



Breastfeeding training improved healthcare professional's self-efficacy to provide evidence-based breastfeeding support: A pre-post intervention study

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ABSTRACT

Objective: To describe healthcare professional's (HCP's) perceived self-efficacy in their ability to provide breastfeeding support before and after a breastfeeding training program.

Design: Pre-post intervention study.

Setting: Antenatal care and child healthcare (CHC) centres in Sweden during 2020.

Participants: An intervention group consisting of 39 HCPs (midwives 51.3%, child healthcare nurses 46.2%) completing a questionnaire at baseline and after intervention, and a control group of 34 HCPs (midwives 61.8%, child healthcare nurses 38.2%) completing a questionnaire at baseline.

Intervention: A breastfeeding training program in line with the *Ten Steps to Successful Breastfeeding* and WHO recommendations about breastfeeding.

Measurements and findings: The 11-item Breastfeeding Support Confidence Scale (BSCS) measures HCP's self-efficacy regarding providing breastfeeding support in line with *Ten Steps to Successful Breastfeeding* and WHO recommendations. The intervention group experienced a significantly increased self-efficacy from pre-intervention to post-intervention for 8 of the 11 BSCS items, with the overall BSCS index score increasing from 36.87 to 39.56 points ($p = 0.001$). The index score in the intervention group at follow-up was significantly higher than the corresponding score in the control group at baseline ($p = 0.025$). The intervention group had significantly higher scores at follow-up than the control group at baseline on the questions: "I'm sure that I can help mothers continue to breastfeed even if the infant doesn't follow the growth curve" ($p = 0.026$) and "I'm sure that I can help mothers continue to breastfeed when the breastfeeding is painful" ($p = 0.048$).

Key conclusions: The breastfeeding training program improved HCP' self-efficacy to provide evidence-based support to breastfeeding mothers.

Implications for practice: This training program is well suited to implement in clinical practice and follows the *Ten Steps to Successful Breastfeeding*.

Trial registration: ACTRN12623000648628

Introduction

The importance of breastfeeding for both mothers and infants is well documented (Victora et al., 2016), and the World Health Organisation (WHO) recommends that infants be exclusively breastfed for 6 months

with continued breastfeeding, along with appropriate complementary foods, up to 2 years of age or longer (WHO, 2022). A meta-analysis on the health benefits of breastfeeding highlights that the prevalence of exclusive breastfeeding at 6 months and any breastfeeding at 12 months is very low in high-income countries (Victora et al., 2016), including

Abbreviations: CHCC, child healthcare centre; CHCN, child healthcare nurse; CI, confidence interval; HCP, healthcare professional; SD, Standard deviation; WHO, World Health Organization.

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Sweden. Specifically, exclusive breastfeeding at 2 months has decreased over time in Sweden from 80% in 2000 to 60% in 2020. At 6 months, approximately 10% of the infants in Sweden are exclusively breastfed (The National Board of Health and Welfare, 2020).

The support that allows mothers to continue breastfeeding for at least 6 months is complex and multifaceted. Mothers in high-income countries emphasise that breastfeeding support strategies should involve information regarding maternal health benefits, promotion of partner support, and informal face-to-face support (Hauck et al., 2016). Moreover, intervention studies to explore appropriate support strategies within specific country contexts are recommended (Hauck et al., 2016). Swedish mothers who breastfed for at least 6 months stressed that healthcare professionals (HCPs) should provide evidence-based care in a sensitive and individualised manner (Blixt et al., 2019) and that they should create a respectful and mutual dialogue with breastfeeding mothers about breastfeeding experiences, intentions, expectations, and what kind of support mothers want. The Swedish mothers perceived that HCPs did not help them to solve problems such as tongue-tied babies, infant weight loss, or painful breastfeeding, and that HCPs had a controlling attitude regarding the infant's growth charts and suggested using formula on loose grounds. Many mothers expressed dissatisfaction with the attitudes at the child healthcare centre (CHCC), e.g. physicians and child healthcare nurses (CHCNs) advising mothers to discontinue night-time breastfeeding and encouraging parents to introduce solid foods before 6 months. Mothers often perceived that they did not receive sufficient support to breastfeed exclusively and reported that HCPs showed negative attitudes towards breastfeeding of older children (Blixt et al., 2019).

In 1991, the WHO and UNICEF launched the Infant-Friendly Hospital Initiative with *Ten Steps to Successful Breastfeeding* to protect, promote, and support breastfeeding (Pérez-Escamilla et al., 2016). *Ten Steps to Successful Breastfeeding* step 2 is a key issue and states that HCPs should have sufficient knowledge, competence, and skills to support breastfeeding (Table 1). This means that all HCPs must be trained in breastfeeding. When step 2 has been implemented in health care, it has been shown to affect HCP's attitudes to breastfeeding (Balogun et al., 2017). Systematic reviews have found that *Ten Steps to Successful Breastfeeding* positively impacts breastfeeding outcomes (Gavine et al., 2021; Pérez-Escamilla et al., 2016). One review found that *Ten Steps to Successful Breastfeeding* step 10 ("Coordinate discharge so that parents and their babies have timely access to ongoing support and care") is a key to helping mothers maintain breastfeeding (Pérez-Escamilla et al., 2016),

Table 1
WHO/UNICEF *Ten Steps to Successful Breastfeeding*.

Critical management procedures:	
1.	a. Comply fully with the International Code of Marketing of Breast-milk Substitutes and relevant World Health Assembly resolutions.
	b. Have a written infant feeding policy that is routinely communicated to staff and parents.
	c. Establish ongoing monitoring and data management systems.
2.	Ensure that staff have sufficient knowledge, competence and skills to support breastfeeding.
Key clinical practices:	
3.	Discuss the importance and management of breastfeeding with pregnant women and their families.
4.	Facilitate immediate and uninterrupted skin-to-skin contact and support mothers to initiate breastfeeding as soon as possible after birth.
5.	Support mothers to initiate and maintain breastfeeding and manage common difficulties.
6.	Do not provide breastfed newborns any food or fluids other than breast milk, unless medically indicated.
7.	Enable mothers and their infants to remain together and to practise rooming-in 24 h a day.
8.	Support mothers to recognise and respond to their infants' cues for feeding.
9.	Counsel mothers on the use and risks of feeding bottles, teats, and pacifiers.
10.	Coordinate discharge so that parents and their infants have timely access to ongoing support and care.

Source: World Health Organisation.

while another review found that breastfeeding support from HCPs affects mothers' decisions to maintain exclusive breastfeeding at 3 months, but not at 6 months (Gavine et al., 2021).

HCPs perceive that lack of knowledge and skills as well as negative attitudes towards breastfeeding are the most important barriers to support breastfeeding mothers (Laanterä et al., 2011). Attitudes may be described as a person's views on a subject on a favourable to unfavourable continuum (Albarracín and Shavitt, 2018), and HCP's personal experiences of breastfeeding can influence their attitude, e.g. female physicians who did not reach their own breastfeeding goals more often had negative emotions about breastfeeding (Sriraman and Kellams, 2016). Studies have also identified that HCPs' attitudes towards breastfeeding can affect mothers' breastfeeding decisions (Blixt et al., 2014; Odom et al., 2014; Taveras et al., 2004). Mothers did not initiate breastfeeding when they perceived that their physician preferred formula feeding (Odom et al., 2014). If mothers felt that their physician did not have an opinion or did not know their views on breastfeeding, fewer mothers chose to initiate and maintain exclusive breastfeeding (Odom et al., 2014; Taveras et al., 2004).

Self-efficacy may be described as a person's judgements regarding their ability to perform a certain activity (Bandura, 1977). HCPs' self-efficacy to provide evidence-based support can also affect mothers' decisions about breastfeeding. Physicians often have low self-efficacy to help mothers solve their breastfeeding problems, such as insufficient milk production or cracked nipples (Taveras et al., 2004). HCPs meet families during the whole breastfeeding period; thus, their ability to provide support is paramount to breastfeeding mothers and their babies (Pérez-Escamilla et al., 2016). A systematic review (Gavine et al., 2016) and a synthesis (Watkins and Dodgson, 2010) of intervention studies concluded that there is a need for studies that describe and evaluate breastfeeding training programmes for HCPs. The aim of this pre-post intervention study was to describe HCPs' perceived self-efficacy in their ability to provide breastfeeding support before and after a breastfeeding training programme.

Methods

Study design

The study reported in this paper used a pre-post intervention design, with the addition of a control group. At baseline, before the intervention, both the intervention and the control group answered the Breastfeeding Support Confidence Scale (BSCS) instrument, while only the intervention group answered the BSCS after the training day. The intervention consisted of web lectures and an inter-professional training day.

This study is part of *The Breastfeeding Study*, aiming to develop and implement a complex intervention with appropriate evidence-based support strategies (Oras, 2020) to help mothers reach their breastfeeding goals. It focuses on HCPs who meet mothers during the whole breastfeeding period and work at antenatal clinics and CHCCs. The overall project aims to review evidence-based breastfeeding practice in line with the *Ten Steps to Successful Breastfeeding* and the WHO's recommendations on breastfeeding.

Setting

The study was conducted in a central Swedish region where the healthcare organisation provides care for about 3,300 infants/year. The region has major socio-economic challenges. Many mothers have a low level of education (59%), are 25 years or younger (13%), and represent a high proportion of foreign-born mothers (35%) in Sweden. Most mothers in Sweden (72.5%) and in the region (69.4%) breastfeed exclusively for at least 1 week, but only 9.7% in Sweden and 7.5% in the region continue to breastfeed exclusively for 6 months. Few mothers in Sweden (28%) and in the region (25%) continue to breastfeed for 1 year

(The National Board of Health and Welfare, 2020).

The healthcare service in the region includes 15 antenatal clinics, 2 hospitals with breastfeeding outpatient clinics, and 26 CHCCs. Antenatal care provided by midwives includes approximately 8–10 visits during pregnancy. These midwives also follow-up on the women by telephone 7–10 days postpartum and at a visit 8–12 weeks postpartum. Parents often see a CHCN at the CHCC 1–2 weeks postpartum. The infant's first year includes approximately 12–13 visits to a CHCN and 3 visits to a physician. During the years 2020–2022, there were no breastfeeding training meetings on group level for women and partners at the antenatal clinic or at the CHCC due to the Covid-19 pandemic. In addition, partners were not allowed to attend the visits to the antenatal clinic, since pregnant women were seen as a risk group for Covid-19.

Participants

All 15 antenatal clinics in the region had participated in a project aiming to provide safe and equal care, individually adapted to the family's postpartum needs, with input from mothers regarding the design of care and evaluation of the project. *The Breastfeeding Study* was developed based on the results from this project. All 15 antenatal clinics in the region were invited to participate. For practical reasons, six antenatal clinics were non-randomly selected to constitute the intervention group, while the remaining nine clinics served as the control group. The intervention as well as the control group cared for about 1,650 women/year. After being informed about the breastfeeding project and the possibility to participate, all 15 antenatal clinics agreed to take part in the project.

All 26 CHCCs in the region were invited to participate in the breastfeeding project. The 11 CHCCs with regular contact with the 6 antenatal clinics in the intervention group were invited to participate in the intervention group. Meanwhile, the 15 CHCCs in regular contact with the nine antenatal clinics in the control group were invited to participate in the control group. HCPs in the control group were informed that they would receive the same breastfeeding training programme after the study was completed. After being informed about the project and the possibility to participate, eight of the 11 CHCCs in the intervention group and nine of the 15 CHCCs in the control group agreed to take part in the project. Among the reasons given for non-

participation were “engaged in other projects” and “being short-staffed”.

In total, 72 HCPs worked at the six antenatal clinics and eight CHCCs included in the intervention group, while 69 HCPs worked at the nine antenatal clinics and nine CHCCs included in the control group. Of these, 47 (65.3%) individuals in the intervention group and 34 (49.3%) in the control group agreed to participate and answered the study-specific questionnaire at baseline. At follow-up after the intervention, 39 of the 47 individuals in the intervention group answered the BSCS instrument. The study population consisted of the 39 individuals in the intervention group who had answered the BSCS instrument both at baseline and at follow-up after the intervention, as well as the 34 individuals in the control group who answered the BSCS instrument at baseline. A flow chart with details of the recruitment process is given in Fig. 1.

Development of the breastfeeding support confidence scale (BSCS) instrument

Based on earlier research, *Ten Steps to Successful Breastfeeding*, and the WHO recommendations on breastfeeding (Bandura, 1977; Blixt et al., 2019; Dennis, 1999; Feldman-Winter et al., 2010; Hauck et al., 2016; Kronborg et al., 2008; Scott et al., 2003; WHO, 2018, 2022), the research group constructed the BSCS instrument, which intends to capture HCPs' self-efficacy regarding breastfeeding support in line with the *Ten Steps to Successful Breastfeeding* and the WHO recommendations. Higher scores indicate better self-efficacy. The research team comprises HCPs (including midwives), a CHCN, and a physician. All participants have long professional experience of providing breastfeeding support in healthcare and research. The team discussed and refined the questions several times.

BSCS consists of 11 questions intended to measure self-efficacy regarding provision of support during breastfeeding, i.e. to inform about advantages and management of breastfeeding, to give practical breastfeeding support, and to have the ability to manage breastfeeding problems. The questions are answered using a 4-point scale: 1 = “is not correct at all”, 2 = “is not correct”, 3 = “fits pretty well”, and 4 = “fits just right”, and are summarised to give an overall index ranging from 11 to 44 points, with higher scores indicating a higher degree of self-efficacy.

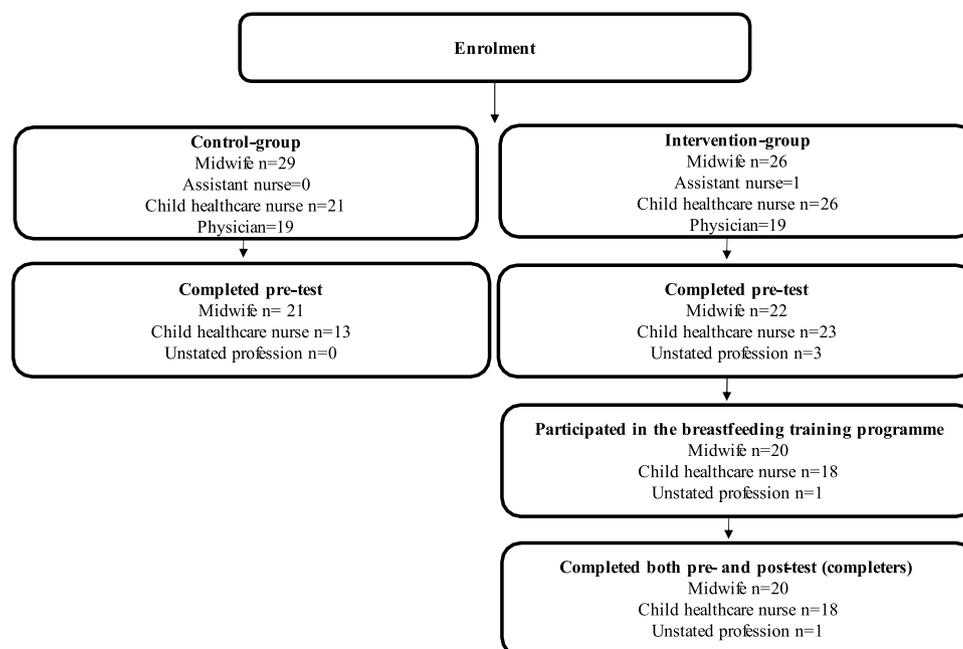


Fig. 1. Recruitment flow chart.

All questions were pilot tested on 10 midwives working in antenatal clinics and/or in hospitals and on three CHCNs working at CHCCs. The purpose was to establish content validity, ensure that the questions were understandable, find out if any issues were perceived as sensitive, and ensure that the length of the questionnaire was appropriate. The whole questionnaire took approximately 20 min to complete. The HCPs in the pilot study gave written comments concerning their opinions and stated if the questions were relevant and clear. The CHCNs pointed out that the infant's age should be clarified in some questions. Minor modifications were made after the test to clarify if the questions concerned a newborn (birth to two months) or an infant (birth to one years old).

Data collection

All HCPs working at the study units were invited to complete a study-specific questionnaire including the BSCS instrument and demographic questions (age, gender, country of birth, profession, years in profession) between July 2020 and September 2020. The online questionnaire was distributed by e-mail with written information about the study. Participants were informed that participation was voluntary and that they could terminate their participation at any time. Submitting the online questionnaire was considered as an implied consent to participate in the study. Most of the HCPs answered the pre-test questionnaire 1–3 weeks before their training day. When the pre-test was received by the researchers, HCPs at each clinic received an email with a web-link to the online breastfeeding education. Some clinics chose to watch the online education individually, while others watched it in small groups. The web-link was sent out 5–14 days before the inter-professional training day. On the training day, HCPs filled in an attendance list. Midwives and CHCNs answered the post-intervention questionnaire at the end of the inter-professional training day. The questionnaire contained questions about whether they had participated in the training day and whether they had watched the short online lectures before the training day. No reminders were sent out.

Intervention

Midwives working at the antenatal clinics and CHCNs at the CHCCs who were included in the intervention group participated in a breastfeeding training programme in line with the *Ten Steps to Successful Breastfeeding* and the WHO recommendations on breastfeeding. The training programme is described in detail in the online only Supplementary Data and involved two phases:

Phase one:

A. Online breastfeeding education (3.0 h). The intervention group received an email with a web-link to 13 short online lectures with the following content: 1. Breastfeeding and professional support, 2. Breastfeeding and health, 3. Breastfeeding and self-efficacy, 4. The very first breastfeeding session, 5. Breastfeeding, skin-to-skin contact, and kangaroo mother care, 6. Attachment, skin-to-skin contact, and breastfeeding, 7. Expressing milk by hand, pumping, and supplementation, 8. How to prevent breastfeeding problems, 9. Breastfeeding recommendations and the WHO code, 10. Breastfeeding and complementary feeding, 11. Breastfeeding patterns, 12. Breastfeeding and growth, and 13. Breastfeeding, sleep, and infant crying.

B. Participants should also reflect on three questions before the training day (1.0 hours):

- i Personal experiences of and attitudes towards breastfeeding,
- ii Evidence-based professional breastfeeding support, and
- iii What changes they would like to introduce at their workplace to make it easier for mothers to breastfeed.

Phase two:

An inter-professional training day (8.5 h, face-to-face). The training day programme is displayed in the online only Supplementary Data. On the training day, HCPs worked with their personal experiences and attitudes towards breastfeeding. HCPs trained to offer and provide evidence-based support guided by the pictures and conversation material and the breastfeeding plan to parents in the intervention group. HCPs trained to listen to the mother and her partner and ask open-ended questions in the dialogue about experiences of breastfeeding and what kind of breastfeeding support women and partners wanted. The material included photos of infants breastfeeding after two years of age. The training day also included small group discussions on breastfeeding case scenarios. The material, the breastfeeding plan, and discussions of case scenarios aimed at strengthening HCPs' and parents' self-efficacy about breastfeeding, in line with the *Ten Steps to Successful Breastfeeding* and the WHO recommendations.

All three individuals responsible for the training day worked in the healthcare region. One was responsible for the development of care at the antenatal clinics, one was head of an antenatal clinic, and one was a care developer at the CHCC. All three were experienced breastfeeding trainers and counsellors and had personal experiences of breastfeeding. The training day was given on two occasions, with 18 and 28 participants on each occasion, respectively.

Standard care in the control group

All HCPs working in the region are normally invited to participate in a voluntary breastfeeding education course (3 h) every year, with various themes. The course may, e.g. cover health benefits of breastfeeding or breastfeeding problems. During the years 2020–2021, no education was given due to the Covid-19 pandemic, since there were restrictions on meeting in large groups (50–60 people).

Statistical analyses

Categorical variables are presented as frequencies and percentages, n (%), while ordinal and continuous variables are given as means with accompanying standard deviations (SDs). Tests of differences between independent groups were performed using Fisher's exact test for categorical data, the Wilcoxon rank sum test with continuity correction for ordinal data, and Welch's two-sample t -test for continuous data, while tests of differences between dependent data were performed using the Wilcoxon signed rank test with continuity correction for ordinal data. All statistical analyses were performed in $R \geq 4.0$ (R Foundation for Statistical Computing, Vienna, Austria), with two-sided P -values < 0.05 considered statistically significant. Data from the pilot study were not included in the analyses.

Findings

Of the 34 individuals in the control group, 21 (61.8%) were midwives, while 13 (38.2%) were CHCNs. Among the 39 individuals in the intervention group, 20 (51.3%) were midwives, while 18 (46.2%) were CHCNs. One participant did not state her profession. In total, 20 (76.9%) of the 26 midwives and 18 (69.2%) of the 26 CHCNs completed both the pre- and post-tests (completers); see Fig. 1. Of those who completed the tests, 35 (89.7%) had watched the web lectures before the training day, and all had participated in the inter-professional training day.

Characteristics of the intervention and control groups are given in Table 2. Age was the only characteristic that differed significantly between the two groups. Individuals in the control group were, on average, 5.4 years older than those in the intervention group. Almost all participants were female, born in Sweden, and had three or more years of college/university education.

Table 2
Characteristics of the participants.

	Control n = 34	Intervention n = 39	P-value
Female, n (%)	33 (97.1)	39 (100.0)	0.466 ^a
Age, mean (SD)	46.5 (9.6)	41.1 (10.2)	0.022 ^b
College/University education > 3 years, n (%)	30 (88.2)	34 (87.2)	1.000 ^a
Born in Sweden, n (%)	32 (94.1)	38 (97.4)	0.595 ^a
Profession, n (%) ^c			0.481 ^a
– Midwife	21 (61.8)	20 (52.6)	
– Child healthcare nurse	13 (38.2)	18 (47.4)	

Note: SD, standard deviation. Significant *P*-values are given in **bold**. *P*-values from ^a Fisher's exact test and ^b Welch's two-sample t-test. ^c One of the individuals in the intervention group did not state her profession.

Changes in the BSCS scores from baseline to follow-up

For 10 of the 11 BSCS questions at baseline, the score was three or higher on the 1–4 point scale, with an overall mean index score of 36.87 points in the intervention group and 37.58 points in the control group (Table 3). Both groups had the highest score on the question “I'm sure that I can inform parents about the infant's early signals that he/she wants to breastfeed”, with mean scores of 3.70 points in the control group and 3.59 points in the intervention group. The lowest score was recorded for the question “I'm sure that I can help mothers continue to breastfeed when the breastfeeding is painful”, with mean scores of 2.97 points in both groups. The only question that differed significantly between the two groups at baseline was “I'm sure that I can inform mothers about how milk production works”, where the control group had a mean score of 3.64 compared to 3.33 points in the intervention group ($p = 0.048$). The difference in the overall index score between the two groups was small and non-significant, and 10 of the 11 BSCS items did not differ significantly between the groups, thus implying that the two groups had essentially the same level of self-efficacy.

In general, individuals in the intervention group increased their self-

efficacy from baseline to follow-up. On average, the overall index increased with 2.68 points, from 36.87 to 39.56 points ($p = 0.001$). The index score in the intervention group at follow-up was significantly higher than the mean score of 37.58 in the control group at baseline ($p = 0.025$).

The intervention group had higher mean scores at follow-up compared to baseline for all 11 questions, with the largest increase of 0.38 points ($p = 0.001$) observed for the question “I'm sure that I can help mothers continue to breastfeed when the breastfeeding is painful” and the second largest increase of 0.36 points ($p = 0.001$) noted for the question “I'm sure that I can inform mothers about how milk production works”. Only the questions “I'm sure that I can inform parents about the health benefits of breastfeeding for the infant” ($p = 0.244$), “I'm sure that I can give mothers the emotional help they need to decide for themselves how long they want to breastfeed” ($p = 0.362$), and “I'm sure that I can help a mother continue breastfeeding when she's got milk congestion” ($p = 0.076$) had a non-significant increase in the mean scores from baseline to follow-up.

The intervention group had higher mean scores at follow-up compared to the control group at baseline for all 11 questions. The

Table 3
Results for the Breastfeeding Support Confidence Scale on self-efficacy regarding providing support during breastfeeding in the intervention and control groups.

Statement	Baseline	Intervention	Change	P-value ^a	Control	Compared with	
	n = 39 Mean (SD)	Follow-up n = 39 Mean (SD)	n = 39 Mean (SD)		n = 34 Mean (SD)	Baseline P-value ^b	Follow-up P-value ^c
– Inform parents about the health benefits of breastfeeding for the infant	3.46 (0.55)	3.62 (0.75)	0.15 (0.78)	0.244	3.59 (0.50)	0.350	0.339
– Give mothers the emotional help they need to decide for themselves how long they want to breastfeed	3.23 (0.58)	3.36 (0.74)	0.13 (0.80)	0.362	3.09 (0.68)	0.433	0.048
– Inform parents about the health benefits of breastfeeding for the mother	3.41 (0.59)	3.74 (0.44)	0.33 (0.58)	0.002	3.55 (0.56)	0.327	0.121
– Inform parents about the infant's early signals that he/she wants to breastfeed	3.59 (0.55)	3.77 (0.48)	0.18 (0.45)	0.023	3.70 (0.47)	0.436	0.387
– Inform mothers about how milk production works	3.33 (0.70)	3.69 (0.61)	0.36 (0.58)	0.001	3.64 (0.55)	0.048	0.493
– Show mothers how they know that the infant has a big hold on her breast	3.49 (0.60)	3.69 (0.52)	0.21 (0.47)	0.013	3.58 (0.56)	0.541	0.332
– Help mothers continue to breastfeed even if the infant doesn't follow the growth curve	3.21 (0.74)	3.49 (0.56)	0.29 (0.77)	0.029	3.12 (0.71)	0.628	0.026
– Help a mother continue breastfeeding when she's got milk congestion	3.41 (0.59)	3.59 (0.55)	0.18 (0.60)	0.076	3.39 (0.70)	0.904	0.242
– Show a nursing mother how she can feed with a cup, spoon or feeding set when the infant needs replacement	3.26 (0.79)	3.56 (0.68)	0.31 (0.69)	0.011	3.39 (0.79)	0.404	0.342
– Help mothers continue to breastfeed when the breastfeeding is painful	2.97 (0.87)	3.36 (0.74)	0.38 (0.63)	0.001	2.97 (0.87)	1.000	0.048
– Show mothers how to have a good breastfeeding position	3.41 (0.64)	3.69 (0.52)	0.28 (0.51)	0.003	3.52 (0.57)	0.528	0.143
Index	36.87 (5.91)	39.56 (4.82)	2.68 (4.39)	0.001	37.58 (4.50)	0.684	0.025

Note: SD, standard deviation. Significant *P*-values are given in **bold**. *P*-values from ^a the Wilcoxon signed rank test with continuity correction for tests of no change in the intervention group between measures at baseline and follow-up, and the Wilcoxon rank sum test with continuity correction for tests of differences between ^b intervention and control groups at baseline, and ^c intervention group at follow-up and control group at baseline.

difference was significant for three questions: "I'm sure that I can give mothers the emotional help they need to decide for themselves how long they want to breastfeed" ($p = 0.048$), "I'm sure that I can help mothers continue to breastfeed even if the infant doesn't follow the growth curve" ($p = 0.026$), and "I'm sure that I can help mothers continue to breastfeed when the breastfeeding is painful" ($p = 0.048$).

Discussion

This study found that a breastfeeding training programme significantly improved HCPs' self-efficacy to provide evidence-based support to breastfeeding mothers. After the training, the intervention group had higher self-efficacy to support mothers to solve breastfeeding problems, such as to continue to breastfeed when breastfeeding is painful or when the infant does not follow the growth charts. In addition, the training programme significantly improved HCPs' perceived ability to inform parents about milk production, the health benefits of breastfeeding for the mother, and the infant's early signals that he/she wants to breastfeed, as well as to show a nursing mother how she can feed with a cup, spoon, or feeding set when the infant needs replacements.

Results in perspective

It is important to improve HCPs' self-efficacy in providing evidence-based breastfeeding support in line with the *Ten Steps to Successful Breastfeeding* and the WHO breastfeeding recommendations. HCPs working in antenatal clinics and in CHCCs are key persons in supporting mothers to maintain breastfeeding (Pérez-Escamilla et al., 2016). Dykes argues that HCPs' knowledge about the health benefits of breastfeeding needs to be balanced with self-efficacy to provide mothers with skilled breastfeeding support (Dykes, 2006). Moreover, a synthesis of intervention studies reported that HCPs often have low self-efficacy to help mothers to solve their breastfeeding problems (Watkins and Dodgson, 2010). Thus, it is important to create training programmes that increase HCPs' ability to support breastfeeding mothers.

Bandura (1997) introduced the idea of self-efficacy in the context of *Social Cognitive Theory*. He suggested that the most influential way to strengthen a person's self-efficacy is to learn the necessary skills, which then leads to the person's sense of success. Bandura calls this a mastery experience (Bandura, 1997). For participants who received the intervention, the self-efficacy to help mothers to continue breastfeeding when the infant was not following the growth chart improved significantly. The mechanisms of improved self-efficacy may reflect both increased knowledge and improved support skills. The HCPs trained their support skills through case scenarios and were guided by pictures and conversation material. For example, they trained to create a dialogue with breastfeeding mothers who perceived that their infant was unsettled after breastfeeding or when the mother perceived insufficient milk supply. The pictures and conversation material encouraged the breastfeeding families to let the infant breastfeed frequently on demand, to hold their infant skin-to-skin and to carry the infant in a sling instead of giving supplements with formula if the infant was difficult to settle. This can be recognised as a mastery experience: skills lead the participant to a sense of success (Bandura, 1997).

It is important that HCPs can help mothers continue breastfeeding when the infant does not follow the growth charts. A study from the US showed that mothers often stopped earlier than they wanted when HCPs believed that the infant was not gaining enough weight (Odom et al., 2013). The intervention group increased its self-efficacy to inform mothers about milk production. Knowledge about milk production may have reduced HCPs' anxiety about the infant not gaining enough weight. Another explanation may be that HCPs increased their self-efficacy when they discussed case scenarios normalising slow weight gain with the help of the WHO's growth charts for healthy breastfed babies (WHO, 2006). The results from our study support the findings of Feldman-Winer et al. (2010) which showed that breastfeeding training increases HCPs'

confidence to manage breastfeeding problems (Feldman-Winter et al., 2010).

In contrast to the results of the present study, the 16 h *Outpatient Breastfeeding Champion* webinar breastfeeding education programme from the US did not significantly improve HCPs' self-efficacy to manage breastfeeding problems (Patterson et al., 2020). One explanation for this may be that our study started with online education about breastfeeding and that HCPs in the next step trained their skills to manage breastfeeding problems by discussing case scenarios and using role play between HCPs and breastfeeding families, guided by images and conversation material. Thus, in contrast to Patterson et al., our programme emphasised the importance of training support skills to manage breastfeeding problems. Another explanation may be the small sample size in the US study (Patterson et al., 2020).

Many mothers experience nipple pain during the first weeks after birth, which is a common reason to stop breastfeeding earlier than wanted (Marshall et al., 2021; Odom et al., 2013). Painful breastfeeding/nipple pain is often a result of suboptimal latching and can be associated with decreased milk supply, milk stasis, or mastitis (Marshall et al., 2021). The training programme implemented in the present study increased HCPs' self-efficacy to support mothers practically to be able to attach their infant to the breast and have a good position for the mother and infant. The improved self-efficacy to solve problems with painful breastfeeding is in accordance with the findings from a previous intervention study (Kronborg et al., 2008).

The training programme used in the present study might have increased HCPs' communication skills to provide evidence-based care in a sensitive and individualised manner (Blixt et al., 2019). The content in the training programme aims to normalise breastfeeding in line with the WHO's recommendations on breastfeeding (WHO, 2022). As an example, the material in the programme involves case discussions and photos of infants breastfeeding after two years of age to normalise breastfeeding for an extended period. The participants should also reflect on their own breastfeeding experiences. A previous study by Ekström et al. (2005) argues that it may be important to allow HCPs to reflect on their own breastfeeding experiences to help them change their attitudes towards breastfeeding (Ekstrom et al., 2005). In a review of barriers related to implementation of the *Ten Steps to Successful Breastfeeding*, Semenic et al. (2012) found that HCPs have negative attitudes towards providing evidence-based breastfeeding support because it could make mothers feel guilty or not respected due to cultural norms (Semenic et al., 2012). Breastfeeding exclusively for four months and partially up to ten months could be understood as the cultural norm in Sweden (The National Board of Health and Welfare, 2020), which is far from being in line with the WHO's recommendations (WHO, 2022). Therefore, it is important to train HCPs in their ability to provide skilled, sensitive, and individual support in line with the WHO's recommendations. It is a particular challenge to support breastfeeding in countries with a breastfeeding culture that differs substantially from the WHO's recommendations (WHO, 2022).

Implementation of the Ten Steps to Successful breastfeeding at antenatal clinics and CHCCs

The training programme discussed in the present study can be used to implement the *Ten Steps to Successful breastfeeding* at the antenatal clinics and CHCCs on a national level in Sweden. The breastfeeding programme and the material can be used to provide women with equal breastfeeding support, since nearly all women in Sweden attend antenatal clinics and CHCCs. The process described in the *Ten Steps to Successful Breastfeeding* implementation guide is most useful. National leadership and coordination are essential to succeed with the implementation (WHO, 2018). The Swedish Association of Local Authorities and Regions (SALAR) has developed national programme areas (NPOs) to collect supportive knowledge (The Swedish Association of Local Authorities and Regions SALAR, 2023). A NPO comprises experts with

broad competence in each area, and all Swedish healthcare regions are represented. Today, there is no national programme for breastfeeding, but in order to create equal breastfeeding support for women in Sweden, such a programme would be helpful. Finally, it should be noted that support to help women to continue breastfeeding is complex and multi-faceted (Hauck et al., 2016). Societal, cultural, political, and economic factors as well as factors related to the family, the mother/infant dyad, and the commercial milk formula industry are important to consider (Baker et al., 2023; Hauck et al., 2016).

Strengths and limitations

A strength of the present study was that both HCPs working in antenatal clinics and in CHCCs were included and trained together, since these are key persons in providing breastfeeding support. A limitation was that none of the physicians in the intervention group participated in the inter-professional training. Breastfeeding may not be a high priority topic among physicians in Sweden (Gerhardsson et al., 2021), but Balogun et al. argue that physicians have an important role in supporting breastfeeding mothers (Balogun et al., 2017). Another limitation was that the study was not randomised, and that age differed significantly between the intervention and control groups. Other limitations were the relatively small sample size and that participants could not be blinded regarding whether they belonged to the intervention or control group.

Conclusions and clinical implications

The breastfeeding training programme evaluated in the present study improved midwives' and CHCNs' self-efficacy to provide evidence-based support to breastfeeding mothers. HCPs in the intervention group had an increased self-efficacy to support mothers to continue breastfeeding when they experienced problems with painful breastfeeding or when the infant did not follow the growth charts. This training programme is well suited to be implemented in clinical practice and follows the *Ten Steps to Successful Breastfeeding*.

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CRedit authorship contribution statement

Ingrid Blixt: Conceptualization, Methodology, Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Andreas Karlsson Rosenblad:** Conceptualization, Methodology, Formal analysis, Writing – review & editing. **Ove Axelsson:** Conceptualization, Methodology, Formal analysis, Writing – review & editing. **Eva-Lotta Funkquist:** Conceptualization, Methodology, Data curation, Formal analysis, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare no conflicting interests.

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Ethical approval

Ethical scrutiny and approval were provided by the regional ethical review board at Uppsala University (Dnr 2020–01425).

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.midw.2023.103794.

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