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Enhancement of midwives' and child healthcare nurses' attitudes towards the WHO's recommendations following breastfeeding training: A quasi-experimental study

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ABSTRACT

Objective: This study aimed to assess healthcare professionals' attitudes towards breastfeeding, in line with the WHO guidelines, before and after a breastfeeding intervention in Sweden.
Methods: A quasi-experimental, prospective, longitudinal before-and-after design with a control group was used. Data were collected between 2020 and 2021. The sample included 26 midwives and child healthcare nurses in the intervention group, and 18 in the control group, all working in antenatal and child healthcare centres. The intervention group received breastfeeding training based on the WHO recommendations. The 15-item Healthcare Professionals' Attitudes instrument was used to measure attitudes.
Results: The intervention improved attitudes on nine of the 15 questions immediately post-training, with effects maintained at one-year. The largest change was for the item: 'It is appropriate for infants to wait until they are six months old before tasting samples' ($p = 0.000$). At follow-up, five items differed significantly between groups: 'Infants can have commercial milk formula in the evening if they breastfeed frequently at night' ($p = 0.002$), 'It is inappropriate for a mother to breastfeed a one-year-old in a restaurant' ($p = 0.017$), 'It is appropriate for infants to breastfeed every three hours' ($p = 0.020$), 'When a mother has bleeding nipples, it is appropriate to inform her that formula is acceptable' ($p = 0.023$), and 'It is important for infants to have uninterrupted sleep at night' ($p = 0.047$).
Conclusion: The breastfeeding training programme improved healthcare professionals' attitudes towards breastfeeding, with positive effects sustained one year following the intervention.

Introduction

Breastfeeding is crucial for the health of both infants and women [1]. The World Health Organisation (WHO) recommends exclusive breastfeeding for the first 6 months of life, and continued breastfeeding for up to 2 years or longer [2]. However, in high-income countries, few infants are breastfed in line with these recommendations [1]. In Sweden, only 12 % of infants are exclusively breastfed at 6 months, with rates varying from region to region. There has been a significant decline in exclusive breastfeeding over the past few decades. Conversely, at 1 year, partial breastfeeding has increased slightly; nevertheless, only about 30 % of women continue breastfeeding at this age [3].

The majority of pregnant women report that they plan to breastfeed [4], but many stop earlier than planned due to various barriers [4,5]. For example, women may experience breastfeeding difficulties, or healthcare professionals (HCPs) may suggest that the infant is not gaining enough weight [5]. Women who discontinue breastfeeding earlier than desired often report feelings of stress [6], shame [7] and depression [8]. A Swedish study found that women perceived negative attitudes from HCPs towards exclusive breastfeeding at 6 months. They also expressed the need for HCPs to improve their breastfeeding knowledge and skills. Moreover, they suggested that HCPs refrain from offering unsolicited advice such as ceasing nighttime breastfeeding, introducing solid foods at 4 months, or reducing breastfeeding after 6 months. They also emphasised the importance of HCPs maintaining a positive attitude towards breastfeeding beyond the first months after birth and providing

Abbreviations: CG, Control group; HCPs, Healthcare professionals; IG, Intervention group; WHO, World Health Organisation.

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greater breastfeeding support after 6 months [9].

Despite the understanding that extra support from HCPs can influence women's decisions to continue breastfeeding [10], and that HCPs are expected to protect, promote and support the WHO's recommendations for breastfeeding [11], little research has focused on how HCPs can assist women in maintaining breastfeeding beyond the first few months after birth [10]. Studies indicate that HCPs often hold negative attitudes towards the WHO's breastfeeding recommendations [12]. A systematic review revealed that HCPs' competence in providing breastfeeding support diminishes after the infant reaches 6 months, and the social acceptability of breastfeeding also tends to decrease as the infant grows older [13]. HCPs frequently report that the support they provide is influenced by their personal breastfeeding encounters [12], as well as by cultural norms and the marketing strategies of the commercial milk formula and food industries [14]. The typically brief postpartum hospital stay further underscores the pivotal role of HCPs in antenatal- and child healthcare centres in providing guidance to families throughout the breastfeeding journey [15]. Our previous research demonstrated that a training programme improved midwives' and child healthcare nurses' self-efficacy in supporting women to overcome breastfeeding difficulties [15]. However, there is a need to evaluate the impact of the training programme on HCPs' attitudes towards supporting women to continue breastfeeding beyond the first few months after birth, and to determine whether these attitudes are sustained over time. Such knowledge could offer valuable insights into how forthcoming training programmes should be designed [10].

The aim of this study was to assess healthcare professionals' attitudes towards breastfeeding in accordance with the WHO's guidelines, before and after a breastfeeding intervention implemented in Sweden.

Methods

Research design

A quasi-experimental, prospective, longitudinal before-and-after design, including a control group [16], was used to compare HCPs' attitudes towards breastfeeding in accordance with the WHO's recommendations, both before and 1 year after a breastfeeding intervention. This study is part of a larger project aimed at developing and implementing an intervention with evidence-based support strategies [17] to help women achieve their breastfeeding goals. The overall aim of the project is to strengthen evidence-based breastfeeding care in accordance with the WHO's recommendations [2] and the Ten Steps to Successful Breastfeeding [11]. The study was performed in accordance with the Declaration of Helsinki [18]. Ethical review and approval were granted by the Regional Ethical Review Board at Uppsala University (Dnr 2020–01425).

Setting and relevant context

The study was conducted in a central region of Sweden with approximately 3,300 childbirths annually in 2020. In 2019, the exclusive breastfeeding rate at 6 months was 8 %, and partial breastfeeding at 1 year was 25 % [3]. Within the region, 59 % of pregnant women had a low level of education and 35 % were foreign born. The region includes 15 antenatal clinics, two hospitals with breastfeeding outpatient clinics, and 26 child health centres. Midwives and assistant nurses work in antenatal clinics, while child healthcare nurses and physicians work in child healthcare centres. During pregnancy, women typically see their midwife 8–10 times. They are followed up by telephone one week postpartum and receive an in-person visit 8–12 weeks after giving birth. Infants are followed up 1–2 weeks after birth and then approximately 12–13 times during the first year by a child healthcare nurse. The physician at the child healthcare centre sees the infant 3 times during the first year.

Intervention

The intervention consisted of web-based lectures and an inter-professional training day, in line with the WHO's recommendations [2] and the Ten Steps to Successful Breastfeeding [11], as previously described [15]. The training programme involved two phases:

Phase one includes online breastfeeding education (3.0 h). The intervention group received an email with a web-link to 13 short online lectures covering 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. Preventing 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. Participants were also asked to reflect on three questions before the training day (1.0 h):

i. Their 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 included an inter-professional training day (8.5 h, face-to-face). HCPs explored their personal experiences and attitudes towards breastfeeding. In small groups, they discussed the three pre-assigned questions they had reflected on, while others in the group listened without interrupting. HCPs also practised providing evidence-based support to parents. Specifically, they focused on actively listening to mothers and their partners, and asking open-ended questions in the dialogue about experiences of breastfeeding and the type of breastfeeding support they desired. The training day also included small group discussions of breastfeeding case scenarios. The educational materials, breastfeeding plan, and case-based discussions were designed to enhance both HCPs' and parents' self-efficacy in breastfeeding, in accordance with the WHO's recommendations and the Ten Steps to Successful Breastfeeding.

Standard care

All HCPs in the region are invited annually to attend a voluntary 3-hour breastfeeding course, covering various themes [15]. During 2020–2021, no education was delivered due to the COVID-19 pandemic.

Sample

The inclusion criteria comprised HCPs working at the 15 antenatal clinics and 26 child healthcare centres in the region during 2020. All 15 antenatal clinics agreed to participate in the project. For practical reasons, six clinics were selected non-randomly to constitute the intervention group (IG), while the remaining nine clinics served as the control group (CG). Both the IG and the CG provided care for approximately 1,650 pregnant women per year. Child healthcare centres that had regular contact with the antenatal clinics in the IG (n = 11) were invited to participate, as were those with regular contact with the antenatal clinics in the CG (n = 15). After receiving information about the project, eight of the 11 child healthcare centres in the IG and nine of the 15 centres in the CG agreed to participate.

Measurements

Development of the healthcare professionals' attitudes instrument

HCPs' attitudes were measured using the HATTIS. The items were developed by the research team based on the WHO's recommendations on breastfeeding, the International Code of Marketing of Breast-milk Substitutes, the Ten steps to Successful Breastfeeding and previous research [2,9,11,19–23]. The research group comprised midwives, a child healthcare nurse, and a physician, all with extensive experience in providing breastfeeding support.

The questionnaire includes 15 items using a 4-point Likert scale, with response options ranging from "not correct at all" to "fits just right". Items were reverse-coded when necessary, so that higher scores indicated a more favourable attitude towards breastfeeding in accordance with the WHO's recommendations (Table 1).

Content validity of healthcare professionals' attitudes instrument

During the development process, the research group refined the items several times through discussion. The items were also discussed with professionals with long clinical experience in breastfeeding support. They were pilot tested on midwives (n = 10) working in antenatal care and maternity wards, and on child healthcare nurses (n = 3) from another region, to establish content validity, ensure relevance, clarity, identify any potentially sensitive issues, and confirm that the length of the questionnaire was appropriate [15]. In this study, the Swedish validated version of HATTIS was used.

Table 1
Healthcare professionals' Attitudes instrument (HATTIS). The table presents the question number, the statement for which respondents indicate their level of agreement, and whether the question has been reverse-coded.

Number	Question	Question is reversed
1	It is appropriate for infants to breastfeed every three hours	Yes
2	Some mothers who breastfeed for a long time bond with the child in a way that excludes the partner	Yes
3	Parents should receive information that the WHO recommends continuing breastfeeding for two years or longer	No
4	The nutrients in breast milk decrease when the infant is around six months	No
5	I receive good information from baby food companies about when to start feeding my infant solid foods	Yes
6	It is important for infants to have uninterrupted sleep at night	Yes
7	Infants can have commercial milk formula in the evening if they breastfeed frequently at night	Yes
8	Mothers with breastfeeding problems seek help themselves if they need it	Yes
9	When a mother has bleeding nipples, it is appropriate for her to be informed that it is acceptable to give commercial milk formula	Yes
10	When the infant does not follow the weight curve, it is appropriate for the mother to supplement with commercial milk formula	Yes
11	It is appropriate for infants to start tasting samples at four months of age	Yes
12	At the age of four months, it is important that the infant is introduced to gluten	Yes
13	It is appropriate for infants to wait until they are six months old before tasting samples	No
14	It is inappropriate for a mother to breastfeed a one-year-old child in a restaurant	Yes
15	It is important to refer breastfeeding mothers to peer support	No

Data collection

All HCPs working at the study units were invited to complete the online questionnaire between July and September 2020. Both full-time and part-time HCPs working in antenatal clinics and child healthcare centres were eligible. Midwives did not rotate between antenatal clinics and the maternity ward. The questionnaire was distributed by email, along with written information about the purpose of the study, procedures, benefits of participation, potential risks and inconveniences, confidentiality of data and the contact person. HCPs were informed that participation was voluntary and could be withdrawn at any time. They were also informed that submission of the online questionnaire would be considered implied consent [15]. At baseline, both the IG and CG completed a pre-test. The questionnaire included the HATTIS, the BSCS instrument and demographic questions (age, gender, country of birth, profession, years in profession). Most HCPs in the IG completed the pre-test 1–3 weeks before their training day. Thereafter, the web lectures were emailed to each IG clinic 5–14 days before the training day. HCPs in the IG completed the post-test at the end of the inter-professional training day. No reminders were sent out. One year after the intervention, both the IG and CG completed a follow-up test, which was distributed by Two reminders were sent to encourage participation. (Fig. 1).

Data analysis

Characteristics of the IG and CG are provided in Table 2. Means and standard deviations are presented for age and years of experience in the field, while profession is summarised as counts and percentages. Differences between the groups were assessed using Welch's two-sample t-tests for age and years of experience, and Fisher's exact test for profession. All tests were two-sided.

To estimate the effect of the intervention, we compared responses from the IG at follow-up with those from the CG using the Wilcoxon Rank-Sum tests to determine if the values in the IG were systematically higher. In addition, the IG's follow-up values were compared with their baseline values using the Wilcoxon Signed Rank tests to assess whether the follow-up values were systematically higher. We hypothesised that, if the intervention had an effect, its short-term impact would be greater than its long-term impact, as some information acquired during the intervention might be forgotten over time. Specifically, we expected that responses at follow-up would, on average, be higher than baseline scores but lower than those recorded immediately post-intervention. Accordingly, the hypothesis tests were one-sided in the anticipated direction, reflecting the underlying assumption that, on average, baseline scores < follow-up scores < post-intervention scores. To investigate general trends in attitudes, two-sided tests were also performed comparing the CG's follow-up scores with their baseline scores. All analyses were conducted in R $\geq$ 4.0 (R Foundation for Statistical Computing, Vienna, Austria). P-values < 0.05 were considered statistically significant.

Results

At baseline, the age and professional experience of the HCPs were reasonably similar between the IG and CG, although the CG was slightly more experienced. On average, HCPs in the IG were 43 years old (SD = 9.6) and had 9 years of experience in the field (SD = 6.5). The corresponding numbers for the CG were 44 years of age (SD = 9.3) and 12 years of experience (SD = 9.8). All HCPs were women.

In the IG, the HCPs included 26 midwives, one assistant nurse, 26 child healthcare nurses, and 19 physicians. In the CG, the HCPs included 29 midwives, no assistant nurses, 21 child healthcare nurses, and 19 physicians (Fig. 1).

The final study population consisted of 26 individuals in the IG and 18 in the CG, all of whom completed the Healthcare Professionals' Attitudes Instrument (HATTIS) both before and 1 year after the

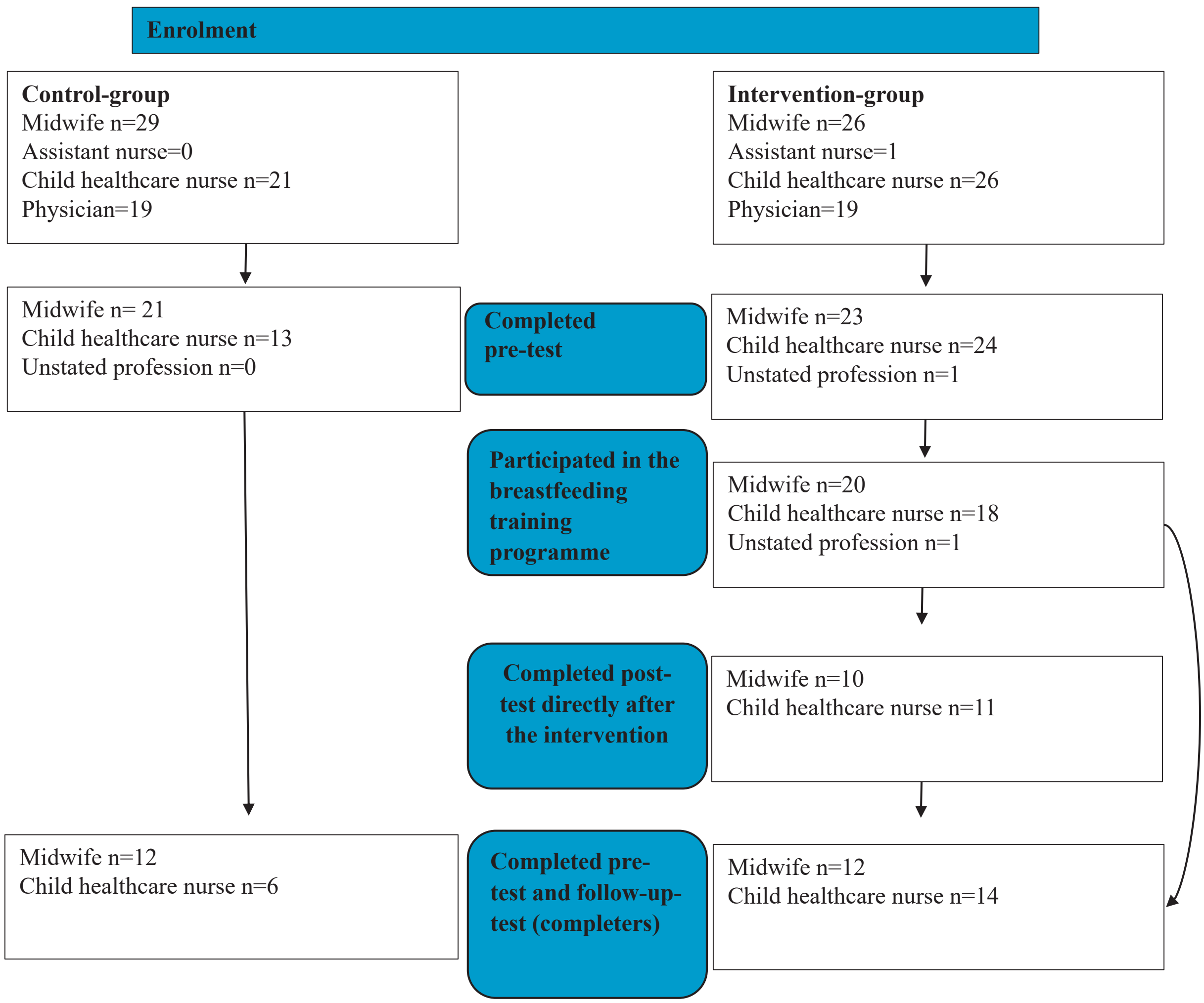

Fig. 1. Recruitment flow chart.

Table 2
Characteristics of the participants at baseline.

	Control n = 18	Intervention n = 26	P-value
Age, mean (SD)	44 (9.3)	43 (9.6)	0.816[a]
Years of experience in the field, mean (SD)	12 (9.8)	9 (6.5)	0.387[a]
Profession, n (%)[c]			0.227[b]
Midwife	12 (66.6 %)	12 (46.2 %)	
Child healthcare nurse	6 (33.3 %)	14 (53.8 %)	

Note: SD, standard deviation. Significant P-values are given in **bold**. P-values are from two-sided [a] Welch's two-sample t-tests and [b] Fisher's exact test, respectively.

intervention (completers). Among the IG participants, 25 (96.2 %) had viewed the web lectures before the training day, and all attended the inter-professional training day. Of the 26 participants in the IG, 12 (46.2 %) were midwives and 14 (53.8 %) were child healthcare nurses. Among the CG participants, 12 (66.7 %) were midwives and 6 (33.3 %) were child healthcare nurses (Fig. 1).

Changes in the healthcare professionals' attitudes instrument scores from baseline to follow-up

In general, participants had positive attitudes towards breastfeeding in accordance with the recommendations set forth by the WHO at baseline. For all HATTIS questions, the median score was 3 or higher on the 1–4 scale at baseline. In the IG, the distribution of responses tended to shift upwards at follow-up. The results can be found in the Supplementary material (Tables S1 and S2). Table S3 displays the percentage and number of individuals who changed their responses after the intervention.

Table 3 shows that the intervention had a statistically significant effect on nine of the 15 HATTIs items immediately after the training programme (post-intervention). The largest increase was observed for the item: 'It is appropriate for infants to wait until they are six months old before tasting samples' ($p = 0.000$).

The difference between the IG and CG at one-year follow-up was significant for five HATTIS items: 'Infants can have commercial milk formula in the evening if they breastfeed frequently at night' ($p = 0.002$), 'It is inappropriate for a mother to breastfeed a one-year-old child in a restaurant' ($p = 0.017$), 'It is appropriate for infants to breastfeed every three hours' ($p = 0.020$), 'When a mother has bleeding nipples, it is appropriate for her to be informed that it is okay to give commercial milk formula milk' ($p = 0.023$) and 'It is important for infants to have uninterrupted sleep at night' ($p = 0.047$).

Discussion

This study reveals that the breastfeeding training programme significantly enhanced HCPs' attitudes towards continued breastfeeding

Table 3
Results for the intervention effect in the intervention group (IG) versus (v) the control group (CG).

Question	CG Md Baseline	Md Follow-up	P-value Baseline v Follow-up	IG Md Baseline	Md Post-intervention	Md Follow-up	P-value Baseline v. Post-intervention	P-value Baseline v. Follow-up	P-value Post-intervention v. Follow-up	IG v. CG P-value IG v. CG at Baseline	P-value IG v. CG at Follow-up
It is appropriate for infants to breastfeed every three hours	2.5	3	1	3	3.5	3	0.594	0.143	0.945	0.312	**0.020**
Some mothers who breastfeed for a long time bond with the child in a way that excludes the partner	4	4	1	4	4	4	0.281	0.109	0.656	0.635	0.129
Parents should receive information that the WHO recommends continuing breastfeeding for two years or longer	3	3	0.766	3	4	4	**0.019**	**0.014**	0.234	0.862	0.134
The nutrients in breast milk decrease when the infant is around six months	3.5	3	0.766	3	4	4	**0.009**	**0.028**	0.062	0.912	0.123
I receive good information from baby food companies about when to start feeding my infant with solid foods	3	3	1	3	4	3	0.064	0.817	0.014	0.968	0.672
It is important for infants to have uninterrupted sleep at night	3	3	1	3	4	4	**0.003**	**0.038**	0.172	0.779	**0.047**
Infants can have commercial milk formula in the evening if they breastfeed frequently at night	3	3	1	3	4	4	**0.012**	**0.009**	0.398	0.316	**0.002**
Mothers with breastfeeding problems seek help themselves if they need it	3	3	1	3	3	3	0.187	0.683	0.145	0.872	0.624
When a mother has bleeding nipples, it is appropriate for her to be informed that it is acceptable to give commercial milk formula milk	3	3	0.453	3	3	4	**0.036**	**0.031**	0.391	0.802	**0.023**
When the infant does not follow the weight curve, it is appropriate for the mother to supplement with commercial milk formula	3	3	0.875	3	4	3	**0.014**	0.230	0.036	0.835	0.474
It is appropriate for infants to start tasting samples at four months of age	3	3	0.070	3	4	4	**0.007**	**0.004**	0.500	0.373	0.070
At the age of four months, it is important that the infant is introduced to gluten	4	4	0.688	3	4	4	**0.003**	**0.004**	0.344	0.366	0.223
It is appropriate for infants to wait until they are six months old before tasting samples	3	3	1	3	4	4	**0.000**	**0.001**	0.180	0.551	0.093
It is inappropriate for a mother to breastfeed a	4	4	0.500	4	4	4	0.391	**0.031**	1	0.053	**0.017**

(*continued on next page*)

Table 3 (*continued*)

Question	CG Md Baseline	Md Follow-up	P-value Baseline v Follow-up	IG Md Baseline	Md Post-intervention	Md Follow-up	P-value Baseline v. Post-intervention	P-value Baseline v. Follow-up	P-value Post-intervention v. Follow-up	IG v. CG P-value IG v. CG at Baseline	P-value IG v. CG at Follow-up
one-year-old child in a restaurant											
It is important to refer breastfeeding mothers to peer support	3	3	0.312	3	3	3	0.123	0.498	0.172	0.765	0.148

The table displays medians and p-values from various tests, investigating whether the intervention had an effect. IG v CG was assessed using the Wilcoxon Rank-Sum Test, while the other p-values were obtained from Wilcoxon Signed-Rank Tests comparing values within the intervention group at two time points. All tests involving the IG were one-sided in the direction hypothesising that the intervention increased scores, except for the post-intervention to follow-up comparison, where the p-value reflects a one-sided test investigating whether scores declined between the post-intervention and follow-up assessments. The comparison of the CG at baseline and follow-up was two-sided. Due to non-responses at post-intervention, sample sizes are smaller for comparisons involving this time point. Higher scores indicate a more favourable attitude towards breastfeeding, in line with recommendations from the World Health Organisation.

in accordance with the recommendations set forth by the WHO. Participants in the IG also exhibited notable improvements in various aspects, including a more favourable attitude towards waiting until 6 months before introducing complementary foods. The IG also demonstrated an increased tendency to normalise nighttime breastfeeding and abstained from recommending the supplementation of commercial milk formula in the evening, particularly when infants breastfed frequently at night or when women encountered issues such as bleeding nipples.

Furthermore, participants in the IG displayed more positive attitudes towards continued breastfeeding for 2 years or more and disagreed with statements suggesting a decline in the nutritional value of breast milk at 6 months, as well as with the notion that it is inappropriate for a mother to breastfeed a 1-year-old infant in a restaurant. These findings indicate that HCPs in the IG have adopted a less regulatory approach to breastfeeding, with a greater focus on the infant's needs. This is consistent with a previous study using a process-oriented training programme, which also found that HCPs adopted a less regulatory stance towards breastfeeding [19].

HCPs are expected to protect, promote, and support breastfeeding [11]. However, they often exhibit negative attitudes towards the WHO's recommendations that infants should be exclusively breastfed for six months [2,12]. These attitudes may be influenced by cultural norms in Sweden that are not fully aligned with the WHO guidelines [3], as well as by HCPs' personal breastfeeding experiences [12] and the influence of marketing strategies employed by the commercial milk formula and food industries [14].

In this study, the training programme sought to counteract such attitudes by focusing on evidence-based breastfeeding care [2,11]. Additionally, HCPs reflected on their own breastfeeding experiences and were trained to actively listen to parents' breastfeeding journeys, which may enhance their attitudes towards the WHO's recommendations [3,23], and their ability to offer informed, evidence-based choices and support tailored to families' needs. This approach is important, as women prefer support that helps them achieve their breastfeeding goals, which can improve their overall breastfeeding experiences [9]. After the training programme, HCPs in the IG were less likely than those in the CG to agree with statements suggesting that infants should have uninterrupted sleep at night or that infants should receive commercial milk formula in the evening if they breastfeed frequently. In The Lancet's series on breastfeeding, researchers emphasised that, to mitigate unwarranted recommendations for commercial milk formula, HCPs require knowledge about the normalcy of frequent breastfeeding and nocturnal awakenings as normal infant behaviours [24]. Moreover, HCPs in the IG exhibited a more favourable attitude towards refraining from offering commercial milk formula when mothers encountered breastfeeding issues. This observation holds significance considering reports from Swedish women indicating inadequate support from HCPs in resolving breastfeeding issues [25]. Finally, HCPs in the IG showed a heightened inclination to delay the introduction of complementary foods until the age of 6 months, aligning with the guidelines established by the WHO [2].

HCPs in the IG exhibited more positive attitudes towards continued breastfeeding for 2 years or more [2] and were more sceptical of the misconception that the nutritional value of breast milk diminishes when the infant reaches 6 months of age. Reports from women who wish to breastfeed indicate that HCPs at child healthcare centres often pressure them to introduce solid foods prematurely as the infant approaches 6 months [9]. Such practices should be avoided, as a gradual introduction of solid foods can support prolonged breastfeeding [26].

Previous reports from Sweden indicate that parents often feel uncertain or fear negative reactions when women breastfeed in public [27,28]. HCPs in the IG displayed improved attitudes towards women breastfeeding 1-year-old infants in public, which is important because parents require support and information regarding their right to breastfeed publicly. To ensure equitable breastfeeding support for families, comprehensive evidence-based breastfeeding training for HCPs is recommended [15]. The healthcare system should provide structured education and training for HCPs who support families throughout the breastfeeding journey [15]. This is particularly relevant in countries such as Sweden, where adherence to the WHO recommendations may not align with prevailing cultural norms [2,3].

Previous studies from Sweden and the USA suggested that HCPs' attitudes towards breastfeeding tend to remain stable over time[19,29]. The results of the present study indicate that the positive attitudes achieved within the IG remained after one year. However, short breastfeeding programmes, such as the one used here, may necessitate repetition every one to two years to maintain their impact.

In conclusion, the findings indicate that the training programme enhanced the attitudes of midwives and child healthcare nurses towards promoting breastfeeding in accordance with the WHO's recommendations. The programme is well suited for implementation in clinical practice.

Limitations

HCPs working in antenatal clinics and child healthcare centres are key persons in providing breastfeeding support, and they were included and trained together in this study, which can be seen as a strength [15]. However, this study is not without limitations, and one is the non-randomised design. Additionally, the lack of physician participation, consistent with findings from a previous study conducted in Sweden [20], highlights the challenge of engaging physicians in breastfeeding support. In this study, the research team received the following comments from heads of the child healthcare centres concerning reasons for physicians' non-participation: 'Physicians do not have time allocated for education', 'Child healthcare nurses are the breastfeeding experts' and

'Physicians do not provide breastfeeding advice'. In contrast, a Swedish study reported that women often received unsolicited advice from physicians, for example, to cease nighttime breastfeeding, introduce solid foods at 4 months, or reduce breastfeeding after 6 months [9]. Another limitation is that individuals within the IG and CG interacted as part of their daily work, making it likely that they discussed the intervention with each other, violating the statistical assumption of independent observations. This is unavoidable in a study of this kind due to the way healthcare work is structured in the studied region. In addition, because of the limited range of possible responses to each question, ties were common, which may affect the study's statistical power [30]. Finally, this study was conducted in a single region of Sweden, and the results may not be directly generalisable to other international or cultural contexts.

CRediT authorship contribution statement

Ingrid Blixt: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Philip Fowler:** Writing – review & editing, Writing – original draft, Formal analysis. **Ove Axelsson:** Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Eva-Lotta Funkquist:** Writing – review & editing, Writing – original draft, Validation, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Ethics approval and consent to participate

Ethical scrutiny and approval were provided by the Regional Ethical Review Board at Uppsala University (Dnr 2020–01425). All participants received both verbal and written information about the study and were given the opportunity to ask questions. They were informed about the voluntary nature of participation and that they could terminate their participation at any time. All participants were also informed that submitting the online questionnaire would be considered as implied consent to participate before inclusion. Trial registration: ACTRN12623000648628, registered retrospectively on 15th June 2023.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Availability of data and materials.

The datasets used and/or analysed are available from the corresponding author upon reasonable request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.srhc.2025.101152.

References

[1] Victora CG, Bahl R, Barros AJ, Franca GV, Horton S, Krasevec J, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet 2016;387(10017):475–90.
[2] World Health Organization. Infant and young child feeding. 2023. [cited 2025 May 24]. https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding.
[3] National Board of Health and Welfare. Statistics on Breastfeeding. 2020. [cited 2025 May 24]. https://sdb.socialstyrelsen.se/if_amn/val.aspx.
[4] Claesson IM, Myrgård M, Wallberg M, Blomberg M. Pregnant women's intention to breastfeed; their estimated extent and duration of the forthcoming breastfeeding in relation to the actual breastfeeding in the first year postpartum-a Swedish cohort study. Midwifery 2019;76:102–9.
[5] Odom EC, Li R, Scanlon KS, Perrine CG, Grummer-Strawn L. Reasons for earlier than desired cessation of breastfeeding. Pediatrics 2013;131(3):e726–32.
[6] Ayers S, Crawley R, Webb R, Button S, Thornton A. What are women stressed about after birth? Birth (Berkeley, Calif) 2019;46(4):678–85.
[7] Jackson L, De Pascalis L, Harrold J, Fallon V. Guilt, shame, and postpartum infant feeding outcomes: A systematic review. Mater Child Nutr 2021;17(3):e13141.
[8] Borra C, Iacovou M, Sevilla A. New evidence on breastfeeding and postpartum depression: the importance of understanding women's intentions. Mater Child Health J 2015;19(4):897–907.
[9] Blixt I, Johansson M, Hildingsson I, Papoutsi Z, Rubertsson C. Women's advice to healthcare professionals regarding breastfeeding: "offer sensitive individualized breastfeeding support"- an interview study. Int Breastfeeding J 2019;14:51.
[10] Gavine A, Shinwell SC, Buchanan P, Farre A, Wade A, Lynn F, et al. Support for healthy breastfeeding mothers with healthy term babies. Cochrane Database Syst Rev 2022;10(10):Cd001141.
[11] World Health Organization. Ten steps to successful breastfeeding. 2018. [cited 2025 May 24]. https://www.who.int/teams/nutrition-and-food-safety/food-and-nutrition-actions-in-health-systems/ten-steps-to-successful-breastfeeding.
[12] Duarte ML, Dias KR, Ferreira D, Fonseca-Gonçalves A. Knowledge of health professionals about breastfeeding and factors that lead the weaning: a scoping review. Cienc Saude Colet 2022;27(2):441–57.
[13] Ojantausta O, Pöyhönen N, Ikonen R, Kaunonen M. Health professionals' competencies regarding breastfeeding beyond 12 months: a systematic review. Int Breastfeeding J 2023;18(1):55.
[14] Rollins N, Piwoz E, Baker P, Kingston G, Mabaso KM, McCoy D, et al. Marketing of commercial milk formula: a system to capture parents, communities, science, and policy. Lancet (London, England) 2023;401(10375):486–502.
[15] Blixt I, Rosenblad AK, Axelsson O, Funkquist EL. Breastfeeding training improved healthcare professional's self-efficacy to provide evidence-based breastfeeding support: a pre-post intervention study. Midwifery 2023;125:103794.
[16] Handley MA, Lyles CR, McCulloch C, Cattamanchi A. Selecting and improving quasi-experimental designs in effectiveness and implementation research. Ann Rev Public Health 2018;39:5–25.
[17] Oras P. Care for the New-Born Breastfeeding and Skin-to-Skin Contact [dissertation]. Uppsala. Uppsala University; 2020. http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-421577.
[18] World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. JAMA. 2013;310(20):2191-4.
[19] Ekström A, Widström AM, Nissen E. Process-oriented training in breastfeeding alters attitudes to breastfeeding in health professionals. Scand J Public Health 2005;33(6):424–31.
[20] Gerhardsson E, Oras P, Mattsson E, Blomqvist YT, Funkquist EL, Rosen-blad A. Developing the Preterm Breastfeeding attitudes Instrument: a tool for describing attitudes to breastfeeding among health care professionals in neonatal intensive care. Midwifery 2021;94:102919.
[21] Scott J, McInnes R, Tappin D, Guthrie E. Breastfeeding_opinions_knowledge_management_practices_and_training_of_Scottish_midwives [cited 2025 May 24] Research Gate 2003. https://www.researchgate.net/publication/304567661_Breastfeeding_opinions_knowledge_management_practices_and_training_of_Scottish_midwives.
[22] World Health Organization. The International code of marketing of breastmilk substitutes. 1981. [cited 2025 September 04]. https://www.who.int/teams/nutrition-and-food-safety/food-and-nutrition-actions-in-health-systems/code-and-subsequent-resolutions.
[23] Ekström A, Matthiesen AS, Widström AM, Nissen E. Breastfeeding attitudes among counselling health professionals. Scand J Public Health 2005;33(5):353–9.
[24] Pérez-Escamilla R, Tomori C, Hernández-Cordero S, Baker P, Barros AJD, Bégin F, et al. Breastfeeding: crucially important, but increasingly challenged in a market-driven world. Lancet (London, England) 2023;401(10375):472–85.
[25] SALAR. The national pregnancy survey. Sammanfattning av resultat per 1 januari – 31 December 2022. 2023. [cited 2025 May 24]. https://skr.se/download/18.4d8a68f7188420c4004d4a15/1686292464785/Graviditetsenk%C3%A4ten-Sammanfattning-av-resultat-fr%C3%A5n-2022.pdf.
[26] Stern J, Funkquist EL, Grandahl M. The association between early introduction of tiny tastings of solid foods and duration of breastfeeding. Int Breastfeeding J 2023;18(1):4.
[27] Blixt I, Axelsson O, Funkquist EL. Partners' experiences of breastfeeding: a qualitative evaluation of a breastfeeding support intervention in Sweden. Intl Breastfeeding J 2024;19(1):6.
[28] Dykes C, Ny P, Hauck YL, Kuliukas L, Gallagher L, Brady V, et al. Women's perceptions of factors needed to encourage a culture of public breastfeeding: a

cross-sectional study in Sweden, Ireland and Australia. Int Breastfeeding J 2023;18 (1):49.
[29] Patterson JA, Keuler NS, Eglash AR, Olson BH. Outpatient Breastfeeding Champion Program: Breastfeeding support in Primary Care. Breastfeeding Med: Official J Academy Breastfeeding Med 2020;15(1):44–8.
[30] Chlaß N, Krüger JJ. Small sample properties of the Wilcoxon signed rank test with discontinuous and dependent observations (No 2007, 032) Jena Economic Research Papers. 2007.