Midwifery (2009) **25**, 50–61

midwifery

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A systematic review of education and evidence-based practice interventions with health professionals and breast feeding counsellors on duration of breast feeding

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Received 7 August 2006; received in revised form 7 November 2006; accepted 8 January 2007

Abstract
Objective: to examine the effects of training, education and practice change interventions with health professionals and lay breast feeding educator/counsellors on duration of breast feeding.
Review methods: this was part of a series of reviews of interventions that affect duration of breast feeding. Full details of methods used, including search strategy, are reported separately.
Selection criteria for included studies: randomised controlled trials, non randomised controlled trials with concurrent controls and before after studies (cohort or cross-sectional), undertaken in a developed country, published between 1980 and 2003 in any language. The primary outcome was duration of breast feeding. Secondary and process outcomes, including attitude, knowledge and behaviour change of participants, were included from papers that also reported breast feeding duration outcomes.
Study-quality assessment: inclusion and exclusion criteria were applied, data extracted and study quality assessments made by one reviewer and independently checked by another, with a third reviewer to resolve differences, as recommended by the NHS Centre for Reviews and Dissemination's guidance for reviews.
Findings: the search identified nine papers. All were before after studies that included the education of health professionals; no studies were identified that related to breast feeding counsellors. In six of the studies, the participants were working with mothers and babies in hospitals (three in the UK, two in Italy and one in France); in three studies, the participants were working in community settings (Canada, Spain and the USA). Two UK studies and two non-UK studies (Spain and USA) involved mothers living in disadvantaged areas. Most interventions aimed to increase knowledge and change professional practice in support of breast feeding.
Key conclusions: many of the studies reviewed have methodological limitations. Study settings and contexts vary and lack comparability. Evidence from these studies was insufficient to draw conclusions about overall benefit or harm associated with the interventions. From the studies identified, there seems to be no single way that consistently achieves changes in breast feeding duration. From one of the methodologically more robust studies, it seems that

0266-6138/$ - see front matter
doi:10.1016/j.midw.2007.01.006

UNICEF/WHO Baby Friendly Hospital Initiative (BFI) training might have the potential to influence breast feeding duration.
Recommendations for further research: further testing of the BFI initiative within a controlled design. Future research into the education of health-care professionals that relates to the support of breast feeding women should have appropriate theoretical underpinning, describe educational programmes and the context of care delivery comprehensively and use standardised time points in the assessment of the effect of interventions. Intermediate outcomes should also be reported, including those related to the effect on education and practice.

Keywords Systematic review; Intervention; Training; Education; Practice change; Breast feeding duration

Introduction

The advantages of breast feeding for the health of women and their babies are clearly documented (Gwinn et al., 1990; Howie et al., 1990; Newcombe et al., 1994; Kramer et al., 2001). Rates of initiation of breast feeding vary considerably between countries. In the UK, the initiation rate is relatively low, and a high proportion of mothers discontinue breast feeding early (Hamlyn et al., 2002). In addition, there is a socio-economic gradient associated with breast feeding: women from lower socio-economic groups are less likely to breast feed, thus compounding social disadvantage (Hamlyn et al., 2002). A range of issues influences women's decision to and duration of breast feeding; these include society, policy, media, the delivery of care and availability of support mechanisms. The World Health Organization (WHO) recommendation for exclusive breast feeding to continue until a baby reaches 6 months (WHO, 2003) has been endorsed in the UK. Other recent UK policy initiatives include the need to achieve a 2% increase in the initiation of breast feeding among socially disadvantaged women (DoH, 2003) and the introduction of *Healthy Start*, which replaces the previous Welfare Food Scheme and calls upon health-care professionals to identify women and families requiring extra help with breast feeding and achieving an appropriate diet (DoH, 2005a, b).

In March 2003, the Health Development Agency (HDA) commissioned a systematic review of public health interventions aimed at promoting the duration of breast feeding. This review was commissioned to fill a gap in review level evidence about duration of breast feeding identified in previous work commissioned by the HDA (Protheroe et al., 2003). The HDA function was incorporated into the work of the National Institute for Health and Clinical Excellence in April 2005.

The purpose of the review was to inform UK practice; however, the findings are of relevance to non-UK settings, as evidence from other settings defined as developed countries (Renfrew et al., 2005) was included. A series of linked systematic reviews of interventions was organised into four main themes including public policy, public health and clinical interventions. This paper reports on the fourth main theme: the effects of training, education and practice change interventions with health professionals and lay breast feeding educator/counsellors on duration of breast feeding.

Support from an appropriately skilled practitioner can have positive effects on women's initiation, duration and experiences of breast feeding (Sikorski et al., 2002). The preliminary education provided to health-care professionals who support breast feeding women varies in amount, scope, orientation and philosophical model (predominantly illness/health vs. family centred, societal perspectives), educational level, and assessment strategy. This preparation seems to be inadequate and fragmented (Smale et al., 2006), particularly for pre- and post-graduate training of medical practitioners.

In addition to health-care professionals, a further important source of support for breast feeding women comes from voluntary trained breast feeding counsellors and peer supporters. Information about the process and curriculum to prepare voluntary breast-feeding supporters is available from national and international organisations, including the National Childbirth Trust and La Leche League; these programmes involve both theoretical and practical components. The perspectives and expertise of women and breast-feeding counsellors has only recently been incorporated into UK education programmes for health professionals (Jack et al., 2001), and such involvement is still not common practice. Dykes (2003) reviewed 79 Infant Feeding Projects funded by the Department of Health, and identified 16 education or training interventions for health professionals; voluntary breast feeding organisations were reported as contributing to these in five cases, with two additional initiatives that incorporated evidence-based practice components.

Evidence-based practice initiatives in midwifery have often been developed as a response to changes in service delivery. Such initiatives have involved the development of evidence-based guidelines for care during labour (Walsh et al., 1999; Spiby and Munro, 2001), but timescales for development and introduction have not always allowed the incorporation of control groups into evaluations. The production of evidence-based guidelines alone will not usually achieve changes in professional practice, and introduction accompanied by an interactive educational programme is usually more effective (Bero et al., 1998). Moderately effective strategies for changing professional practice involve audit, feedback and the involvement of local opinion leaders; educational materials alone and didactic approaches to education are usually ineffective in changing professional practice (Haines and Donald, 1998).

Methods

Full details of methods for the full series of reviews have been reported elsewhere (Renfrew et al., 2005). The search strategy for the series of reviews was conducted in accordance with the NHS Centre for Reviews and Dissemination's guidance for reviews of research on effectiveness (Khan et al., 2001). Medline, CINAHL and 17 other electronic databases were searched from 1980 to June 2003. Three sets of key words designed to capture studies of clinical and public health interventions influencing breast feeding were used. The search was not restricted by language or outcome. Three key journals (*Health Promotion International*, *Health Education Quarterly* and *Journal of Human Lactation*) were hand searched. Around 63,000 citations were identified and reviewed independently by two reviewers. A total of 940 papers were obtained and allocated to the various reviews in the series.

As recommended by Khan et al. (2001), inclusion and exclusion criteria were applied, data extracted and study quality assessments made by one reviewer and independently checked by another; differences were resolved by a third reviewer. For the review reported here, studies to be included were randomised controlled trials, non randomised controlled trials with concurrent controls and before–after studies (cohort or cross-sectional), undertaken in a developed country and published between 1980 and 2003 in any language. The primary outcome was duration of breast feeding. Data from time points beyond the first feed were considered breast feeding duration data for the purposes of this review. Studies with no breast feeding duration data were excluded. Secondary and process outcomes, including attitude, knowledge and behaviour change among health-care professionals, women's views and costs of the intervention were included from papers that included the primary outcome. Quality appraisal was developed to address the range of study designs.

Included studies were described, their quality assessed and their findings examined. Meta-analysis was not appropriate because of the range of methodologies, contexts and study details reported.

Findings

Nine studies were located that reported interventions targeted at health professionals. All used before–after designs; no randomised controlled trials were identified. Three studies were conducted in the UK, two in the US and Canada, and the remaining four in mainland Europe. Four were relevant to those working with women living in areas of socio-economic deprivation. Eight papers reported education or training interventions, and one an evidence-based practice initiative. Information about the setting, participants and interventions in the included studies is presented in Table 1. Breast feeding duration outcomes and the times at which these were measured are shown in Table 2.

Quantitative quality scores were not allocated to studies to avoid possible implication of spurious accuracy and inappropriate interpretation of findings (Renfrew et al., 2005); this appeared particularly important in the context of the range of different research methods used. The following attributes of study quality were assessed: sampling frame and method, whether or not *a priori* sample size calculation was reported, clarity of inclusion and exclusion criteria, comparability of groups for possible co-factors, reporting of withdrawals and appropriateness of analysis. Randomisation was reported in one study but not the means by which this was achieved (Durand et al., 2003); three (Hartley and O'Connor, 1996; Grant et al., 2000; Cattaneo and Buzzetti, 2001) calculated sample size a priori. Inclusion criteria for staff receiving the intervention were specified in three papers (Stokoe et al., 1994; Hartley and O'Connor, 1996; Ingram et al., 2002). Three of the seven papers that reported withdrawals did so by study group and with reasons (Grant et al., 2000; Cattaneo and Buzzetti, 2001; Ingram et al., 2002). Interpretation of results in five papers was difficult because of problems including presentation as percentages

Table 1 Included studies: settings, participants and interventions.

Author, year and country	Setting	Participants (*n*)	Intervention
Cattaneo and Buzzetti (2001), Italy	Four hospitals (three general and one teaching) in North and South Italy	Eight hospitals; 571 health workers; 2669 mother–baby pairs (birth weight > 2000 g)	UNICEF 18-hour training course (training for trainers) and 2-hour WHO counselling training
Durand et al. (2003), France	Teaching hospital	73 staff (midwives and paediatricians); 100 mother–baby pairs; 50 before and 50 after the intervention	Standardised 3-day seminar for staff
Gainotti and Pagani (1980), Italy	Hospital serving a population of peasant farmers, crafts people, artisans and teachers	650 mother–baby pairs; 325 before and 325 after the intervention	Increasing staff awareness of the psychological and biological aspects of breast feeding
Grant et al. (2000), UK	Hospital serving a deprived area of South London	1568 mothers; 702 before and 866 after the intervention	Evidence-based guidelines supported by education sessions, newsletters, audit and feedback, and educational materials
Hartley and O'Connor (1996), USA	Clinic at a women's health centre of a university hospital serving a disadvantaged community, primarily African–American women	Records of 180 babies, 90 before and 90 after the intervention	Best start, a breast-feeding education programme for health professionals and clerical staff comprising didactic education based on social marketing theory
Ingram et al. (2002), UK	Teaching hospital postnatal ward serving predominantly white women living in a lower socio-economic area of city with low uptake of breast feeding	1400 mothers of babies born at 35–43-week gestation	'Hands off' technique taught to hospital midwives and health-care assistants in 45-min training workshops, subsequently taught to mothers
Manitoba Pediatric Society and Committee on Breast Feeding (1982), Canada	Urban, rural and Indian reservation settings in Manitoba	556 mothers; 277 before and 279 after intervention	Education provided by the committee of the Manitoba Paediatric Society, including seminars to doctors, public health nurses and home economists; guidelines provided plus information to general public
Matilla-Mont and Rios-Jimenez (1999), Spain	Paediatric clinic in a socio-economically deprived area of Barcelona	209 mothers; 96 before and 113 after the intervention	Two public health nurses raised awareness of the importance of breast feeding among clinic staff and changed clinic organisation to improve co-ordination and access for mothers
Stokoe et al. (1994), UK	All Oxfordshire women who gave birth during two 1-month periods	90% of midwifery workforce (number not stated); 1007 mothers, 532 before and 475 after the intervention	Eleven training sessions for midwives led by the hospital breast-feeding adviser. Content addressed problems identified by women in prior survey

Table 2 Breast-feeding duration outcomes and times measured.

Author, year and country	Participants (n)	Time measured	Breast-feeding duration outcomes
Cattaneo and Buzzetti (2001), Italy	Eight hospitals; 571 health workers; 2669 mother–baby pairs (birthweight > 2000 g)	Hospital discharge; 3 and 6 months	After training, significant differences in exclusive breast feeding at hospital discharge (at least $p < 0.05$); 3 months exclusive plus partial breast feeding; 6 months any breast feeding
Durand et al. (2003), France	73 staff (midwives and paediatricians); 100 mother–baby pairs; 50 before and 50 after the intervention	12 weeks	No significant difference in duration of any breast feeding
Gainotti and Pagani (1980), Italy	650 mother–baby pairs; 325 before and 325 after the intervention	Hospital discharge; 6 days	Exclusive breast feeding: before 48%, after 90%; mixed feeding: before 37%, after 7%. Bottle feeding: before 15%, after 3%
Grant et al. (2000), UK	1568 mothers; 702 before and 866 after the intervention	12 weeks	Ever breast fed: before 91%, after 91%; ever exclusively breast fed: before 75%, after 74%; proportion of ever exclusively breast fed that stopped before 11 weeks: before 40%, after 36%
Hartley and O'Connor (1996), USA	Records of 180 babies; 90 before and 90 after the intervention	Hospital discharge; 2 weeks	Hospital discharge increased significantly: before 15%, after 31% ($p < 0.03$); 2 week non-significant increase: before 13%, after 13%
Ingram et al. (2002), UK	1400 mothers of babies born at 35–43-week gestation	2 and 6 weeks	At 2 weeks significant increase in any ($p = 0.005$) and exclusive breast feeding; 6 weeks no significant differences
Manitoba Pediatric Society and Committee on Breast Feeding (1982), Canada	556 mothers; 277 before and 279 after the intervention	Hospital discharge; 2–4 months	No difference in breast feeding at discharge; at 2 months significantly more urban (50%) than rural (36%) babies breast fed after intervention ($p < 0.05$)
Matilla-Mont and Rios-Jimenez (1999), Spain	209 mothers; 96 before and 113 after the intervention	3 months	Exclusive breast feeding: before 31.4%, after 50.4%; mixed feeding: before 9.4%, after 7.1%; bottle feeding: before 59.4%, after 42.5%; mean duration any breast feeding: before 4 months, after 6 months
Stokoe et al. (1994), UK	90% of midwifery workforce (number not stated); 1007 mothers, 532 before and 475 after the intervention	2 weeks	Exclusive breast feeding: before 55.2%, after 58.1%; mixed feeding: before 23.8%, after 19.1%; discontinued breast feeding: before 19%, after 14.4%

without denominators; analysis was appropriate in four papers (Hartley and O'Connor, 1996; Grant et al., 2000; Cattaneo and Buzzetti, 2001; Ingram et al., 2002) but could not be determined clearly in the remainder. Additional quality assessment issues for each study are described in the study summaries below.

Cattaneo and Buzzetti (2001) described the effect of providing the 18-hour UNICEF training to prepare eight hospitals for the Baby Friendly

Hospital Initiative (BFI) in Italy. The study was conducted in two groups of four hospitals, in North and South Italy between 1996 and 1998. UNICEF training was augmented with a 2-hour WHO counselling training session. There was an initial period of assessment in both groups of hospitals, followed by training for trainers, subsequently cascaded to health professionals in the first group. This was followed by a second assessment phase and implementation of the intervention in the second group of hospitals. Third assessments occurred in both groups 5 months after completing training. Data collection methods included the self-assessment tool of the BFI, a questionnaire for the trainees, interviews with mothers at discharge from hospital, and telephone interviews after 3 and 6 months. The findings included an increase in compliance with the BFI Ten Steps. Health professionals' knowledge increased after training. Significant differences ($p<0.05$) were demonstrated, with more mothers reporting exclusive breast feeding at discharge, full breast feeding at 3 months and any breast feeding at 6 months. Changes were seen for both groups of hospitals. Following logistic regression, full breast feeding at 4 months was significantly associated with exclusive breast feeding at discharge and previous experience of breast feeding. In addition to the quality assessment issues described above, there is no reassurance that factors other than the intervention did not affect outcome. Although there is a suggestion of some adjustment for potential confounders, the mechanism for this is unclear, even though information is included about withdrawals.

Durand et al. (2003) reported a feasibility study exploring the introduction of an education programme based on the WHO 10 Steps in a Level 3 maternity facility in Grenoble. Training was provided as a standardised 3-day seminar of theory and practice with 10 participants per group. All maternity care professionals were targeted and 73 members of staff completed training between early 1998 and early 2000. The selection of these individuals and their proportion of the total workforce trained are not reported. Outcome data were collected from the case notes of 50 women, randomly selected before the introduction of the training programme, and a further 50 women who received care after the introduction of the training programme. The two groups of women gave birth over 6 months, between July and December 1997 and January and July 2000. Breast feeding was initiated by a similar proportion of women (76%); no differences were detected between groups for the median duration of breast feeding (12 weeks). Other changes observed after the training included fewer babies separated from their mothers overnight and less use of formula feed in hospital. More women reported feeling informed about breast-feeding positions ($p<0.05$), that advice given by maternity personnel was very or fairly consistent ($p<0.04$), and being informed about sources of support available after discharge from hospital ($p<0.01$). In addition to the quality assessment issues reported above, this study reports withdrawals, although reasons are not given, and there also seems to be considerable time between women receiving care from staff who had received the intervention and distribution of the data collection instrument.

Gainotti and Pagani (1980) described work carried out with staff working with mothers and babies in one hospital in Como, Italy. Practice at that time was reported to include the transfer of babies to a nursery after birth and babies being brought to their mothers for feeding with care provided by nurses. The aim of this work was to modify the cultural and psychological attitudes of neonatal personnel, to increase staff awareness of psychological aspects of breast feeding and beneficial properties of breast milk. The authors report that preparatory work was undertaken with staff but the content is not described. Emphasis was given to following Leboyer-type approaches to birth, supporting 'skin to skin' contact, keeping mother and baby together for the first 2 hours after birth and early breast feeding. The breast feeding outcomes reported for women who received the staff training intervention were exclusive feeding, mixed feeding and bottle feeding at hospital discharge (6 days). Findings were reported on 325 women before (48%, 37% and 15%, respectively), and 325 women after the intervention (90%, 7% and 3%, respectively; statistical significance of these findings is not reported in the paper). A lack of information on issues related to outcomes and withdrawals suggests that caution is necessary in the interpretation of this work.

Grant et al. (2000) reported a programme of evidence-based practice change conducted between 1998 and 1999 at a teaching hospital serving a deprived community in South London between 1998 and 1999. Evidence-based guidelines were developed that focused on three aspects of care related to breast feeding selected from the UNICEF UK Baby Friendly Hospital Initiative (BFI): antenatal discussion of breast feeding with women; promotion of 'skin-to-skin' contact with early breast feeding, and the prevention of neonatal hypoglycaemia and the care of babies with breast feeding difficulties. The guidelines were supported by a programme of educational interventions, audit and

feedback, one-to-one and group discussion, newsletters and provision of educational material, targeted at staff and facilitated by an experienced midwife. Sample size was based on a priori power calculation. When their babies were 12 weeks old, 442 women who gave birth in hospital or at home before the intervention period completed postnatal questionnaires; after the intervention period had ceased 469 women contributed data. Other data collection included audit data, using specific tools. Professional practices that changed significantly included providing women with evidence-based leaflets and discussion about baby feeding during pregnancy and 'skin-to-skin' contact on the labour ward. No significant differences in breast-feeding initiation, duration or in the number of babies re-admitted to hospital were detected, although there was an increase in re-admission due to jaundice. Grant et al. (2000) provide details of method of allocation and factors that might have affected outcome, including the study hospital's existing commitment to the BFI. Groups were comparable for possible confounding factors and some withdrawals were accounted for.

Hartley and O'Connor (1996) reported an evaluation of the 'Best Start' breast-feeding education programme conducted between 1993 and 1994 in a hospital centre for women's health care in Ohio, USA. The programme was presented to medical, nursing and secretarial staff at the women's health centre serving an urban area of socio-economic disadvantage. The training used a didactic approach to the provision of information about breast feeding, in order that staff could answer women's questions appropriately. The second component of that 3-hour training comprised an introduction to 'Best Start' educational techniques based on the theory of social marketing or promotion of socially beneficial practices. Sample sizes were calculated to detect a doubling of existing breast-feeding rates. The aim was to provide a three-step approach to education for women during their antenatal appointments. These included enquiry to identify and acknowledge concerns about breast feeding, explanation of the benefits of breast feeding and specifically asking women not to make a decision about feeding method at the first discussion. Lactation nurses were available to help mothers to initiate breast feeding during the 24-hour postpartum inpatient stay. Mothers received one home visit within the first 72 hours after discharge from hospital and a lactation clinic was available for mothers with breast-feeding problems. Data collection used babies' hospital charts and records of attendance at a children's hospital outpatient department 2 weeks after birth. Ninety mother baby pairs were included at each time point who were comparable for several demographic factors, including ethnicity, parity and type of payment for care. Rates of breast feeding at discharge increased from 15% to 31% after the education programme ($p<0.03$). At 2 weeks postpartum, an increase was still apparent (13% vs. 21%, $p<0.2$) but did not achieve the target difference. Data for small subgroups of women reflect benefits for women under 20 years of age and over 30 years of age; for African American women, a statistically significant difference was observed (12% vs. 31%, $p<0.01$). One key factor is that most of the mothers contributing data to the study were also recipients of the Women, Infants and Children Supplemental Nutrition Programme. It is unclear whether the groups were comparable for this possible confounding factor; there is some reporting of withdrawals but analysis seems appropriate.

Ingram et al. (2002) reported a study conducted at a teaching hospital in South Bristol in which hospital midwives used a 'hands-off' approach to supporting attachment. Outcomes of interest included incidence of breast-feeding problems and effect on breast-feeding duration. The population served by the hospital had low rates for initiation and continuation of breast feeding. Women who lived in South Bristol all received postnatal care on one designated postnatal ward at the start of the study, which took place in four phases between October 1996 and November 1998. The first phase comprised collection of baseline data. A research fellow then provided training to the hospital midwives and health-care assistants; this consisted of 45-minute workshops incorporating physiology, rationale and eight practice points for using a 'hands-off' technique, a video and practical work. During phase two, hospital midwives taught women to use these techniques; a research midwife assessed a sample of 395 mothers for use of the techniques through observation and use of a scoring system. Phase three continued the work of phase two; a research midwife also provided leaflets to mothers reinforcing the technique. In phase four, hospital midwives continued to provide guidance and to distribute the leaflet. Data were collected from women using postal questionnaires or, for a small number, follow-up phone calls at two (1173 women in total) and 6 weeks (1071 women) postpartum. No significant differences between the groups were detected for parity, intention to breast feed or breast feeding within 1 hour of birth. During phase four, significant organisational changes occurred in the hospital, necessitating caution in the interpretation of results. The percentage of total

breast-feeding women recruited at each stage was 74%, 68%, 68% and 58% for the four phases of the research. The decline in recruitment may lead to an ascertainment bias, as it cannot be ruled out that those most likely to agree to being recruited are more likely to breast feed. Although withdrawals from the study and the reason for these were reported, the lack of comparability between groups and lack of adjustment for confounding factors suggest caution in the interpretation of results. Data collected at 2 weeks postpartum reflect significant differences in exclusive and any breast feeding; at 6 weeks postpartum no significant differences were detected. Mothers with high scores for 'hands off' technique were significantly more likely to be breast feeding at 6 weeks (OR 2.4; CI 1.3–4.3).

The Committee on Breast feeding of the Manitoba Paediatric Society reported a range of educational activities targeted at both professionals and the general public, carried out during 1979 (Manitoba Paediatric Society, 1982). Guidelines related to preparation for and establishing breast feeding were posted to doctors, public health nurses and home economists. Seminars were provided for staff in urban and rural hospitals, health departments, the medical school and at provincial health conferences, although information about their content and standardisation is not described. A leaflet, 'One to Grow On', was selected as the agreed and official standard for teaching about baby feeding to professionals. For the general public, the committee contributed to the development of a poster, 'Come Close to Your Baby — Be a Nursing Mother', displayed in doctors' offices, hospitals and other health-care premises. Junior and senior high schools received information encouraging the incorporation of education on baby feeding into curricula. Public newsletters, press releases and media interviews were also used. Rates of breast feeding before and after the intervention were determined by telephone interview when babies were about 6 months old. Information about feeding method at discharge from hospital was provided by 277 and 249 mothers in the 1978 and 1979 groups respectively, together with reasons for choice of feeding method, discontinuation of breast feeding and when the latter occurred. Women providing information came from Winnipeg, rural Manitoba with a small proportion from the Indian reservations. No significant differences were detected in breast feeding at discharge between the two samples (57% vs. 56%). More babies from urban communities were breast feeding at 2 months compared with babies from rural communities (50% vs. 36%). At 2 months, increases in breast feeding were seen after the campaign for Winnipeg residents, but fewer of the rural residents were breast feeding; however, numbers and tests of statistical significance are not reported. The pattern seems to be similar for Winnipeg residents at 4 and 6 months. For rural settings, breast feeding remained less frequent after the intervention but the difference was less pronounced. During the delivery of the intervention programme, other concurrent public health interventions in progress. In addition to the quality assessment issues reported above, information relating to withdrawals was incomplete, and appropriate analysis was absent.

Two primary care nurses reported a breast-feeding promotion training intervention for staff of a paediatric clinic serving a socio-economically disadvantaged area of Barcelona. This aimed to increase breast feeding initiation, rates at 3 months and the duration of breast feeding (Matilla-Mont and Rios-Jimenez, 1999). Training was provided in 1994 to health care and other staff working at the clinic; this included nutritional advantages of breast feeding, physiology and problem solving, and aimed to help staff reflect on how their attitudes towards breast feeding might influence parents. Information was collected for 96 babies born between October 1993 to September 1994, and 113 babies born October 1995 and September 1996. Information about the content and delivery of the training, and methods of data collection, are not reported. Breast feeding rates increased between 0 month (understood to mean the first clinic visit after discharge and before 1 month of age) (58% vs. 73%) and 3 months (31% vs. 50%). The mean duration of breast feeding was also reported as 4 months before the intervention and 6 months after. It is unclear whether the two groups were comparable and withdrawals, if they occurred, have not been reported. For these reasons, and the absence of clear inclusion criteria, prior sample size calculation and appropriate analysis, results should be interpreted with caution.

Concerns about static breast-feeding rates in Oxford in 1991 triggered multi-agency partnership working to support breast feeding (Stokoe et al., 1994). During March 1993, 353 women completed questionnaires offered by health visitors at the first postnatal contact about 2 weeks after birth. Problems most commonly reported by women included difficulties with latching, sore nipples and insufficient milk supply. Eleven training sessions were subsequently provided by the hospital's breast-feeding adviser and attended by 90% of hospital midwives. The survey was repeated among women who gave birth in September 1993; 356

women completed questionnaires. Rates of initiation of breast feeding were similar at the two time points. Exclusive breast feeding increased at the time of the health visitor's first postnatal contact (55% vs. 58%), and fewer women reported changing to bottle feeding by that point (19% vs. 14%). However, reports of breast-feeding problems were higher for the second group of women. No information is provided about the content of the training programme. It is suggested that difficulties with staffing levels confounded the effect of training. A further factor that may have influenced outcomes included differences in length of postnatal hospital stay. Reporting of withdrawals was incomplete.

Discussion

No studies of training for breast feeding educators, counsellors or peer supporters were identified for inclusion in this review. One study describing the effect of Maternal Infant Health Outreach Workers in rural, very low income, isolated communities was identified in the search but excluded as the review's primary outcome of breast-feeding duration was not reported (Clinton, 1988).

A range of educational interventions for healthcare professionals was identified that aimed to increase knowledge and support breast feeding (Manitoba Pediatric Society, 1982; Stokoe et al., 1994; Hartley and O'Connor, 1996; Matilla-Mont and Rios-Jimenez, 1999; Cattaneo and Buzzetti, 2001; Durand et al., 2003). The focus of other work included trying to change unit philosophy (Gainotti and Pagani, 1980), and an evidence-based practice approach combined the introduction of evidence-based guidelines supported by other strategies (Grant et al., 2000).

The proportion of women continuing breast feeding was increased after the introduction of the 18-hour UNICEF training in eight Italian hospitals (Cattaneo and Buzzetti, 2001), albeit in the context of a very low baseline rate of breast feeding. However, Durand et al.'s (2003) feasibility study, comprising a similar intervention, had no effect on breast-feeding duration, although other important cultural changes occurred. However, of these two studies, the former achieves a higher quality assessment profile compared with that of Durand et al. (2003).

The focus of this series of reviews was to inform UK policy and practice. Therefore, as previously described, only primary research conducted in developing countries was included. We are aware of studies conducted in settings that do not meet these criteria or that have been published outside the date limits of our review. The PROBIT study, a cluster randomized controlled trial conducted in Belarus, tested an intervention based on the WHO BFI. Significant increases in the duration and exclusivity of breast feeding were seen in babies born in the intervention group sites (Kramer et al., 2001). This study was excluded from our review, as it did not meet the criteria for setting stipulated in this research.

A high-quality prospective cohort study has been conducted by the MRC Centre of Epidemiology for Child Health to evaluate the effectiveness of the UNICEF UK BFI for Maternity Services (Bartington et al., 2005). This study, based on data from the UK Millennium Cohort Study, provides clear evidence of effectiveness for the achievement of the BFI Full Accreditation Award by maternity services to increase initiation rates among all women, including women from disadvantaged and vulnerable groups. The health economics analysis of the BFI for maternity services, presented as part of the recently published clinical guideline for postnatal care, provides evidence of the cost effectiveness of this approach (National Collaborating Centre for Primary Care, 2006).

The MRC evaluation found no association between delivery in a participating BFI Maternity Unit and increased breast feeding duration at 1 month. Although the evidence of effectiveness for the package of UNICEF UK BFI in the community in England is currently limited to observational studies, evidence from other countries has indicated that a combination of both hospital-based and community-based BFI breast-feeding training and support is effective in increasing breast-feeding duration and exclusivity up to 6 months of age compared with hospital-based BFI alone (Coutinhom et al., 2005). A moderate quality, before and after evaluation of a multi-faceted intervention based on the BFI in both the hospital and community in the USA, also demonstrated significant improvements in initiation and duration rates of any breast feeding (Wright et al., 1997). Findings from these studies suggest it is the combination of the principles and practices common to both hospital- and community-based BFI that are necessary to achieve increases in the initiation and duration of breast feeding for all women.

It has been demonstrated that guidelines will not usually effect a change in practice unless they are supported by other strategies, such as interactive educational programmes (Bero et al., 1998; NHS Centre for Reviews and Dissemination, 1994). Grant et al. (2000) reported a well designed evidence-based practice initiative that included

those additional strategies with facilitation by an experienced practitioner fulfilling the role of opinion leader. The authors ascribe the lack of positive effect, in part, to aspects of hospital postnatal care. Significant changes were seen in professional practice with the potential to improve women's experiences, reflecting the importance of addressing both culture and practice, although no changes in initiation or duration of breast feeding occurred. One study, published in 2003, outside the period of our literature search, investigated the use of evidence-based guidelines as a component of protocol-based postnatal care provided by midwives in the UK over an extended duration. This high-quality, cluster randomised controlled trial focused on postnatal health problems frequently experienced by new mothers. One guideline related to breast feeding. Although other benefits to women's health were found in the intervention group, no differences in breast feeding rates were detected at 4 or 12 months (MacArthur et al., 2003). One further evidence-based practice initiative, conducted in the USA and published outside the parameters for our search strategy, evaluated an opinion leader strategy for effect on breast-feeding initiation, but effect on duration of breast feeding was not reported (Sisk et al., 2004).

Although significant increases in the proportion of women breast feeding at 12 weeks were reported by Gainotti and Pagani (1980), the relevance of this information for UK policy seems to be limited, as the context of care and care-giving practices were very different from current UK practice. The intervention reported by Hartley and O'Connor (1996) was associated with a significant change in breast feeding rates at 2 weeks, particularly among certain subgroups of women. However, the reason for the different directions of effect for urban and rural women is unknown. Ingram et al. (2002) reflected that the teaching of positioning and attachment using a 'hands off' technique can be cascaded from a trainer to midwives to women. Although the findings seem encouraging, there were confounding factors. This intervention merits testing in settings more socially and demographically diverse than the original study setting. The 'Best Start' Breast-feeding randomised controlled trial further investigating this approach found no difference in breast-feeding duration measured daily to 6 weeks and weekly to 4 months after birth (Wallace et al., 2006). The authors suggest that positioning and attachment advice needs to be consistently applied beyond the immediate postpartum (first postnatal ward) feed. Again, this was published outside the time limits of our search. One additional study published since the completion of the review reported positive effects on breast-feeding duration from education programmes. Vittoz et al. (2004) report the effect of a 3-day training programme in France that aimed to increase practitioners' knowledge of breast feeding and to develop counselling skills. A range of educational methods was used, including lectures, role-play, panel discussions and educational materials. A statistically significant effect on duration of breast feeding was observed (median duration increased by 3 weeks).

Several studies had methodological limitations, including absence of a priori power calculations, unclear presentation of data and an absence of tests of statistical significance. The main outcome of interest in this review of duration of breast feeding was measured at a range of time points, not always prospectively. The absence of repeated measurement precludes an understanding of whether initial effects were sustained over time. In some studies, information about the context and content of services is insufficient, although inevitably there will be a divergence between settings that limits the transferability of that research. The use of before–after study designs is associated with a risk of biases in participant selection and outcome measurement; other changes in practice in study settings may pass unreported.

Several of these studies were conducted in health-care settings that served women from situations of social disadvantage; such women are the focus of a current UK target for increasing both the initiation and duration of breast feeding (DoH, 2003). The methodological limitations of the studies reviewed are particularly disappointing as they offer little to the evidence base in this area. Information about the direct and indirect costs of providing educational interventions or of their cost-effectiveness was not reported. These are important issues for service providers and commissioners of health-care and health-professional education. Although several of the studies reviewed included women in situations of social disadvantage, the composition of those groups was not explicit in all studies; it is therefore likely that some groups of women affected by UK policy were missing or absent from the reported research. Future research should include health-care professionals who provide care to women from diverse cultural backgrounds, paying particular attention to the needs of women from disadvantaged groups, as stipulated in the National Service Framework for Children, Young People and Maternity Services (DoH, 2005a, b).

Little has been reported on the pre-registration education received by health professionals in the studies reviewed, in addition to the lack of

description of the content of the education interventions. Caution must, therefore, be exercised in interpreting the results of individual studies, when the knowledge levels of practitioners are not known and where there has been no reporting of intermediate outcomes, such as changes to knowledge or practice. The lack of reference to general education models is a concern. Although some interventions in the studies reviewed may have been underpinned by educational theory, that was not made explicit. In addition to methodological rigour, it is important for future studies of educational interventions to incorporate the evidence base from adult education. In addition, educational and psychological research can be used in the development of valid and reliable assessment measures that are pedagogically appropriate, linking expected knowledge outcomes to appropriate training methods (e.g. problem-based learning) (Savin-Baden, 2003). Future research should also include investigation of outcomes of educational programmes for health-care professionals delivered by different trainers (e.g. experienced breast feeding counsellors and educators with a health-care background). The evaluation of such approaches is promising but larger scale research is required (Dykes, 2003).

Many of the reviewed studies were conducted before evidence-based health care was integral to health-care systems. Future research should incorporate emerging evidence-based practice theory, as recommended by Grimshaw et al. (2004). Further work exploring the social marketing elements of Hartley and O'Connor's (1996) 'Best Start' approach, possibly with modification of the training package to avoid didactic teaching and incorporating rigorous evaluation with follow up extended beyond 2 weeks, would provide information that would inform UK practice and allow further exploration of the promising findings for certain subgroups of women. Future research should report the costs of providing training and calculate its cost-effectiveness using whole systems perspectives.

From the studies reviewed, no single approach consistently positively affected breast-feeding duration. However, from the apparently methodologically more rigorous studies, Cattaneo and Buzzetti (2001) provided evidence of the effectiveness of the UNICEF training. Replication using controlled studies would be useful, especially in the context of the studies reported above (Kramer et al., 2001; Bartington et al., 2005; Coutinhom et al., 2005) and by Merten et al. (2005) of an increase in breast-feeding duration among mothers in Switzerland who had received care in hospitals that demonstrated greater compliance with the UNICEF BFI guidelines. The implementation of other educational interventions cannot be recommended for UK practice due to methodological limitations or difference from UK practice.

At this stage, the appropriate educational approach to equip health professionals to provide the support to women stipulated in Healthy Start (DoH, 2005a, b) cannot be determined. There is, therefore, an urgent need for further research to provide the essential evidence base so that health-care professionals can deliver on this national policy.

Acknowledgements

This research was funded by the NHS HDA, now incorporated into the NHS National Institute for Health and Clinical Excellence.

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