A Process-Oriented Breastfeeding Training Program for Healthcare Professionals to Promote Breastfeeding: An Intervention Study

Anette Ekström,¹ Elisabeth Kylberg,¹ and Eva Nissen^{1,2}

Abstract

Aim: The aim of the study was to evaluate the effects of process-oriented training in supportive breastfeeding counseling for midwives and postnatal nurses on the time lapse between the initial breastfeeding session, introduction of breastmilk substitutes and solids, and the duration of breastfeeding.

Materials and Methods: Ten municipalities in Sweden were randomized to either the intervention or control groups. The intervention included a process-oriented training program for midwives and postnatal nurses in the intervention municipalities. Primiparas ($n=540$) living in either an intervention or control municipality were asked to participate in a longitudinal study to evaluate the care given. Data collection for control group A (CGA) ($n=162$) started before the intervention was initiated. Data for control group B (CGB) ($n=172$) were collected simultaneously with the intervention group (IG) ($n=206$). The mothers responded to questionnaires at 3 days, 3 months, and 9 months postpartum.

Results: As a result of the process-oriented training program for midwives and postnatal nurses, the IG mothers had a significantly longer duration of exclusive breastfeeding, even if the initial breastfeeding session did not occur within 2 hours after birth, than the corresponding group of CGA mothers ($p=0.01$). Fewer infants in the IG received breastmilk substitutes (in the first week of life) without medical reasons compared with the control groups ($p=0.01$). The IG infants were significantly older (3.8 months) when breastmilk substitutes were introduced (after discharge from the hospital) compared with the infants in the control groups (CGA, 2.3 months, $p=0.01$; CGB, 2.5 months, $p=0.03$).

Conclusion: A process-oriented training program for midwives and postnatal nurses was associated with a reduced number of infants being given breastmilk substitutes during the 1st week without medical reasons and delayed the introduction of breastmilk substitutes after discharge from the hospital.

Introduction

DIFFERENT FACTORS, SUCH AS breastfeeding knowledge and confidence, affect the duration of breastfeeding.¹⁻³ Evidence-based information is significant in guaranteeing good quality in breastfeeding counseling,⁴ and several studies have focused on healthcare professionals' breastfeeding knowledge and attitudes.⁵ Women's expectations of how long they would be breastfeeding in relation to the actual breastfeeding experience differed among women who planned to breastfeed partially and women who planned to breastfeed exclusively. The impact of giving an infant food other than breastmilk on the duration of breastfeeding depends on several factors, such as the infant's age at introduction, what is

introduced, how much, how often, and how.⁶ The World Health Organization recommends that mothers should be supported to breastfeed exclusively for 6 months; thereafter, adequate and safe complementary foods should be combined with continued breastfeeding for 2 years or more.⁶ In 2003, the National Food Administration, the National Board of Health and Welfare, and the Ministry of Health and Social Affairs presented a common recommendation supporting mothers to exclusively breastfeed for up to 6 months; thereafter, the organizations recommended that mothers continue to breastfeed in combination with adequate complementary foods for up to 1 year or longer, according to the mother's preference.⁷ To promote an extended duration of breastfeeding, early initiation of breastfeeding has been shown to be of utmost

¹School of Life Sciences, University of Skövde, Skövde, Sweden.

²Division of Reproductive and Perinatal Health Care, Department of Woman and Child Health, Karolinska Institutet, Stockholm, Sweden. This study is registered with the Australian New Zealand Clinical Trials Registry with trial registration number ACTRN12611000354987.

importance,^{8–10} but the relationship with professional support is sparsely described.

Child Health Care (CHC) is organized into local clinics all over Sweden and gives recommendations about feeding. The CHC also plays an important role in how parents actually feed their infants. At the time of this study, CHC recommended that parents introduce solids at 4–6 months of age, with more emphasis on 4 months than on the range of 4–6 months.¹¹ Hörnell et al.⁶ showed that breastmilk substitutes but not solids limit breastfeeding duration when introduced before 6 months. Evidence to date supports this recommendation with exclusive breastfeeding during the first 6 months, but further research in industrialized countries is needed.

Earlier studies show the importance of providing counseling to parents to achieve exclusive breastfeeding during the first 6 months.^{12,13} This study is part of a larger intervention study that includes a process-oriented program on breastfeeding management and promotion for midwives and postnatal nurses from prenatal and child health centers. Earlier results showed that the process-oriented training influenced prenatal midwives and postnatal nurses to be more positive in encouraging breastfeeding; postnatal nurses in particular improved their attitudes. The process-oriented training improved counseling attitudes, especially reducing control behaviors and increasing facilitating behaviors in regard to breastfeeding mothers.¹⁴ In addition, the results showed that mothers were more satisfied with the emotional and informative support provided by the midwives and the postnatal nurses during the first 9 months postpartum.¹⁵ Mothers also felt better prepared to take care of their babies' needs and were better informed about breastfeeding.¹⁶

The aim

The aim of the study was to evaluate the effects of process-oriented training in supportive breastfeeding counseling for midwives and postnatal nurses on the time lapse between the initial breastfeeding session, introduction of breastmilk substitutes and solids, and the duration of breastfeeding.

Hypotheses

Through process-oriented training for prenatal midwives and postnatal nurses, a changed attitude toward more facilitating support could have the following effects for mothers and infants. The following hypotheses were tested:

1. H1: The initiation of breastfeeding will occur earlier, and the introduction of breastmilk substitutes and solids will occur later.
2. H2: Fewer infants will receive breastmilk substitutes (with no medical reason) in the first week of life.
3. H3: The expected results above will affect the duration of breastfeeding in a positive way.

Subjects and Methods

Setting

This study is part of a larger intervention study (see below) that includes a process-oriented program on breastfeeding management and promotion (Appendix), which was conducted during 2000–2003 in the southwest of Sweden. The county consists of 13 municipalities and comprises urban,

suburban, and rural districts with 280,000 inhabitants. Approximately 2,500 births occur annually at maternity clinics. The prenatal and child health centers in the county serve urban/suburban and rural districts. The pregnant women meet a midwife at the prenatal care center outside the hospital approximately eight to 11 times during pregnancy. Most women give birth at the hospital, and the care within the delivery and maternity wards is provided by midwives not known to the woman. The average length of hospital stay is between 6 hours and 4 days, and a child health nurse from the CHC takes over responsibility for the infant after he or she is discharged from the hospital and continues until the child is 6 years of age.

Intervention

Phase 1. The process-oriented training program for midwives and postnatal nurses for support during childbirth and breastfeeding. Based on the findings of a baseline study^{6,16} the 10 largest municipalities in the selected area were paired according to their size and the duration of breastfeeding in those municipalities. The paired municipalities were randomly designated to the intervention (five municipalities) or control (five municipalities) groups. Furthermore, prenatal midwives and postnatal nurses were allocated to the intervention or control groups depending on whether the midwives' and nurses' work site had been selected as an intervention municipality or as a control municipality.^{15,19} A process-oriented training program¹⁷ in breastfeeding counseling was conducted for the midwives and postnatal nurses from the intervention municipalities from September 1999 through March 2000 (Fig. 1). The teaching program was composed of evidence-based lectures with collegial discussions on professional stance, reflective processes, problem-solving processes, and practical skills in relation to providing support during childbirth and breastfeeding (Appendix).

Phase 2. The sample of mothers and the data collection procedures. The mothers included in this study had either been cared for by healthcare professionals in the five intervention municipalities as described above or by healthcare professionals in the five control municipalities. Consequently, the mothers who were recruited for the study lived in either the intervention municipalities or the control municipalities. The mothers did not know if their prenatal midwife and postnatal nurse had taken the process-oriented training program (intervention group [IG]) or not (control groups). The sample size was based on results from the baseline study^{6,16} to detect a difference between the IG group and the control groups of 1 month of exclusive breastfeeding with $\beta = 0.8$ and $\alpha = 0.05$.

Before the process-oriented training program commenced, data were collected for a baseline group called control group A (CGA) ($n = 148$). Data for control group B (CGB) ($n = 160$) and IG ($n = 172$) were collected simultaneously (Fig. 1). This design allowed changes and any spillover effects of the intervention to be detected over time. CGA and CGB were drawn from the same five municipalities.

Inclusion criteria. Swedish-speaking, healthy, first-time mothers who gave birth to single, healthy, full-term babies delivered spontaneously, by vacuum extraction, or by

FIG. 1. Flow diagram of how mothers were enrolled in the study. Data were collected for questionnaire number 1 at 1–3 days postpartum from control group A (CGA) from April 2000 to July 2001 and from the intervention group (IG) and control group B (CGB) from November 2000 to April 2002. Follow-up with questionnaires number 2 and number 3 occurred at 3 and 9 months postpartum, respectively.

cesarean section were enrolled. The mothers had been cared for either by healthcare professionals in the intervention municipality, as described above, or by healthcare professionals in the control municipalities.

Exclusion criteria. Mothers were excluded who had given birth to babies with life-threatening diseases or malformations, for example, life-threatening illness such as very severe asphyxia.

Information about all mothers who fulfilled the inclusion criteria and had been cared for at the prenatal and child health clinics in the municipalities selected for this study was consecutively collected from the hospital registry, and the mothers were invited to participate in the study. In total, 584 mothers were recruited; of those, 480 gave their informed consent to participate in the study (Fig. 1).

Questionnaires

Obstetric data were collected from birth records, and three different questionnaires were developed for follow-up at 3 days, 3 months, and 9 months postpartum. The caregivers in

the maternity wards distributed the first questionnaire to participants on day 3 after childbirth. The questionnaire covered sociodemographic background (see Table 1), the time of the initial breastfeeding session, and whether the baby was given breastmilk substitutes during the first week (see Table 2). The questionnaires at 3 months and 9 months were sent to the mothers and covered questions about breastfeeding and the use of breastmilk substitutes and/or introduction of solids (see Table 3). One reminder was sent for each questionnaire to those mothers who did not respond. Mothers who had not responded to the questions regarding breastfeeding duration, breastmilk substitutes, or introduction of solids received a follow-up telephone call.

Definitions

At the time of the study, the National Board of Health and Welfare defined breastfeeding as follows:¹¹ *Exclusive breastfeeding* was defined as breastfeeding with occasional use of water, breastmilk substitutes (not more than a few times), and/or solids (not more than 1 tablespoon/day). *Partial breastfeeding* was defined as infants who received breastmilk

and breastmilk substitutes (every day) and/or solids (more than 1 tablespoon/day). *Total breastfeeding* was defined as the duration of exclusive and partial breastfeeding.¹¹ The *initial breastfeeding session* was defined as the first breastfeeding episode postpartum. *Supplementation within the first week for medical reasons* applied to infants who received breastmilk substitutes in the maternity ward because of maternal, medical ill health and infants at risk of having low blood glucose levels, as well as infants cared for in the neonatal ward or infants who had lost more than 10% of their birth weight. *Supplementation within the first week without medical reasons* was defined as those infants who received breastmilk substitutes for reasons such as that the infant was crying, the mother was tired, or the staff had advised the mother to give extra as she was not producing enough milk. *Introduction of solids* was defined as the time when 1 or more tablespoons of solids daily were introduced.

Statistics

For the statistical analyses of the results, we used the Statistical Package for the Social Sciences (SPSS version 14.0, SPSS, Inc., Chicago, IL). Central measurements were presented as mean with dispersion by SD. To test differences among the groups, independent *t* test, one-way analyses of variance, and Tukey's Honestly Significant Different test for post hoc comparisons were performed. The χ^2 test was performed on categorical data. Values of $p \leq 0.05$ were considered significant.²⁰

Pilot test

The three questionnaires developed for this study were pilot-tested by 20 mothers for acceptability and face validity, and the questionnaires were corrected before data collection began. In addition, an expert group of midwives and pediatric nurses was consulted to establish the content validity of the questionnaires. Thus, a few minor corrections were made to the wording.

Ethical considerations

The Ethics Committee of the Medical Faculty of Gothenburg University, Gothenburg, Sweden, approved the study.

Results

Response rate and dropouts

The response rate for the three questionnaires is shown in Figure 1. Sixty-one percent of the mothers completed all three questionnaires. The obstetric data for the participants and the external dropouts did not differ significantly (Table 1). There were no significant differences regarding background data, time for introduction of supplementary feeding (breastmilk substitutes or solids), or breastfeeding duration between the mothers who had answered just the first questionnaire compared with those who had answered all three questionnaires.

Sociodemographic background and obstetric data

Sociodemographic background and obstetric data are shown in Table 1. There were no significant differences among IG, CGA, and CGB with regard to age, educational level, or marital status. Furthermore, there was no significant difference among the groups concerning the mode of delivery.

Initiation of breastfeeding

The breastfeeding initiation rate was high in all groups: 90% initiated breastfeeding within the first 24 hours, and 97% initiated breastfeeding within the first 3 days. No significant differences were found between IG (with 100% initiating breastfeeding) and CGA and CGB (with 97% initiating breastfeeding).

In the IG, 40% of mother-infant couples initiated breastfeeding within 2 hours of birth. The corresponding figures were 45% for CGA and 40% for CGB with no significant

TABLE 1. SOCIODEMOGRAPHIC AND OBSTETRIC BACKGROUND OF MOTHERS IN THE INTERVENTION GROUP (IG) AND CONTROL GROUPS (CGA AND CGB)

	IG (n=172)	CGA (n=148)	CGB (n=160)
Age (years) (SD)	26.6 (4.5)	27.2 (4.6)	27.0 (5.0)
Gestational weeks (SD)	40.4 (1.4)	40.5 (1.4)	40.4 (1.4)
Education (%)			
Compulsory school	6 (3%)	5 (3%)	3 (2%)
High school	77 (37%)	73 (45%)	71 (41%)
University	74 (36%)	55 (34%)	62 (36%)
Other	14 (7%)	15 (9%)	21 (12%)
Missing	35 (17%)	14 (9%)	15 (9%)
Marital status (%)			
Cohabitation (3 days postpartum)	125 (61%)	102 (63%)	118 (69%)
Married	42 (20%)	43 (27%)	38 (22%)
Single	3 (1.5%)	2 (1%)	2 (1%)
Other	1 (0.5%)	3 (2%)	2 (1%)
Missing	35 (17%)	12 (7%)	12 (7%)
Obstetric data (%)			
Vaginal delivery	146 (70%)	120 (74%)	129 (75%)
Cesarean section	32 (16%)	22 (14%)	31 (18%)
Vacuum extraction/forceps	28 (14%)	20 (12%)	12 (7%)

Data are mean (SD) values or number (%).

difference found among the groups. If the initial breastfeeding session did not occur within 2 hours after birth, the IG mothers breastfed exclusively for a significantly longer period than the corresponding group of CGA mothers ($df=2$, $F=4.43$, $p=0.01$). Among the CGA mothers, those who breastfed within 2 hours had a significantly longer duration of exclusive breastfeeding than those who did not initiate breastfeeding within 2 hours ($df=2$, $F=3.45$, $p=0.03$). No effect of the point in time for first breastfeeding session and duration of exclusive breastfeeding was found in CGB.

Intake of breastmilk substitutes during the infants' first week of life in relation to breastfeeding duration

Fewer IG infants received breastmilk substitutes during the first week *without medical reasons* (10%) compared with infants in CGA (20%) and CGB (14%) ($\chi^2=5.04$, $df=1$, $p=0.01$, for all three groups) (Table 2). Those infants who had received breastmilk substitutes without medical reasons had a significantly shorter duration of exclusive breastfeeding compared with those infants who did not receive breastmilk substitutes in all groups: IG, $df=152$, $t=2.4$, $p=0.02$; CGA, $df=116$, $t=3.03$, $p=0.01$; CGB, $df=130$, $t=2.48$, $p=0.01$. Fewer infants in the IG received breastmilk substitute on one occasion during the first week than infants in both control groups (IG, 0.3%; CGA, 2.3%; CGB, 2.6%; $p=0.005$). There were no significant differences between infants who received breastmilk substitute for more than one occasion during the first week among the groups.

Infant age at introduction of breastmilk substitutes after discharge from the hospital in relation to breastfeeding duration

The IG infants were significantly older when breastmilk substitutes were used every day, compared with the infants in the control groups: IG, 3.8 months; CGA, 2.3 months, $p=0.01$; CGB, 2.5 months ($p=0.03$) (Table 3). There was no significant correlation between the infant's age at the introduction of breastmilk substitutes every day after discharge from the hospital and the duration of total breastfeeding in any of the groups.

Infant age at introduction of solids in relation to breastfeeding duration

There were no significant differences among the groups with regard to the infants' age at the introduction of solid foods at more than 1 tablespoon/day (Table 3). There was no significant correlation between the infant's age at the introduction of solids and the duration of total breastfeeding in any of the groups.

Duration of breastfeeding

Data were analyzed for the duration of exclusive breastfeeding for IG (mean=3.9, SD=2.2 months), for CGA (mean=3.2, SD=1.7 months), and for CGB (mean=3.5, SD=2.0 months). There was a significant difference between IG and CGA ($p=0.02$). Data were also analyzed for the

TABLE 2. BREASTFEEDING DURATION IN RELATION TO TIME OF THE INITIAL BREASTFEEDING SESSION AND BREASTMILK SUBSTITUTE DURING THE INFANTS' FIRST WEEK FOR MOTHERS IN THE INTERVENTION GROUP AND THE CONTROL GROUPS

	IG (n=172)		CGA (n=148)		CGB (n=160)			p value ^a			
	n	Mean (SD) months	n	Mean (SD) months	n	Mean (SD) months	F test	IG vs. CGA	IG vs. CGB	CGA vs. CGB	
Exclusive breastfeeding in relation to ^b											
Initial breastfeeding session within 2 hours of birth ^c	49	5.2 (3.4)	57	4.8 (2.2)	54	5.0 (2.5)	0.18	0.82	0.92	0.98	
Initial breastfeeding session after 2 hours of birth ^c	69	5.3 (1.8)	41	3.9 (2.3)	56	4.9 (2.7)	4.43	0.01	0.60	0.12	
No breastmilk substitute in the first week of life ^c	140	4.9 (2.1)	90	4.7 (2.5)	106	5.0 (2.5)	0.54	0.66	0.90	0.61	
Breastmilk substitute in the first week of life without a medical reason ^c	18	3.6 (2.3)	28	3.2 (2.5)	26	3.2 (3.0)	0.20	0.85	0.97	0.87	
Breastmilk substitute in the first week of life with a medical reason ^c	9	7.4 (6.4)	9	5.6 (2.5)	9	4.0 (2.5)	1.58	0.72	0.20	0.59	
Total breastfeeding in relation to ^b											
Initial breastfeeding session within 2 hours of birth ^c	47	7.1 (4.9)	52	7.8 (4.2)	44	7.5 (4.2)	0.32	0.71	0.90	0.95	
Initial breastfeeding session after 2 hours of birth ^c	67	8.4 (4.3)	44	6.7 (3.5)	43	6.7 (3.5)	3.27	0.07	0.12	0.96	
No breastmilk substitute in the first week of life ^c	131	7.6 (4.6)	86	7.6 (4.8)	106	7.4 (4.8)	0.08	1.00	0.93	0.95	
Breastmilk substitute in the first week of life without a medical reason ^c	16	6.1 (3.7)	24	4.9 (4.7)	23	6.1 (3.9)	0.58	0.68	1.00	0.60	
Breastmilk substitute in the first week of life with a medical reason ^c	9	8.5 (6.7)	9	8.5 (2.6)	8	5.1 (2.6)	1.61	0.72	0.12	0.59	

^aBy Tukey's Honestly Significant Difference test.

^bDependent variable.

^cIndependent variable.

TABLE 3. TIME OF INTRODUCTION (BABY'S AGE IN MONTHS) OF BREASTMILK SUBSTITUTE AND SOLIDS IN THE INTERVENTION GROUP AND CONTROL GROUPS

	IG (n=172)		CGA (n=148)		CGB (n=160)		F test	p value ^a		
	n	Mean (SD) months	n	Mean (SD) months	n	Mean (SD) months		IG vs. CGA	IG vs. CGB	CGA vs. CGB
Introduction of breastmilk substitute	80	3.8 (5.1)	79	2.3 (2.7)	75	2.0 (2.5)	5.50	0.01	0.03	0.83
Introduction of solids	143	4.3 (0.7)	115	4.2 (0.1)	122	4.3 (0.1)	0.15	0.87	1.00	0.91

^aBy Tukey's Honestly Significant Difference test.

duration of any breastfeeding for IG (mean=7.5, SD=4.7 months), for CGA (mean=7.1, SD=4.6 months), and for CGB (mean=7.0, SD=4.5 months). At 9 months, 23% of all mothers had stopped breastfeeding (IG, 29%; CGA, 22%; CGB, 17%). There was no significant difference among the groups with regard to the duration of total breastfeeding.

Discussion

This study showed that process-oriented training for prenatal midwives and postnatal nurses was associated with specific effects on mothers' feeding practices. All mothers met the same professionals in the maternity ward; the only difference was that the IG mothers had met specially trained midwives during pregnancy in contrast to the control mothers who had not met specially trained midwives during pregnancy. A possible explanation is that IG mothers were better informed about good breastfeeding routines, which might result in less frequent use of breastmilk substitutes (without medical reasons) in the first week of life than in the control groups. The introduction of breastmilk substitutes every day occurred significantly later in the IG than in both control groups. The introduction of solids did not differ among the groups.

There were no significant differences among the groups regarding the point-in-time for the initial breastfeeding session. If the CGA mothers' initial breastfeeding session did not occur within the first 2 hours after birth, the mothers breastfed exclusively for a significantly shorter duration than those who initiated breastfeeding within 2 hours. These results are in line with other researchers' findings, showing that early initiation of breastfeeding is associated with breastfeeding success.⁸⁻¹⁰ However, a delayed initial breastfeed did not shorten the duration of exclusive breastfeeding in the IG, probably because of the supportive care, which buffered the negative event of a delayed first breastfeeding session.

Indeed, as a result of the process-oriented training program for midwives and postnatal nurses, a lower number of IG infants received breastmilk substitutes without medical reasons during the first week of life than the infants in the control groups. Infants who received breastmilk substitutes without medical reasons had a significantly shorter duration of exclusive breastfeeding compared with infants who did not receive breastmilk substitutes during the diest week in all groups. In addition, the IG infants were significantly older when breastmilk substitutes were introduced every day compared with the infants in the control groups. Whether this is a cause or consequence, researchers have shown that daily breastmilk substitute feeding is associated with a shorter duration of breastfeeding.³ Results in our study confirm the

findings of Hörnell et al.,⁶ who showed that the introduction of breastmilk substitutes decreased breastfeeding duration, whereas introducing solids did not influence the duration. The younger the infants were when they were regularly introduced to breastmilk substitutes, the younger the infants were when they stopped breastfeeding.^{2,6} Koehler et al.²¹ evaluated different types of nutritional counseling on infant diet in a randomized controlled trial; they found that face-to-face counseling seemed to have the best effect. Earlier studies also show the importance of support with breastfeeding counseling for parents to achieve exclusive breastfeeding during the first 6 months.^{12,13} In the Swedish setting, where almost all infants and parents meet the prenatal midwife and the postnatal nurse, there are frequent opportunities to talk to parents and strengthen appropriate breastfeeding support.

In this study, only 40% of the infants had their initial breastfeeding session within 2 hours of birth. The reason for the low initiation of breastfeeding within the first 2 hours in the present study is not known. We may speculate that mothers were exposed to pain medication during labor such as pethidine²² or epidural,²³ which delays the first sucking occasion. It is also possible that the mother and her newborn infant were separated soon after birth in order to perform other caring tasks, such as examination of the newborn or allowing the mother to have a shower, etc. If so, this indicates unsatisfactory maternity practices, which may result in a delayed breastfeeding start. In a previous study, we found a much higher rate of early initiation of breastfeeding⁹ where approximately 70% of the mothers breastfed their baby within the first hours after birth. In the previous study, the mothers answered the question when the child was between 9 and 12 months compared with this study, when the question was answered 3 days after birth. Perhaps the different results are caused by the different timing of the question. More implementation studies of obstacles in co-care for the mother and her infant in the first hours after birth are needed, including a careful mapping of what actually happens with the mother and infant during the first hours after birth.

The methodological approach in this study with two control groups, one before the intervention and one parallel with the intervention, was helpful in order to evaluate the intervention from a time perspective.²⁰ More differences were found when the IG was compared with CGA (where data were collected before the intervention) than when the IG was compared with CGB (where data were collected simultaneously with the IG). The results show that changes also take place among the controls when an intervention is being rolled out. In midwives' and postnatal nurses' professional networks, knowledge and information are shared, which easily lead to spillover effects

between intervention and control professionals. These results thus demonstrate the value of using a historic control group, with reference to the spillover effect.²⁰ This intervention should have been strengthened by including midwives and nurses working in the delivery and maternity wards.

Conclusion

A process-oriented training program for midwives and postnatal nurses was associated with reducing the number of infants being given breastmilk substitutes during the first week without medical reasons and delaying the introduction of breastmilk substitutes after the infants were discharged from the hospital.

Acknowledgments

This study was supported by the Skaraborg Institute for Research and Development, School of Life Sciences of the University of Skövde, Sweden; the Primary Care Unit in Skaraborg and the Science Committee, Central Hospital, Skövde, Sweden; and the Board of Research for Health and Caring Sciences, Swedish Research Council, with grant numbers K1999-27P-13085-01A and K2001-27P-13085-036.

Disclosure Statement

All authors were active in the design, data collection, analysis, and writing up of the study. All authors also read and approved the final manuscript. This manuscript has not been sent to any other scientific journal, and there are no conflicts of interest or funding of the research in this manuscript.

References

- Thulier D, Mercer J. Variables associated with breastfeeding duration. *J Obstet Gynecol Neonatal Nurs* 2009;38:259–268.
- Chezem J, Friesen C, Boettcher J. Breastfeeding knowledge, breastfeeding confidence, and infant feeding plans: Effects on actual feeding practices. *J Obstet Gynecol Neonatal Nurs* 2003;32:40–47.
- Hogan S. Overcoming barriers to breastfeeding: Suggested breastfeeding promotion programs for communities in eastern Nova Scotia. *Can J Public Health* 2001;92:105–108.
- Miracle D, Fredland V. Provider encouragement of breastfeeding: efficacy and ethics. *J Midwifery Womens Health* 2007; 52:545–548.
- World Health Organization. *Global Strategy for Infant and Young Child Feeding*. World Health Organization, Geneva, 2003.
- Hörnell A, Hofvander Y, Kylberg E. Introduction of solids and formula to breastfed infants: A longitudinal prospective study in Uppsala, Sweden. *Acta Paediatr* 2001;90:477–482.
- National Board of Health and Welfare. *Breastfeeding, Children Born 2007*. National Board of Health and Welfare, Stockholm, 2009.
- De Chateau P, Holmberg H, Jakobsson K, et al. A study of factors promoting and inhibiting lactation. *Dev Med Child Neurol* 1977;19:575–584.
- Ekström A, Widström A-M, Nissen E. Duration of breastfeeding in Swedish primiparous and multiparous women. *J Hum Lact* 2003;19:172–178.
- Salariya E, Easton P, Cater JI. Infant feeding. Duration of breastfeeding after early initiation and frequent feeding. *Lancet* 1978;2:1141–1143.
- National Board of Health and Welfare. *Breast-Feeding, Children Born 2002*. National Board of Health and Welfare, Stockholm, 2004.
- Britton C, McCormick F, Renfrew M, et al. Support for breastfeeding mothers. *Cochrane Database Syst Rev* 2007;(1): CD001141.
- Guisse JM, Palda V, Westhoff C, et al. The effectiveness of primary care-based interventions to promote breastfeeding: Systematic evidence review and meta-analysis for the US Preventive Services Task Force. *Ann Fam Med* 2003; 1:70–80.
- Ekström A, Widström A, Nissen E. Process-oriented training in breastfeeding alters attitudes to breastfeeding in health professionals. *Scand J Public Health* 2005;33:424–431.
- Ekström A, Widström A, Nissen E. Does continuity of care by well-trained breastfeeding counselors improve a mother's perception of support? *Birth* 2006;33:123–130.
- Ekström A, Widström A-M, Nissen E. Breastfeeding support from partners and grandmothers: perceptions of Swedish women. *Birth* 2003;30:261–266.
- Jerlock M, Falk K, Severinsson E. Academic nursing education guidelines: tool for bridging the gap between theory, research, and practice. *Nurs Health Sci* 2003;5:219–228.
- World Health Organization, UNICEF. *Protecting, Promoting and Supporting Breastfeeding: The Special Role of Maternity Services*. World Health Organization, Geneva, 1989.
- Ekström A, Nissen E. A mother's feelings for her infant are strengthened by excellent breastfeeding counseling and continuity of care. *Pediatrics* 2006;118:309–314.
- Machin D, Campbell LM, Walters S. *Medical Statistics. A Textbook for the Health Sciences*, 4th ed. Wiley & Sons, Chichester, UK, 2007.
- Koehler S, Sichert-Hellert W, Kersting M. Measuring the effects of nutritional counseling on total infant diet in a randomized controlled intervention trial. *J Pediatr Gastroenterol Nutr* 2007;45:106–113.
- Nissen E, Lilja G, Matthiesen AS, et al. Effects of maternal pethidine on infants developing breastfeeding behaviour. *Acta Paediatr* 1995;84:140–145.
- Thorvaldsen S, Roberts CL, Simpson JM, et al. Intrapartum epidural analgesia and breastfeeding: A prospective cohort study. *Int Breastfeed J* 2006;11:1–24.

Address correspondence to:
Anette Ekström, R.N.M., Ph.D.
School of Life Sciences
University of Skövde
Box 408
SE 541 28 Skövde, Sweden
E-mail: anette.ekstrom@his.se

Appendix: The Process-Oriented Training Program for Healthcare Professionals

Definition of the process-oriented training program

To change healthcare professionals' attitudes, the training program was based on a literature review and collegial discussions containing professional stance, reflective processes, problem-solving processes, and practical skills in relation to support during childbirth and breastfeeding. The healthcare professionals were trained in problem-solving, reflection, decision-making in terms of competence, and personal qualifications to ensure that they would be ready to meet the demands of their profession.¹⁷

The process-oriented training program involved 7 days of lectures, and the main theme brought up was the participants' own breastfeeding experiences (private and professional), breastfeeding attitudes, breastfeeding counseling, and collaboration and communication between prenatal centers and child health centers in line with World Health Organization recommendations.¹⁸ Midwives and postnatal nurses were asked to reflect on different areas in breastfeeding support. The supervisors on the

training program were chosen to strengthen the process between the healthcare centers and the hospital wards. The following topics were chosen by the healthcare professionals as homework:

- How do we protect, promote, and support breastfeeding?
- How do we inform parents about parenthood and family life?
- How do we broaden our minds in order to help parents from another cultural background?
- How can you share parental leave on an equal basis, or should we not do this?
- What is attachment, and how do parents best support attachment?
- What happens if postnatal depression occurs?
- Relationships with healthcare professionals and significant others.
- How do we support families with complicated deliveries?
- How do we best support parent–infant interaction when the infant is cared for on the neonatal ward?
- How do we talk about lifestyle problems?
- How do we approach single parents?