Journal of Neonatal Nursing 25 (2019) 93–98

Contents lists available at ScienceDirect

Journal of Neonatal Nursing

journal homepage: www.elsevier.com/locate/jnn

Original Article

Evaluation of the Family and Infant Neurodevelopmental Education (FINE) programme in the UK

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ARTICLE INFO

Keywords:
Developmental care
Education and training
Infant and family centred care
Neonatology
NIDCAP

ABSTRACT

Aims: Family and Infant Neurodevelopmental Education (FINE) is a comprehensive, multidisciplinary educational pathway designed to support quality improvements in infant and family centred developmental care in neonatal services. This study aims to evaluate the impact of FINE on neonatal care in the UK.

Methods: A mixed method evaluation was based on two surveys of staff to explore perceptions of change in the care of infants, parent participation, and staff experience since the introduction of FINE. Survey 1 (S1) was conducted across a regional neonatal network where all units had sent delegates to FINE foundation courses. The Chi Squared Test was used to compare scores indicating that practice had got better, worse or stayed the same; Z numbers showed differences in perceptions between those staff who had and had not attended FINE courses. An on-line survey (S2) explored how participants from many different areas of the UK perceived the impact of FINE courses on their practice.

Results: Staff responses to Survey 1 ($n = 95$) indicated significant improvements in all areas of impact ($p < 0.001$) regardless of whether participants had ($n = 33$) or had not ($n = 62$) attended FINE courses. In general those that had attended were more positive about all areas of practice except for "infant safety" where both groups had equally positive views. Survey 2 ($n = 44$) mirrored these results with 70–95% of participants indicating that their practice had improved.

Conclusion: The results of this study suggest that FINE provides appropriate education for enhancing infant and family centred developmental care in neonatal units.

1. Introduction

Over 95,000 babies in the UK need neonatal care each year and the care they receive determines their chances of survival, long term health and development, and quality of life (Kelly, 2018; Montirosso et al., 2017). Infant and family centred developmental care is increasingly acknowledged as a vital part of neonatal care as summarised by Roué and colleagues (Roué et al., 2017) in eight key, evidence based principles: unlimited parental access, psychological support for parents, pain management, a supportive environment, postural support, skin to skin contact, breastfeeding and lactation support, and sleep protection.

Some aspects of infant and family centred developmental care are integrated into most modern neonatal practice standards and guidelines (e.g. Bliss, 2015a; EFCNI, 2018; Milette, Martel, Ribeiro da Silva et al., 2017a; Milette, Martel, Ribeiro da Silva et al., 2017b; NHS Department of Health, 2009; White et al., 2013) but despite supportive policies the key principles are not always fully integrated into practice (Greisen et al., 2009; Losacco et al., 2011; Pallás-Alonso et al., 2012). Policies do not implement themselves; staff education and training are crucial for quality improvement. While information is widely available, skills training in this area of practice is not. In the absence of inspired leadership it may be difficult for staff who have had little exposure to exemplary practice to envision opportunities beyond their own experience and consequently to identify the need for training. Family and Infant Neurodevelopmental Education (FINE) (Warren, 2017) aims to deliver a universal education and training programme. Bliss, the UK's main neonatal charity, promotes FINE as a national curriculum that supports the Bliss Baby Charter (Bliss, 2015a). Designed to standardise high quality family-centred care, the Bliss Baby Charter is a self-audit tool for neonatal units to assess themselves against core principles of neonatal practice that include meeting social, developmental and emotional needs.

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https://doi.org/10.1016/j.jnn.2018.11.004
Received 27 August 2018; Received in revised form 14 November 2018; Accepted 14 November 2018
Available online 29 November 2018

Abbreviations

FINE	Family and Infant Neurodevelopmental Education
NIDCAP	Newborn Individualised Developmental Care and Assessment Program
NICU	Neonatal Intensive Care Unit
SCBU	Special Care Baby Unit

2. The FINE model

The Family and Infant Neurodevelopmental Education (FINE) programme (Warren, 2017) aims to make high quality education and training widely available to neonatal professionals of all disciplines in services for preterm and newborn infants requiring specialist medical and nursing care. FINE offers an educational and training pathway, based on Benner's model of nursing education (Benner, 1984), that progresses from “novice” to “competent practitioner”, and prepares those who may wish to proceed to more specialised training.

FINE draws on many models of care, including the NIDCAP (Newborn Individualised Developmental Care and Assessment Program. Als, 2015), an advanced and internationally recognised training and intervention programme based on infant neurobehavioural observation and evaluation of all aspects of the caregiving environment. FINE also incorporates knowledge and experience from specialists in neonatology and child development services. It references evidence based interventions such as skin-to-skin, non-pharmacological pain management, and baby-led feeding.

The FINE model is based on 3 interrelated principles of practice.

1. Neuroprotection: sensitive care helps to stabilise the infant, to protect and promote brain development.
2. Relationships: interactions between infant and caregivers, most particularly family members, have a significant impact on child development.
3. Individualised care: every infant is unique and individual needs can be interpreted through observation of the behavioural signs that give the baby a voice.

FINE courses are structured around six key themes designed to cover gaps in healthcare professionals' knowledge and skills that became apparent during the programme's development. Each theme is linked to the three underlying principles of neuroprotection, relationships and individualised care.

Key themes:
1. Preterm and newborn development.
2. Behavioural observation.
3. Family engagement.
4. Reflective practice.
5. Systems organisation.
6. Theoretical and empirical evidence.

The FINE pathway has two well-established levels of education and training:

Level 1: Foundations, is a classroom based event that mixes formal, informal and interactive teaching methods to introduce the scope and evidence behind infant and family centred developmental care, to identify gaps in knowledge and skills and to share ideas and question assumptions about practice.
Level 2: Practical Skills, is a structured, self-directed programme in 12 units that include in vivo infant observations, assignments that evaluate practice, prompts for encouraging parent and staff participation and reflective writings that are sent to a mentor for feedback.

This pathway provides opportunities for individuals to develop their practice according to current personal and professional development needs; it can also facilitate system's change in neonatal services.

3. Methods

This study investigated the impact of the FINE programme on neonatal care outcomes in the UK using two surveys.

Survey 1 (S1) was conducted within one of the UK's 16 neonatal networks. Neonatal networks are clusters of units organised to co-ordinate neonatal care across defined geographical regions. It included staff who had been employed across the Network since the introduction of FINE, regardless of whether or not they had attended FINE courses themselves. The Network Manager distributed the survey forms to the respective unit nursing managers who were asked to inform and invite participation from staff who had been in their posts their for more than two years, and would therefore have had an opportunity to witness change since the introduction of FINE. All disciplines within the multidisciplinary team were eligible to participate. Completed surveys, which indicated the unit where the respondent was employed, their professional designation, and attendance at FINE courses, were submitted anonymously via the hospital post to the Network Data Manager

Table 1
Network survey as adapted from Westrup et al., (2002) (S1): Questions about perceived change in practice (6 areas of impact; 19 items) scored on a 7 point scale representing worse (1-3), same (4) or better (5–7).

In the last 3 years or since you started work on your unit do you believe that …….	
1. **Infants' well-being**	the well-being of the infant during its hospital stay has become…..:
	my ability to influence the infant's well-being has become……..
	the infant's chances to rest and sleep have become
	the infant's ability to cope with enteral feeding has become……
2. **Infants' safety**	the safety of the infant has become ……..
	my ability to assess the infant's condition has become …
3. **Parents**	the presence of the parents at the infant's bed has become……
	the parents' way of care-giving for their infant has become…….
	the attachment of the parents to their infant has become…
4. **Sound, light and activity and infants' well-being**	the influence of sound on the infant's well-being has become…….
	the influence of light on the infant's well-being has become…….
	the influence of activity on the infant's well-being has become…….
5. **Sound, light and activity and staff's well-being**	the influence of sound on my well-being has become …..
	the influence of light on my well-being has become …..
	the influence of activity on my well-being has become …..
6. **Working conditions**	my confidence in my professional ability has become …..
	the conditions for performing my job have generally become…..
	my working conditions in general have become…..
	my satisfaction with my work in general has become…..

who screened them for the inclusion criterion (2 years in post since introduction of FINE) and processed the data. Ethical permission was not required as the survey was part of a quality improvement initiative, participation was optional and unconditional, no identifying information was recorded and there was no risk of harm to participants.

Between 2014 and 2016 131 staff, representing all units within the network, attended FINE Level 1 courses. The majority of these (> 80%) were providing nursing care. Ten people based in intensive care units also completed FINE Level 2; seven of these were nurses in full time posts, two were physiotherapists and one was a speech and language therapist.

S1 explored perceptions of change in the quality of care after FINE was introduced. The survey was adapted from an original Swedish version designed to evaluate perceptions of NIDCAP (Westrup et al., 2002), which has been used in other European centres (Mambrini et al., 2002; Mosqueda et al., 2013; Solhaug et al., 2010). Some items were changed or omitted because FINE is an educational initiative while NIDCAP is also a neurodevelopmental intervention.

Survey 1 asked participants to grade 19 items grouped in six areas of impact (Table 1).

Items were graded using a seven point likert scale ranked from "worse" (1-3), through "no change" (4) to "better"(5–7) in answer to the questions "In the last 3 years, or since you started work in your unit, do you believe that …" (Table 1). The survey also invited comments.

An additional section of the survey asked about frequency of parent participation with 7 items scored on a 5 point scale between "never" and "always". Points 4 and 5 were taken to represent a high level of implementation while 1 and 2 represented low implementation.

The Chi Squared Test was used to analyse scores for each area of impact, for those who had (A) or who had not (NA) attended FINE courses. The one sample z test was used to compare group A and NA responses.

Survey 2 (S2) (Table 2) was circulated via email using Survey Monkey (www.surveymonkey.co.uk) to 139 healthcare professionals who had participated in Level 1 FINE courses organised by Bliss during the previous year (2017) in London, Durham or Birmingham. No personal data was recorded and participation was voluntary. Attempts to contact a further 13 participants failed due to extinct email addresses. The items in Survey 2 were adapted from Survey 1 to explore perceptions of the respondents' own practice rather than change across the unit. For example items related to the impact of the environment were excluded as they were considered beyond the scope of individual practice. Items were arranged to fit four impact factors: infant well-being, infant safety, parent participation, and staff well-being (Table 2). Impact factor 3, Parent participation, included secondary items about ability to engage parents in nine specific caregiving activities.

4. Results

Survey 1 (S1) received 124 responses, 29 of which were excluded from the main data set because the respondent had not been in their posts for more than 2 years. Of the 95 that were included there were 76 from nursing staff, 8 from neonatal nurse practitioners, and 11 from neonatologists (Table 3) from 10 units (no responses were received from one Special Care Baby Unit); the majority (69) worked in regional Neonatal Intensive Care Units. Response rates are unknown as information about how many people had been in their posts for more than 2 years during this period was not available.

In all six impact areas both groups A (n = 33) and NA (n = 62) scored "better" more frequently than either "same" or "worse" with p values less than 0.001 (Fig. 1). Individual items that were most often perceived as "better" related to infant well-being, ability to assess infants' condition and confidence in professional role. The areas least likely to be perceived as "better" related to working conditions and impact of the environment on well-being of staff (Fig. 2).

When responses were compared using one sample z test to look at proportions of each group (A and NA) that had scored "better", "worse" or "same" there were variations between the two groups. Group A viewed the impact on infant, parent participation and staff experiences more favourably than group NA in all areas except for infant safety where there was no significant difference (Table 4). Of the 19 items included within the impact areas there were significant differences between groups for two items, both of which reflect sensitivity to infant behavioural cues: "My ability to influence the well being of infants has become …. " (p = 0.01), and "The parents' way of caregiving has become …. ." (p = 0.03).

The 29 responses that did not meet the primary inclusion criteria were included in the data about current practice as this part of the survey did not ask for comparisons between past and present practice. Information about parent opportunities for participation showed variability between items and between units within the network (Fig. 3). Skin to skin appeared to be widely practiced on a daily basis but parent participation in tube feeding and weighing was less likely and were reported to be rare in some units.

S2 elicited 44 responses (response rate of 31.7%) from participants working in 22 units. 66% described themselves as having a nursing role, 16% as medical, 11% as allied health professionals. A wide range of health care professionals attended these courses and were eligible to take part in the survey. 14% described themselves as "other", which may have included psychologists, health care assistants, chaplains, midwives and advanced nurse practitioners. 55% worked on a Level 3 (neonatal intensive care) unit, 32% in a Level 2 unit (admitting babies from 28 weeks gestation) and 14% in a Level 1 special care baby unit (Table 3); the majority had worked in neonatology for many years, 48% for more than 10 years, 27% less than 4 years. The proportion who felt that their practice had improved ranged from 70% (support for oral feeding) to 95% (influence on wellbeing of infant, engagement of parents, opportunities for closeness, and self-confidence) (Fig. 4).

Questions that asked if participants felt more able to involve parents in caregiving activities showed a similar pattern to S1 with least influence on weighing and tube feeding (< 60%) and highest on skin-to-skin (80%) (Fig. 5). 95% of respondents stated that they would recommend the FINE course to colleagues.

In both surveys one of the strongest results was improved confidence in professional ability or role. Areas in S1 where staff were most likely to feel that things had not improved were related to the working environment. Comments about staffing levels and inadequate provision

Table 2
Bliss survey (S2): 4 areas of impact with 22 items scored on a 7 point scale.

Infant well being.	My ability to support the transition to oral feeding has become…….	
	My ability to support tube feeding has become…….	
	My ability to provide bedding support has become ……	
	My ability to support sleep and rest has become …….	
	My ability to influence the infant's wellbeing has become……..	
Infant safety	My ability to assess the infant's condition has become…….	
	My ability to ensure the infants safety has become…….	
Parents and families	My confidence to create opportunities for closeness has become ….	
	My confidence to engage with parents has become ……..	
	My confidence to communicate with parents has become …….	
	I feel more able to involve parents in their infant's care	Medical procedures
		Nappy change
		Pain assessment
		First bath
		Mouthcare
		Weighing
		Skin to skin
		Tube feeding
		First bottle feed.
Staff wellbeing	I believe my satisfaction with work has become ……	
	I believe my confidence has become ……..	

Table 3
Professional roles and area of employment for respondents to Network survey (S1) and Bliss survey (S2).

Job Title	Survey 1: n = 95	Survey 2: n = 44
Matron/Manager	2 (1.9%)	66%
Sister/Charge Nurse	25 (23.75%)	
Staff Nurse	45 (42,75%)	
Health Care/Nursing Assistant	2(1.9%)	
Nursery Nurse	2 (1.9%)	
ANNP	8 (7.6%)	
Doctor	11 (23.75%)	16%
Allied Health Professionals		11%
Other		14%
Unit Level		
Level 3	69 (73%)	55%
Level 2	n/a	32%
Level 1	26 (27%)	14%

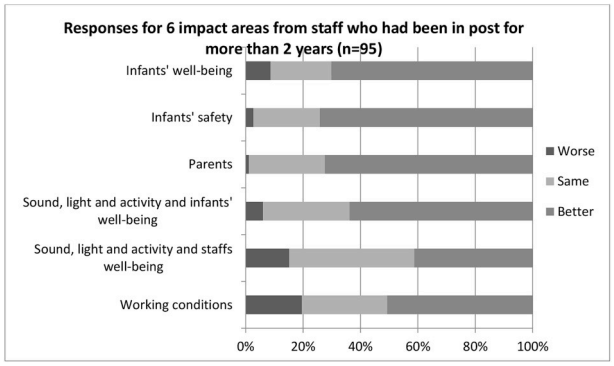

Fig. 1. Responses to impact factors for network staff in post 2 years or more (n = 95), including those who had (n = 33) and had not (n = 62) attended training. Results significantly in favour of better p = < 0.001.

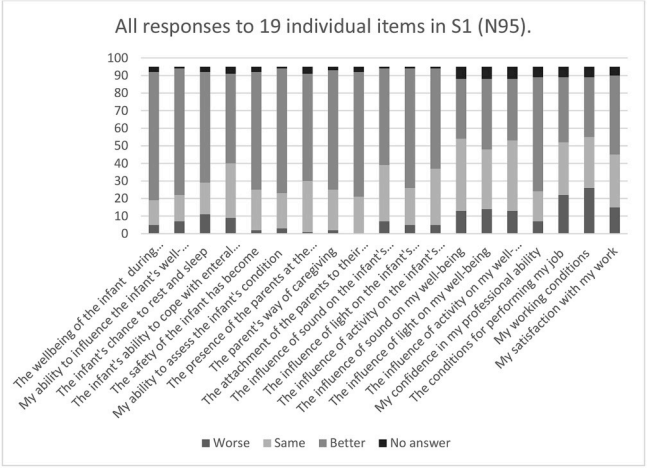

Fig. 2. Network survey (S1): All responses to 19 individual items (n = 95).

for breaks suggest that this could be influenced by factors beyond the scope of FINE e.g. "… *working conditions have become considerably strained due to inadequate provision for breaks".*

The impact of sound, light, and activity was perceived to have improved for infants but impact on staff was one of the areas least likely to be viewed positively.

"I now feel challenged in my ability to see clearly in dimly lit rooms although I appreciate the benefit of light limiting surroundings for infant, I spend a significant amount of time in documentation work/computer work and in clinical procedures requiring adequate lighting".

Table 4
Network survey (S1): z number analysis comparing staff who had (A, n = 33) and had not (NA, n = 62) attended FINE courses.

Impact factor		Z =	P =
Infant's well-being	Worse	−3.03062163	0.002
	Better	5.160423835	0.00001
	Same	−3.48484755	0.000494
Infant's safety	Worse	−0.01818182	0.41107
	Better	1.283862317	0.199212
	Same	−0.99493668	0.320223
Parents	Worse	−0.08094756	0.936237
	Better	4.182008796	0.000029
	Same	−4.19723816	0.0000275
Environment baby	Worse	−1.72942005	0.083809
	Better	3.698151386	0.0000217
	Same	−2.87105303	0.004092
Environment staff	Worse	−1.93781047	0.052745
	Better	5.792864608	0.00001
	Same	−3.90403515	0.00001
Working conditions	Worse	−1.76821759	0.077061
	Better	3.352143085	0.000802
	Same	−2.00102774	0.045392

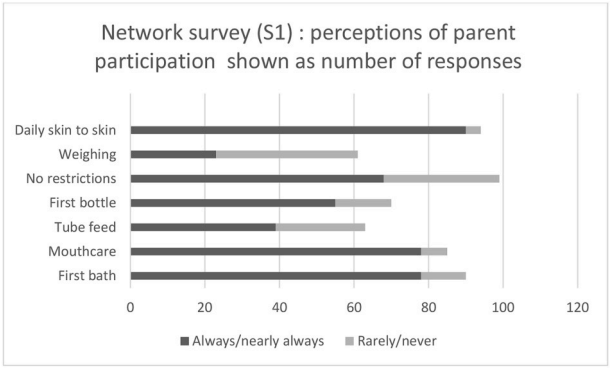

Fig. 3. Network survey (S1): number of respondents recording high and low implementation of parent participation opportunities.

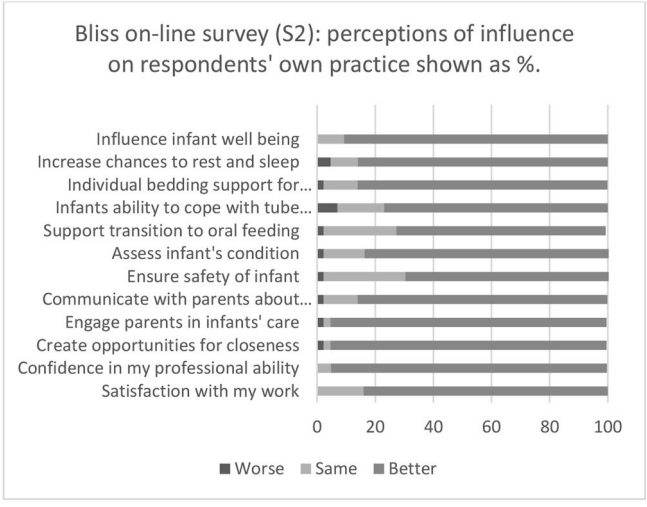

Fig. 4. Bliss survey (S2): Attendees perceptions of influence of FINE foundation courses on their own practice.

Nurses are the largest group of staff in a neonatal team and the majority of those who attended the training and responded to the survey had nursing roles. Some who had not attended commented that it would be helpful for themselves and others to do so.

"I feel that from observing and through discussions with nurses that have

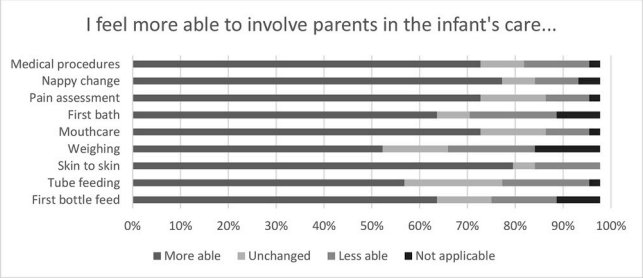

Fig. 5. Bliss survey (S2): Respondents' perceptions of their ability to engage parents in their infants' care after attending FINE foundation courses.

done the course that myself and other nurses would benefit greatly from doing these courses".

Level 1 course feedback often raises the issue of training for doctors and although several consultant neonatologists have attended this was mentioned in several comments.

"Since attending the developmental care Toolkit day I have changed and improved my practice. I do feel doctors would benefit from attending the session".

5. Discussion

This study showed positive staff perceptions across a range of impact factors related to the core principles and themes of the FINE programme. Most importantly those results suggest confidence in FINE as a way to achieve goals that are common to all neonatal services, namely enhancement of the well-being and safety of infants as well as parent engagement in their care. The perceived improvement in professional confidence and job satisfaction offers reassurance that this model of training has benefits for staff as well as infants and families. Although negative perceptions were low across all areas these were most likely to refer to areas that were beyond the scope of individual control, such as lighting and working conditions.

One of the goals of FINE is to bridge the gap between theory and practice and it is of interest that the response to the Bliss email survey (S2) indicated not only that participants felt more confident in their own practice but that they felt more able to engage parents in specific caregiving activities. This fits well with current interest in models of care that emphasise parental participation in their infant's care.

6. Strengths

A strength of this study is that it was multidisciplinary and involved people working across many neonatal units in different parts of the country. S1 looked at the impact on a cluster of units that collaborate for training and service delivery across one network while S2 covered a wider geographical distribution. This diversity and the consistency in the results makes this study more significant than a study on a single unit.

Another strength of this study is the consistency between the results of the FINE and NIDCAP surveys. FINE is recognised as appropriate foundational education for the more advanced NIDCAP and is based on similar principles of practice. NIDCAP surveys conducted in Sweden, France, the Netherlands, Norway, and Spain (Mambrini et al., 2002; Mosqueda et al., 2013; van der Pal et al., 2007; Solhaug et al., 2010; Westrupet al., 2002) show similar patterns to both FINE surveys reported here, all of which recorded least enthusiasm for impact on working conditions while strongly supporting the benefits for infant well-being, parent participation and professional confidence.

Comparisons between staff who had and had not attended training (S1) showed that both groups had similarly high scores for infant safety, which was one of the strongest improvement factors. This is an important finding because it will reassure managers that FINE training makes a positive contribution to infant safety.

7. Limitations

FINE aims to transform practice. However it is difficult to get an objective view of change without historical data with which to compare current practice, and this was a limitation of this study. Some units record practices such as skin-to-skin or pain scoring on their electronic database, but on the whole there is no systematic or reliable recording of family and infant centred developmental care; establishing easy and objective ways to routinely record such activity would be of great value for guiding quality of care improvements in neonatal units.

In S1 small numbers of people from each unit attended each course and the numbers on each unit grew incrementally. The estimated total number of staff attending FINE courses was less than 20% of the workforce across the Network, and it was not known how many of those were still in their posts at the time of the survey. Response rates could not be calculated as the number of people across the network who had been in post for more than two years, and would therefore have been eligible to take part in the survey, was not known. Response rates may have been influenced by opportunities to promote the survey.

The authors cannot be certain that the reason why items were perceived as "better" or "worse" were due to the influence of FINE; there may have been other influences on personal beliefs. The time span of three years in S1 made it difficult to rule out potential influences such as changes of management or working practice. Staff shortages, which is a chronic problem in neonatal services throughout the UK (Bliss, 2015b), and pressure of work, may have affected perceptions. However, similarly positive views were expressed in S2, which were less likely to be affected by external factors as it was conducted within one year of attendance at FINE courses.

Surveys are widely used to evaluate the impact of education on practice (e.g. Boss et al., 2013; Meyer,2010) but results tend to be biased because the people most likely to respond are those with most interest in the topic. Attendance at FINE courses is usually voluntary and attracts people who are already interested. Respondents in S1 who had attended FINE courses were generally more positive than those who had not, which may reflect their greater interest, awareness and understanding of infant and family centred developmental care but nevertheless staff who had not attended any courses also had positive perceptions in all areas, which suggests that the impact had generalised across the units.

High scores do not necessarily represent high service quality. A small amount of change in a unit with poor practice may be perceived as a big change while a similar degree of change on a unit with high levels of practice would be perceived as little change. The tendency for low achievers to overestimate their performance while high achievers underestimate is well known (Dunning, 2011).

8. Conclusion

The engagement of parents in infant care, and a caregiving approach that minimises stress and promotes developmentally appropriate experience, have become universally approved goals of infant and family centred developmental care with a raft of standards and guidelines available (or in development) to promote these as essential components of high quality neonatal care. The FINE programme has been developed to support quality improvements in these areas. Over three years one Neonatal Network introduced FINE to all its neonatal units. Across the UK other courses have been attended by staff from a growing number of units. The results of two surveys that explored staff perceptions suggest that FINE training has a positive impact on both individual and unit practice, with benefits perceived for infant, parents and staff.

Funding

No specific funding was provided for this project.

Acknowledgements

The authors would like to thank Martyn Boyd, Network Manager, who organised the training and survey (S1) in the Northern Neonatal Network. Support from Bliss made the study possible. We gratefully acknowledge the guidance of Panagiota Nikolpoulou-Smyrni and Veronique Pierrat in preparing this manuscript.

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