6 Chapter Six: Phases Three and Four – design and implementation of the intervention plan

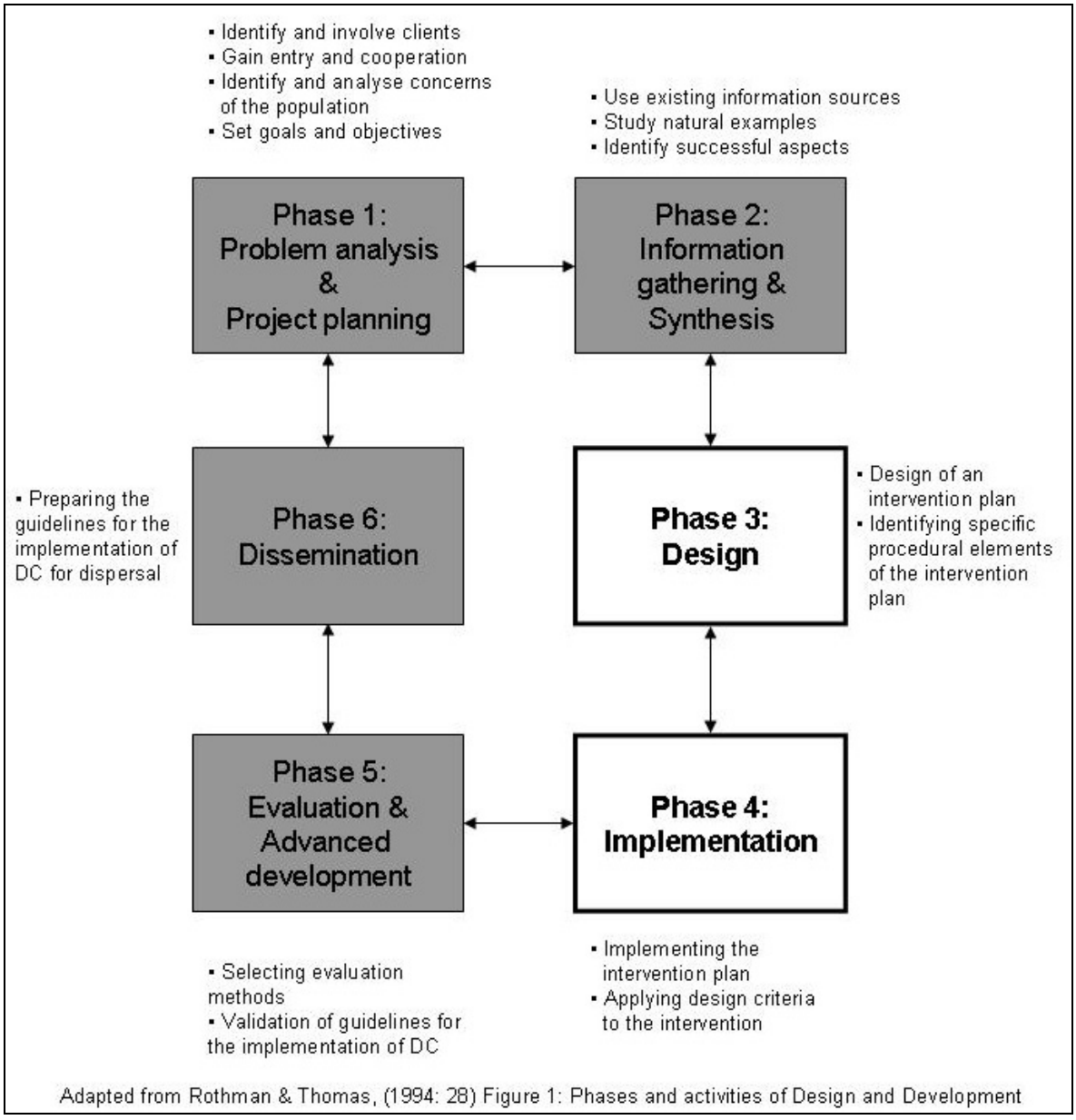

Figure 7: Overview of the phases and activities of the research process (3 & 4)

6.1 Introduction

Low levels of DC practices in the setting were identified in Phase One, and information about current levels of implementation gathered from extant literature and natural examples in Phase Two. Phase Three focused on the design of an observational

system. Specific procedural elements of the intervention were discussed, which lead to the development of implementation guidelines for DC (Fawcett *et al*., 1994: 34). For the purposes of this study, the headings were slightly adapted in this chapter to be more appropriate to the design of the intervention plan.

These implementation guidelines formed the basis of the intervention plan and were used during the implementation phase. According to the intervention research methodology described in Phase Four (see chapter three), the designed intervention plan evolved into a product that could be tested in an empirical study. The activities included in Phase Four addressed the development of a prototype and the implementation and refining of the intervention plan (Fawcett *et al*., 1994: 36).

The implementation guidelines were derived from extant literature and lessons learned from natural examples, and included specific procedural elements under each applicable guideline. As Phases Three and Four were interdependent, they are both discussed in this chapter under the headings Planning and Implementation. Procedural elements (planning) include selected specified procedures, such as in-service training, communication and feedback, which need to be included in the prototype. For this reason, the development of a prototype is not discussed as a separate activity, but together with the procedural elements (Fawcett *et al*., 1994: 36). The refining of the intervention plan will be discussed after the guidelines are set out.

6.2 Designing an intervention plan

The research problem, as stated in chapter one, addressed the poor level of implementation of DC in a selected South African public NICU. The research question focused on the process of implementation: how can DC be successfully implemented in a South African public NICU setting? To answer this question while following the intervention research methodology (see chapter three), and to fulfil the requirements of this phase, possible problems in the process of designing an intervention plan were identified in the extant literature (see chapters two and five) and natural examples of the implementation of DC (see chapter five).

Problems identified from previous research into the implementation of DC included a high level of staff turnover and rotation of key staff members, which negatively affected the implementation process. A lack of managerial participation and leadership and of

uniform education for staff were also problematic, and resulted in inconsistent DC practices leading to staff confusion and frustration. Staff shortages, anxiety associated with change and a lack of knowledge, uncaring attitudes, unfavourable working conditions, financial restraints, multidisciplinary team conflict and inconsistency of care givers were also highlighted as problems (see chapters two and five). Specific changes occurring in the unit simultaneously with implementation also created problems. These changes included physical relocation of the neonatal unit, changes in existing management policies, raised patient acuity and increases in the number of patients delegated to one staff member. Resistance to change was a general problem, as was poor record-keeping (see chapters two and five).

Problems were also identified through the investigation of natural examples. Some of these were the same as those found in the literature, such as staff rotation, high staff turnover, passive management, resistance to change and multidisciplinary team conflict. Additional problems emerging from the interviews included a lack of empowerment of staff and parents, underlying problems at the site of implementation, a lack of professionalism, low quality nursing training, low level of commitment to patients, sabotage from different disciplines and a lack of knowledge and transfer of knowledge between participants (see chapter five).

Factors supporting sustainability of DC were discussed in chapter five and included the following: constant supervision, training and re-training, external interest in the unit, face-to-face facilitation, previous successful change processes, group dynamics, hierarchy, interpersonal relationships, management styles, personality differences, power play, active research during the implementation phase, same education for all staff and the driver of the implementation process.

Environmental audits conducted in eastern American hospitals (see chapter five) showed sustainable practice, but suggested that implementation never ends, since constant supervision and re-training is needed. For example, evidence of the practice of some principles was more apparent than that of others; developmental positioning practices were more consistently used than appropriate handling and touch. The initiative to implement DC was more successful when driven by the nursing staff.

The environmental audits conducted at the chosen implementation site during problem analysis and project planning (see chapter four) showed little or no evidence of the principles of DC at this site. Individual attempts were seen but relied on the individual

nurse's care philosophy. No documentation supported the implementation of DC or KMC. Other problems that could negatively influence implementation were also identified, such as a lack of trained and educated staff working in the chosen site, which highlights the risk for medico-legal hazards. A lack of DC practices increases the risk for morbidity for pre-term and sick infants.

If the ethical-legal framework as established by the South African Nursing Council is applied to the implementation of DC, it is clear that nurses are obligated, once trained in the practice of this care, to implement its principles as best practice for the neonatal population. Chapter two of Regulation 2598 (SANC, 1984) stipulates the Scope of Practice for registered nurses and clearly states the obligated responsibilities of the nurse to his/her patient. These responsibilities include DC, as the following quote of the regulation makes clear. In the quote given below, the needs of the pre-term and sick infant have been highlighted and the applicable DC principle written in italics:

> 2. The scope of practice of a registered nurse shall entail the following acts or procedures, which may be performed by scientifically based physical, chemical, psychological, social, educational and technological means applicable to health care practice:
>
> …(c) the treatment and care of and the administration of medicine to a patient, including monitoring or the patient's vital signs and of his reaction to disease conditions, trauma, **stress** (*individualised care*), anxiety, medication and treatment;…
>
> (e) the prescribing, promotion or maintenance of hygiene, **physical comfort** (*developmental positioning and environmental manipulation*) and re-assurance of a patient;
>
> (f) the promotion of exercise, **rest and sleep** (*individualised care*) with a view to healing and rehabilitation of a patient;
>
> (g) the **facilitation of body mechanisms** and the **prevention of bodily deformities** (*developmental positioning and non-nutritive sucking*) in a patient in the execution of the nursing regime;…
>
> (j) the facilitation of the healing of wounds and fractures, the protection of the skin and the **maintenance of sensory functions** (*environmental manipulation of noise and excessive light, appropriate handling and touch*) of the patient;…
>
> (o) the facilitation of the attainment of **optimum health** for the individual, the **family** (*family-centred approach*), groups and the community in the execution of the nursing regimen;...

Chapter two of Regulation 387 (SANC, 1985) stipulates the acts or omissions of registered nurses that can lead to disciplinary steps by SANC. Again, the needs of the pre-term and sick infant have been highlighted and the applicable DC principle written in italics:

> 3. Wilful or negligent omission to carry out such acts in respect of the diagnosing, treatment, care, prescribing, collaborating, referral, co-ordinating and patient advocacy as the scope of his profession permits;
>
> 4. Wilful or negligent omission to maintain health status of a patient under his care or charge, and to protect the name, person and possessions of such a patient, through -
>
> > …(b) determining the health status of the patient and the physiological response of the body to disease conditions, trauma and **stress** (*individualised care*);…
> >
> > (d) the prevention of accidents, injury or other trauma (*developmental positioning, environmental manipulation and non-nutritive sucking*);…
> >
> > (g) specific care and treatment of the very ill, the disturbed, the confused, the aged, **infants** and children, the unconscious patient, the patient with communication problems and the **vulnerable and high-risk patient** (*developmental care*);...

In the Standards of Nursing Practice (SANC, 1998) compiled by the South African Nursing Council, chapter three discusses the rights of the high-risk newborn, in a quote highlighted as before:

> 3.2.1 The high-risk newborn infant includes … the underdeveloped premature and the severely deformed newborn. These babies have the right to –
>
> - **protection** and **safety**;
> - maintenance of physical cleanliness and **comfort**;
> - **warmth** and **cuddling**; (SANC, 1998)

The ethical-legal framework of the SANC, as interpreted and applied in this study, therefore supports and stresses the need for DC practices to form the foundation of neonatal nursing care.

6.3 Procedural elements and implementation of the intervention plan

Implementation guidelines were established as part of the intervention plan. The specific steps under each guideline addresses the specific procedural elements of the intervention plan (see chapters two, four, and five). For the purposes of this study, procedural elements will be described as planning. The intervention plan, based on implementation guidelines for DC, was used to implement DC at the chosen site. The selection of the research site and the design participants or role players was discussed in chapter four (Phase One).

Phase Four was actively implemented from September 2004 until the end of August 2005. Field notes reflecting the researcher's perceptions of what was happening and her experience of the process of implementation were used for data collection during the implementation phase. The positive and negative experiences encountered during the intervention plan either supported or confirmed the established implementation guidelines. Discussion of these experiences is integrated into the discussion of the implementation guidelines. These guidelines, derived from the literature and natural examples, are discussed below, with their actual application at the research site.

6.3.1 Guideline one: Planning and preparation should take place before the intervention phase

6.3.1.1 Planning

A thorough literature review on DC was conducted (see chapters two and five) to gather and synthesise knowledge about possible processes for the intervention plan. From this review the necessary steps needed to create awareness among the participants were identified. Awareness meetings were planned, in which the research study and the participants' role in it would be discussed, and informed consent documentation signed (see chapter four). Questionnaire 1 was designed to identify the needs and concerns of the population (see chapter four), and three environmental audits planned to assess the current state of DC practices in the unit prior to the implementation phase.

6.3.1.2 Implementation

Access was gained to the research site six months before the active implementation phase. Awareness was created by through awareness meetings held in the NICU. Informed consent documentation (see Appendix 1) and questionnaire 1 (see Appendix 2) were completed, and the three environmental audits conducted prior to the intervention phase.

Information was gathered from extant literature and from natural examples to identify those elements that either contributed to or inhibited the implementation of DC. This data gathering included a review of previous research, in-depth interviews with 27 multidisciplinary team members, and environmental audits conducted at eastern American hospitals (see chapter five).

Active implementation began in September 2004, where information gathered during Phases One and Two were used to form the intervention plan. Much planning and preparation were done during this month. As aspects were planned, feedback and approval was obtained from the participants, and in particular from key informants, during regular meetings. At this stage, the planning and preparation of the intervention plan, the participants' involvement was mostly passive, with the researcher doing all that needed to be done. The participants just agreed on all planning and preparation that was discussed with them during the meetings (see Guideline six).

The implementation of DC was launched at a function held on 1st October 2004. Invitations for the project launch were given to the key informants and participants. An open invitation was given to other departments in the maternity division as well. All persons attending the project launch received an information pamphlet on DC (see Appendix 7), to help to create awareness about the approach.

Unfortunately, the unit manager who was scheduled to officiate the launch of the project did not arrive and the donated items that would have been presented to her where presented to the second-in-charge of the NICU. Since the support and involvement of the unit manager are vital to the project, her absence and lack of explanation for her absence could be interpreted as resistance towards the project.

6.3.2 Guideline two: A programme coordinator or developmental care specialist should be in place to drive the implementation process

6.3.2.1 Planning

Information collected from the interviews and literature highlighted the need for a developmental specialist and/or DC nurse educator in the unit. Ballweg and Lee (2004: 504, 509) describe these different roles. The developmental specialist's responsibilities in clinical practice include advanced assessment, interpretation and implementation of individualised developmental patient plans which integrate the infant's physiological needs and the family's psychosocial needs. He/she also coordinates staff in performing the actual hands-on activities of DC. The DC nurse educator is responsible for the clinical implementation of DC practices. These developmental roles are dedicated positions and the developmental specialist and DC nurse educator are not part of the NICU workforce.

In this study, these roles had to be combined into one role called programme coordinator, with the researcher providing knowledge about and training in DC. The researcher did not have set times when the NICU was visited, but visited daily from Monday to Friday. Periodically, visits were made during the weekend. Availability of the researcher in the unit depended on the activities taking place, and she was always available telephonically for advice or emergencies. The responsibilities involved in this combined role include the following:

- Demonstrating good interpersonal skills,
- In-service training,
- Practical support and accompaniment,
- Mentoring,
- Leadership of the DC committee and chairing of its regular meetings,
- Observation and evaluation of progress,
- Consultation for difficult patient care problems,
- Interdisciplinary communication and conflict management, and
- Family support.

6.3.2.2 Implementation

Since the researcher was not part of the NICU workforce, she could hold the position of programme coordinator, which combines the roles of a developmental specialist and a DC nurse educator, as discussed above. As the programme coordinator, the researcher was responsible for organising and presenting in-service training and practical support.

The researcher directed and led the DC committee and chaired its meetings. This required good interpersonal skills, for interdisciplinary communication and conflict management. Three months into the implementation phase, an incident occurred due to a misunderstanding and ineffective conflict management. Positioning of the infants was particularly poor as only five infants in the unit were positioned according to the principles that had already been taught to the staff. The participants felt that they were doing the best they could with staff shortages and a lack of extra hands for the supervision of DC practices, and the researcher felt that an improvement could still be made.

Although this incident was a negative experience, it resulted positively with an improvement in communication and conflict management where the researcher was given permission from the unit manager to correct nursing staff as problems arose. These problems were then fed back to the shift leader. This kept the shift leader informed, while reducing her responsibilities of supervision. The nursing services manager who mediated the incident commented that, although the incident had resulted in conflict, the openness of all involved to resolve the problems during the implementation process was positive.

Progress was monitored, daily DC practices were observed, and the implementation evaluated (see chapter seven). When difficult patient care problems arose, the researcher was consulted to provide input for optimal patient care. When the need for family support and empowerment was observed, assurance of the positive benefits of DC was given.

The researcher was not the preceptor for students and staff in the NICU, but the nursing staff began to ask for demonstrations on how to perform basic nursing care procedures, for example inserting a nasogastric tube. The researcher experienced this

as positive as it showed that the nursing staff trusted her. It did however identify a lack of knowledge and the definite need for training in basic nursing care skills.

6.3.3 Guideline three: Management support and involvement is essential

6.3.3.1 Planning

Management support must consist of active involvement and participation. Robison (2003: 380) discusses the need for broad-based leadership to improve implementation success, reduce conflict and enhance optimal outcomes. Leadership should therefore include multidisciplinary team members who have the necessary **influence**, **authority** and **power**.

Authoritative support is needed to ensure that participants are held accountable for their actions. In this plan, the nursing services manager and the unit manager of the NICU were identified as vital authority figures. DC should be incorporated into the participants' performance appraisals, and staff allocations organised to insure consistency of care givers to particular patients over consecutive shifts.

6.3.3.2 Implementation

Because managerial support is so important, the nursing management in particular were targeted, since they have influence and authority over the nurse participants, who formed the largest component of the total number of staff implementing DC. Initial and awareness meetings were held with the nursing management of the maternity division (see chapter four), in which their involvement and active participation were emphasised.

At the site chosen for the study, the nursing professionals and medical professionals have a defined hierarchy. The hierarchy for these professionals is summarised in Table 8 below, with the highest position listed first.

Table 8: Summary of hierarchy of nursing and medical professionals

Nursing profession	Medical profession
Nursing service manager	Neonatology consultant
Unit manager	Clinical assistant / registrar
Chief professional nurse	Medical officer
Senior professional nurse	Community service doctor
Professional nurse	Intern / house doctor
Nursing student	Medical student
Enrolled nurse	
Auxiliary nurse	

The nursing services manager and unit manager were needed in this study to provide authoritative support and ensure that participants were held accountable for their actions, for example through including DC in performance appraisals. By including DC in the performance appraisals, participants would be encouraged and motivated to continue day-to-day DC practices. The unit manager worked 12-hour shifts instead of office hours, and so was difficult to reach. For this reason feedback was given twice a week to the nursing services manager responsible for the NICU. To ensure that continuity of implementation was achieved, any positive progress was mentioned and problems attended to in this feedback. The nursing services manager's buy-in and support were stronger than the unit manager's, which meant that external management was more supportive of DC than internal management, which was problematic.

In January 2005, financial incentives were awarded to some participants according to their performance appraisals. The nursing staff were not happy as the nursing services manager responsible for the NICU was the only person who received such a financial incentive, and protested by performing only the routine care tasks expected of them by the institution, which does not include DC.

In April 2005, neonatal nursing staff were assessed as part of their yearly performance appraisal. Although DC was not a specified aspect of evaluation included in the performance appraisal, staff added it as an additional point under participation in research. Management felt that the participants' contribution was not significant and in some cases, points were not awarded. This negatively influenced the implementation progress, since the participants felt they were not getting recognition for their

contributions to the project. The researcher was asked to write a progress report of the implementation progress in support of the participants.

Over this same time period, nursing staff of the research site joined their fellow nurses employed by the Department of Health in protesting the poor uniform allowances included in their salaries. Their protest involved refusing to wear uniforms and wearing their own clothes to work. These underlying negative currents did affect the practice of DC.

Although consistent and stable staff provision would have been optimal for the intervention plan, the resources available to the hospital did not allow this due to frequent rotation and a lack of staff. The chosen research site is an academic hospital that provides learning opportunities for a range of students, from nursing assistants to medical registrars, which means that staff rotate frequently. It was therefore suggested that staff be allocated to the same patients as far as possible. For example, if a registered nurse was working three 12-hour shifts, all three shifts would be spent looking after the same patients.

Management support and involvement was obtained from the neonatal consultant who encouraged the medical doctors to practice DC. Regular contact sessions were held in scheduled meetings or via e-mail with the neonatal consultant. The allied health professionals did not have managerial involvement from their departments, so the participants themselves were relied upon for support and involvement.

In one feedback session the neonatal consultant commented that the atmosphere in the NICU was changing and becoming more professional. A consultant who had been away for some years also commented positively after visiting the unit again, saying that the unit looked tranquil, the infants were positioned in flexion, the noise levels had improved and the lights were turned off at times (translated freely from Afrikaans).

6.3.4 Guideline four: Resources needed to facilitate the intervention plan

6.3.4.1 Planning

Resources for the project were to be accumulated through fundraising efforts and donations initiated by the researcher. A control system would be needed to ensure that none of the donated items went missing as the laundry facilities were initially off the hospital premises. Any additional resources needed would be arranged from the hospital if available, or sourced and funded by the researcher.

6.3.4.2 Implementation

Donations were received from the hospitals visited in eastern America. One hospital provided the research site NICU with 140 positioning nests, and two other hospitals sent boxes of blankets, quilts, pacifiers, pre-term and newborn infant clothing, and other items like hats, burp towels and socks. Although the need to look after the donated items was emphasised, blankets and quilts did go missing. In one case, for example, a needy mother without clothes or a blanket for her infant was given what she needed at discharge.

Additional resources were supplied by the hospital if available. For example, the donated items needed to be stored in a safe place in the NICU, and so an old metal cupboard was supplied to be used for this purpose. The cupboard was washed and painted, and the shelves covered with adhesive paper to hide rusted areas. A lock was then put on the cupboard and it was used to store the DC resources.

To ensure that the donated items did not go missing, a system was put in place to control the number of nests in the unit and the number of nests in the laundry. This control system was initially needed while the positioning nests were being laundered off site, but once the laundry appliances were in place the control system was no longer needed. The cupboard remained locked at all times and the keys were kept at the nurses' duty station.

At the end of November 2004, the participants started showing evidence of buy-in, as comments were made about being proud of the NICU. Agency nurses had commented that the unit "looked nice" and wanted more information on DC. Some even enquired about how they could get positioning aids for their units. The participants mentioned that the smaller sizes of positioning nests were always used fastest, and asked whether more nests in smaller sizes could be obtained.

If the hospital could not supply necessary additional items, the researcher sourced these. If sponsors could not be found, the researcher funded the necessary items. In one case, during the implementation of non-nutritive sucking, concern was raised about pacifiers' being left in the infants' beds with the risk of contamination and cross-infection from surfaces. A company called Avent was approached and kindly donated 45 containers to be used at each patient's bed. Each infant's container was marked and if the pacifier was not in use, it was expected to be in the container.

Two fundraising efforts (see Appendix 8) were held with Woolworths on the 29th January 2005 and 5th March 2005 to raise money to buy a washing machine and tumble dryer for laundering the positioning nests and blankets. The first event was the selling of *boerewors* rolls at a Woolworths store in Pretoria. Woolworths donated 28 kg of *boerewors* and the necessary bread rolls. The second fundraising event was held at the same Woolworths store. In addition to the sale of *boerewors* rolls, face-painting and a jumping castle were available for children's enjoyment under supervision, while their parents did their grocery shopping. These fundraising events resulted in approximately R7000.00, enough for a washing machine, a tumble dryer, 20 hand towels for swaddled bathing, six plastic mobile baths, six changing mats and a toaster for the participants in the NICU. The laundry appliances were delivered to the NICU in May 2005. Buy-in of the participants fluctuated as no participants came to the fundraisers, although transportation was arranged for them.

In September 2005, 52 new nests were given to the NICU (see Appendix 9). The nests were made by a seamstress and fabric was funded by the researcher's parents. The nests were in extra-small, small and medium sizes, since these were the sizes used most frequently. The resources used during the project were adequate for the daily practices of DC in the unit. Although the hospital management bought into DC implementation, no funds were available for acquiring resources.

6.3.5 Guideline five: Developmental care committee

6.3.5.1 Planning

Role players were identified according to the attributes suggested by Robison (2003: 380) namely those with influence, authority and power. **Influential leaders**, for example were registered nurses with an additional qualification in neonatal nursing have knowledge and insight into DC. **Authoritative leaders**, for example the unit manager, were selected to ensure that professional competencies were maintained according to the standards of practice, and make certain that staff were accountable for their actions. **Leaders with power**, for example the medical neonatology consultants, were individuals able to make medical decisions about infants' care.

6.3.5.2 Implementation

The seven key informants identified in Phase One were invited to form the core of the DC committee. The members were chosen across the multidisciplinary team and included registered nurses, a radiographer, non-medical support services and a doctor. These chosen key informants either had knowledge and insight into DC or were willing to learn and participate in implementation. A medical doctor was included who could make decisions about infants' care. Although the neonatal consultant was not directly part of the DC committee, she approved the decisions made.

Meeting schedules had to be flexible, since some meetings were cancelled and rescheduled due to the circumstances in the NICU. Participants were not always on duty when a meeting was scheduled and did not come in from home for meetings on their off days. Commitment to meeting attendances was low, which were not well attended by the allied health members. Contact sessions were scheduled with the audiologist, dietician and radiologist to address this problem. The identified key members were contacted and invited to the committee. They expressed a desire to attend but because of staff shortages this was not always possible. Thus, though the concept of a DC committee was strongly recommended from previous research and natural examples, such a committee did not become established at the chosen site.

6.3.6 Guideline six: Develop practice guidelines for the principles of developmental care

6.3.6.1 Planning

Robison (2003: 381) highlights the importance of establishing standards of care and suggests that the following four standards form a solid foundation for success:

- Care-giving should be flexible and infant-driven where the participant responds to communication from the infant by altering care practices as to prevent compromise of the pre-term or sick infant.
- The multidisciplinary team should coordinate their care to provide the infant with synchronised care practices.
- An environment that is developmentally appropriate should be provided to the pre-term and sick infant within the NICU.
- Parents should be involved with the infant from delivery to promote parent-infant attachment and bonding.

Therefore, practical guidelines had to be compiled for each new DC principle, based on relevant literature. These guidelines for practice were to be made available for feedback from participants at regular meetings and via e-mail from the neonatal consultant. Once approved, the guidelines were to be signed by a member of the DC committee, the nursing services manager, the unit manager and the neonatal consultant. They would then be made available at the beginning of the month in a file accessible to all participants.

6.3.6.2 Implementation

Guidelines for practice (see Appendix 10) for each new DC principle were compiled from the relevant literature, and made available to the participants for feedback at the regular meetings held in the NICU. Input and approval were also gained from the neonatal medical consultant via e-mail. Once the guidelines were approved, they were signed by a member of the DC committee, the nursing services manager, the unit manager and the neonatal consultant, and then made available at the beginning of each month in a file accessible to all participants.

It was important for the multidisciplinary team to coordinate the care they provided to the infant. Synchronised care practices result in fewer interruptions of sleep, longer rest periods and clustered care. For example, the radiographers routinely came to the NICU to take x-rays of patients at 10h00 each morning. This does not fit with the routine times for nursing care, 09h00 and 12h00. Once trained, the radiographers suggested that the time be changed to 11h00. This would allow the infants longer sleep periods.

A staggered approach was adopted where a new principle of DC was implemented every month. The order of implementation of principles was chosen so that the more visible or tangible principles were implemented first. For example, positioning was planned for October 2004, light manipulation for November 2004 and noise manipulation for December 2004. This order was presented to the participants for feedback and input and they accepted it, suggesting no changes.

6.3.7 Guideline seven: Education and empowerment of staff are critical for success

6.3.7.1 Planning

Chapter four (see 4.9 Project planning) discusses the adoption of a staggered approach where a new principle of DC was to be implemented every month. As the sole educator, the researcher was to train the participants in each principle as it was implemented. Training was to take place within the unit across all shifts. Training sessions were to be held during day and night shifts to ensure that as many participants were involved as possible. Enlarged pictures of examples and a white board would be used for explanations. Questions could be asked during the session and a time for questions would be available at the end of the training session.

The multidisciplinary team and non-medical support services were to be included in all training opportunities. Presentations about DC were to be held for all the staff in the unit, as well as at the different departments involved, for example radiography and human nutrition. If the resources were available, a PowerPoint presentation was to be used. All participants attending the training sessions were to be trained in the theory of the DC principle as well as its guidelines for practice. A training manual was to be

compiled from all the different in-service training sessions that was to be made available to the participants. Additional training was to be provided as required by the participants.

Training was to be delivered on the appropriate level according to the level of patient interaction; for example, the non-medical support staff were to be trained about environmental manipulation only whereas the nursing staff were to be trained on all principles. Parental empowerment was to be emphasised during the training sessions, and parents included in training and routine patient care.

Because many of the DC principles are practical in nature, the staff were to be accompanied in their practical duties after the training session, to ensure that they applied the correct skills. On-the-spot training was to be done for new participants, participants who could not attend the training, or for frequently rotating medical students. An orientation programme would be helpful for all newcomers to the unit, especially due to the high staff rotation rate. The nursing sister-in-change of each particular shift was to be responsible for supervising DC practices. The identified role players were expected to be role models and set the standard of practice through example.

6.3.7.2 Implementation

79 in-service training sessions varying in length between 30 and 90 minutes took place between October 2004 and August 2005. The in-service training sessions were presented by the researcher, who trained the participants in each principle being implemented. The multidisciplinary team and non-medical support services were included in all training according to their level of patient interaction. For example, the nursing staff were trained in all the DC principles, whereas the non-medical support services only received training on environmental manipulation with an overview of the DC approach.

The in-service training sessions for the nursing staff and non-medical support services took place in the NICU, to facilitate attendance, since attendance problems could be foreseen if the training was held off-site. All participants on duty for that specific shift attended the in-service training sessions. These sessions were held during both the day and the night shifts to ensure that as many participants were involved as possible.

Attendance of participants was recorded to monitor that staff received all of the presented training sessions.

Due to the small number of medical staff and allied health professionals involved in the unit, training sessions were arranged and held at the most convenient time and venue for the participants. Some sessions took place at the follow-up clinic, the doctor's refreshment area and at the different allied health departments. Additional training sessions were provided as requested by participants.

The presentation of the in-service training sessions was structured in content, but informal in style, since questions could be asked during the session and a time period for questions was also available at the end of each training session. This relaxed training atmosphere was chosen as the least threatening approach. Participants were encouraged to participate by giving examples from their own experience in the care of pre-term and sick infants. Parental empowerment was incorporated into all the training sessions. Including parents in routine patient care of their infant was also emphasised.

As teaching resources were limited in the NICU, a white board was used for explanations and enlarged pictures and photographs were used as examples of the DC principles. Where more technological facilities were available, a PowerPoint presentation was used for the training. Participants attending the training sessions received a training manual containing theory and guidelines for practice on the DC principles.

Due to the practical nature of DC, practical support was provided on a regular basis. This assisted in affirming the new skills learned. Staff were accompanied at the infant's bedside, and trained on-the-spot if necessary. Practical accompaniment helped to ensure that the correct skills were applied as learned during the training sessions. On-the-spot training was also done for new participants or participants who could not attend the in-service training sessions. This technique of training was also helpful for medical students who rotated frequently. Involving medical students to strengthen the implementation of DC was not planned but appeared to be valuable for continuity of care.

The high rate of staff rotation started to affect the progress of the project in January 2005, and so an orientation programme explaining the DC principles already implemented was introduced. To reduce the effect of staff rotation, more support was

given to permanent non-rotating staff and the orientation programme was specifically targeted at the students who were rotating through the NICU on a regular basis. Nursing students rotated monthly and the medical students weekly. The orientation programme consisted of a contact session with the orientating registered nurse or medical doctor and the student was then given an orientation information sheet (see Appendix 11). The student was expected to sign an orientation register once the contact session was complete and the orientation information sheet had been read and understood.

The role players identified in Phase One (see chapter four) were expected to be role models and set the standard of practice by their example in the NICU. The nursing sister-in-change of each particular shift was responsible for supervising DC practices in the NICU, but due to staff shortages, the researcher was also given authority to supervise and correct staff in their DC practices, if she was present in the unit.

6.3.8 Guideline eight: Good communication pathways are vital for positive implementation

6.3.8.1 Planning

Good communication between disciplines and in the unit was vital for a positive implementation experience. Various methods of communication could be used, including the following:

- Interpersonal relationships,
- DC information wall,
- Notice board,
- Newsletters,
- Short message service (SMS) via cellular telephone,
- Easily understandable user-friendly research,
- In-service posters, and
- Signage.

6.3.8.2 Implementation

As stressed during the interviews in Phase Five, good communication during implementation was imperative for successful implementation of DC. A variety of different communication methods were utilised:

- A DC information wall (see Appendix 12) was assembled on one of the walls of the NICU. It consisted of a research summary, the main DC concepts and the participant's commitment certificates.
- The general notice board at the nurses' duty station was used for notices.
- Newsletters to which participants contributed (see Appendix 13) were circulated to all participants, as well as to upper managerial staff who were not directly involved in the study, for example, the Assistant Director of Nursing, the Hospital Superintendent, and the Head of the Department of Paediatrics.
- Short message service (SMS) available on cellular telephones was also used to notify key informants of future meetings.
- In-service training posters and signage (see Appendix 14) about DC principles were put up in the NICU.
- Easy to understand research articles were made available to participants on request.

6.3.9 Guideline nine: Changing policies and procedures

6.3.9.1 Planning

Policies and procedures were to evolve during the intervention plan. As participants became more involved with the necessary buy-in, new policies and procedures were to be drafted. A new mission, vision and philosophy for the unit was also to be established.

6.3.9.2 Implementation

As seen during the environmental audits of Phase One (see chapter four), no policies and procedures or guidelines on DC were available in the unit. Policies and procedures for DC evolved during the intervention plan, where the guidelines for

practice formed the new procedures for satisfying the basic needs of patients. A new mission, vision and philosophy (see Appendix 15) were established and put up in the NICU.

When the intervention plan called for a new mission, vision and philosophy, no input was received from the participants. The researcher compiled the mission, vision, philosophy and guidelines of practice, and participants accepted it when asked for feedback. Once the documents were finalised, large posters were made for the walls in the unit. Formulating the new policies needed for DC was left to the participants.

The possibility of changing the visitation policy was discussed as part of the family-centred principles of DC. The unit's original policy only allowed parents in between 10h00 and 20h00. However, the participants gave reasons for the time restriction. The morning was a very busy time in the unit and due to morning cleaning, routine care and bathing, doctors' rounds and special investigations, the space available for additional people was limited. The attitude towards family-centred care was positive as the staff believed that once the physical relocation of the NICU had taken place, more space would be available and the visitation policy could be revised.

6.3.10 Guideline ten: Monitoring and evaluation of the intervention plan are essential

6.3.10.1 Planning

A DC committee was planned to provide essential feedback during all the steps of the intervention plan, for example establishing guidelines for practice. Monitoring of progress was to be done continuously with weekly meetings held with the role players, and any other interested participants. Minutes were to be taken at these meetings, and questions and problems addressed as they arose. Any problems highlighted were to be followed up and feedback given to the participants. All meeting agendas and minutes were to be made available in the unit in a file accessible to all.

To evaluate progress, different methods were planned to determine the level of implementation achieved. Questionnaire 2 (see Appendix 16) was to be given to the

participants to assess their opinion of the progress of the intervention. (The methodology and findings of the data collection are discussed in chapter seven).

Checklists (see Appendix 17) based on the guidelines for practice of the principles of DC were to be used to observe the progress of implementation, either by direct observation of care, for example assessing appropriate handling and touch, or indirect observation of care, for example, infant positioning. As a new principle was to be implemented, its checklist was to be added to those already implemented. The checklists were planned for mid-month by the researcher and at the end of the month by a volunteer participant, who was to be a registered nurse who had attended the training sessions.

Environmental audits (see Appendix 4) were to be carried out at unannounced times by an independent person. The researcher and participants were not to be informed of the times of these evaluations. The approximate time needed to complete one environmental audit was three hours. As the implementation was being assessed, all participants on duty that particular time were to be observed.
Two focus group interviews (see Appendix 18) were to be held at the end of the active intervention phase to determine which factors motivated participants to continue practicing DC on a daily basis, and to identify any negative or problematic areas of implementation that were experienced.

6.3.10.2 Implementation

Progress was monitored throughout the implementation process. The DC committee held regular meetings, 41 in total, with documented agendas and minutes. At these meetings, participants were encouraged to be actively involved in feedback and to give their own ideas and concerns. Questions and problems were addressed as well as any follow-up on issues previously discussed. All meeting agendas and minutes were available from the researcher on request, and after the meetings were made available in the NICU for participants. Participants who could not attend a meeting were requested to sign the meeting minutes to show that they had read them.

The researcher visited the NICU frequently to monitor progress. The positioning nests and blankets were initially laundered by the researcher, which facilitated her monitoring

of the use of the control system, condition of donated items, use of items, and the storage cupboard.

In one incident, the researcher was away for five days and no washing of positioning aids was done during that time. What was exciting though was that in the absence of clean nests the participants made use of alternative resources, making boundaries for the babies from available linen.

In April 2005 the unit was exceptionally full, which slowed the progress of implementation. There were 39 patients admitted in the unit, which has a 30-bed capacity. This resulted in over-crowding, more staff shortages, increased noise levels and a large turnover of agency staff who had not attended the in-service training, all of which affected the progress of implementation. Evaluation of the implementation process was impaired as the bi-monthly completion of the checklist evaluations was not realistic under these circumstances.

Various methods of evaluating the progress of the intervention plan were employed. (The data analysis, findings and conclusion will be discussed fully in Phase Five, see chapter seven). Questionnaire 2 (see Appendix 16) was given to the participants to assess their personal experience of the progress of implementation. Checklists (see Appendix 17) based on the approved guidelines for practice were conducted mid-month by the researcher and at the end of the month by a participant who had been trained in that particular principle.

An independent person carried out four environmental audits (see Appendix 4) at unannounced times; the researcher and participants did not know when the evaluations would be done. Two focus groups were held at the end of the 12-month period, to investigate the factors that motivated participants to continue practicing DC on a daily basis (see chapter seven).

6.3.11 Guideline eleven: Re-enforcing tactics are useful

6.3.11.1 Planning

Any donated items for the project were to be given to the unit and the participants. They were to be encouraged to use the items to improve the appearance of their working environment. Donated items were not only to be sourced for the unit, but also for the participants. This was intended to give them the feeling of being rewarded for their efforts. Incentives in the form of small gifts were also planned for participants identified as having done a job well. Money was not to be used as an incentive.

The hospital had a quality improvement programme that awards financial benefits to any unit that implements successful changes which improve quality of care rendered to patients. Therefore the participants were to be encouraged to enter their project for this purpose.

6.3.11.2 Implementation

This required the introduction and maintenance of those factors that should support the sustainability of the implementation. The items donated during the project were handed over to the unit manager. It was interesting to see that although participants were encouraged to use the items to improve the appearance of their working environment, the unit manager sealed the donated items in boxes for use in the unit after relocation. Relocation of the unit took place in April 2006. When items were purchased from the funds raised in conjunction with Woolworths, a toaster was bought for the participants' tearoom.

Incentives consisting of a small packet with four to five bite-size chocolates were given to participants who had mastered the guidelines for practice of each implemented principle. Problems did however arise from this, since incentives were awarded after random "spot checks" in the unit, and some participants felt this was unfair, since not everybody received incentives. Other participants started to demand incentives regardless of their DC proficiency.

No financial incentives were given as part of the project. Certificates for commitment and participation were awarded to the participants at the beginning and end of the implementation phase. Verbal encouragement was given to participants in recognition of good work done.

The project received recognition from external visitors. An occupational- and a physiotherapist came to visit from another public hospital after hearing about the implementation project. These visitors were interested in how they could implement DC in the NICU where they worked. The researcher shared literature and information with the visitors. The more external recognition the project received, the more the participants seemed prepared to go the extra mile for DC implementation.

The hospital has an annual quality improvement programme that awards financial benefits to any unit, ward or division that successfully implements changes which result in the improvement of the quality of patient care. The participants of this study were encouraged to submit their project for this award, which involved making a presentation to the quality improvement board. The researcher left the entering and preparation for the presentation to the key informants. Assistance was offered for technical support, resources and detailed information needed for the presentation. The nursing services manager became actively involved and encouraged the participants to enter. Five participants took the main initiative for the project, which was awarded first prize for the changes made to the NICU during the project. Although the participants were not actively involved when the researcher was leading the way, they showed buy-in towards DC with their efforts towards the presentation once the researcher had withdrawn from the unit.

6.4 Refinement of the intervention plan

In the refinement stage, the questions suggested by Fawcett and colleagues (1994: 37) were used to apply the design criteria (design criteria in italics below). These questions helped to determine whether the implementation guidelines for DC were appropriate. The questions were applied to the implementation guidelines and the answers are summarised below.

The intervention plan was *effective* and could be *replicated* by other users. The intervention plan was *practical*, *simple* to use and could be *adapted* to various contexts

regardless of the amount of resources available. The intervention plan was *flexible* and could be adjusted to be *compatible with local customs and values*. After implementation, in short, no changes to the implementation guidelines of DC seemed necessary.

6.5 Conclusion

The aim of Phase Three was to design an intervention plan for the implementation of DC in the chosen research site. The plan consisted of implementation guidelines for DC, which were derived from extant literature and natural examples. These implementation guidelines were used during Phase Four of the intervention research, the implementation of the intervention plan. Implementation took place at a public NICU. The implementation guidelines were found to be effective and practical. A focus group was also held to validate the content of the guidelines for generalisation, as will be discussed in the next chapter.

7 Chapter Seven: Phase Five – evaluation and advanced development

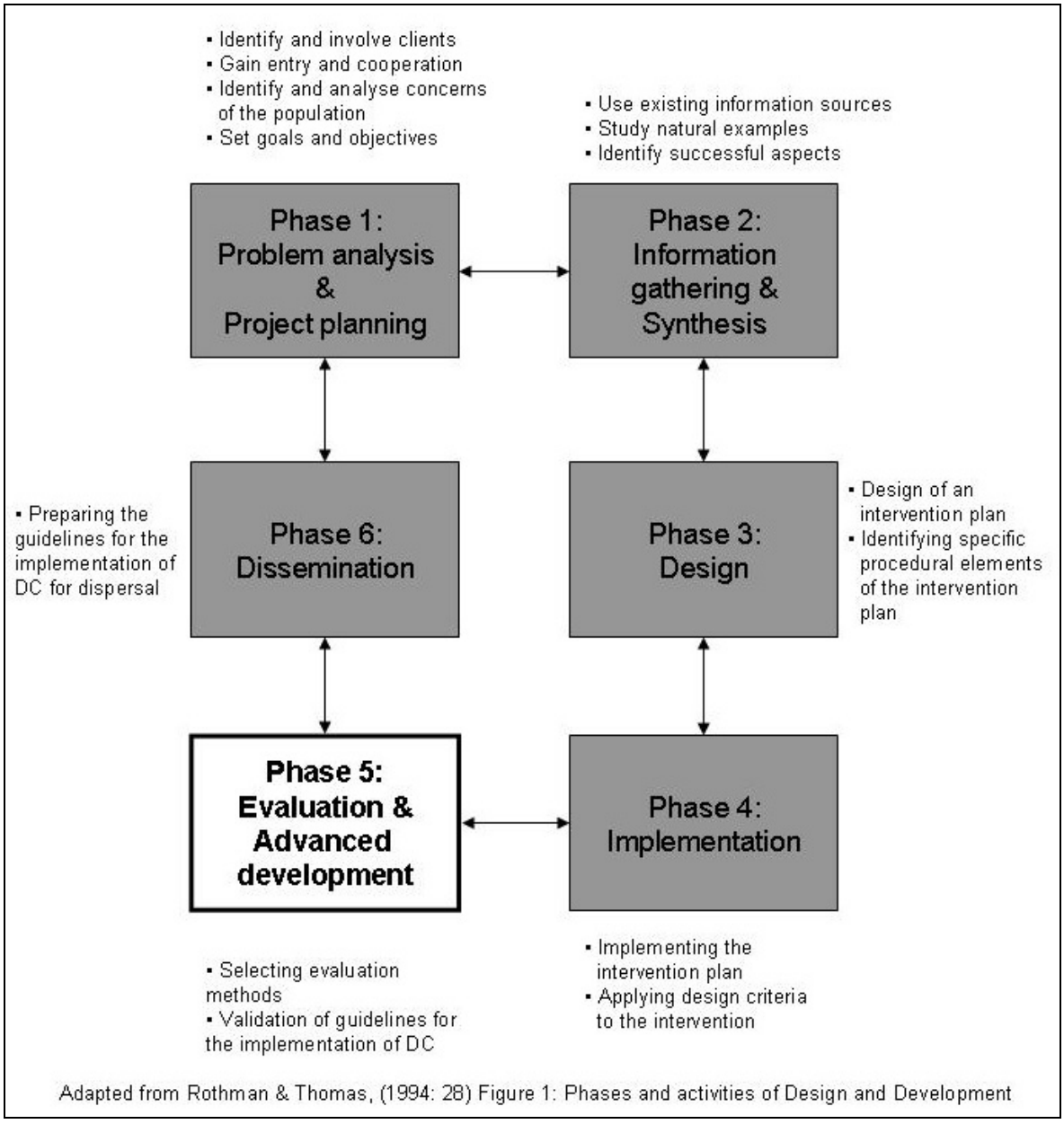

Figure 8: Overview pf the phases and activities of the research process (5)

7.1 Introduction

The aim of Phase Five was to determine the effectiveness of the intervention plan, and to validate and refine the implementation guidelines for DC as formulated in the

intervention plan. In this chapter, the selected evaluation methods are discussed as well as the expert focus group held for validation of implementation guidelines for DC.

7.2 Evaluation methods

Four methods for evaluating the progress of the intervention plan were chosen. Checklists based on the practice guidelines for the principles of DC were conducted mid-month by the researcher and at the end of the month by a participant for all the months of implementation and for all the DC principles implemented (see heading 7.2.1 Checklists).

Six months after active implementation (Phase Four) began, questionnaire 2 was given to the participants to assess the intervention progress, as is discussed under heading 7.2.2.

To overcome possible bias from the researcher or participants' side, an independent person, who had completed a Master's degree in Advanced Neonatal Nursing Science, carried out four environmental audits at random times, without warning the researcher or the participants beforehand (see heading 7.2.3 Environmental audits).

Two focus groups were held at the end of the active intervention phase, to determine which factors motivated the participants' continued practicing of DC on a daily basis, and to identify any negative or problematic areas of implementation that the participants experienced, as discussed in heading 7.2.4.

7.2.1 Checklists

7.2.1.1 Methods and procedures: checklists

In order to evaluate the implementation of DC practices in the neonatal unit on a regular basis, checklists were completed every two weeks. The content validity of the checklists was established using the practice guidelines for the implementation of DC set up in Phase Four, and was assessed by two experts in neonatal care and research

methodology. The checklists listed specific aspects of care that had to be marked as present, absent or not applicable (see Appendix 17).

The researcher completed the checklist evaluations in the middle of the month, and a participant who had completed the DC training sessions completed them at the end of the month. Although the involvement of the participants in the evaluation of implementation could result in bias, it was intended to facilitate active participation and buy-in. As each principle was implemented according to the staggered approach, the number of checklist evaluations that had to be completed increased throughout the active implementation phase. Owing to the increased number of checklist evaluations, after February 2005 completion of the checklists took longer than initially expected. This was further complicated as the participants completing the evaluations did so during on-duty time in addition to their normal responsibilities.

7.2.1.2 Data analysis: checklists

In order to determine the main trends that presented during the implementation phase, the collected data was analysed using quantitative analysis and a qualitative description was given (Babbie & Mouton, 2001: 491-492).

7.2.1.3 Findings: checklists

The same trend was identified for each principle implemented. The data presented in Figure 9 shows that the implementation of DC practices fluctuated depending on the circumstances in the NICU. This was exacerbated when existing internal problems flared up, the unit was over-crowded or staff shortages were present. Over-crowding and staff shortages resulted in the need for external agency staff, who had not participated in the DC training.

The monitoring of the implementation of positioning will be discussed as an example of the use of the checklists. Figure 9 illustrates the fluctuations experienced from one month to the next. The summary includes the checklist evaluations for the DC principle of positioning, from the middle of October 2004 to the middle of August 2005. The DC practices (Q1-15 in Figure 9) listed in the positioning checklist (see Appendix 17) that were noted as 'present' are plotted on the graph below as a percentage. Although a

visible trend can be seen of fluctuating improvement and deterioration, an overall improvement is evident over the course of the study. Two aspects of the positioning practice guideline (see Appendix 10) that refer to documentation of stress cues (Q13) and recording of performed DC interventions and observations (Q14), remained poor throughout the active implementation phase.

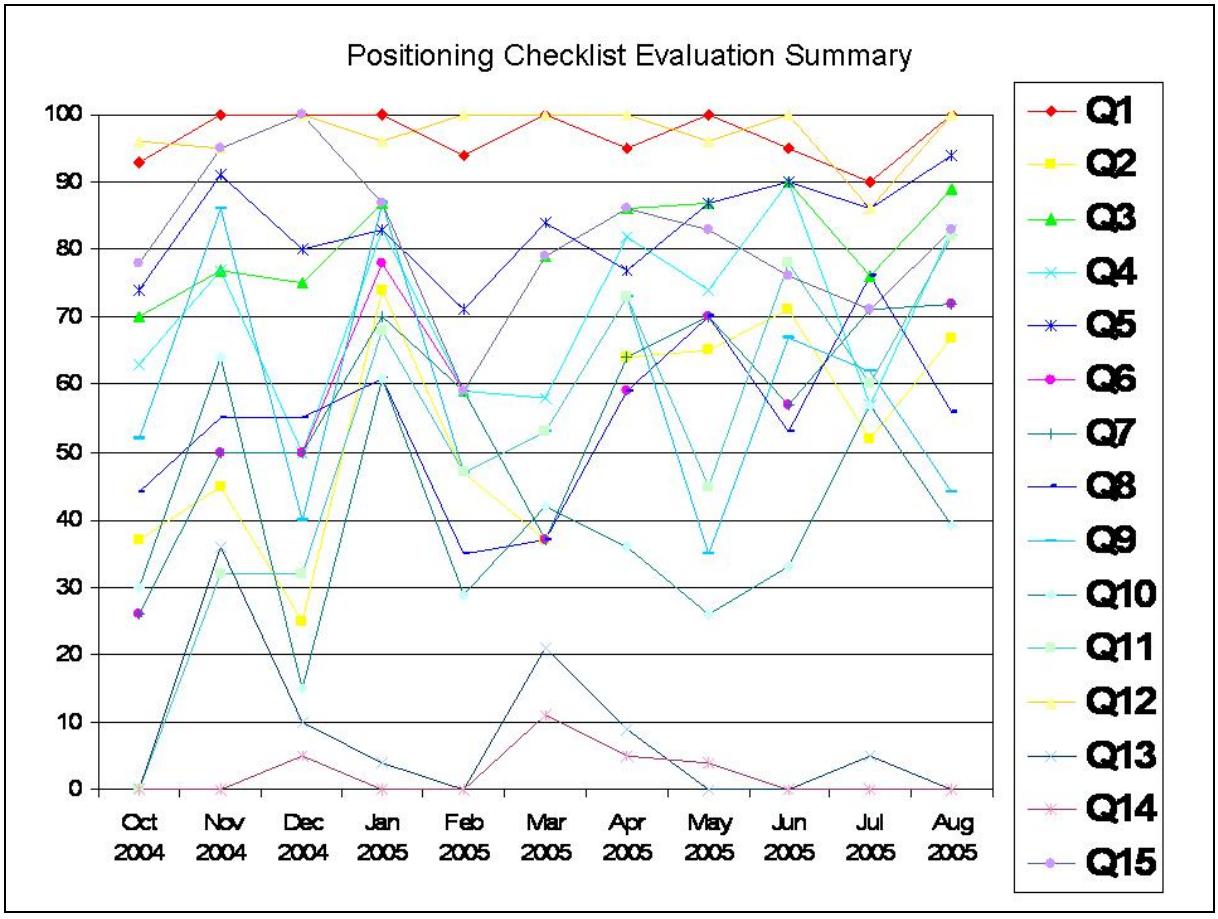

Figure 9: Positioning checklist evaluation summary

The Halo effect can be seen in the data collected by the research participants. Figure 10 gives an example of the positioning checklist evaluation conducted by the research participant at the end of October 2004. All of the questions answered by the participant reflect positive responses above 80%, except for one (Q11). Figure 11 is an example of the positioning checklist evaluation conducted by the researcher two weeks later. This is perhaps a more trustworthy evaluation of the level of positioning at the time of the evaluation.

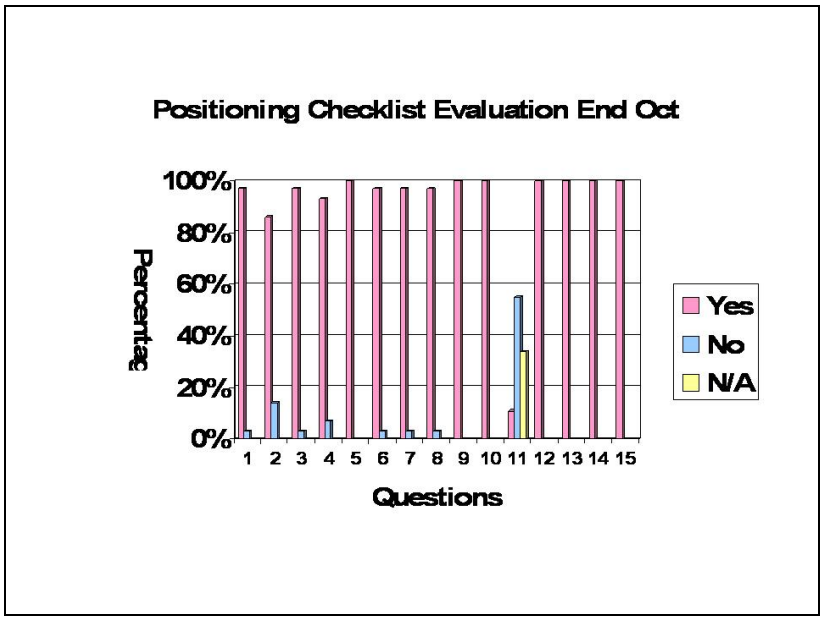

Figure 10: Participant's positioning checklist evaluation for the end of October 2004

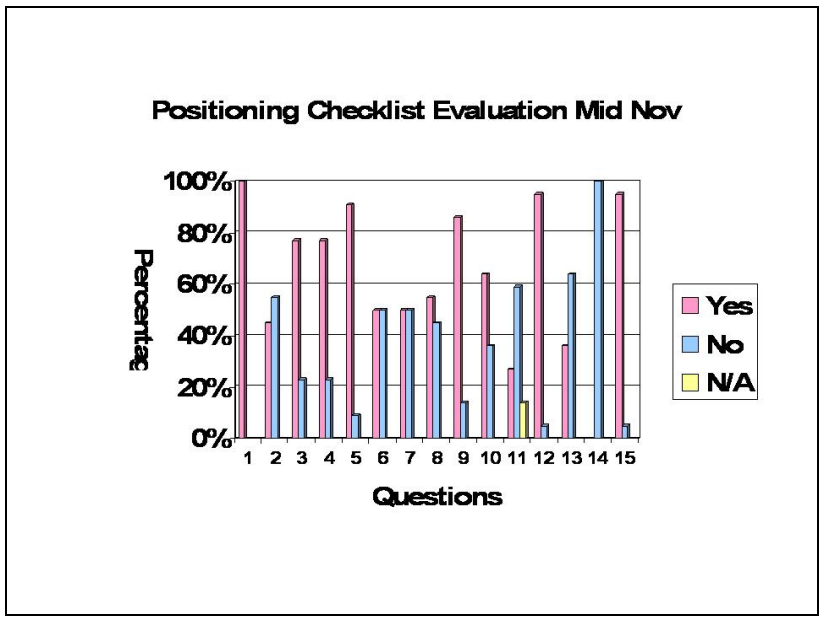

Figure 11: Researcher's positioning checklist evaluation for the middle of November 2004

Strategies were put in place in order to reduce the Halo effect. The researcher approached an independent evaluator to conduct four environmental audits (see heading 7.2.3) during the active implementation phase, and a second questionnaire was conducted to collect data for comparison with the first questionnaire. Two focus group interviews (see heading 7.2.4) were held as an additional evaluation method.

Overall, though the checklists did reveal a varying trend in the success of implementation, and did show bias, they did seem to encourage participant involvement and buy-in. Also, this process of evaluation contributed to the guidelines for the implementation of DC by showing that progress needed to be monitored on a regular basis to identify problem areas and strong points. Problem areas could then be attended to and strong points emphasised and used to encourage the participants. As mentioned, similar trends were identified in the implementation of the other DC principles. Since this study focuses on the implementation process and not on determining the success of implementation, the findings for the implementation of the other DC principles will not be discussed here, but could be published elsewhere.

7.2.2 Questionnaire 2

7.2.2.1 Methods and procedures: questionnaire 2

A second questionnaire (see Appendix 16) was used to describe the participants' perceptions and experience of the DC implementation process. The questionnaire consisted of eight questions: two closed questions, where 'YES', 'NO' or 'UNSURE'; and 'POSITIVE', 'NEGATIVE' or 'BOTH' could be answered respectively; and six open-ended questions which explored the individual's experience of DC implementation, perception of the impact of DC, aspects learned during implementation, and any other needs not attended to. The questions, once formulated, were scrutinised and validated for content by two experts and then finalised. The questionnaire was formatted on a double-sided A4-page with tick-box answers for the closed questions and writing space provided for the open questions (De Vos, 1998: 156-157, 160).

The questionnaires were delivered by hand. Some participants completed the questionnaires and delivered them to a collection point where the researcher collected them directly. Other participants took the questionnaires and completed them at a convenient time. These questionnaires were put at a point for collection by the researcher at a later time. 57 questionnaires were handed out and 48 (84%) were returned, which on its own was a positive sign of commitment from the participants (De Vos, 1998: 155). The data collection of this questionnaire was included in the initial informed consent document that was signed by the participants in Phase One. All data collected was anonymous and kept confidential.

7.2.2.2 Data analysis: questionnaire 2

48 members (n=48) of the multidisciplinary team completed the questionnaires given out during six contact sessions. A distribution and summary of the participants in terms of professions is reflected in pie diagram Figure 12 below.

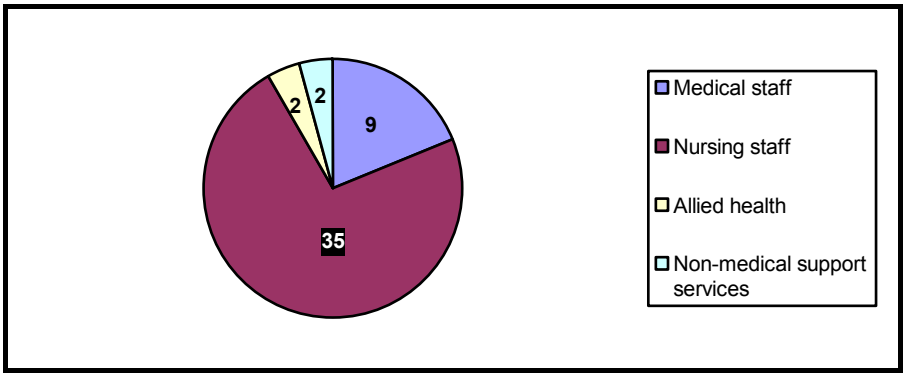

Figure 12: Distribution of multidisciplinary participation for questionnaire 2

The responses to the six open-ended questions were analysed according to the principles of qualitative conceptual analysis (Babbie & Mouton, 2001: 492-493). The data collected from the questionnaires was ordered by open-coding the responses per question into themes and sub-themes. After the raw data had been classified, the data was co-coded by an independent person qualified in advanced neonatal nursing to ensure trustworthiness in terms of credibility of the identified themes and sub-themes (Babbie & Mouton, 2001: 277).

7.2.2.3 Findings: questionnaire 2

The first two closed questions, discussed in heading 7.2.2.3.a and 7.2.2.3.b, aimed to establish the participants' feelings towards the implementation process. This nominal data is now described.

7.2.2.3.a Implementation success

When asked, "Do you think that DC is being implemented successfully in your unit so far?", 38 participants (79%) responded by marking the 'positive' box. No participants responded by marking the 'negative' box, and ten participants (21%) marked the 'unsure' box.

7.2.2.3.b Experience of implementation

The second question addressed the participants' experience of change in the unit, asking "How are you experiencing the changes in the unit?" One participant (2%) marked the 'negative' box, 30 participants (63%) marked the 'positive' box, and 17 participants (35%) marked the 'both' box.

The responses to questions 4-8 were related to the participants' positive and negative experiences, their perceptions of the impact of DC, the aspects they learned and additional needs they faced during the first six months of implementation. The identified themes and sub-themes are summarised in Table 9. A discussion of these themes and sub-themes follows.

Table 9: Main themes and sub-themes identified from questionnaire 2: question 3-8

Main themes and sub-themes identified					
Question 3: What are your **positive** experiences?	Question 4: What are your **negative** experiences?	Question 5: What is the **impact** of DC **on you**?	Question 6: What is the **impact** of DC on the **baby and family**?	Question 7: What have you **learned** so far while implementing DC?	Question 8: What **additional needs** do you have that are not being attended to?
Project-related experiences • Evidence of change • Staff involvement	Project-related experiences • Lack of participation • Resources			Aspects learned about the project • Importance of DC	Project-related needs • Knowledge and skills
Organisation-related experiences • Patient care • Unit benefits	Organisation-related experiences • Working conditions • Maintenance of resources	Impact on the organisation • Standard of care			Organisation-related needs • Unit management • Working conditions
Patient-related experiences • Improved patient outcomes • Family benefits			Patient • Short-term sequelae Family • Parental empowerment • Bonding	Aspects learned about the patient • Patient response • Individual care	
Personal experiences • Attitude changes • Knowledge & skills	Personal experiences • Lack of participation & motivation • Personality differences • Lack of application of knowledge and skills	Personal impact • Professional growth and development		Personal emancipation • Paradigm shift • Job satisfaction	

7.2.2.3.c Positive experiences

The third question, "What are your positive experiences?", determined the participants' positive experiences of the DC implementation process. Four main themes were identified, namely project-related, organisation-related, patient-related and personal experiences.

Project-related experiences

The two sub-themes identified under project-related experiences include evidence of change and staff involvement. Many participants commented on the evidence of change in the NICU. Some made comments that referred to the overall appearance, for example, "Big changes [are] visible"; and some made comments that referred to specific principles of DC that were now in place, for example, "Positioning has improved greatly [and] light control is attended to." One participant felt that "the unit [was] less noisy and [that there was] less handling of the babies."

Participants also observed changes in the unit's atmosphere. One said, "Atmosphere – more quiet and relaxed. Patients seem to be more comfortable. Blankets etc. make it look more cosy." Another commented that the atmosphere was calm and peaceful with better handling of infants (freely translated from Afrikaans).

Five participants experienced staff involvement as positive, saying, for example, "Most of the staff members are following the developmental care implementation" and, "Staff members try their level best to implement it in addition to our work load".

Organisation-related experiences

Organisation-related experiences showed two sub-themes, patient care and unit benefits. Two participants responding on patient care said that more attention was being paid to the details of caring for the patients. Another commented that the nursing staff were handling the infants with more sympathy (freely translated from Afrikaans). These comments about the care of patients justified one of the expectations raised by questionnaire 1, that nursing care would improve in the unit during the project. Unit benefits included a well-organised ward; as one participant stated, "The unit has improved".

Patient-related experiences

Two sub-themes were identified that related to the patient, namely improved patient outcomes and family benefits. 21 responses referred to improved patient outcomes, which were pointed out by the participants as positive experiences. One said, "The babies look more comfortable and the prem[ature] heads are not as flat as they used to be before the project started." Another participant stated that you "can see the change it makes for the babies; [they are] more calm and comfortable during painful procedures." Another participant said that "patients grow well with their DC procedures taught by the tutor, [and] the nests keep them in acceptable positions, which assist in their growth". Some comments repeated facts taught during the in-service training session, such as "diminished length of hospitalisation."

The second sub-theme was family benefits. Participants responded that "parent[s] bond well with babies [and] learn how to take care of their premature babies", and "education [is] hand[ed] over to the parents about their babies, about caring and touching."

Personal experiences

Attitude changes and knowledge and skills were identified as the two sub-themes for positive personal experiences. Responses from participants indicating attitude changes included the following:

- "Better attitude and care towards care of the babies and parents. Generally a more caring / comfortable environment."
- "The handling and touch does miracles as it allows the nurse to work with the baby [who] enjoys the gentle touch and the introduction of touch."
- "I've noticed that babies feel much more comfortable in the nests. They actually enjoy resting in the nests. We can see this on the babies' facial expression."
- "According to my experience the positioning in premature babies is more effective because they look calm and restful and grow nicely. The more you practice the more you get used to it and do it automatically as part of your nursing care."

Gaining increased knowledge and skills was also cited as a positive personal experience, with participants making comments like, "Nursing staff learn[ed] about caring and nursing premature [infants]" and "I have learnt a lot about how to handle the premature baby."

7.2.2.3.d Negative experiences

It was clear that some of the participants had negative experiences with DC implementation. Question four asked, "What are your negative experiences?". The responses from the participants were again divided into main themes and then into the sub-themes. The main themes included project-related experiences, organisation-related experiences and personal experiences.

Project-related experiences

A lack of participation and a lack of resources were identified as the two sub-themes for negative project-related experiences. The participants documented a lack of participation with the following responses:

- "Some of the nursing staff are not participating well; this is demotivating those who care [and are] trying their best."
- "The doctors after working with the babies…do not reposition the baby and are very negative when they are corrected."
- "Other people don't adhere to the rules, especially [the one about] reducing noise in the unit."
- "Not everyone has bought into the process. To ensure future success, the unit itself must accept responsibility for implementation" (freely translated from Afrikaans).
- "Depending who is on duty, the unit is not peaceful and a lax attitude is adopted" (freely translated from Afrikaans).
- "Personnel do not always work together, for example the noise in the unit" (freely translated from Afrikaans).

Resources were the second sub-theme. One participant felt the colour of the positioning aids should be changed "to minimise extra work after spoiling." Another participant said that "sometimes we run out of developmental nests and then positioning is not done properly without the nests."

Organisation-related experiences

Two sub-themes were identified for negative organisation-related experiences, namely working conditions and maintenance of resources. The negative aspects highlighted about working conditions included the following:

- "Sometimes the ward is so busy that we cannot meet the developmental care requirements, e.g. proper positioning."

- "The unit itself is small and congested. Some staff members don't adhere to the rules."
- "Work load is very high in this unit and you have to prioritise."
- "It takes time because we are short-staffed and we are unable to follow procedures as taught."

The negative experiences involved in maintaining the resources included the care of the positioning aids and blankets used for the implementation of DC practices. Participants' comments included, "The washing of blood on the nests [is a problem] as we have got no sluice room to do this [in]", as is "doing washing during my spare time."

Personal experiences

Three sub-themes were identified as negative personal experiences:

- Lack of participation and motivation,
- Personality differences, and
- Lack of application of knowledge and skills.

A lack of participation and motivation was evident as "there are personnel who still feel it is extra duties and therefore influence other personnel negatively by negative attitudes and perceptions." Two participants highlighted personality differences, saying that "our facilitator can become impatient and that is demotivating" and it "causes conflict sometimes between us and our facilitator as we prioritise." One participant's comment showed a lack of application of knowledge and skills: "[developmental positioning] extubates the patients especially the bendy bumper as sometimes the tube positioning is impaired."

7.2.2.3.e Impact of developmental care on participant

Question five addressed the impact of DC on the participant. Two main themes emerged, namely the impact of DC on the organisation, and the personal impact of DC on the participants.

Impact on the organisation

Only one sub-theme was identified for this theme, namely standard of care. One participant said that the "nursing care [had] improved, and another said that DC would "improve the standard of health."

Personal impact

One sub-theme was identified for this theme, namely professional growth and development. Evidence of professional growth and development was identified in the following statements:

- DC "force[s] one to be cognisant of the baby and its non-medical needs."
- "We need to consider each infant as an individual, and we need to offer a complete package of care, including developmental care as well."
- "It makes me proud of being a nurse, especially knowing how to improve the health status of the babies in the unit."
- "It targets lots of things I did not know, especially positioning of baby."
- "I have actually learnt a lot. It is easier for me to examine babies on the nests because they are well supported."
- "It helps me a lot [in] caring [for] the baby, especially to reduce [his] stress."

Five participants' responses showed an emotional reaction to professional aspects of implementation. One participant said, "it has really changed my attitude, I am very excited about it." Another said that DC was "just a change of procedures and attitude [that] you had to implement in your everyday work." A participant commented that it made her happy to see that the infants were definitely benefiting from the additional care delivered (freely translated from Afrikaans). Another said that it was nice to work with positively inspired people in order to make a difference (freely translated from Afrikaans).

7.2.2.3.f Impact of developmental care on patient and family

Patient

All the responses from the participants dealt with the short-term sequelae of the patient, and were similar to the benefits mentioned in previous studies (see chapter 2), including:

- "Short stay in hospital."
- "It promotes growth and development of pre-term babies."
- "Their condition improves [more quickly] and they look calm."
- "The babies experience less pain, [and are] less physiological instability (e.g. desaturation)."
- "[Fewer] skull abnormalities."
- "Decreased incidence of stress to baby, less crying and agitation noticed."

- "More babies are sleeping and [are] quiet after procedures, and babies cry less."

Family

Parental empowerment and bonding were the two sub-themes identified for the impact of DC on the family. One participant said the family got "more information on how to care for premature and sick bab[ies]." Another commented that the "family [got] first-hand information on caring for the baby." "More family involvement" had been seen since the start of the implementation, and "more mothers do KMC; the babies tend to notice them when they touch them [and] they become so peaceful." One participant said "it helps the family to care well for the baby in order to reduce stress for them."

The second sub-theme of the impact of DC on the family is that it "improves bonding." One participant said that DC helped mothers to bond with their babies, and that some "mothers also enjoy doing some of the demonstrations with their babies."

7.2.2.3.g Aspects learned during the implementation of developmental care

Question seven asked, "What have you learned so far while implementing DC?" The responses were divided into three main themes, namely aspects learned about the project, aspects learned about the patient, and personal emancipation.

Aspects learned about the project

The importance of DC was the only sub-theme, which had 48 identifiable responses. Some participants referred to the importance of DC as a care approach, saying, for example, "Developmental care is good to be practised everyday in the unit, since it is producing positive results for both the baby and family". Others mentioned the importance of individual principles, citing "the importance of positioning, light and noise control including bonding between baby and mother" as the aspects learned during DC implementation.

Aspects learned about the patient

The second main theme identified was aspects learned about the patient. Two sub-themes were seen here, namely patient response and individual care. One participant commented, "Babies enjoy the new environment of our NICU. They enjoy the nap times and they actually look much more comfortable." Three participants' responses centred on individual care. One participant said he had learned "to be more objective and cognisant towards voiceless patients." Another said, "I've have learned that babies

are human beings as well who need to be respected like others in order for the development to take place quickly."

Personal emancipation

Personal emancipation was the third main theme identified, and has two sub-themes, namely paradigm shift and job satisfaction. Six participants' responses focused on personal emancipation:

- "I had no clue of developmental care before starting here, so everything was new to me. Initially I was negative, but as I became aware of the reasons things are done, it is definitely more positive."
- "Be careful of what you do; stop and consider the implications and effect of simple interventions to the baby."
- "I have made lots of mistakes which can cause lifetime damage to the other person's life. I want to make sure that I implement developmental care so that every baby will grow normally and be happy."
- "Babies stress a lot more than I initially thought."
- "Be patient with the babies. Nurse them as if you are nursing your own babies. It encourages growth of premature babies."
- "I have learned to do things the right way and the effects of developmental care,…a good, right way of nursing premature babies and the importance of developmental care."

Job satisfaction was the second sub-theme. A few comments such as the following were made: "Nurses are happy to work with relaxed babies and at the end of the day it creates job satisfaction."

7.2.2.3.h Additional needs

The last question, question eight, addressed additional needs that the participants felt were not being attending to during the implementation process. Two main themes were identified, namely project-related needs and organisation-related needs. If the needs were related to the project and were within the scope of the implementation process, they were identified as project-related needs. Additional needs related to the organisation that were beyond the researcher's means were listed under organisation-related needs.

Project-related needs

Only one sub-theme emerged for project-related needs, and this was knowledge and skills. Four participants pointed out a need for additional training sessions. Particular reference was made to swaddled bathing, handling and touch, KMC and swaddled weighing of the infants. One participant wanted to write a test to remind her of what she had learned. Another participant requested that the time of the training sessions be changed to a time in the morning.

Organisation-related needs

Unit management and working conditions were the sub-themes observed for organisation-related needs. With reference to unit management, two participants commented on the lack of resources. One asked for additional staff, and the other asked for "enough linen in the unit for swaddled bathing of the babies because babies really enjoy this bath. Besides it is a nice feeling when bathing the babies knowing that they enjoy it." Another participant made suggestions for how infection control and hygiene could be improved in the unit.

Two participants highlighted the working conditions, the second sub-theme. One participant referred to doing the washing as a problem, saying that "sometimes…we are already overloaded with the ward routine." The other participant asked for a door that opened itself: "Our neonatal unit has a lot of traffic, rules are not observed and doors are left open by people who are not fully orientated to this programme. We need a door that opens and closes itself."

7.2.2.3.i Discussion

When comparing the main and sub-themes analysed from the data collected by questionnaires 1 and 2, it is evident that the participants' expectations have been met and that the concerns have remained consistent. Table 10 draws a comparison between the themes identified in questionnaire 1 and questionnaire 2 that are concerned with participants' expectations and concerns for the project, and their positive and negative experiences of the project.

Table 10: Comparison of participants' expectations and concerns (questionnaire 1) and positive and negative experiences (questionnaire 2)

What are your **expectations** for the project?	What are your **positive** experiences of implementation?	What are your **concerns** about this project?	What are your **negative** experiences of implementation?
Project expectations • Project success • Participation/staff involvement	Project-related experiences • Evidence of change • Staff involvement	Project concerns • Lack of resources • Prospects of failure • Existing problems identified	Project-related experiences • Lack of participation • Resources
Organisational expectations • Nursing care • Long-term benefits	Organisation-related experiences • Patient care • Unit benefits	Organisational concerns • Working conditions • Frequent staff rotation	Organisation-related experiences • Working conditions • Maintenance of resources
Patient expectations • Improved patient outcomes • Family involvement	Patient-related experiences • Improved patient outcomes • Family benefits	Patient concerns • Patient safety • Patient recovery • Obstacles regarding family involvement	
Personal expectations • Professional growth and development (knowledge and skills)	Personal experiences • Attitude changes • Knowledge & skills	Personal concerns • Lack of participation and motivation • Resistance to change • Lack of knowledge and skills • Personality and cultural differences	Personal experiences • Lack of participation and motivation • Personality differences • Lack of application of knowledge and skills

Concerns previously raised about the project during the first questionnaire that could have had an effect on the implementation process included existing problems at the research site, working conditions and the frequency of rotating staff. Themes identified as personal concerns were very similar to the personal related negative experiences,

and included a lack of participation and motivation, personality differences and a lack of application of knowledge and skills.

The data collected from the second questionnaire shows that the implementation of DC has had an impact on the organisation, by improving the standard of care; on the personnel, by aiding their professional growth and development; on the patients, by improving their short-term sequelae; and on the families, by increasing the benefits of parental empowerment and parent-infant bonding. Although some participants did have negative experiences, most of the participants' experiences of the implementation process were positive.

7.2.3 Environmental audits

In order to evaluate the level of DC practiced in the unit during implementation, an independent evaluator completed four environmental audits of the NICU. These audits were completed at random times during the implementation phase, and neither the researcher nor the participants were warned before the audits were conducted. The environmental audits were carried out in May, June, August and September 2005.

7.2.3.1 Methods and procedures: environmental audits

The environmental audit instrument (see Appendix 4) was the same instrument used during Phase One (see chapter four for methods and procedures). The evaluator completed the environmental audit by observing and recording the specified information. The general findings of the four audits, which indicate an improvement in DC practices in the NICU after the implementation of the intervention plan, are now discussed.

7.2.3.2 Data analysis: environmental audits

The data collected from the environmental audits was analysed by qualitative descriptive analysis to identify themes and sub-themes. The findings are described below.

7.2.3.3 Findings: environmental audits

7.2.3.3.a Section one: health-care facility

Section one of the environmental audit recorded the health care facility's details, including date of audit, unit manager's contact details, DC implementation date, bed capacity of the unit, number of patients at the time of the audit, estimated staff-patient ratio and acuity levels of the neonatal care provided.

Although the significance of these variables was not statistically tested, most of these details remained constant. Variation was seen in the staff-patient ratio according to patient acuity, staff availability and bed occupancy. The unit's bed capacity is 30 patients and during the four audits patient occupancy ranged between 113% and 140%. A summary of the bed occupancy and staff-patient ratio is represented below in Table 11. The intensive-care (IC) area consisted of patients receiving ventilation support and unstable patients. Ventilation support includes mechanical ventilation, oscillation and nasal continuous positive airway pressure. High-care (HC) patients are not ventilated and their condition is stable. Low-care (LC) patients are those infants in bassinets for weight gain and pre-discharge.

Table 11: Summary of bed occupancy and staff patient ratio

Items as they appear in the audit	**Environmental audit 1**	**Environmental audit 2**	**Environmental audit 3**	**Environmental audit 4**
Bed occupancy	34 (113%)	38 (127%)	42 (140%)	39 (130%)
Staff-patient ratio	IC 1:3 HC 1:4 LC 1:5	IC 1:2 HC 1:4 LC 1:4	IC 1:3 HC 1:4 LC 1:4	IC 1:2 HC 1:3 LC 1:4

7.2.3.3.b Section two: developmental care principles

Section two focused on the seven different principles of DC, individualised care, family-centred care, positioning, handling techniques, environmental manipulation, non-nutritive sucking and pain management (as discussed in chapter 2). Each of these

principles had particular observable details, and was marked for example with 'YES', 'NO', 'UNSURE' or 'NOT APPLICABLE'; or 'SPECIFY' and 'BRIEFLY DISCUSS'.

Principle one: individualised care

Before implementation, some individualised patient care plans were observed, but overall procedures were not carried out according to the infant's needs. There was little evidence of cluster care or written verification of individualised care. Some registered nurses did say that individualised care was present, and registered nurses enrolled in the neonatal course did practice individualised care. A lack of individualised care was seen for infants with a higher acuity; in general, the more sick and unstable an infant was, the less individualised was his/her care. During the second and third audits, bed occupancy was 127% and 140% respectively. The evaluator made a comment in her notes that the lack of individualised care was due to too many patients in relation to available staff.

In general, patients' bed spaces were not individualised by personal belongings or toys, but evidence of this was seen during the second environmental audit.

Because the recognition of physiological and behavioural stress cues directs individualised care, the staff's response to these stress cues was observed. During the first environmental audit, the evaluator documented that the staff did observe the physiological stress cues but did not respond correctly. She noted that, "it happened often that a baby was showing physiological stress cues and although the alarms were alarming, nobody responded or someone just switched the alarms off." The evaluator observed the same during all four audits and commented the following during the second environmental audit: "Very few personnel are focused on physiological stress cues. I do not know if this is due to a lack of knowledge or a lack of caring."

The staff often observed behavioural stress cues but seldom responded to them. During the first environmental audit, the evaluator stated that "very few members (especially the non-nursing staff) of the multidisciplinary team paid attention to behavioural stress cues." No response in the form of altered care delivery was visible.

Principle two: family-centred care

The facilities available in the unit for parents and grandparents were observed. Chairs were available for parents but there was less than one chair per bed. No resting area for the parents was available. Refreshment facilities were available outside the unit.

The visitation policy for the unit allowed parents to visit after 10h00 in the morning until 20h00 in the evening. No siblings were allowed into the unit and grandparents were allowed in on the day of admission and then on Sundays for a short period of time.

Family involvement and empowerment was facilitated by staff, but the evaluator commented that parents were not involved in active decision-making about their infant's care. The evaluator noted a mother being taught how to express breast milk. Also, parents in the intensive care area were not encouraged to touch or hold their infants, but this depended on the nurse working with the infant.

When practices of informed consent for treatment were assessed as specified in the environmental audit, the staff said that they informed the parents about the infant's condition and related aspects, but no evidence of this could be found in the patient records. There was no evidence that parents were involved in the decisions made involving their infants, but rather they seemed to be informed after the decisions had been made and the actions carried out.

No verbal or written informed consent was obtained for minor procedures, such as blood sampling and x-rays, and these procedures were done when necessary. The patient records verified that written informed consent was obtained for major procedures, such as surgery and administration of blood transfusions.

Principle three: positioning

Patients were only found to be positioned correctly in the second audit. Although positioning was not 100% correct, all patients were positioned with positioning aids. The main problems experienced included a lack of curved shoulders and backs, and positioning aids that were too big, resulting in a lack of containment. This lack of containment contributed to some infants' inability to maintain flexion and midline orientation. The practice of intermittent KMC was evident during three of the four environmental audits but the evaluator did not specify the number of infants receiving KMC.

Principle four: handling techniques

The evaluator observed that staff-patient interactions during routine care delivery or medical intervention showed ineffective handling of the patients, with no positive touch or transitional touch observed. Fingertip touch was often used instead of palmer touch and no containment was provided during positional changes. The evaluator

documented 'preemie-flips' (rapid 180˚ turning of the infant) as well as rough handling of infants. The evaluator did comment that a lack of time due to overcrowding could be a cause for these incorrect postural changes.

Principle five: environmental manipulation

Light, noise and smell were evaluated. The evaluator observed that the lights in the unit were switched on in all cases, but most infants had protective barriers either in the form of covers over their eyes or blankets over the incubators. There were no dimmer switches in the unit. Nap times were specified, when the lights were supposed to be switched off, but these times were not adhered to.

The levels of noise were not measured objectively, but the evaluator commented on her perceptions of the noise level. During the first environmental audit the noise levels in the unit were "very high" with "alarms going off the whole time". Staff generated noise levels were high and the evaluator commented that conversations were held at the bedsides. The telephone volume was also very high. The evaluator then commented that the doctors and non-medical support services were making most of the noise during the second audit, and that the radio was on. Much noise was also observed during the third audit: "people are calling to each other, the telephone is not being answered, and the cleaners are bumping equipment." The fourth audit presented the same trend.

Staff commonly waited a while after applying alcohol hand spray for the spray to dry before touching the infant.

Principle six: non-nutritive sucking

Pacifiers were available in the unit and most infants had pacifiers at their beds. During one environmental audit, however, it was observed that although the pacifiers were available, non-nutritive sucking was only used when the infant was crying.

Principle seven: pain management

For the level of pain management to be determined, the evaluator observed the use of oral sucrose during painful procedures as well as intravenous pain medication practices. She recorded no evidence of non-pharmacological pain management, since sucrose was not provided for infants during painful procedures like venous cannulation and blood sampling. Pharmacological pain management was used, though the evaluator observed an intercostal drain being inserted without any pain relief.

7.2.3.3.c Section three: orientation, training, participation and documentation

Section three addressed the orientation, training, participation and documentation involved in DC practices.

Orientation

Non-permanent staff (nursing students and medical students) rotated internally within the hospital on a weekly to a monthly basis, with medical doctors rotating approximately four monthly. Orientation on DC was given to rotating staff in both oral and written format.

Training

Participants in the unit had been specifically trained in DC. A specific protocol or policy ensuring that all staff were adequately trained in DC principles was not available but management did encourage staff to attend the training sessions.

Participation

All the members of the multidisciplinary team were involved at some level of DC implementation. The hospital superintendent granted consent for the research project but no further involvement of top-level management was observed. Middle management at the maternity division was initially involved but later supported the implementation in a less active manner. Lower management's commitment was evident.

Developmental care documentation

The unit records, including the unit register, nursing records, medical records and individualised patient care plans, showed no evidence of DC. The philosophy, mission and vision of the unit were changed during the project and made specific reference to the NICU and DC. These documents were displayed on the wall in the unit. Guidelines and procedures for DC implementation were available. Information was available to parents with infants in the unit in the form of posters, pictures on the walls and oral information.

7.2.3.4 Conclusion: environmental audits

The evaluation of the environment by the independent evaluator yielded clear evidence of changes within the unit in comparison to the first environmental audits conducted

during Phase One (see chapter four). Principles implemented earlier in the implementation phase were more practiced than those implemented towards the end of the implementation phase; for example positioning and environmental manipulation were more established than pain management and family-centred care. Participants had received training on the principles of DC, and an orientation programme was in place for new and frequently rotation staff.

The data from the environmental audits show evidence of the implementation of the principles of DC, and documentation is in place to support the implementation of DC and KMC. The principles of DC have been implemented and evidence of DC practices is visible in the unit. The evaluator gave a general impression of DC practices observable during all four of the environmental audits. This is reflected in Table 12.

Table 12: Summary of general impression of developmental care practices for environmental audits 1-4

General impression	Environmental audit 1	Environmental audit 2	Environmental audit 3	Environmental audit 4
good				
average			✓	✓
poor	✓	✓		

7.2.4 Focus groups

7.2.4.1 Methods and procedures: focus groups

The focus groups were held at the research site during the last week of the implementation phase. Participants from the two dominant multidisciplinary groups, doctors and nurses, were invited to participate, and participation was voluntary. Invitations were handed out by the researcher to participants and they were requested to confirm if they decided to attend. The first focus group had five participants, and the second focus group six participants.

Independent focus group facilitators were arranged to conduct the focus group interviews. Both facilitators were experienced in qualitative data collection and in focus

group facilitation. Facilitators who would be culturally sensitive to the participants' needs were chosen.

For the first focus group, the researcher recorded field notes and observations of verbal and non-verbal behaviour. Similar notes were made by the focus group facilitator for the second focus group. Once the participants had arrived at the venue, the reason and proceedings for the focus group were explained, and informed consent documentation (see Appendix 19) was completed before the focus groups commenced. The informed consent documents were kept in a safe place where only the researcher had access to them.

Three open-ended questions were asked that aimed to evaluate the participants' perceptions of the implementation process. Although the main questions were set, the facilitators asked additional questions to promote the flow of the discussion and probe particular topics. The first two questions addressed the implementation process: (1) What motivates you to practice and continue with DC daily? and (2) What inhibits or prevents you from practicing DC daily?

Resistance toward implementation of the last principle, family-centred care, was observed, and the researcher wanted to establish the reasons for this by asking a third question: according to your experience, how could family-centred care be implemented? Some of the problems that participants' reported with the implementation of family-centred care can be briefly mentioned. Parents were not empowered as part of the decision-making team and were frequently informed of interventions already performed rather than being involved in decision-making or being allowed to decide for their infant. The visitation policy was rigid, which restricted parental visitation, sibling involvement and the support of other family members, like grandparents, and multidisciplinary team communication with the parents did not fully disclosure information.

7.2.4.2 Data analysis: focus groups

The two focus group interviews were digitally recorded and transcribed *verbatim*. The data collected was analysed using qualitative content methods, and the editing analysis style described by Polit and Hungler (1997: 378, 380–384). Open coding allowed the main themes and sub-themes to be identified. This process of analysis was repeated

to confirm correct coding and an independent co-coder validated the analysed data, which strengthened the trustworthiness of the identified themes and sub-themes in terms of confirmability (Babbie & Mouton, 2001: 278). The independent co-coder who validated the analysed data was an expert in advanced neonatal nursing science.

7.2.4.3 Findings: focus groups

The data from the two focus group interviews were integrated. The main themes and sub-themes identified during the data analysis of the focus group data are summarised below in Table 13. A detailed discussion of these themes will follow.

Table 13: Summary of main themes and sub-themes identified in the focus group discussions

Main themes and sub-themes identified from the focus groups		
Question 1: What **motivates** you to practice and continue with DC daily?	Question 2: What **inhibits** or prevents you from practising DC daily?	Question 3: According to your experience, how could **family-centred care** be implemented within these constraints?
Project • Programme coordinator • Project implementation • Project ownership		
	Organisation • Lack of resources • Workload	Organisation • Resources
Patient • Patient benefits • Family benefits		Patient • Family involvement
Personal • Professional growth and development	Personal • Multidisciplinary team conflict • Cultural issues • Different personalities • Lack of insight	

7.2.4.3.a Motivating factors

Question one asked, "What motivated you to practice and continue with DC daily?" Three main themes were identified, namely project-related factors, patient-related factors, and personal factors.

Project-related factors

Project-related motivating factors for the continuation of DC practices are divided into three sub-themes. The sub-themes include the programme coordinator, project implementation and project ownership. The programme coordinator played an important role, with one participant commenting that, "I think the time that the researcher spends coming in and orientating and just keeping a finger on everything is very important. There must be someone driving the whole process." The participants agreed that the programme coordinator had to be an independent person who was not involved in the unit workforce. As one put it,

> If one person is dedicated towards it that is not really involved in the day-to-day management, it becomes a lot easier, because the unit gets quite full and it is quite difficult to manage everything at one time… If it is somebody, say, that has sufficient time or things like that on their hands, but if you are, for instance, say, the sisters-in-charge, you should do it. There are so many other things that they have to divide their attention amongst and it probably is not practical to expect them [to do it].

The second sub-theme relates to project implementation. One participant said,

> The fact that everything has been pre-organised also makes things a lot easier, in the sense that you had the nests available, you had the covers of the incubators available, simplex syrup is available in the fridge. It has been set up already as a regular process that takes place, every month now you get a new bottle of syrup simplex. So it makes it easier to implement all those things, because it is there to be used. So it just becomes part of the daily routine and that makes it a lot easier to do as well.

Project ownership emerged as the third sub-theme. One participant said, "It is in our blood … So Viva developmental care, viva." Other participants agreed that DC practices would continue after the implementation phase was terminated, saying, "It is in us, so even someone coming from wherever, they will follow us", and "it will be part of orientation that we have to give all our new staff."

Patient-related factors

Patient-related motivating factors formed the second main theme, which two sub-themes, namely patient benefits and family benefits. Many participants commented that the patient's response to the new DC practices had motivated them to continue practising. As one said, "Well, the first thing is that you actually see the change in the babies. When you implement the care you can immediately see that this baby reacts differently. To give an example, if you take blood, with giving the sucrose and the dummy, and somebody holding the baby as well, it is easier actually to take the blood and the risk is less for yourself and the baby reacts differently." Another participant said, "I think, over the years, we are aware [that] the babies that [have] been cared for in a more organised developmental way are [the] babies [that] are picking up weight more easily, and even when we see them afterwards with the mom on follow-up, they are more content babies."

One participant said a motivating factor for her was that DC was evidence-based and that current research literature supported the concept, saying, "I do it because I know it has been proven … and it is the best for our babies." Another participant commented that DC changed her opinion of the infant. She said,

> the other thing about developmental care that motivated us, [is that] we used to nurse the babies … just nursing … what can I say … nursing was just nursing. But now that we have learnt this developmental care we started correlating the theory into practice so that when you nurse a neonate, you know you are nursing somebody that is unique and is a total human being.

The second sub-theme is family benefits. One participant commented that he was forced to be more aware of the family, saying that the approach

> …just forces you to think about ... the family aspect of it. It is always an undercurrent to suggest, be cognisant of the mother and father, keep the parents involved. It is difficult in the setting, but it actually forces you to think of the baby in that light or that particular social situation and it also comes to the fore especially when [you are] doing procedures in front of the parents. Just basically keeping the parents in touch with your normal situation, not where you want to extubate the baby and it is really essential to get their consent but just with your normal day-to-day things … it has come through quite a bit.

One participant commented that parents' involvement had improved during the implementation, saying,

> …Even the parents started seeing something new when they came to the hospital. The baby was lying there nicely in a nest. So parental involvement also improved because parents became more interested. They want to learn more when they see you putting these babies in a special way, in swaddled bathing, … trying to focus on the baby, like … if you can touch the baby roughly, you see the frown on the faces or the hands will go up [*Moro reflex*]. So even the parent think, oh gosh, our babies are getting the best care. The parents started to trust the nurses even more, [thinking,] they are doing the best they can for our baby.

Personal factors

The last main theme under motivating factors is personal factors. Only one sub-theme emerged for personal factors, which is professional growth and development. One participant puts it clearly, saying, "Again for the personnel themselves, I think it helps them to have a lot of insight as to what is happening, especially with the prematures, and everything; you do it with a lot of caution and understanding and then some of them they just come naturally, you do not have to prepare anything, we just do it, it is part of your routine." Another participant said, "We started correcting ourselves because somewhere along the line you are not doing the right thing. We thought we were right but you are not doing the right thing. So, the DC enriched our knowledge as far as the nursing practice of the neonate was concerned." Another participant commented that

> Just looking after the baby and the baby became well and then give treatment and the baby goes home. We did not have something in mind like the correct positioning, the minimizing of light and noise, the implication of too much noise, pain inflicted on the baby. These things, we took them lightly but after the implementation of the whole DC process in general, we started to be more cautious.

One of the clinical assistants commented that her motivation was directed by team pressure from the nursing staff, saying,

> I think on my part, the nursing staff actually takes it very seriously. If you leave the baby not wrapped up in the nest, they will come and say, 'You left my baby open' or something like that. So that pushes you to carry on, because I should have done it. I think that has helped. Now I just do it automatically. I think I got my motivation from the sisters because they took it seriously and that is how I saw it in the unit.

7.2.4.3.b Inhibiting factors

The second question investigated the inhibiting factors of the implementation process, asking, "What inhibits or prevents you from practising DC daily?" Organisation-related factors and personal factors were identified as the two main themes.

Organisation-related factors

Two sub-themes emerged that related to the organisation, namely a lack of resources and workload. Participants commented on the lack of resources, mentioning both non-human resources and human resources. A lack of non-human resources included the absence of dimmer switchers on the lighting in the unit, a shortage of linen and a shortage of clean nests (before the donation of the laundry appliances). A lack of space was also identified as a factor that inhibited the practice of DC. As one participant put it, "In the ICU unit we have got, they say eight beds, but if you look at it, it does not fit. It fits six beds because of the oxygen points and suction."

A lack of human resources implied a shortage of personnel. One participant said, "… Sometimes there is not always a sister available to hold the babies, there really is not. It is not that they do not want to; they are just really busy with other things. It is probably just the availability of stuff and the available staff." Another participant added, "It is sometimes very difficult when you have got a very sick baby to cover them up; you need to see what is going on … things like that. If you have got a one-on-one situation of nursing care it would be much easier to do the full spectrum of DC, but if there are no resources and not enough hands."

Workload is the second sub-theme that emerged for the organisational factors inhibiting the implementation of DC. Overcrowding of patients in the unit and the high workload that results were mentioned, for example when a participant said,

> I think the fuller the unit gets, if it gets up to forty patients and you have ten babies to take blood from, then when you get to the baby you realize you are stand there with the needle and now you have forgotten the syrup simplex, then you are less likely to walk to the fridge and get it if you are really busy. The more time there is, the more time you actually spend implementing it, it is a problem.

Another participant commented, "Sometimes our ward is so full then we cannot even adhere to the correct positioning." Another explicitly linked overcrowding, understaffing

and a high workload as inhibiting factors that reduced the effectiveness of the DC implementation, saying,

> Initially we were resistant, not in the respect that we do not want to change. No, we were resistant because the workload was overpowering … us. We could not even see the lights that the researcher was bringing. We were just thinking about work, work, work, work and then no one was … seeing that we were overworked. So when the researcher came we were not negative. We tried but in the end what she was trying to implement was not as effective because of the workload.

Personal factors

The inhibiting factors that impacted on a personal level included four sub-themes:

- Multidisciplinary team conflict,
- Cultural issues,
- Personality differences, and
- Lack of insight.

Multidisciplinary team conflict is the first sub-theme. This conflict was evident between the nursing personnel and the medical personnel. In the words of one participant:

> We find that as we have positioned the babies, switched off the light, here comes the doctor for procedures, he switches on the light. He will just prick the baby without giving any thing for pain management and then he will leave the baby just like that, without positioning the baby. We do tell the doctor and then he will reposition for that time, but when he jumps to the next baby, he has forgotten what you have told him.

The second sub-theme is cultural issues. Participants made specific reference to the noise levels in the unit. A doctor commented,

> I am not sure if [the developmental care approach has] unrealistic expectations especially with regards to certain aspects, for instance sound and having a limit of seventy decibels and that type of thing, which we are not used to having worked in other units where that may be a reality but in this particular setting not necessarily related to resources but maybe related to cultural issues … [It] seems to be not working … especially related to the sound in particular.

One of the nursing participants confirmed this: “We are noisemakers in a way.” Another commented that “We are trying but we are bad.” Noise levels in the unit remain a problem.

Personality differences were also seen between the different multidisciplinary team members and these differences caused conflict as times. One participant discussed an incident of conflict between the researcher and the nursing staff, saying,

> Sometimes the researcher would come before we understood that or before the DC can go further; she would come and find that things are not the way that she expects them and then she would become so irritable. That de–motivated us because we were trying to cooperate.

The researcher identified a lack of insight as the last sub-theme for personal inhibiting factors because, although some participants had attended the training sessions and practiced DC, they still seemed not to understand various fundamental elements of DC. One participant commented, “We learnt a lot but, if you are honest enough, a ward like ‘up there’ [would have been better]. Maybe she wanted very premature babies, I do not know … With a ward [like ours], we ended up in friction with her.”

7.2.4.3.c Family-centred care

The researcher observed that the implementation of family-centred care was being resisted, and the third question therefore addressed how family-centred care could be better implemented. Organisation and patient-related aspects were identified as the main themes.

Organisation-related

One sub-theme was highlighted here, which again was lack of resources. In answer to the question, can family-centred care be better implemented, one participant bluntly said, “It cannot!” and another said “It is not possible in this unit.” Varying reasons were given, including a lack of space, overcrowding, not enough chairs, busy morning routines and a rigid visitation policy. The visitation policy only allowed parents to visit between 10h00 and 20h00. One participant commented, “It is a very small unit and it gets very crowded, but to say to a mother, you can only see the baby after ten in the morning, I think is cruel.”

Another participant said "I do not think you are going to get [parents] more involved until you get a bigger unit at least; just logistically speaking, if you have 36 babies in the unit you do not have 36 chairs for the mothers to sit on. Forget anything else." Due to the lack of resources and space, additional problems arose. One participant said, "The other thing is, in this day and age, we have several … cultural differences … to have a mother expressing breast milk sitting next to you on a chair, when you have other fathers and grandparents coming in is quite constrictive." No privacy screens or separate area was available so that mothers could express breast milk for their infants in privacy.

Patient-related

The last main themes for family-centred care involved patient-related aspects. One sub-theme emerged, which was family involvement. With some aspects of family-centred care in place, one participant commented, "Parents were treated very positively because the manner in which we displayed it, the parents trusted us that we are doing the best we can for their babies and they also learned how to position the babies." Other participants mentioned that family-centred care was positive as it improved bonding, visitation of parents and empowerment of parents through knowledge.

One doctor thought parents should be given more responsibility, saying,

> From what I have seen, if the mother is willing, if she comes in regularly, they immediately show her how to KMC. I do think that happens, probably not enough because I actually think the mother should be doing all the feeding, under supervision of course of the nurses staff. All the feeding and cleaning probably of the baby should be done by the mother. That I do not see happening, but the KMC happens if the mother is available.

The increased involvement of parents, however, sometimes caused family-staff conflict. One participant described some parents as "difficult". Another commented, "Sometimes [parents] would be telling you, 'No, I have had four or five babies before this one and they are doing just fine without whatever you are doing. So I think it is best if you just leave my child as they are then they will just grow like the others'." One participant pinpointed that parents' attitude as the problem, saying,

> Sometimes it can depend on the attitude of the parent, sometimes you can show everything to them and they begin on the correct thing but just because the parents have got their own agenda it is sometimes difficult. Even if you try your best they do not see the best in it. They only want the doctors to explain to

them, to show them and the doctors cannot be a hundred percent into the developmental care programme. So we are the nurses [who] are … there 24 hours but you have got those difficult patients that only want to hear from doctor. Nurse is nothing, from the admission of the baby up to the discharge, no matter what you tell them, what are you doing, you are doing nothing. The doctors got the final say.

7.2.4.3.d Field notes

During the first focus group interview, the neonatology consultant was seen to insist on her authority over one of the registrars, but it was not clear whether this would have an effect on the group dynamics or the interactions within the group. After the focus group interview had been concluded, further discussion suggested that the staff in the unit lacked understanding about pain management principles, which could result in unsafe practice in the use of sucrose solution.

Before the start of the second focus group interview, the facilitator made a note that in some cultures, the family took a submissive role in their dealings with medical personnel, because these medical staff were seen as more knowledgeable and highly ranked on the social hierarchy. The families tended to employ a 'no questions' policy. The facilitator did not observe any verbal or non-verbal behaviour that contributed or negatively influenced the data collection during the focus group.

7.2.4.4 Conclusion: focus group interviews

The focus groups yielded important information about the motivating and inhibiting factors that influenced the daily practice of DC. Participants commented that a programme coordinator, well organised project implementation, patient and family benefits and empowerment through knowledge and skills motivated them to continue practicing DC. They also reported that a lack of resources, a high workload and overcrowding were factors that inhibited their implementation of the care approach. Other negative aspects also mentioned were those expected before implementation began, such as multidisciplinary team conflict, cultural issues, personality differences and a lack of insight. These factors were unavoidable.

After the implementation phase had been evaluated, the established guidelines for implementing DC were refined by being validated by a panel of experts.

7.3 Validation of implementation guidelines for developmental care

The Concise Oxford Dictionary (Allen (ed.) 1990: 411) defines an expert as an individual with special knowledge or skill in a subject. A panel of experts would then consist of several experts with special knowledge or skill in a subject, who work together to produce a desired result. As discussed by De Vos (1998:180), the literature that exists in any discipline usually represents only a section of the knowledge of people involved on a daily basis in a specialized field. An expert panel was used to contribute to and validate the established guidelines for the implementation of DC for this reason.

As this study has a clinical focus, and centres on neonatology, the expert panel consisted of four specialists working among the population of pre-term and ex-pre-term infants (Davis, 1992: 194). Lynn (1986: 383) says that an expert panel should have a minimum number of three members, and states that a maximum number of ten is usually sufficient. Panel members were chosen purposively according to certain criteria, namely professional certification related to neonatology, presentation and/or publication of professional papers pertaining to the topic and research initiated on the research topic (Davis, 1992: 194).

The guidelines for implementing DC as developed during the intervention plan (Phase Three) were validated by an expert group during a focus group interview. Nine experts were invited, based on their expertise and experience in DC. Four experts were able to attend. The experts consisted of the four registered nurses with expertise in neonatology and DC implementation.

The implementation guidelines were sent to the experts before the focus group, thus allowing them time to work through the guidelines before the meeting. The researcher facilitated the focus group interview. Before the interview began, the research process and the purpose of the focus group were explained, and informed consent documentation was completed (see Appendix 19). The focus group interview was digitally recorded and transcribed *verbatim*.

For each of the eleven guidelines, the experts were asked the following questions:

- Is the content of the guideline acceptable for the implementation of DC, i.e. will you
    - accept the guideline;
    - reject the guideline;
    - add to the guideline; or
    - refine the guideline?
- Are the guidelines logical and user-friendly so as to facilitate use in a practical setting?
- Are the guidelines appropriate for the South African context?

The experts participating in the focus group interview accepted all of the implementation guidelines. No guidelines were rejected, but recommendations were made for additions such as definitions of specific roles, examples of procedures and samples of evaluation documents. Language editing and format refinement of the implementation guidelines were also suggested.

7.4 Conclusion

The intervention plan aimed to educate staff about the principles of DC, assist them in putting the principles into everyday practice, provide the necessary resources needed for sustainable DC and evaluate the progress of the implementation process. Change objectives were set up with input and feedback from the participants, and were divided into an overall goal, programme objectives, policy objectives and practice objectives (see heading 4.10 Setting goals and objectives).

As a conclusion of this chapter, these change objectives will be assessed as set up in Phase One. The goal of the project was attained, since evidence of DC practices were visible during routine infant care by the multidisciplinary team members at the research setting by the end of 2005. The four programme objectives were also met, since by November 2004 an intervention plan for the implementation of DC principles was designed, all staff had attended some form of training according to the intervention plan, resources had been supplied to satisfy the particular principles of implementation according to the intervention plan, and participation and involvement of multidisciplinary team members were noticeable.

The two policy objectives were also partly attained. The first stated that DC should be included in the unit policy and in the unit's vision, mission, and philosophy by the end of 2005. This policy objective was not completely fulfilled, as the nursing personnel who were asked to write a policy on DC for the unit did not complete the task. The nursing personnel were however encouraged to continue with policy development at the new NICU premises. The vision, mission and philosophy were however changed to include DC principles. The second policy objective stated that, by the end of the implementation phase, DC practice guidelines should be available in the unit. This objective was fulfilled.

The practice objectives were mostly met, since evidence of DC implementation was seen in the public NICU during the implementation phase and is still continuing. This is particularly evident when the pre-implementation and post-implementation environmental audits are compared. Most of the objectives are satisfied, and the goal of the project attained.

8 Chapter Eight: Conclusion and recommendations

8.1 Introduction

There is limited evidence about guidelines for how to implement developmental care in units for high-risk neonates. This research study implemented DC in a public NICU in South Africa using an intervention research design methodology, and in the process developed guidelines for the implementation of DC in the South African context. The researcher hoped to empower the multidisciplinary team members at the research site by increasing their knowledge and awareness of DC, and so to improve the patient care they deliver to sick and pre-term neonates. These improvements would result in more positive short- and long-term sequelae for the personnel, organisation and patients at the chosen research site. The guidelines for the implementation of DC that formed the final outcome of this study can be used in any similar practical setting to achieve these improvements.

In this concluding chapter, the research methodology is summarised and the realisation of the strategies implemented to ensure trustworthiness and the ethical considerations discussed. Then the limitations of the study are highlighted and recommendations made for further study. As the dissemination phase of the intervention research was not within the scope of this research study, recommendations are also made for wider dispersal of the guidelines established for DC implementation.

8.2 Summary of the research methodology

The research question asked how DC could be implemented successfully in the setting of a South African public NICU. The purpose of the research study, derived from the research question, was to develop guidelines for the implementation of DC in the South African context. An intervention research methodology was used to implement DC in the chosen research site, because this research design provides an appropriate research structure, applicable to social research, for the implementation process of DC and development of the implementation guidelines.

The research design chosen, intervention design and development, had six phases: (1) problem analysis and project planning, (2) information gathering and synthesis, (3) design, (4) implementation, (5) evaluation and advanced development, and (6) dissemination. Phase Six fell outside the scope of this study, although recommendations are made for the wider dissemination of the guidelines for the implementation of DC (see section 8.6).

Five objectives were initially established for the study. These five objectives were attained with the completion of the five phases of the intervention research methodology. Phases One to Five are now discussed.

8.2.1 Phase One: problem analysis and project planning

Phase One, problem analysis and project planning, involved the analysis and description of the level of DC practiced at the research site before the implementation phase, and the planning of the project for implementation of DC in a South African public NICU. This planning involved consulting relevant literature and the multidisciplinary team of the unit.

Data was collected at awareness meetings held at the research site where the first open-ended questionnaire was completed by participants. The questionnaire was used to determine the concerns of the population. Data was also collected by means of three environmental audits that described the extent to the problem. The data collected from the questionnaire were analysed using content analysis for theme identification. The environmental audits were analysed by deductive reasoning for qualitative description of the observed data.

8.2.2 Phase Two: information gathering and synthesis

Information gathering and synthesis was the second phase. This Phase identified the factors involved in the implementation of DC from national and international examples of DC implementation in neonatal intensive care. These factors were established by reviewing relevant literature and other resources, including institutions where DC and KMC had been implemented, so as to provide a contextual framework for designing the intervention plan.

A purposive sampling technique was used to identify members of the multidisciplinary team to participate in in-depth individual interviews. A practice-based framework of knowledge was formed by an extensive literature review on implementation of DC in national and international sites. In-depth individual interviews that identified specific problems and possible solutions, and environmental audits were conducted during an international visit of DC implementation sites. Data collected from these in-depth interviews were transcribed. Content analysis for theme identification was used to identify positive and negative factors. Data from the environmental audits were qualitatively described.

8.2.3 Phase Three: design

Phases Three to Five used the same population and the same data collection and analysis methods, since these three phases are linked in intervention research, where assessment, planning, implementation, evaluation and re-assessment form an interdependent process.

The intervention plan for the implementation of DC at the research site was designed in Phase Three, based on the information gathered and synthesised in Phase Two. The plan consisted of descriptive representations of the realities of clinical practice combined with applicable theoretical perspectives on the practice of developmental care. Guidelines for the implementation of DC were established as part of the intervention plan, and are listed below in Table 14.

Table 14: Guidelines for the implementation of developmental care

Guideline number	Description of guideline
Guideline one	Planning and preparation should take place before the intervention phase
Guideline two	A programme coordinator or developmental care specialist should be in place to drive the implementation process
Guideline three	Management support and involvement is essential
Guideline four	Resources needed to facilitate the intervention plan
Guideline five	Developmental care committee

Guideline number	Description of guideline
Guideline six	Develop practice guidelines for the principles of developmental care
Guideline seven	Education and empowerment of staff are critical for success
Guideline eight	Good communication pathways are vital for positive implementation
Guideline nine	Changing policies and procedures
Guideline ten	Monitoring and evaluation of the intervention plan are essential
Guideline eleven	Re-enforcing tactics are useful

Members of the multidisciplinary team were involved in the planning and design of the intervention plan for the implementation of DC in the particular South African public NICU. Relevant literature was used to compile a DC training programme.

8.2.4 Phase Four: implementation

Phase Four involved the execution of the intervention plan for DC implementation in the South African public NICU with participation of members from the multidisciplinary team.

8.2.5 Phase Five: evaluation and advanced development

The intervention plan was refined and developed further in Phase Five, through the monitoring and evaluation of DC principles in the public NICU. Checklist evaluations were completed based on the principles of DC already implemented in the unit, four environmental audits were performed to observe the changes that occurred in the NICU environment, and two focus group interviews were held with members of the multidisciplinary team involved in the intervention plan. The checklist evaluations were analysed for trends using qualitative methods, the environmental audits were analysed for the purpose of qualitative description, and the focus group interviews were transcribed and their content analysed.

The intervention plan and guidelines for implementation of DC were refined from data collected during Phases One to Four to describe the implementation of developmental care.

8.3 Realisation of strategies to ensure trustworthiness

The model for trustworthiness described by Lincoln and Guba (1985: 305) was used for the study. The strategies proposed by these authors to ensure trustworthiness were applied in this study.

The researcher is specialised in neonatal nursing science, with a specific interest in DC. Her previous research for her M.Cur degree focused on DC (Hennessy, 2003: 1-52), and she has extensive experience in the NICU environment.

Extant literature, information from other hospitals, field notes and environmental audits were used for data collection, to ensure triangulation of methods (Lincoln & Guba, 1985: 306). This triangulation of different qualitative data collection methods increases the credibility of the research findings.

27 in-depth individual interviews were conducted to identify implementation problems and possible strategies to solve these problems. These interviews were done at different sites to facilitate data saturation. Data saturation was obtained after interview number 15, where repetition of identified themes were observed Triangulation of data sources was used to enhance the quality of the evidence and add to the trustworthiness of the study. Data sources were both national and international, contributing to triangulation of sources (Lincoln & Guba, 1985: 305).

Checklist evaluations, environmental audits and focus group interviews were used for data collection, again ensuring triangulation of methods (Lincoln & Guba, 1985: 306). Once the data from the interviews were transcribed and themes had been identified, the process of analysis was repeated to confirm correct coding and an independent co-coder validated the analysed data to strengthen the objectivity of the collected data. In other words, the researcher's findings were validated by an expert (Polit & Hungler, 1997: 378, 380–384).

As the Halo effect was observed during analysis of the data gathered by the checklists, further data were collected during the implementation using environmental audits conducted by the researcher and an independent evaluator. The independent person conducted these audits to objectively observe the implementation of DC. This individual was not involved with the study, which improved the data's neutrality. Also, having multiple investigators increases the trustworthiness of the findings (Lincoln & Guba, 1985: 292, 307).

8.4 Ethical considerations

Ethical clearance for the research proposal was obtained from the ethics committee of the University of Pretoria before the study commenced (protocol number: 21/2004) (see Appendix 21).

Institutional consent was obtained from the Superintendent, the Head of the Paediatrics Department, the consultants in the NICU (see Appendix 5), and the nursing management in the NICU at the setting. This permitted the researcher to perform the study in the NICU of a public South African hospital. Institutional consent was also obtained from the American hospitals before data were collected.

This was not an experimental study, therefore no experimental and control groups were used. Rather, DC was implemented uniformly in the NICU, so that all the infants received the same type of care and reaped the benefits of the intervention, benefits described by a number of studies, as discussed in chapter two of this report.

No harm or damage were expected to result for the research participants, as the implementation of DC would be to their benefit and improve their working environment. The implementation of DC principles did however increase the staff's workload.

Confidentiality was ensured at all times for the participants and institutions involved, and the data collected were kept anonymous and stored in a secure place. The companies that supported the study and gave donations were given the necessary recognition.

Informed consent to take part in the study was obtained from the individual participating members of the multidisciplinary team (see Appendix 1) involved in neonatal care in

the NICU. Informed consent was also obtained from the parents for any photographs taken (see Appendix 20). The parents were given the option of having their infants' eyes uncovered or covered to ensure anonymity in the photographs.

During the study, ethical issued arose involving the methods of care observed by the researcher. When the care observed could negatively influence the patient, the researcher addressed the problem directly with the individual participant involved. If negative trends were observed in methods of care, the researcher discussed this with the nursing services manager responsible for the NICU whilst maintaining the anonymity of the participants concerned.

The University of Pretoria retains the copyright of this study. The requirements were fulfilled according to the University of Pretoria's policy on intellectual property. To prevent plagiarism, all literature references and information used throughout the study were given due credit by referencing all sources appropriately.

8.5 Limitations of the study

The NICU is a dynamic environment that cannot always be controlled, due to the nature of the intensive care delivered to the high-risk neonate. Existing circumstances are not predictable and could have influenced the progress of the implementation, and the results of the evaluations of this progress.

The prescribed scope of the study limited the time period over which sustainability of the intervention plan could be observed. A recommended time period for the implementation of DC should be between two and three years.

The guidelines for the implementation of DC were based on previous international research and only one South African NICU. The guidelines were therefore validated by a focus group interview consisting of South African neonatal experts.

A consistent level of participation from members of the multidisciplinary team cannot be guaranteed, which could result in unsuccessful implementation. Bias was observed during the participants' checklist evaluations, which showed a Halo effect. Although this bias was unavoidable, neutrality was improved by using an independent evaluator for the environmental audits conducted during the implementation phase.

The researcher was the programme coordinator, and so her absence from the NICU, for example on overseas visits and sick leave, could have influenced the implementation process. As far as possible, the researcher arranged for substitutes to ensure that processes continued and resources (for example, clean positioning aids) remained available. At the same time, this could have contributed to a degree of dependence on the researcher for the successful implementation of DC, and so she had to prepare the participants for her leaving the field and their continuing with the project.

Phase Six of the intervention design and development research methodology was not included this study, although recommendations for post-doctoral publications have been made.

8.6 Recommendations for dissemination of this research

8.6.1 Recommendations for nursing practice

It is recommended that the guidelines for the implementation of DC be tested in other hospitals to implement DC. The need for a DC facilitator to maintain the process of implementation of DC was identified. The additional position of DC facilitator should be created in neonatal intensive and high-care environments.

DC should be included in the legislative policies for infant and child health provided by the Department of Health. The Department of Health should also initiate implementation of DC in the different provinces. This will ensure that DC becomes mandatory in all South African neonatal intensive-care settings for the delivery of developmentally sensitive care for pre-term and sick infants.

The guidelines for the implementation of DC should be made available to nursing organisations, for example the Democratic Nursing Organisation of South Africa (DENOSA) or the South African Neonatal, Infant, and Toddler support Association (SANITSA). This will facilitate increased awareness of DC and availability of guidelines for implementation to affiliated members.

8.6.2 Recommendations for nursing education

DC should be included in the curricula for all undergraduate nursing students and postgraduate courses with specific interest in midwifery and neonatal care. DC is not exclusive to the nursing profession and should be incorporated into medical and allied health professionals' curricula.

Courses should be presented that train professionals to implement DC in their own units. The guidelines for the implementation of DC should be presented at conferences for increased awareness and dissemination of this information.

8.6.3 Recommendations for the nursing profession

A recommendation should be made to the South African Nursing Council (SANC) to include DC into nursing curricula for all neonatal nurses. This will establish a higher standard of care among South African neonatal nurses. DC should also be included into the Standards of Nursing Practice for newborn and infant care.

Feedback about the results and recommendations should be given to the NICU and a research article published in order to increase awareness of and knowledge about the guidelines for implementing DC in the South African context. A more comprehensive form of the guidelines with additional details of the implementation process should also be published.

Additional sections of the data collected during this study that were not appropriate for detailed discussion in this thesis should also be published, for example checklist evaluation data.

8.6.4 Recommendations for research

The NICU where DC was implemented should be followed up in order to monitor further progress and sustainability of the implementation efforts. The impact of DC on the multidisciplinary team, the organisation, the patients and their parents could be investigated.

It is also recommended that the study be repeated in other NICU settings on the same scale, but with a longer implementation time frame to improve the generalisability of the guidelines.

New topics for study emerged in the course of this project, including the determination of the possible economic implications of DC for South Africa, the cost-effectiveness of this intervention, and the evaluation of the impact of DC on the standard of care delivered in organisations that lack resources.

8.7 Conclusion

This intervention study targeted a specific neonatal unit where the multidisciplinary team consisting of where medical, nursing, allied health profession and non-medical support personnel were involved in the process of implementing developmental care. The targets and goals set during Phase One included improvement of the quality of care rendered at the research setting, reduced developmental delays for pre-term and sick infants and an improved working environment for the multidisciplinary team. On a personnel level, the targets were to increase the knowledge and skills of the staff, and to improve staff morale and job satisfaction. These targets and goals were on the whole successfully achieved.

The intervention design and development method was used to answer the research question of how DC could be implemented in a public NICU in South Africa, by using the methodology to implement DC at the research site and develop guidelines for the implementation of DC in the South African context. The effects of this project are of ongoing benefit to the staff and patients at the research site, and should contribute greatly to the effectiveness of neonatal intensive care throughout South Africa.