on the BFHI's *Ten Steps to Successful Breastfeeding* and the three guiding principles of the Neo-BFHI (Table 1a and 1b) (Nyqvist et al., 2013). The questions were formulated as items describing professionals' attitudes and all items were anchored with a 4-point Likert scale where 1 = "is not correct at all", 2 = "is not correct", 3 = "fits pretty well", and 4 = "fits just right". For some questions, the answers were reverse-scored so that 1 = "fits just right" and 4 = "is not correct at all" (Table 2). Scores were summed to produce a total score, with higher scores indicating more positive attitudes towards breastfeeding and SSC. The research group has, regarding breastfeeding, long insight into both research, clinical practice and problems discussed at a grass-root level. Based on this knowledge the group formulated the items with the intention of capturing attitudes that were in line with the *Ten Steps* and attitudes that contradict *Ten steps* (Table 1a and b). Thirty-five items were pilot tested for content validity and acceptability. After this, a major revision was done and 20 items were added.

The demographic data collected using the online questionnaire were gender, profession, and years in the profession. The questionnaire also included yes/no questions about breastfeeding education previously or at the current place of work and personally experienced need for more breastfeeding education. Participants were further asked to answer in free text how they updated their breastfeeding knowledge. Three questions were answered on a 10-point scale ranging from 1 = "not satisfied at all" to 10 = "very satisfied" or 1 = "not important at all" to 10 = "very important". These questions dealt with how HCPs experienced consistency of breastfeeding support across the care chain; how important breastfeeding was to them; and how they valued their personal breastfeeding experience. A complete list of the questions is given in the online supplementary files.

Ethical considerations

Ethical scrutiny and approval were provided by the regional ethical review board at Uppsala University (Dnr 2016/274). Written information was given to the HCPs ensuring them of confidentiality and

anonymity and the right to withdraw from the study without giving any reason.

Statistical analyses

Categorical data are presented as frequencies and percentages, n (%), while ordinal and continuous data are given as means and medians, with accompanying ranges and standard deviations (SDs), respectively. Spearman's rank correlation coefficient (r_s) was used to examine correlations between PreBAI scores and demographic variables. Tests of differences for paired dependent ordinal/continuous data were performed using the Wilcoxon signed-rank test, while Kruskal-Wallis test was used for independent ordinal/continuous data and Pearson's χ^2 -test was used for categorical data.

To construct the PreBAI, an EFA of the 55 items/questions about HCPs' attitudes to breastfeeding was conducted to identify the underlying factor structure of the data. The EFA was performed using principal components factor extraction retaining all factors with Eigenvalues >1 , and varimax rotation, with missing values replaced with mean values. A high factor loading was defined as a loading with an absolute value of ≥ 0.4 after varimax rotation. In a stepwise iterative procedure, starting with all 55 questions, individual items were removed from the analysis and the EFA was rerun if an item had no high factor loading, if there were fewer than three items with high factor loadings for a particular factor, or if an item had high factor loadings for two different factors. Thus, in the final EFA solution, constituting the PreBAI, all remaining factors had at least three items with high factor loadings, and no item had high factor loadings for more than one factor.

After constructing the PreBAI, forward and backward selection linear regression analysis was performed to investigate the relation between PreBAI scores (outcome) and potentially influencing factors (predictors). These results are presented as adjusted slope coefficients, β , with accompanying standard errors (SEs). All statistical analyses were performed in IBM SPSS Statistics 25 (IBM, Armonk, NY, USA), with two-sided P-values <0.05 considered statistically significant.

Findings

Background characteristics for the 70 HCPs included in the study are given in Table 3. The participants had a mean of 11.3 (SD 12.1) years in the profession.

Construction of the preterm breastfeeding attitude instrument

Health care professionals' attitudes to breastfeeding

The final EFA solution for the 55 items/questions about attitudes to breastfeeding among the 70 HCPs resulted in twelve items being re-

Table 3
Background characteristics of the study participants ($n = 70$).

Profession	n	%
Specialist registered nurse*	25	36
Registered nurse	13	19
Assistant nurse	29	41
Physician	3	4
Breastfeeding education	n	%
During education	23	33
At work	41	59
Extra education	16	23
Need more education	59	84
Professional experience	Mean	SD
Years	11.3	12.1

* Midwife, paediatric nurse or intensive care nurse.

tained, which loaded on three distinct factors/domains. This final EFA solution therefore constitutes the PreBAI. The results are presented in Table 2. We identified the three separate underlying factors/domains measured by the twelve items in the PreBAI, as follows: (A) Facilitating (items 1–5, factor loadings 0.569–0.771); (B) Regulating (items 6–9, factor loadings 0.664–0.773); and (C) Breastfeeding- and SSC-friendly (items 10–12, factor loadings 0.616–0.853). The twelve items, each scored from 1 to 4, are summed to produce a total score ranging from 12 to 48 points, with higher scores indicating more positive attitudes to breastfeeding and SSC. The median total PreBAI score among the participants was 42 (range 32–48) points.

Table 4 gives the results of the three 10-point scale questions about HCPs' perception of consistency in breastfeeding support throughout the care chain, how important breastfeeding was to them, and how they valued their personal breastfeeding experience, separately for each profession. The majority of HCPs rated breastfeeding as very important on the 10-point scale, with a median of 10 (range 5–10) points. There was no significant difference between professions. The question that dealt with consistency in breastfeeding support scored a median of 5 (range 0–10) points. There was a significant difference between the professions ($p = 0.032$). Specialist RNs had the lowest perception of consistency in support of breastfeeding, median 3 (1–7) points, while the physicians scored the highest rating for this item, median 7 (4–8) points.

Of the HCPs, 55 had breastfed a child and two were the partner of someone who had breastfed. The majority valued the experience as positive, median 9 (1–10) points. There was a positive correlation between how they valued their own breastfeeding experience and how important they thought breastfeeding is ($r_s = 0.295$, $p = 0.026$).

The majority (84%) of the HCPs felt that they needed further breastfeeding training and regarding this question, there were no significant differences in score between the professions. Altogether 23% of the participants had acquired extra breastfeeding training in addition to their professional qualification and work (Table 3) and there was a significant difference in their total score ($p = 0.033$), showing higher scores in HCPs with extra breastfeeding education, median 43.5 (range 36–48) versus 41.5 (32–48) points for those without extra education. Chi-square tests showed that a significantly higher proportion of HCPs who had extra breastfeeding education were SRNs (56%) compared with the other HCPs (0–30%). Of the HCPs, 53 answered that they kept updating their breastfeeding skills. The most common way to do this was by asking more experienced colleagues, with 42.8% stating that they used this method. We also found a positive correlation between how many years the HCPs had worked in the profession and PreBAI scores; in other words, the more years worked, the higher the score ($r_s = 0.383$, $p = 0.001$).

To investigate possible factors that could influence the HCPs' PreBAI scores the following factors were included in a regression analyses: years in the profession; HCPs' perception of: consistency in breastfeeding support, and of the importance of breastfeeding; their profession

(excluding physicians because of too few observations); and whether they had extra breastfeeding education. For both forward and backward selection, years in profession (adjusted $\beta = 0.090$, $SE = 0.036$, $p = 0.016$) and HCPs' perception of the importance of breastfeeding (adjusted $\beta = 1.119$, $SE = 0.451$, $p = 0.017$) emerged as significant factors.

Changes in preterm breastfeeding attitude instrument scores between pre- and post-measurements

Of the 70 participants who answered the pre-questionnaire, 26 also answered the post-questionnaire. Of these 26, only two had participated in the training programme. The HCPs had a median total score of 42 points on both the pre- and post-questionnaires, showing no significant difference ($p = 0.462$). Examining the score by domain showed that there were no significant differences for the domains Facilitation ($p = 0.077$) and Breastfeeding- and SSC-friendly ($p = 0.233$). However, scores in the Regulating domain changed significantly between the pre- and post-measurements ($p = 0.035$) and the participants had lower median values in this domain after the training programme, as further discussed below.

Discussion

The aim of this study was to develop an instrument that measures HCPs' attitudes to breastfeeding and SSC in relation to the BFHI's *Ten Steps to Successful Breastfeeding* and the Neo-BFHI. The HCPs' attitudes were investigated before and after a training programme. An EFA of 55 questions concerning HCPs' attitudes to breastfeeding and SSC resulted in a final solution, constituting the PreBAI, consisting of twelve items measuring three separate underlying attitude domains: Facilitating, Regulating, and Breastfeeding- and SSC-friendly.

These three domains show how HCPs think about their role in providing breastfeeding support. Our interpretation of the three domains is that HCPs with high scores on the Facilitating domain have trust in preterm infants' ability to breastfeed despite low gestational age. These HCPs are active in informing mothers about breast pumping, SSC and breastfeeding. Health care professionals with high scores in the Regulating domain believe that breastfeeding can fatigue the preterm infant and the mother. They also believe that separation between mother and infant is sometimes unavoidable and they believe that the partner's bonding with the infant benefits from bottle feeding. Finally, HCPs with high scores on the Breastfeeding- and SSC-friendly domain are of the opinion that breastfeeding and SSC have benefits for mothers and infants. They also think that attachment and bonding between mothers and infants are promoted through breastfeeding. The results are partly in line with a previous study in Sweden, in which midwives' and nurses' attitudes were evaluated and four dimensions were found: Regulating, Facilitating, Disempowering, and Breastfeeding antipathy attitudes (Ekstrom et al., 2005a).

Results in context

This study showed a positive correlation between how the HCPs valued their own breastfeeding experience and how important they thought breastfeeding is. Ekstrom et al. describe the need for HCPs to process their own breastfeeding experiences in relation to the support they provide to new mothers (Ekstrom et al., 2005b).

Mothers have described a facilitating approach from HCPs to consist of giving information about how to teach their infant to latch on properly and also about the infant's hunger cues (Lau, 2018). When mothers feel that they are getting good breastfeeding support, they gain higher self-efficacy in breastfeeding (Gerhardsson et al., 2018); and higher self-efficacy in breastfeeding is significantly associated with a higher degree of adaptation to the preterm infant's behaviour when breastfeeding (Gerhardsson et al., 2020a). This can be interpreted to mean that the facilitating breastfeeding support translates to the mother's and preterm

Table 4

Intergroup comparisons on the question about own breastfeeding experience ($p = 0.603$), breastfeeding importance ($p = 0.166$), and consistency in breastfeeding support across the care chain ($p = 0.032$).

Profession	n	Variable	median	range
Specialist registered nurse	20	Breastfeeding experience	9	5–10
	25	Breastfeeding importance	10	7–10
	19	Consistency in the care chain	3	1–7
Registered nurse	10	Breastfeeding experience	9.5	1–10
	13	Breastfeeding importance	10	6–10
	10	Consistency in the care chain	5.5	0–10
Assistant nurse	25	Breastfeeding experience	9	2–10
	29	Breastfeeding importance	10	5–10
	22	Consistency in the care chain	6	1–10
Physician	2	Breastfeeding experience	10	10–10
	3	Breastfeeding importance	9	8–9
	3	Consistency in the care chain	7	4–8

infant's relationship. This phenomenon could be understood as attachment and bonding and has previously been described in full-term infants (Ekstrom and Nissen, 2006).

The study shows that HCPs with a regulating attitude have the idea that the infant's attachment to the partner benefits from bottle feeding. This belief has its roots in behaviourism and was first questioned by Bowlby (Bowlby, 1969) who argued that human emotional life is much more complicated than suggested by behaviourism, and extends beyond the need to be fed. The proximity with the attachment person primarily establishes and strengthens emotional ties, while the feed only plays a supporting role. This is important to convey to parents who have a preterm-born infant, since the partner may sometimes feel inadequate. For the breastfeeding mother, the partner is the most important support person and the partner can contribute to the care of a preterm infant in many ways and at the same time facilitate breastfeeding (Denoual et al., 2016).

Specialist registered nurses rated consistency in breastfeeding support in the care chain lower compared with the other HCPs. One explanation for this may be that the SRNs more often had extra breastfeeding education. It is conceivable that extra breastfeeding education may lead to the ability to identify deficiencies in consistency in breastfeeding support. Another explanation could be that the SRN has the main responsibility for the breastfeeding support and that this responsibility leads to an experience of resentment from other professional groups.

Our analyses showed a positive correlation between how many years the HCPs had worked and total PreBAI score, and that the most common way for HCPs to update their knowledge about breastfeeding was to consult more experienced colleagues. A previous study has shown the opposite; length of employment was negatively related to nurses' breastfeeding attitudes in a NICU (Siddell et al., 2003). An explanation for this difference could be that the NICU in the present study allows parents to stay with their infant around the clock and that the parents had the opportunities to perform SSC 24 h/day. The HCPs' more positive attitudes towards breastfeeding after working more years may be explained by social cognitive theory. Observing the positive outcomes in a Neo-BFHI environment provides guidance for one's own actions (Bandura, 1977). In addition, our results that HCPs with extra breastfeeding education had higher PreBAI scores indicated good construct validity of the instrument.

The majority of the HCPs (84%) expressed a desire for more training in breastfeeding. It can be assumed that the perceived lack of training was due to staff shortages and time constraints. Nevertheless, it is important to train all HCPs and create a feasible solution to improve the breastfeeding training provided. The PreBAI can be useful for both identifying the need for further training and for evaluation of the training. Since breastfeeding training is not considered essential in HCPs' basic education, it is of great importance that professionals receive this training after completing their basic education (Folker-Maglaya et al., 2018).

There was no significant difference between the pre- and post-measurements, but scores on the Regulating domain did change significantly ($p = 0.035$) and the participants had lower median values after completing the training programme. An explanation for this may be that hardly any of the HCPs who responded to the post-measurements had participated in the implementation programme and therefore reacted with more regulating attitudes when exposed to the NICU's changes in breastfeeding counselling, which emphasized the importance of SCC and that the child should be in control regarding when it should be breastfed. This highlights the importance that all HCPs should participate in breastfeeding implementation programmes.

Method discussion

Strengths and limitations

A strength of this study was that different HCPs were included. Compliance with the Neo-BFHI requires training all HCPs in skills that are necessary to implement a breastfeeding policy.

Even though physicians have an important role in providing breastfeeding support, many are not adequately educated on breastfeeding (Balogun et al., 2017). The aim of the present study was to investigate HCPs' attitudes before and after participating in a training programme. The study design proposed that the HCPs be asked to complete an attitude instrument before and after participating in a training programme. The authors were concerned that this would be perceived as controlling the participants' attitudes, especially regarding participants with negative attitudes. During the data collection, the research team were confronted with this by HCPs. Of the professionals who participated in the training programme ($n = 48$), only two answered the post-questionnaire, which means that PreBAI cannot be used as an evaluation of the programme in this study. An alternative study design would have been to use anonymous questionnaires, which the research team chose to use in other data collection for the project. However, this design makes it impossible to make individual measurements on attitudes before and after participating in a training programme.

Unfortunately, few physicians participated in the study, and our experience is that it is difficult to motivate physicians to participate in these types of studies, as breastfeeding is not seen as a high-priority topic in their profession, despite the fact that breastfeeding has been proved to be one of the most crucial health-promoting factors for preterm infants (Mosca and Gianni, 2017). The low response rate at both the pre- and the post-measurements (50% and 31%, respectively) was a limitation of this study.

Conclusions and clinical implications

Research has shown that breastfeeding is crucial for the preterm infant and NICUs need to increase their efforts to support breastfeeding.

Training of professionals with positive attitudes to breastfeeding has proved to be of key importance in the promotion of breastfeeding. The PreBAI could be useful for identifying attitudes among HCPs and measuring attitudes before and after participation in a training programme.

Ethical approval

Ethical scrutiny and approval were provided by the regional ethical review board at Uppsala University (Dnr 2016/274).

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Declaration of Competing Interest

There are no conflicts of interest.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.midw.2020.102919](https://doi.org/10.1016/j.midw.2020.102919).

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