CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

In this chapter the research methodology used in the research is discussed. Firstly, the aims and objectives of the research are identified, followed by a discussion of the research design. The pilot study is then presented in terms of results and recommendations. Finally, a description of the subjects, data collection procedures and data analysis used in the main study follows.

4.2 METHODOLOGY

4.2.1 Research question

Which knowledge and skills were acquired by community health nurses post-training in the use of a beginning communication intervention protocol (BCIP)?

4.2.2 Main Research Aim

To develop, apply and evaluate a protocol for training community health nurses who work in PHC settings to increase their knowledge and skills about beginning communication skills (i.e. informational and social communication functions using aided and unaided communication means, creating content for interaction by using ADL and fostering adult and peer communication partners). This protocol is intended to assist community health nurses when training primary caregivers of CSDs to facilitate interaction with their children. The focus of the protocol is not on children of a particular age, but rather on beginning communicators as defined in the previous chapter.

4.2.3 Sub-aims

Four objectives delineate the means by which the aim of the research was realised, namely:

i) To identify the perceptions and the exposure of community health nurses regarding services to CSDs.

ii) To describe the multiskilling dimensions relevant to community nursing when working with CSDs.

iii) To develop a beginning communication intervention protocol (BCIP) aimed at training the identified multiskilling dimensions, namely Level 2 (cross-training of professional non-clinical skills), Level 3 (cross-training of administrative skills) and Level 4 (cross-training of clinical disciplines), for use by community health nurses.

iv) To apply the BCIP to a group of twenty community health nurses and to determine the outcomes.

4.3 RESEARCH DESIGN

4.3.1 Research design

The research is a descriptive survey followed by a quasi-experimental time series group design O_1-X-O_2-O_3- O_4 -O_5 with withdrawal (Leedy, 1993). This design was selected as it would be appropriate to determine the specific skill dimensions acquired by nurses following the implementation of the BCIP. The strength of this type of design lies in the repeated data collection over time, after introducing the independent variable (the BCIP) (Brink, 1999). All subjects act as their own control, providing a strong indication that the independent variable could be responsible for the observed change in the dependent variables (e.g. knowledge, skills and attitudes). In addition, Eayrs and Jones (1992) noted that there is often a lack of control groups due to ethical concerns related to "*no treatment*". Information can also easily be contaminated as nurses tend to talk to each other and to "*try out*" advice given to each other.

The O_1 represents the skills of the community health nurses before training, X represents the training of the community nurses and O_2 represents the skills of the community nurses post-training. The O_3 phase is the first follow-up consultation conducted two weeks after the training and aimed at identifying problem areas in the BCIP and the problem-solving thereof. The O_4 phase again evaluates the skills of the community nurses after a withdrawal period of six weeks. Finally, a withdrawal period of five months (O_5) follows when skills and knowledge are evaluated after a follow-up consultation, as well as their evaluation of training over the 5-month period.

4.3.2 Research phases

This research consists of two major sections. Section I is the pre-experimental phase and is divided into two phases and Section II, the experimental phase, is divided into six major phases, namely O_1, X, O_2, O_3, O_4 and O_5. The research phases are outlined in Table 4.1.

Table 4.1 Research phases

RESEARCH PHASES					
Section I : Pre-experimental phase					
Phase 1 ***Needs analysis: Nurses***			**Phase 2** ***Needs analysis: Primary caregivers***		
Perceptions of, and exposure to severe disability were evaluated by means of focus groups and questionnaires			To ensure cultural relevance and sensitivity of the BCIP, focus groups were conducted with primary caregivers of typically developing children & primary caregivers of CSDs in the specific area		
Section II: Experimental phase					
Phase O_1	**Phase x**	**Phase O_2**	**Phase O_3**	**Phase O_4**	**Phase O_5**
Identifying skill dimensions: Skills, knowledge and attitudes of community nurses before training.	Training community nurses in the application of the BCIP.	Skills, attitudes and knowledge of community nurses directly post-training.	Follow-up 2 weeks post-training: Assessing skills of community nurses and identification of problem areas and problem-solving.	Follow-up 6 weeks post-training: Assessing skills of community nurses and identification of problem areas and problem-solving.	Follow-up consultation 5 months post-training: Assessing skills, attitudes and knowledge as well as an evaluation of the training.

The phases will be described in detail in Sections 4.3.2.1 and 4.3.2.2.

4.3.2.1 Section I: Pre-experimental phase

Section I consists of two phases and deals with the needs analysis of the community health nurses and primary caregivers of CSDs in the Moretele Health District. This information stands central in the development of the BCIP.

i) Section I: Phase 1

Phase 1 aimed at determining community health nurses' perceptions of and exposure to childhood disability. In order to obtain this data, qualitative as well as quantitative measures were employed.

Qualitative description of community health nurses' perceptions and exposure

In order to determine community health nurses' perceptions of and exposure towards CSDs two focus groups with community nurses were held. Focus groups were selected as the method of data collection as they yield information from multiple sources and contain rich contextual data, and are also excellent tools for capturing the nature of experiences, individual perspectives and opinions (Brotherson & Goldstein, 1992; Krogh & Lindsay, 1999; Krueger, 1988; Morse, 1996). A summary of these focus groups is presented in Table 4.2.

Table 4.2 Focus group with community health nurses

Category	Description
Participants	A number of community nurses from the Moretele Health District are involved in an in-service training programme, called *"Nurses-in-Training"* that meet monthly and receive talks on various nursing-related topics. Due to the vast spread out nature of the different clinics and the impracticality of closing a clinic so that nurses can partake in the research, it was decided to include all nurses who attended the first "*Nurses-in-Training*" programme for 2000 in the focus group. These nurses all met the selection criteria that were set, namely that they should be employed by the Moretele Health District and that they should currently be working as a nurse. The qualifications of the nurses were not included as a selection criterion, so that it covered a whole range, from nursing assistants to professional nurses. This resulted in two large focus groups: one focus group with 10, and the other with 11 participants. Literature suggests groups of 6 – 15 participants (Frey & Fontana, 1993). As a result of the commonalties they share and the fact that they mostly knew each other, rapport was quickly established, therefore the focus group was experienced as non-threatening. Each focus group was facilitated by a SLP with a primary interest in AAC and CSDs.
Aims	To determine nurses' perceptions and exposure to CSDs and to encourage them to respond from their own experience, three open-ended interview questions were used (Krueger, 1988), namely: i) How often do you see the primary caregivers of CSDs? Tell us about your experience. ii) What do you think are the biggest problems these primary caregivers have? iii) What can we do to help you to help the primary caregivers of CSDs better?

Category	Description
Method	Both facilitators led the respective focus groups in a semi-structured discussion of the open-ended questions (Frey & Fontana, 1993). During the discussion the facilitators asked for clarification when some concepts were unclear or in cases where the data were open to misinterpretation (Bryman, 1994; Krefting, 1991). They also encouraged the nurses to take part actively, to share their wealth of experiences, to understand that no comments would be regarded as "*stupid*" or "*silly*" and reassured them that they would remain anonymous. Flexibility was allowed in terms of the sequence of questions so that facilitators were able to listen to the discussion, observe and respond to what they saw and heard. Structural coherence of the topic was thus maintained, increasing credibility (Krefting, 1991). In an attempt to enhance trustworthiness, member checks were included, which entailed that the facilitators gave a short summary at the end of the discussion of each of the three questions. Participants were then asked whether they agreed, disagreed, or if any important issues raised were overlooked (Hoffart, 1991). The two facilitators spent some time debriefing directly after the focus groups to discuss their interpretations in order to enhance trustworthiness (Peshkin, 1993). No areas that needed additional probing or clarification were noted. Debriefing is an important part of investigator triangulation and was included to heighten the credibility of the data obtained (Brotherson & Goldstein, 1992; Kimchi, Polivka & Stevenson, 1991) Verbatim transcriptions of these two focus groups were made: Focus group 1 lasted 58 minutes and Focus group 2 lasted 67 minutes.
Analysis	The researcher delineated themes from each of the two focus groups and came to tentative conclusions. Transcriptions were then handed to the other facilitator and she was also asked to delineate themes (peer debriefing). Care was taken to avoid "*coding fetishism*" where coding becomes a mechanical process of labelling involving obsessive and unnecessary details (Webb, 1999). Rather, coding was seen as part of the whole analytic process that also involves theoretical perspectives and interpretations. When two researchers separately code and then cross-check data, the issue of analytic stability comes to the foreground (Brotherson & Goldstein, 1992). In order to address this, both researchers received a set of coding guidelines pertaining to the content and the analytic procedure, e.g. the initial questions that were appropriate as well as the decision rules for determining the categories. Following the development of the themes the two facilitators met to review the theme analysis with a request for verification, correction, clarification and/or elaboration of tentative conclusions drawn from the data analysis. This process is essential in order to ensure the credibility of the data (Krueger, 1988). Apart from only obtaining significant and consistent themes in the data it is also rich in providing illustrative examples. In order to not fragment, decontextualize and/or misinterpret data, it was crucial to go back to the complete text frequently (Webb, 1999).
Results	A summary of the themes delineated from these two independent focus groups is provided in **Appendix C**. Five major themes crystallised, namely the nurses' perception of problems experienced by primary caregivers of CSDs, how nurses perceive their role regarding disability and the type of services they currently provide, problems they experience, their own experiences regarding CSDs and, finally, what they need in order to enhance their service delivery. Regarding problems experienced by primary caregivers aspects such as disempowerment (including a lack of knowledge, poor parenting skills, poverty, limited resources, unemployment and illiteracy), external influences (religion, culture and tradition, family and community), emotional problems (ranging from denial to anger) and the impact (e.g. a loss of status in the community) were mentioned. Nurses perceived their current role mostly as obtaining a case-history, conducting a physical examination, detecting the problem, conducting health promotion and co-ordinating CBR activities, treatment of minor medical ailments, referral and follow-up. However, nurses acknowledged that follow-ups are not done in practice and that most of the service delivery is based on referral. Nurses spontaneously spoke about the problems they encountered in the workplace, despite the fact that this information was not probed. This included aspects such as feelings of inadequacy due to the fact that they do not know how to handle primary caregivers of CSDs, depression, attitudinal barriers due to limited staff and time constraints and the fact that no follow-ups are done.

Category	Description
Results (continued)	Regarding their experiences it was noted that their exposure varied. However, despite the fact that in some instances exposure was limited, the impact was high as most nurses could recall details about the CSDs, even if they had seen them more than a year ago. In addition it was interesting to note how many CSDs are identified informally (e.g. neighbours inform nurses). When asking nurses what they required to enhance their service delivery it became clear that knowledge (education), skills, a positive attitude and raising community awareness were high priorities.
Implications	The focus groups clearly identified that nurses felt inadequate about the way they handled CSDs and their primary caregivers and that they required more knowledge and skills that would in turn have a positive impact on their attitudes. It was also evident that nurses are well aware of primary caregivers' problems and that primary caregivers trust them regarding discussions of their personal problems. This would make the nurses ideally suited to provide training of this nature. It was also clear that many primary caregivers in the Moretele Health District have poor parenting skills and that nurses would like to educate these primary caregivers. Furthermore, there are limited resources in the area, making appropriate referrals difficult. This might impact on the poor feedback that nurses receive (primary caregivers probably do not take their children to the referred places due to poverty, transport issues, etc.). This makes it clear that training should focus on equipping nurses to train these primary caregivers so that their CSDs can remain in the community and that they do not have to move away. The focus group also sensitised the researcher to the terminology that nurses use (e.g. "*Mental retardation*" as opposed to "*developmental delay*" or "*intellectual impairment*", etc.

From the above table it is thus clear that the focus group was able to provide a thick, rich description of the context, rather than to quantify, operationalise or test hypotheses (Krogh & Lindsay, 1999). It made the researcher aware of important information about nurses' expectations and exposure towards CSDs and how they perceived their roles within the community regarding service provision to this population. Due to the fact that the data are descriptive in nature, the same terminology and criteria used in quantitative research (e.g. reliability and validity) cannot be used, but that a new set of criteria, developed for and fit for qualitative research should be used (Cutcliffe & McKenna, 1999; Kirk & Miller, 1986). One such a concept is "*trustworthiness*". Attempts made to increase the trustworthiness of this research through the use of specific techniques as well as the relationship between the qualitative terms and better known quantitative terms are discussed in Table 4.3.

Table 4.3 Increasing trustworthiness of the pre-experimental phase of the research during focus groups with community health nurses

Strategy	Technique	How technique was addressed in present research
Credibility *What is the truth-value of the research?*	Prolonged, sustained engagement (Spencer, 1993)	The researcher has been involved in the Moretele Health District for approximately eight years. Before conducting Phase 1 of the research, one month was spent observing the clinics in an informal way. This prolonged engagement ensured trust between the researcher and the participants, providing her with the opportunity to become entrenched in the culture and work ethics of the nurses and aided in the removal of certain misconceptions (e.g. the number of CSDs seen by nurses).

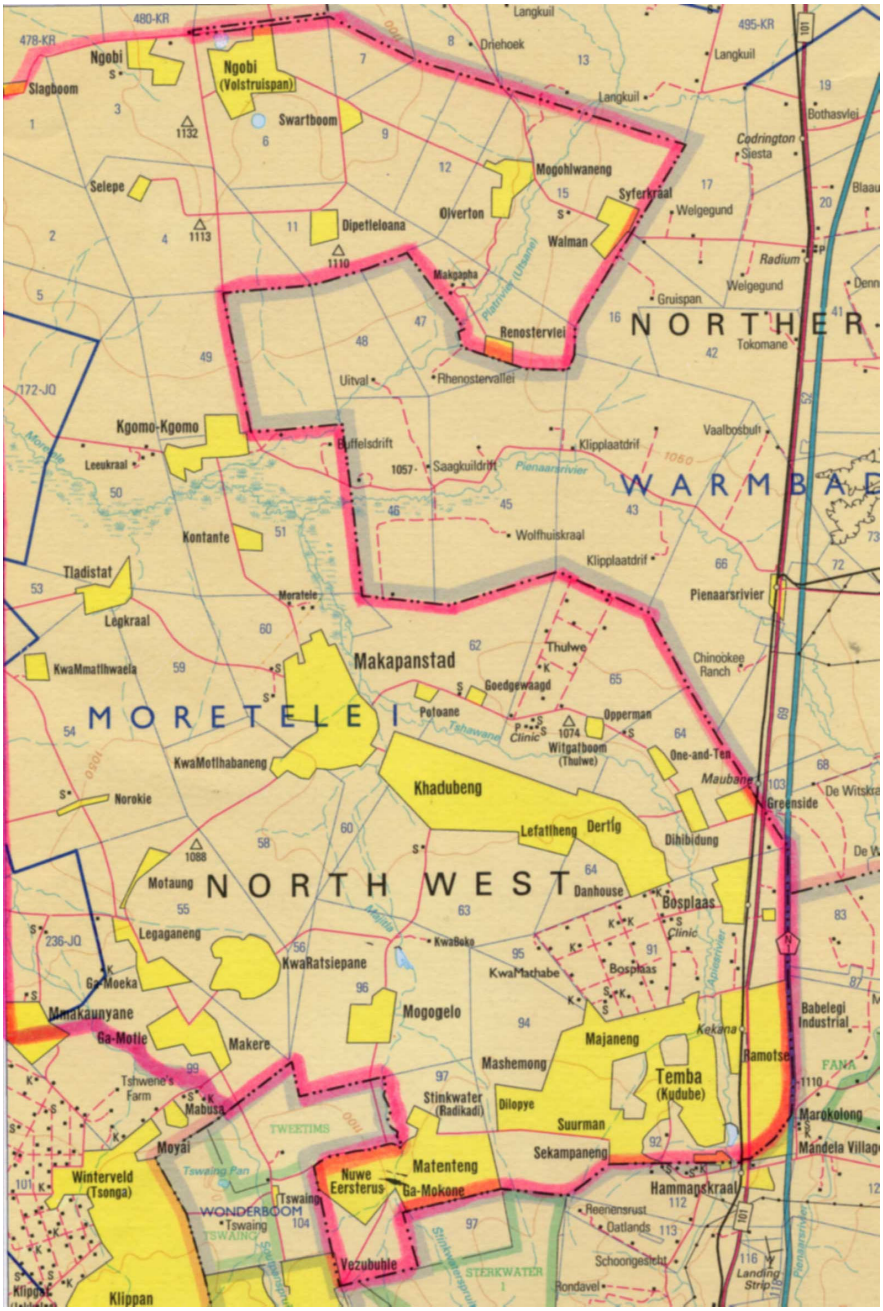
Strategy	Technique	How technique was addressed in present research
Known as **internal validity** in quantitative research.	Persistent observation of phenomena in various contexts and situations.	All clinics in the given health care district were visited, not only a select few. Furthermore, the pilot study was conducted in a different geographical area (ODI Health District). Disability, and the provision of services at PHC level was not only viewed from the nurses' perspective, but information was also obtained from the health care district managers and primary caregivers.
	Triangulation Data triangulation at person level	A number of different triangulation types were used for the purpose of the research. They are as follows: ***Person triangulation*** involved the collection of data on individual levels (questionnaires) and on group level (focus groups). Data collected from one source was used to validate data from the other source.
	Method triangulation	A ***between-methods triangulation*** was used as the research employed qualitative data (obtained from the focus groups) as well as quantitative data (obtained from questionnaires).
	Investigator triangulation	Researchers from ***diverse backgrounds*** (Nurse, SLP, AAC specialist) with experience in qualitative research were included in the research. This enhanced the quality of data as each researcher brought her own expertise to the research.
	Analysis triangulation	Both ***qualitative and quantitative approaches*** were applied in analysing the data. By comparing the results from these two techniques the researcher was able to note similar patterns and thus verify findings.
	Multiple triangulation	Multiple triangulation occurs when ***more than one type of triangulation*** is used, intensifying the advantages of the different types of triangulation, further validating the findings and obtaining a more comprehensive and satisfactory sense of the phenomenon. The present research achieved this.
	Peer group examinations and discussions	Two independent researchers involved in PhD studies with experience in qualitative research but diverse backgrounds (nursing and speech-language pathology) were involved in order to assist with the exploration of concepts and the analysis of data. This provided the researcher with the means to discuss insights and problems, to "*test*" ideas regarding certain aspects and also to prevent personal bias. This bias can be attributed not only to the researcher's own culture, background, interest, etc. but could also arise from the prolonged engagement in the particular community. These peer discussions also led to deeper reflexive analysis of the data.
	Member checking	This is one of the most important aspects of ensuring credibility. After themes were developed and the data analysed, results were presented to the participants to ensure the correctness of conclusions. It provided nurses with the opportunity to correct factual mistakes and to volunteer new information, and also provided the researcher with the opportunity to record the nurse's reactions after seeing the data in the new format. The importance of using the actual words of the participants is also highlighted by Cutcliffe and McKenna (1999) as participants recognise their own words and respond better, as it has specific meaning for them.
	Stakeholder review	Stakeholders were involved throughout the process to assist with reviewing the findings, clarifying points of interpretative or descriptive disagreement, prioritising unresolved issues and collecting information on those issues. One such issue was the time nurses would spend in training. After collecting the data to demonstrate the effect that nurses with specialised training in disability would have, it was decided that the weeklong training would not be problematic.

Strategy	Technique	How technique was addressed in present research
Transferability *How applicable will the data be in other contexts or with other respondents?* Known as **external validity** in quantitative research	Selection of information about the phenomena by a panel of experts	The researcher attempted not to work in isolation, and frequently had meetings with stakeholders, experts in the nursing, disability and AAC fields, government representatives as well as primary caregivers of CSDs throughout the whole research project. Examples include the assistance of nursing experts when the information questionnaire was drawn up, discussions with AAC and nursing experts in determining applicable questions for the nursing focus groups and discussions with primary caregivers and AAC experts regarding questions applicable to the primary caregiver focus groups. AAC experts assisted in reviewing the videos selected for training. All the above-mentioned parties provided input regarding the development of the protocol.
	Use of multiple cases or groups	Two focus groups were used to ensure rich descriptive data and to enhance the transferability of the data. Results from the two groups were compared and this was also compared with data obtained from the questionnaire. Data obtained in the two primary caregiver focus groups were also compared with each other as well as with information from the nurses' focus groups and the questionnaire.
	Ensure representativeness of participants (Spencer, 1993)	The background information of the participants for the focus groups with primary caregivers and nurses was obtained from a short questionnaire. This was then compared with the available demographic information for the whole group in order to ensure representativeness.
	Look at the data rather than the topic of investigation	It is important to determine whether the data obtained can be seen as typical or atypical of the phenomenon under investigation. This is briefly described in Chapters 5 and 6.
Dependability *How consistent are the results? Can the research be repeated?* Known as **reliability** in quantitative research	***Indirect method*** Look at internal and external validity measurements	The above-mentioned discussion on credibility and transferability is important for this section, as Lincoln and Guba (1985) state that no validity is possible without reliability (and thus no credibility without dependability). A demonstration of the former is sufficient to establish the latter.
	Direct method Triangulation	This method, and how it pertains to the current research, has already been discussed in detail.
	Direct method Stepwise replication	In qualitative research the researcher always aims to provide a "*thick*" or "*rich*" description of the context. Rigour was applied in describing the context, how data was obtained, analysed (i.e. the development of themes) and interpreted. The methodology should be explicit enough for an independent researcher to repeat.
	Direct method Dependability audit	A researcher independent from the present research was asked to establish how dependable data is presented, and to determine the accuracy of the data (including analysis and recommendations).
Confirmability *How neutral is the research?* Known as **objectivity** in qualitative research.	Confirmability audit / Process audit trial on described chain of events.	An independent knowledgeable researcher with experience in the field of qualitative research was asked to evaluate the degree to which the research process, including the raw data, data reduction and analysis products (condensed notes and qualitative summaries), data reconstruction (thematic categories), findings, interpretations and recommendations follow acceptable research practice. This researcher (the "*auditor*") stood completely neutral to the research. It should be emphasised that neutrality is not seen as a way to avoid "*contamination*". Rather the researcher's characteristics, attitudes and feelings are recognised as influencing the research and hence made explicit.

Conceptualised from Brotherson and Goldstein, 1992; Cutcliffe and McKenna, 1999; Kimchi, Polivka and Stevenson, 1991; Klopper, 1995; Krefting, 1991; Krogh and Lindsay, 1999 and Krueger, 1993.

Quantitative description of community nurses' perceptions and exposure

Apart from the above-mentioned qualitative data, quantitative data in the form of a questionnaire was also obtained. This questionnaire is included in **Appendix D**. All nurses working in clinics (stationary clinics and mobile points) in the Moretele Health District were asked to complete questionnaires.



Map 1 Area map of the Moretele Health District (Government Printers, 1998)

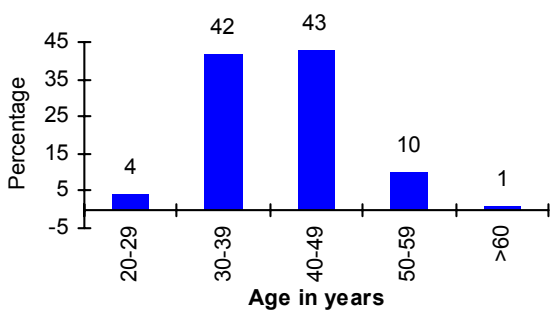
Only nurses who were present on the day of data collection were included; those who were on

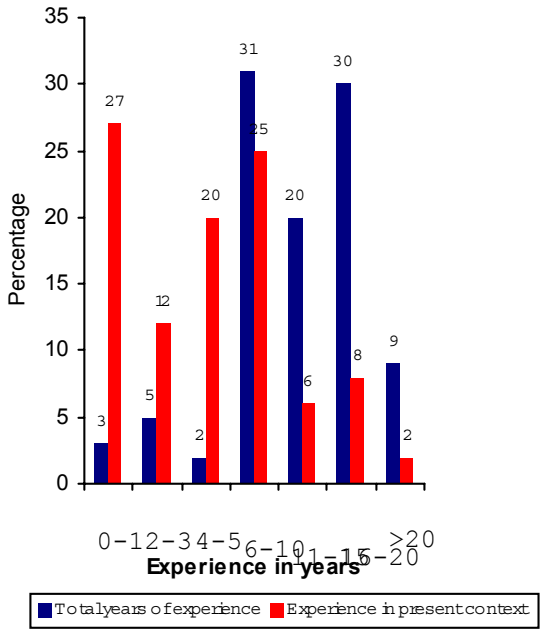
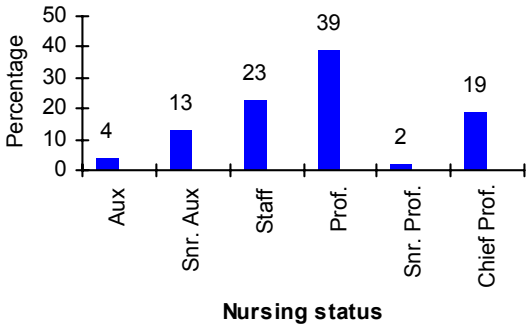
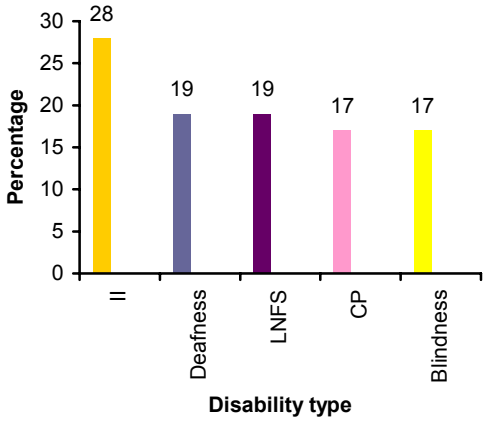
leave or who were sick on that particular day were excluded. All nurses (ranging from nursing assistants to professional nurses) who performed nursing tasks were included. Nurses who had attended the focus groups were also asked to complete the questionnaires. Although this could have impacted on the quality of the answers, it was felt that the questions asked during the focus groups varied substantially from the questions asked in the questionnaire and consequently the impact is regarded as minimal.

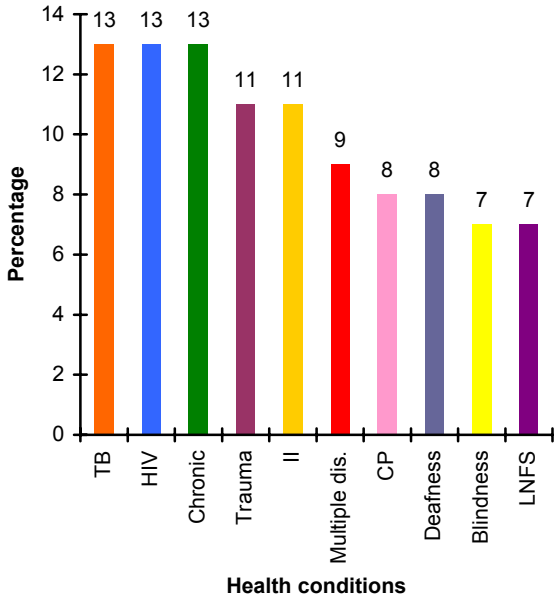
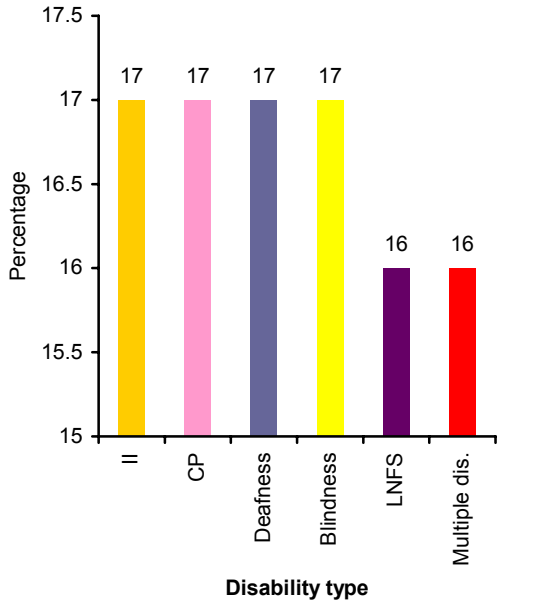
A total of 25 clinics and 14 mobile points, which serve an estimated average of 4365 persons per day, was included. The clinics differ in size, ranging from some with only two nurses serving approximately 30 people daily to some clinics with eight nurses serving 300 people daily. A research assistant was appointed to assist with the completion of the questionnaires. All questionnaires were completed between 14 February and 21 February 2000. A total of 111 questionnaires was completed. This implies that 92% of the total population was surveyed (111 of 121 nurses employed in the Moretele Health District).

More detailed information on the nurses' biographic background, educational levels, current exposure and service delivery to CSDs as well as the needs of these children as perceived by the nurses, are described in Table 4.4.

Table 4.4 Descriptive information about nurses in the Moretele Health District (n=111)

Description	Results
Nurses generally tended to be older (85% in their thirties and forties), impacting on the teaching principles used when training these nurses in the proposed protocol, as issues related to adult learning styles will have to be adhered to.	

Description	Results
More than half the total number of nurses (59%) had more than ten years experience, highlighting the fact that they tended to be a stable workforce who stayed employed for a long time and because of this, had a vast amount of experience. This makes them excellent candidates for additional in-service training, as they will be able to utilise the new knowledge and skills for a long time. The movement between clinics is varied as 27% had spent less than one year in the present clinic but 25% had spent 6 to 10 years and 20% had spent 4 to 5 years in the present clinic. Given the high rates of staff turnover during the past decade, the stability of the nursing workforce in the Moretele Health District is important.	
Almost half the respondents were professional nurses (45%). Staff/enrolled nurses refer to nurses who are currently undergoing training in order to become professional nurses (23%). Chief professional nurses refers to those in charge of specific clinics. Auxiliary nurses refer to nursing assistants.	
Weighted frequency scores were obtained, and children with intellectual impairment (II) were seen most frequently (28%). This was expected as the reported prevalence rate for intellectual impairment in South Africa is 3% comprising 2,5%mild, 0,4% severe and 0,1% profound (Year of the Disabled Persons Report, 1987). The high incidence of epilepsy and the nurses' awareness of it indicates that this is an issue that needs to be addressed in the protocol. Furthermore, multiply handicapped children and children with intellectual impairment frequently have epileptic seizures, including petit mal and grand mal. Literature suggests that as many as 31% of people with severe disabilities have been reported to have seizures and that about 35% of children with cerebral palsy will develop seizures (Sobsey & Thuppal, 1996).	

Description	Results
According to the Department of Health (Government Gazette 17910, 1997) the following health issues should receive the highest priority: namely tuberculosis (TB), HIV/AIDS, chronic diseases (e.g. asthma) and violence and trauma. These health issues together with intellectual impairment (II) were reported as being the most serious problems with which nurses are confronted in the respective clinics.	
Weighted frequencies indicated that there were no significant differences in their level of comfort in dealing with children with different types of disabilities, i.e. they did not feel more uncomfortable with a child with intellectual impairment 1(II) than with a child with CP.	

In order to explore nurses' comfortableness in dealing with CSDs further, contingency tables were created as they indicate the relationship between sets of nominal data. They were therefore used to correlate the relationship between exposure to the different disability types, and how comfortable nurses felt in dealing with these children. The Pearson Chi-square test was administered to all the categories. Results are as follows:

Table 4.5 Significance of exposure to disability vs. comfortableness in handling disability

Disability type	Chi-square value	Significance : p< 0,05
Intellectual impairment	0,024	Yes
Cerebral palsy	0,159	No
Deafness	0,252	No
Blindness	0,352	No
LNFS	0,004	Yes

As intellectual impairment and LNFS proved to be statistically significant, further testing was done. These results are as follows:

Table 4.6 Frequency of exposure to intellectual impairment vs. comfortableness in handling it

Exposure:	Description	Uncomfortable	Comfortable	Total
Never	Frequency Percentage Row % Column %	**1** 1.0 6.3 2.8	**15** 13.5 93.7 20.0	**16** 14.5
Once a week to once a month	Frequency Percentage Row % Column %	**17** 15.3 31 47.2	**37** 33.3 68.5 49.3	**54** 48.6
Less than once a month	Frequency Percentage Row % Column %	**18** 16.2 43.9 50.0	**23** 20.7 56.1 30.7	**41** 36.9
Total	Frequency Percentage	**36** 32.5	**75** 67.5	**111** 100%

This 2x3 contingency table (Table 4.6) clearly shows that the majority of nurses (67.5%) felt comfortable in handling children with intellectual impairment. Only a small number of nurses had indicated that they never see children with intellectual impairment (16 nurses). This table also indicates that despite their exposure to children with intellectual impairment all of them felt more comfortable than uncomfortable in handling these children. However, the nurses who had never seen children with intellectual impairment were notably the group who felt the most comfortable in handling them (93.7%). This might be due to the fact that they were unaware of the potential problems and issues of dealing with these children.

The second disability category that indicated significance on the Pearson Chi-square test, namely children with LNFS. Data for this group is shown in Table 4.7.

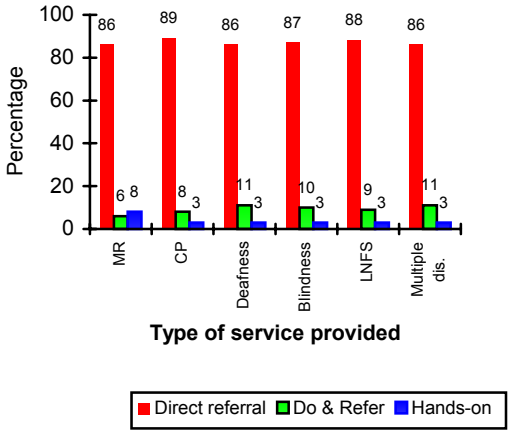
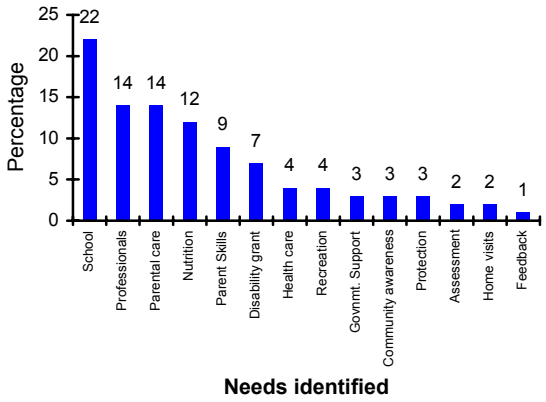
Table 4.7 Frequency of exposure to children with LNFS vs. comfortableness in handling them

Exposure:	Description	Uncomfortable	Comfortable	Total
Never	Frequency Percentage Row % Column %	**16** 14.4 27.6 34.0	**42** 37.8 72.4 65.6	**58** 52.2
Once a week to once a month	Frequency Percentage Row % Column %	**11** 9.9 57.9 23.4	**8** 7.2 42.1 12.5	**19** 17.1
Less than once a month	Frequency Percentage Row % Column %	**20** 18.0 58.8 42.6	**14** 12.6 41.2 21.9	**34** 30.6
Total	Frequency Percentage	**47** 42.3	**64** 57.6	**111** 100%

This 2x3 contingency table indicates that the majority of nurses (57.6%) felt comfortable in handling children with LNFS. The difference between the two groups (42.3% vs. 57.6%) is smaller than the similar difference when viewing intellectual impairment in Table 4.6 (32.5% vs. 67.5%). Children with LNFS are also a phenomenon that nurses do not see as frequently, as 52.2% noted that they had never seen a child with LNFS. Of this 52.2% substantially more nurses felt comfortable (72.4%) rather than uncomfortable (27.6%) in handling these children. However, once they were exposed to these children they became more uncomfortable in handling them, implying that even very infrequent exposure to a child with LNFS is sufficient to sensitise a nurse to the problems associated with dealing with this population. This also provides a strong impetus for training nurses in the handling of CSDs.

The last section that covers the descriptive information regarding the community health nurses of the Moretele Health District is presented in Table 4.8. This relates to the type of service delivery and the needs of the CSDs as perceived by the nurses.

Table 4.8 Service delivery and needs of CSDs as perceived by nurses

Description	Results
As expected, direct referral is the type of service most frequently provided to CSDs, varying from referral to a hospital, a specialist, a therapist, a school, a social worker, etc., irrespective of the disability type. Noticeably lower are cases where nurses perform some direct service (e.g. counselling, advice, screening and obtaining a case history) before referral. Finally, services that include some hands-on service, e.g. talking to the child, organising a wheelchair, giving prescribed treatment or conducting home visits have the lowest frequency. These findings are indicative of the fact that nurses need knowledge and hands-on skills to equip them to handle CSDs and their primary caregivers in a more effective and efficient way.	
A wide range of needs was identified. Nurses perceived the need for a school to be the most pressing for CSDs, followed by the need for trained and skilled people to work with these children (14%) and more effective parental care that emphasises love and care (14%).	

ii) Section I: Phase 2

This section deals with the needs analysis of primary caregivers. In order to ensure the applicability and cultural relevance of the activities selected for the BCIP, two different focus groups were held in the Moretele Health District where the research was conducted. One focus group was held with caregivers of typically developing children with an understanding of the cultural context, and one with caregivers of CSDs. Both of these focus groups will now be discussed in more detail.

a) Focus group 1 Caregivers of typically developing children

This focus group was conducted as an initial stage in determining which activities children in the Moretele area are engaged in, and also to determine how children are perceived and what is expected of them. A summary of this focus group is presented in Table 4.9.

Table 4.9 Focus group with caregivers of typically developing children

Category	Description
Participants	The Gateway clinic was targeted as it has a high number of patients and was easily accessible to the researcher. Although it is now expected of clinics to have a "*supermarket approach*" implying that all services should be available at any given time (Government Gazette 17910, 1997), Tuesdays were traditionally set aside for the "*Under 5 Clinic*". As the majority of mothers with pre-schoolers still tend to attend the Tuesday clinics, it was decided to conduct the focus group on a Tuesday. Six caregivers of typically developing pre-schoolers were asked whether they would be willing to participate. All of them met the selection criteria that were set, namely that they resided in the Moretele Health District, that they had pre-school children and that they were willing to discuss their interaction and the stimulation of their children. Background information on these six caregivers is included in Table 4.10.
Aims	To determine in which activities children in the Moretele area are engaged, how children are perceived and what is expected of them, two open-ended interview questions were used, namely: i) What do children in your village enjoy doing? *(Activities)* ii) What is your idea of a very good child? What must this child do and not do? *(Communication opportunities)*
Method	As this focus group was a one-off event, it was important to establish rapport quickly and to set the participants at ease so that they would talk freely about their experiences. In order to establish a relaxed, non-threatening environment, all participants enjoyed tea and cake before commencing (Fuller, Edwards, Vorakitphokatorn & Sermsri, 1993). This focus group was conducted in the mother tongue of the group, namely Setswana. The research assistant who assisted with the questionnaires facilitated this focus group, as she is a Setswana mother-tongue speaker and has had exposure to some of the most important issues pertaining to disability in the Moretele Health District. She had received training prior to the start of the focus group regarding the facilitation of interaction, how to ask for clarification, how to summarise key issues and how to ask for confirmation of the factual correctness. In order to increase trustworthiness, member checks were done directly after the discussion of each of the questions. This was necessitated by the fact that this focus group was a one-off event. As this was the research assistant's first attempt at facilitating a focus group, optimal facilitation techniques were absent, despite earlier training. She did not always follow-up on some of the ideas presented, and did not steer the participants to obtain more comprehensive data, e.g. when discussing feeding, *what* children were fed was discussed continuously, and the facilitator could have probed to also obtain information on *how* children are fed. Towards the end of the group facilitating improved, e.g. "*What else can they chose from?"* The focus was relatively short (43 minutes). This can be ascribed to the fact that all the caregivers had their young children with them, some of whom were ill, and the children became bored and started crying, fidgeting and moping, leading to the caregivers becoming irritable and impatient. In
Method (continued)	addition none of the participants brought any toys or snacks to help their children occupy the time. A similar tendency was seen in a health clinic of low-income urban parents in Detroit, USA (Downs & Walker, 1996). In future a childminder and/or toys will be highly recommended. Apart from the interview questions, a short questionnaire to gain biographic background information of

Category	Description
	the participants was completed by the facilitator. This information was essential for increasing the trustworthiness of the research as it heightens the transferability (Krefting, 1991). The characteristics of the caregivers were compared with the demographic information of the whole group (primary caregivers from the Moretele Health District) to ensure representativeness. The focus group interaction was audio recorded, and verbatim transcriptions were made.
Analysis	The research assistant made a verbatim transcription of the Setswana interaction and then translated it into English. She was asked to do the first translation, as she is from the Moretele area, and thus familiar with the specific colloquial. In order to heighten the reliability, a mother-tongue Setswana speaker from the Moretele district who lectures at the Department of African Languages at the University of Pretoria was asked to also translate the verbatim Setswana transcription. Minor differences between the two translations were found. These differences are included in **Appendix E**. On the whole, the second translation tended to be richer in description and provided more examples, e.g. translation one read *"helps me clean the house…*" whilst translation two read "*when I clean the house and I hold my broom like this, she hold hers the same…*" In addition, translation one omitted three facts. This could possibly be due to either negligence or the fact that it may have been a difficult concept to translate. In addition, it must be kept in mind that translator two is a professional with more background in language and translations. Because translation two tended to be more complete and correct, this was used for data analysis. This entailed that the main researcher and an independent researcher with experience in qualitative research (who assisted with the community nurses' focus group) analysed the data and delineated themes, following the same procedure as outlined in the previous focus group discussion. This specific method was used as it could enhance the trustworthiness of the results.
Results	Background information of the participants is presented in Table 4.10, indicating that all were mothers and housewives spending the majority of their time at home with the children. All had at least two or more children, making them information rich participants regarding the specific topic. Ages ranged between 21 and 36 years with the majority being in their thirties. When comparing the ages of the mothers and their children, it can be seen that Mother 5 was a pre-adolescent mother whilst the others all seemed to have had their first child in their early twenties. They covered the four ethnic groups frequently found in this area, namely Setswana, Xitsonga, Sepedi and isiZulu. Four of the six mothers lived in informal settlements, while two had formal housing. Only two mothers reported that they had support from grandmothers, and both of these mothers were from the informal settlements, which might be due to the fact that the extended families are more active in these situations. The mothers' highest qualifications varied as one had never attended school, another had Grade 5 and two had Grade 11. Background data also revealed that these six mothers were representative of the larger Moretele area. A summary of the themes delineated from this focus group is presented in **Appendix F**. Two major themes developed, namely the activities children were involved in and the specific communication functions they used. A few general comments were also made, which indicated the mothers' perspectives on children and child-rearing, e.g. that mothers usually have all the responsibility for their children, they generally tend to enjoy "*teaching*" them and place a high value on good manners. It was noted that the activities children engage in are mostly of a domestic nature and involve ADL, e.g. mealtimes, bathtime, sweeping the floor, etc. Play was not frequently mentioned and usually involved interactive games rather than playing with toys. Participants from the formal housing areas indicated that their children had literacy exposure while the children from the informal settlements had none. Regarding communication functions, a whole range was mentioned, including greeting, requesting, providing information, choice-making, signalling presence, etc.
Implications	Results provided invaluable information for the development of the BCIP as the researcher obtained in-depth knowledge and insight into the activities that children in this particular area participate in, as well as the specific communication functions displayed by them. Both of these aspects are corner elements of the BCIP. It became clear that the BCIP would have to focus on ADL rather than on play, as children were usually not engaged in play activities with their primary caregivers. Play was mostly amongst peers and interactive in nature. The activities that had the highest frequency throughout the day, and that involved both the caregiver and child, was mealtime and washing time. Various authors have mentioned that activities spread throughout the day and which frequently occur provide ideal intervention opportunities (Goossens', Sapp-Crain & Elder, 1994; Westling & Fox, 2000). Due to the high incidence of poverty in the area, toys and literacy material is not freely available. Regarding the communication functions it was noted that a strong culture of choice-making prevails regarding dressing and eating.

Category	Description
	Caregivers also placed a high value on greeting, as this is a sign of respect.

The biographic background of the caregivers of typically developing children who participated in this focus group is presented in Table 4.10.

Table 4 .10 Background information on primary caregivers of typically developing children

Category	Mother 1	Mother 2	Mother 3	Mother 4	Mother 5	Mother 6
Age	21 yrs. 4 months	31 yrs. 7 months	33 yrs. 8 months	33 yrs. 0 months	26 yrs. 4 months	24 yrs. 9 months
Ethnic background	Sepedi	Setswana	Xitsonga	Sepedi	Setswana	IsiZulu
Housing	Informal settlement	Formal housing	Informal settlement	Informal settlement	Formal housing	Informal settlement
Highest qualification	Grade 9	Grade 11	Never attended school	Grade 5	Grade 8	Grade 11
Occupation	Housewife	Housewife	Housewife	Housewife	Housewife	Housewife
Support?	Yes: Grandmother	No	No	No	No	Yes: Grandmother
Children	**Daughter** 15 days **Son** 2 yrs. 7 mths	**Son** 12 yrs. 8 mths **Son** 7 yrs. 0 mths **Daughter** 3 yrs. 1 mth	**Son** 13 yrs. 7 mths **Daughter** 8 yrs. 8 mths **Son** 2 yrs. 0 mths	**Daughter** 13 yrs. 0 mths **Daughter** 10 yrs. 3 mths **Son** 1 yrs. 10 mths	**Son** 15 yrs. 5 mths **Son** 13 yrs. 7 mths **Son** 8 yrs. 3mths **Daughter** 2 yrs. 4 mths	**Son** 13 yrs. 3 mths **Son** 2 yrs. 5 mths **Son** 13 days

b) Focus group Primary caregivers of CSDs

Following the focus group with primary caregivers of typically developing pre-schoolers, a focus group with primary caregivers of CSDs was held as it was expected that differences might exists, e.g. caregivers of typically developing pre-schoolers and caregivers of CSDs might not conduct ADL in the same way. In addition, CSDs and typically developing children might not have the same opportunities for interaction with peers and social inclusion (e.g. attending Sunday school), they might not engage in the same activities, caregivers might have lower expectations from CSDs, etc. The main purpose of this focus group was to determine the similarities and differences between these two groups. In addition, information obtained from this focus group would provide guidance in the development of the BCIP.

Table 4.11 Focus group with primary caregivers of CSDs

Category	Description
Participants	All caregivers of the 14 children in the junior phase of a special school in the Moretele Heath District were invited to attend the focus group. It was scheduled on a Wednesday at 12h00, a time that primary caregivers and teachers considered convenient. Invitations were sent by means of a formal letter from the school principal that the children took home a week before the scheduled date. Teachers checked the children's bags to ensure that the letters had been distributed. In cases where the children could understand, they were asked if they had given the letters. A follow-up letter was sent the day before the focus group. Primary caregivers were also assured that their travelling expenses would be covered. This school caters for all disability types, except Deaf children, as there is a separate school for them in the area. A total of four mothers and one father turned up. Five participants is the smallest useable sample (Brink, 1999). Background information on these five caregivers is included in Table 4.12.
Aims	As for the focus group with caregivers of typically developing children, the aims were to determine which activities the children engaged in, how they are perceived and what is expected of them. The two open-ended interview questions that were answered were: i) What do children in your village enjoy doing? *(Activities)* ii) What is your idea of a very good child? What must this child do and not do? *(Communication opportunities)*
Method	Despite the fact that the CSDs attended the same school, caregivers had not previously met except for Mothers 1 and 4, therefore it was necessary to create a non-threatening environment from the onset. Initially teachers had coffee and cake with the caregivers and researchers in an attempt to break the ice. Teachers knew the primary caregivers, and were able to introduce them to each other and also to introduce the researcher and the research assistant. When the focus group discussions started, the teachers left. This was previously arranged, as it was feared that primary caregivers might not feel free to express themselves if the teachers were present. They might have wanted to impress the teachers, so that the teachers would form a positive impression of them, and consequently of their children, leading to the so called *halo effect* (Guy, Edgley, Arafat & Allen, 1987). The same research assistant who had conducted the previous focus group also facilitated this group, again in Setswana. It was evident that she had become more confident and skilled, and that she was able to reflect and summarise better than the previous time. The whole 54 minutes of interaction was audio recorded and verbatim transcriptions were made.
Analysis	As in the case of previous focus group, the research assistant did the first translation and the professional translator (lecturer at the Department of African Languages at the University of Pretoria) the second. Only three differences were noted. This might also be because the research assistant became more skilled and confident. Again the second translator provided more contextual data e.g. *"I don't enjoy it when he plays inside the house with others*" whilst the first translation only read "*I don't like it when he plays with others*". Two facts were also omitted in the first translation An exposition of the two translations is included in **Appendix G.** Consequently, translation two was used to delineate themes from following exactly the same procedure described in the previous focus group (Table 4.9).

Category	Description
Results	Background information on the participants is presented in Table 4 .12. Results indicate an age range of between 27 and 56, with the father being the eldest. The CSDs were relatively young, ranging from 5 to 8 years, covering a range of disabilities, i.e. intellectual impairment, multiple handicaps (intellectual impairment and CP) and no speech (caregivers were unsure about the aetiologies). All the caregivers had at least two children and the CSDs included eldest, middle and youngest children. Two ethnic groups were covered, namely Sepedi and Setswana, and housing included formal housing, informal settlements and a farm. All the mothers were housewives, while the father saw himself as unemployed. Three of the caregivers reported that they had some form of support (mostly from the spouse or grandmother) while two had no support. As in the previous focus group, one mother had never attended school, while the rest had had poor schooling (ranging from Grade 5 to Grade 9). A summary of the themes defined from this focus group is presented in **Appendix H**. Five major themes emerged. Factors pertinent to disability, such as communication means (usually speech is the most obvious means used by typically developing children) and receptive language skills were added. Regarding the activities the children engage in, three participants stated that their children did not really enjoy anything. The activities most frequently seen, as with typically developing children, is mealtimes, bathtime and domestic tasks. Games included interactive games rather than toy-based games. Despite the fact that all these children were exposed to books, three showed no interest. The need for frequent reinforcement was also raised. Communication functions mentioned were almost identical to those of the typically developing children, except for inappropriate interaction (causing shame for the family) that was present in some of the CSDs. A range of communication means were described, namely speech, crying and the use of objects. No mention was made of more formal AAC methods (e.g. line-drawings or manual signs) despite the fact that these children attended a special school. Primary caregivers also noted that their children's receptive language skills were limited, causing frustration and struggle (on the caregiver's side). Challenging behaviour was also noted in cases where the CSDs could not cope with some of the demands placed on them (avoidance). Caregivers generally perceived their children's behaviour to be inappropriate. Some of the children were integrated into their community, while one participant stated that she did not encourage her child to play with typically developing peers as they tease her child and she wants to protect her. Another participant also reported that the typically developing peers tend to take (steal) her child's toys as the child has no form of self-defence.
Implications	Results indicate a great need for the BCIP as young CSDs in the particular area are not receiving effective rehabilitation services. Despite the fact that all five the children under discussion were obvious AAC candidates, none of them received any kind of intervention. As in the previous focus group, it appears that ADL (e.g. mealtimes and bathtime) are done jointly by the primary caregiver and child on a frequent basis throughout the day, providing ample opportunities for communication, e.g. choice-making was frequently mentioned during mealtimes. All caregivers highlighted the importance of greeting. Primary caregivers again stressed the point that they did not play with their children as this was perceived by the community as a sign of being a "*lazy adult with no better work to do.*" Both primary caregiver focus groups provided information about the best activities to use, how the activities were conducted, and what the specific concepts in the particular environment would be, e.g. "*Simbas"* instead of "*chips*", etc. Consequently the examples provided in the BCIP could be more culturally sensitive. Information from this focus group was also used to compile the case studies (Response Form I).

The biographic background of the primary caregivers of CSDs who participated in this focus group is shown in Table 4.12.

Table 4.12 Background information on primary caregivers of CSDs

Category	Mother 1	Father 1	Mother 2	Mother 3	Mother 4

Category	Mother 1	Father 1	Mother 2	Mother 3	Mother 4
Age	36 yrs. 9 months	56 yrs. 5 months	27 yrs. 1 month	44 yrs. 7 months	34 yrs. 4 months
Ethnic background	Setswana	Sepedi	Sepedi	Setswana	Setswana
Housing	Formal housing	Farm	Informal settlement	Formal housing	Informal settlement
Highest qualification	Grade 9	Grade 6	Never attended school	Grade 9	Grade 5
Occupation	Housewife	Unemployed	Housewife	Housewife	Housewife
Support?	No	Yes: Wife	Yes: Husband	Yes: Grandmother	No
Children	**Son** 19yrs. 7 months **Son** 14 yrs. 9 months ***Daughter** 7 yrs. 11 months **Daughter** 4 yrs. 11 months	**Daughter** 28 yrs. **Son** 26 yrs. **Daughter** 23 yrs. **Daughter** 21 yrs. **Son** 15 yrs. ***Daughter** 5 yrs.	**Son** 9 yrs. 6 months ***Daughter** 7 yrs. 5 months **Son** 3 yrs. 1 month	**Daughter** 13 yrs. 5 months ***Daughter** 8 yrs. 2 months **Son** 6 yrs. 3 months **Daughter** 3 yrs. 7 months	***Daughter** 7 yrs. 4 months **Son** 3 yrs. 3 months
Type of disability	No speech	No speech	Intellectual impairment and cerebral palsy	Intellectual impairment and no speech	Intellectual impairment

The CSD is indicated with an asterisk (*)

c) BCIP development

Following the two focus groups a literature review was conducted. This led to the development of the BCIP which was described in the previous chapter (**Appendix A** and **Appendix B**). It is, however, important to again highlight some of the most important aspects. It should be noticed that the BCIP is based on three activities of daily living, namely mealtimes, washing and dressing, as these were seen as the most pertinent activities. In addition, it covers a range of beginning communication functions, namely choice-making, turn-taking, labelling, initiating, requesting, rejecting, commenting and greeting. These activities are taught through the use of deliberate communication temptations, based on the ACE (Bornman, 1998; Rowland & Schweigert, 1993). Five different communication means, namely real objects, photographs, PCS communication boards, manual signs and a digital voice output device (EasyTalk 4-Option) are included.

In an attempt to ensure cultural sensitivity, the three activity-based boards PCS communication boards (adapted from Goossens', Sapp-Crain & Elder, 1994) were translated into all 11 official South African languages. Some of the symbols were also adapted to ensure that it fell into the experiences of the participants (e.g. "*washing*") and that it was appropriate to the cultural/ethnic groups in the Moretele Health District (e.g. "*open*", "*dry*", "*mine*", etc.) (Huer, 2000). In order to test the correctness of the translations and to establish whether children were familiar with the concepts depicted on these communication boards, a pilot study was conducted. The research assistant who is a mother tongue Setswana-speaker residing in the Moretele Health District visited two day care centres and two primary schools in the area. She explained the purpose of the research, and requested permission to interview all the five to seven year old children as well as their class teachers. She showed the children a choice of 4 PCS symbols, and asked them to identify a specific symbol, e.g. "*Show me which one you would use for pour*". All instructions were presented in the child's mother tongue. After this children were also asked if the word used by the research assistant, was the word that they would use. Exactly the same procedure was used with the teachers. In cases where children were unable to identify the correct picture, e.g. "*help*" teachers were asked whether this was a familiar concept, and which word the children mostly used.

A total number of 100 children with ages ranging between five and seven were interviewed. The ages were distributed as follows: 29% were 5 years old, 70% were 6 years old, and 1% was 7 years old. The children's mother tongues also reflected the distribution of languages in the specific area: 83% were Setswana-speaking, followed by 9% Sesotho-speakers, 6% isiZulu-speakers and 2% Sepedi-speakers. A total of 18 teachers taught these children and their ages ranged from 30 – 54 years with 50% in their thirties, 38% in their forties and 12% in their fifties. Their mother tongues also correlated with those of the children with 77% being Setswana and one teacher each being Sesotho, isiZulu, and Sepedi. Results and recommendations are shown in Table 4.13.

Table 4.13 Results and recommendations from pilot study on PCS communication board translations

Category	Children	Adults	Recommendations
NOUNS			
Mug	100% correct of which 56% used synonym *"komiki*"	100% correct of which 50% used synonym *"komiki*"	Include both words on final communication board
Spoon	98% correct of which 35% used synonym *"lelepola"*	78% correct of which 11% used synonym *"lelepola*"	Include both words on final communication board
Water	100% correct	100% correct	No changes
Soap	100% correct	100% correct	Name of well-known brand was added before the pilot.
Pants	100% correct	100% correct	No changes
Shirt	100% correct	100% correct	No changes
Underwear	100% correct	100% correct	No changes
Socks	100% correct	100% correct	No changes
Shoes	100% correct	100% correct	No changes
Pyjamas	78% correct of which 54% used synonym "d*ibijame"*	95% correct of which 72% used synonym "*dibijame"*	Replace with "*cap*", as it is more familiar. Children in rural areas often do not sleep in pyjamas.
VERBS			
Want	91% correct of which 54% used synonym "*nyaka"*	100% correct of which 47% used synonym "*nyaka*"	Include both words on final communication board
Pour	100% correct	100% correct	No changes.
Open (mouth)	100% correct	100% correct	Changes were made prior to pilot study to enhance iconicity.
Eat	91% correct, whilst 9% described it as "*brushing teeth"*	100% correct	Change spoon to fork and draw picture from front angle, not sideways
Drink	100% correct	100% correct	Changes were made prior to pilot study to ensure cultural sensitivity.
Wash	97% correct	100% correct	Changes were made prior to pilot study to ensure cultural sensitivity.
Dry	94% correct, whilst 6% described it as "*crying*"	100% correct	No changes.
Open (tap)	99% correct	100% correct	Changes were made prior to pilot study to enhance iconicity.
Close (tap)	94% correct	100% correct but 5% used synonym "*tima*"	Changes were made prior to pilot study to enhance iconicity.
Put on	100% correct	100% correct	Changes were made prior to pilot study to ensure cultural sensitivity.
Take off	87% correct, 13% unsure	100% correct	Change picture to be clearer.
Help	41% correct	100% correct. (Reported that children know the concept, but couldn't identify picture)	Not picture producer, but was adapted prior to the pilot study to ensure cultural sensitivity.
PREPOSITIONS			
Beside	44% correct	100% correct	Not picture producer.
In	100% correct	100% correct	No changes.

Category	Children	Adults	Recommendations
DESCRIPTIVES			
More	57% correct	100% correct (Reported that children know the concept, but could not identify picture)	Not picture producer.
Finished	40% correct	100% correct. (Reported that children know the concept, but could not identify picture)	Not picture producer.
Dirty (face)	97% correct, of which 87% used synonym "*ditšhila*"	94% correct of which 44% used synonym "*ditšhila*"	Changes were made prior to pilot study to enhance iconicity. Include both words on final communication board.
Clean (face)	100% correct, of which 82% used synonym "*skono*"	100% correct of which 56% used synonym "*skono*"	Changes were made prior to pilot study to enhance iconicity. Include both words on final communication board.
Good	100% correct	100% correct	Changes were made prior to pilot study to ensure cultural sensitivity.
Yuckie	100% correct	100% correct	Changes were made prior to pilot study to ensure cultural sensitivity.
Wet	100% correct, of which 57% used synonym "*thapile*"	100% correct, of which 44% used synonym "*thapile*"	Include both words on final communication board.
Dirty (pants)	19% correct, of which 81% used synonym "*ditšhila*". 81% described it as "*pants*"	100% correct, of which 44% used synonym "*ditšhila*"	Changes were made prior to pilot study to enhance iconicity. Include both words on final communication board.
Clean (pants)	16% correct, of which 84% used synonym "*skono*" 84% described it as pants	100% correct, of which 67% used synonym "*skono*"	Changes were made prior to pilot study to enhance iconicity. Include both words on final communication board.
COMMUNICATIVE WORDS			
I	100% correct	100% correct	Changes were made prior to pilot study to ensure cultural sensitivity.
No	85% correct of which 72% used synonym "aowa"	100% correct, of which 61% used synonym "aowa"	Include both words on final communication board.
Uh Uh	18% explained it as "*shock*" or "*surprise"*	50% explained it as "*shock*" or "*surprise"*	Not picture producer.

In summary, it can be stated that all the concepts displayed on these three communication boards (mealtime, dressing and washing) were familiar to typically developing children in the specific area. In addition they were able to correctly identify the majority of symbols, indicating that the researcher had succeeded in ensuring cultural sensitivity. The correctness of the translations also proved to be high, although in some cases it was recommended that a synonym be included. Although the synonym was not always linguistically correct, it was the word used by the majority of the participants.

4.3.2.2 Section II: Experimental phase

The second main phase of the research, namely the experimental phase, consists of six different phases, all of which followed a linear course. Figure 4.1 illustrates these different phases and is an extension of Table 4.1.

PHASE	**DESCIPTION**
Phase $\mathbf{O_1}$	Identifying skill dimensions: Skills, knowledge and attitudes of community nurses before training
	⇩
Phase **X**	Training community nurses in the application of the BCIP
	⇩
Phase $\mathbf{O_2}$	Skills, attitudes and knowledge of community nurses directly post-training
	⇩
Phase $\mathbf{0_3}$	Follow-up consultation 2 weeks post-training: Assessing skills of community nurses. Identification of problem areas and problem-solving
	⇩
Phase $\mathbf{O_4}$	Follow-up consultation 6 weeks post-training: Assessing skills of community nurses.
	⇩
Phase $\mathbf{O_5}$	Follow-up consultation 5 months post-training: Assessing skills, attitudes and knowledge of community nurses.

Figure 4.1 Six experimental research phases

A detailed discussion of the research procedures implemented at each of the six phases of the experimental research phase follows.

Phase O_1

Purposeful sampling was used to select the 20 community nurses who would attend the training. Of the 111 nurses who completed the questionnaires, a total of 74 (67%) indicated that they were keen to receive training in this field and therefore put their names on the training list. The nurses who were not interested stated that they had already enrolled for other courses while some indicated that they would be on leave during the proposed time of training, and two nurses indicated that they were to go on pension within the next year. As people's attitudes have a direct impact on the training outcomes, it was decided to use only nurses who showed an interest in the field of disability. The Assistant Director of Health selected the 20 nurses from the training list, as she had to ensure an even distribution across the different clinics, so that service delivery at the clinics could continue as usual and not be hampered by the absence of nurses.

During this first phase the skill dimensions that impact on the type and quality of service delivery before training was established through the use of an interview and questionnaire.
Firstly, skills were assessed by means of a structured interview that included an opportunity for demonstration. On the first day of training, after they had been welcomed, nurses were called individually for the structured interviews, while the rest of the group gathered informally around a cup of tea. Nurses who had completed the interviews joined the main group, and were asked not to discuss the interviews.

Results were coded on the interview schedule, namely Response Form I. This interview schedule is discussed in more detail in the material/measuring instrument section. Nurses were provided with a specific case (Case 1), and asked a number of knowledge-based questions about the case, followed by questions on possible recommendations (a skill dimension related to service delivery). Then they were presented with the BCIP and asked to demonstrate how they would use each of the communication means (real objects, photographs, PCS communication board, manual signs and a digital speaker) to teach the case one communication function (choice-making) during a specific ADL (mealtime). This demonstration was based on the specific case study. Each structured interview lasted approximately 30 minutes. Due to logistic considerations four interviewers assisted the researcher in completing these interviews.

Practical considerations, however, resulted in the four interviewers not remaining consistent during the O_1 and O_2 phase and a total of seven different fieldworkers were used, who all received the same training.

Despite various professional backgrounds (six SLP's and one occupational therapist (OT) all interviewers were personnel from the Centre for Augmentative and Alternative Communication (CAAC). They were selected because they all have knowledge and experience in the field of AAC as well as basic interviewing skills due to the nature of their training (Gouws, 1993) which was required to complete Response Form I effectively. They were all female.

All interviewers were trained in a group to ensure that they received the same instructions, thus increasing the reliability of the responses obtained (Punch, 1986). Training commenced with a discussion on the aims and objectives of the research followed by a discussion on the purpose of the structured interview, practical considerations and the method that would be used. Practical considerations included the dress code, e.g. in an attempt to dress like the nurses who wore uniform, interviewers were requested to wear navy blue (Babbie & Mouton, 2001). After this, general and specific information pertaining to the recording of responses was provided. Interviewers were restricted to the questions, their wording and the order in which they appeared, but were allowed to provide neutral feedback, e.g. "*mmm*", "*anything else*?" and "*okay*" (Fowler & Mangione, 1990). Examples that could be provided were also listed on Response Form I, minimising the role and influence of the interviewer and enabling a more objective comparison of results (Brink, 1999). The main researcher and interviewers then went through the questionnaire together, question by question until all uncertainties were cleared. The handout given to interviewers for the training session is provided in **Appendix I.** After the training, all interviewers completed Response Form I while watching a video example. Uncertainties were discussed and all interviewers reported that they felt comfortable in interviewing and recording the data on the form.

The structured interview and the demonstration were video recorded and coded directly onto Response Form I by each interviewer. The main researcher watched every interview on video and also completed a form, in an attempt to check inter-rater reliability and to verify that interviewers had followed the correct procedure. In addition, an independent rater was trained

to cross-check all the interviews conducted by the main researcher and the interviewers. This independent rater did not receive the same training as the interviewers as she only needed training on the recording of responses. This independent rater was a qualified SLP with a master's degree in AAC, providing her with the theoretical background to score the interviews as all the concepts discussed were familiar to her.

After all the nurses had been interviewed individually they gathered as a group at the training venue. They were all handed Response Form II and asked to complete it without talking to their colleagues. The researcher was available throughout to provide assistance with the completion. Question 9, where various elements had to be graded according to representational levels, proved to be problematic. After this questionnaire had been completed, a tea break was given, after which training commenced. The focus of Response Form II is on the primary outcomes of the research (i.e. knowledge and skills) but also includes secondary outcomes (i.e. attitudes, type of service delivery provided and finally, a reflexive self-evaluation section). All aspects included in the BCIP training were covered in Response Form II. The format was mostly close-ended questions but three open-ended questions (for the reflexive self-evaluation section) were included. Details follow in the material/measuring instrument section.

Phase X

This phase comprised the training of the community nurses in the application of the BCIP. Training was conducted over five consecutive days, namely Monday to Friday. As nurses had no other work-related responsibilities for this period they could give their undivided attention to the training (Grissom, 1992). Training was conducted at the University of Pretoria's Hammanskraal campus in the Moretele district, as it restricted travelling time and costs for the nurses. This venue is part of a former monastery and is set in park-like surroundings, setting the mood for a non-threatening learning environment with minimum distraction (Jarvis & Gibson, 1997). The venue is also well-equipped (e.g. video facilities and overhead projectors) contributing to the professional nature of the training.

As the questionnaires from the pre-experimental phase indicated that these nurses were generally older with vast experience (Table 4.4) it was crucial to incorporate the principles of adult learning into the training, as discussed in Chapter 3. Each day of the training started with

a brief revision of the previous day's work. The nature of the training was problem-based as it has repeatedly been shown that adult learners are more satisfied with learning if it applies to their everyday life and if it is practical and current (Barrows, 1985). In addition, working in a problem-based manner with various case studies also enabled the nurses to extend and improve their knowledge base (in particular regarding disability and beginning communication skills), to remain contemporary in their field and to provide appropriate care for the unique problems they might face in their work (Jacobs, 1997; Savin-Baden, 1997). As it was expected of nurses to work independently after the training and to apply the principles to the various CSDs and their caregivers in their caseloads, the value of this approach is evident.

Apart from working in a problem-based format, it was crucial to use educational methods such as interactive workshops with activities that encourage a variety of forms of expression. Activities such as role-play and observation elicited rich personal stories and concerns that, through facilitation, lead to the development of a clear set of principles in completing case studies (Krogh & Lindsay, 1999). This technique was also helpful in developing problem-solving skills required to address anticipated or unexpected dilemmas. Although workshops, in order to reduce fatigue, never exceeded 60 minutes they were long enough to ensure that the nurses could master and practise the skills taught during the particular session.

After the training had been completed all the nurses received a certificate of attendance from the University of Pretoria, leading to a feeling of achievement and general pride. See **Appendix J** for comments on the BCIP training that were made in the *Visitors Book* at the training venue.

Phase O_2

The skills gained by the community nurses directly post-training was established through the use of the same procedure as outlined in Phase O_1. Case study 2 was used. The content of the different case studies remained fairly consistent, with minor variations, namely the names of the children and their gender differed, the objects they used for communication purposes differed (e.g. mug, spoon, plate) as well as the mothers' occupation (hairdresser from home, clothing alterations from home, spaza shop at home and selling food from home). These modifications were necessary in order to combat over-familiarity that could result in boredom, influencing reliability of results as these case studies were repeated at five different intervals. In addition,

the post-training forms were all pink as opposed to the blue of the before training questionnaires used in phase O_1. In order to ensure that the case studies remained consistent and comparable, the independent rater and interviewers evaluated all four. The use of a panel of experts to ensure the same level of difficulty (namely the same level of functioning of the various case studies) is crucial to maintaining external validity, as it is critical that the pre-test and post-test material are exactly the same (Leedy, 1993).

After the structured interviews (Response Form I) Response Form II was completed by all the participants. In addition, a short two-page questionnaire, Response Form III, with closed-ended and open-ended questions was used to evaluate the training. This questionnaire is discussed in more detail in the material / measuring instrument section. All three measuring instruments provide pre- and post-training information, enabling the researcher to identify areas in which the most progress was seen, but also the areas in which more training and support are needed. The skills of each nurse post-training will be compared with her skills before training. As each participant is thus compared with herself the use of a control group is unnecessary.

Phase O_3

This phase was the first follow-up after withdrawal and was conducted two weeks post-training. It was decided to have the first follow-up shortly after the training, so that the researcher could assist with any problems the nurses had when they started implementing the BCIP. For the purpose of the follow-ups it was decided to only measure the nurses' skills (Response Form I). Case study 3 was used for the first follow-up, following the same principles as outlined in phase O_2.

Due to the vastness of the Moretele Health District and the almost impassability of some of the roads, travelling time is long and fatiguing so that this phase was spread over a period of three consecutive days, from Monday to Wednesday. There is no telephonic contact between the different clinics, and thus it was felt the reliability of the results was not influenced. It should also be documented that 4 of the 20 nurses were on leave, but that they specifically went to the respective clinics to see the researcher. See **Appendix K** for a description of the in situ follow-up visits.

The three follow-up phases (O_3, O_4 and O_5) pose definite ethical problems. The researcher had to consider the implications of her actions (being physically in the particular clinic) and had to

make arrangements to address this without contaminating the results. As this area is severely under-served by therapists, and to ensure accountability, the researcher assisted with the problem-solving of issues after having completed Response Form I. At one clinic a nurse had arranged on her own initiative that four CSDs and their primary caregivers attended on the day that the researcher came. Although she had started implementation of the BCIP (children were already making choices and she had taught them between three and five manual signs each), she needed confirmation from the researcher that she was on the right track. She also wanted to increase her credibility with the caregivers by having a lecturer from the University of Pretoria (the researcher) approve the strategies that she was implementing. All issues discussed during this phase were documented.

Phase O_4

This measurement was conducted six weeks after the training, and followed the same procedure as outlined in phase O_3, using Case study 4. As three nurses were on leave this follow-up was conducted over a period of four days. During this phase it became clear that the nurses who had started using the BCIP with specific clients were noticeably more skilled than the rest of the group. The nurse who had arranged the group in phase O_3 expanded the group (including one more CSD as well as the "*teachers*" at the local care group attended by these children). Three more nurses also arranged for CSDs and their caregivers to meet the researcher. A number of nurses who had not seen any CSDs with whom they could implement the BCIP stated that they would make a serious attempt to find suitable clients.

Phase O_5

A withdrawal of five months post-training was done following the procedure described in phase O_4, using the pre-training case, Case study 1. The follow-up was conducted over a period of three days, and on the fourth day nurses met at the original training venue. During this time nurses completed Response Form II (the knowledge-based questionnaire) as well as Response Form III (the training evaluation questionnaire). They were asked to consider the follow-ups as part of the training. After completing the questionnaire a tea break was given. A focus group was then held during which the nurses' experiences and perceptions of the training were discussed. This qualitative data could then be interpreted together with the quantitative data in order to form a more holistic picture of the training.

4.4 PILOT STUDY

4.4.1 Objectives

The objectives of the pilot study were to evaluate and test the applicability of the BCIP, the training procedures and the measuring instruments. They are discussed in detail in Table 4.14.

4.4.2 Context and subjects

The pilot study was conducted in Ga-Rankuwa, one of the residential areas in the ODI Health District. This health district adjoins the Moretele Health District and was selected due to the many similarities, e.g. geographical area, functioning of the clinics and service delivery as well as the nurses' profile. Despite these factors a number of differences also exist. Although these two health districts appear to be comparable in physical size (square kilometres) it appears that the ODI Health District is more densely populated and more peri-urban whereas the Moretele Health District includes a number of truly rural villages. In order to realise the objectives of the pilot study it was essential that the pilot study was highly comparable with the main study.

The profile of nurses also had to be comparable to the profile of the nurses expected for the main study. All the nurses were female, with the majority having between six and ten years

experience, although one nurse had less than one year experience and one more than 20 years. Regarding training in the disability field, one nurse reported that she had an hour's in-service training regarding disability. However, a difference between the profile of the nurses' highest qualifications and nursing categories between the pilot study and main study was found. It was not planned in this way, but it later appeared that the ODI Health District mostly selected the poorer qualified and more junior nurses. Only 7% had a nursing degree, 33% had a nursing diploma and 60% had only school qualifications, including 7% with Grade 8, 47% with Grade 10 and 6% with Grade 12. It was therefore not surprising to note that 60% were working as nursing assistants and staff nurses. One of the nurses commented on Response Form III (training evaluation) that *"more professional nurses should attend, not only juniors"*. However, for pilot purposes this was sufficient as it can be assumed that if the poorer qualified junior nurses found the BCIP training useful and applicable, the better qualified, professional nurses would also do so.

4.4.3 Procedures

The Director of Health: ODI Health District was requested to select 10 nurses who would be interested in the disability field and be able to attend the training. The first training date was cancelled due to a compulsory immunisation campaign of the national Department of Health. A second date, two weeks before the start of the main study, was set. Due to logistic problems the pilot study could only be conducted over a four day period instead of the required five days. Nurses were keen to receive this training and eventually 15 nurses were included. The same steps as outlined for the main study were followed and all three measuring instruments were completed and coded.

4.4.4 Objectives, results and recommendations

The objectives, results and recommendations made after completion of the pilot study are given in Table 4.14.

Table 4.14 Objectives, results and recommendations following the pilot study

Objectives	Materials & Equipment	Procedures	Results	Recommendations
With respect to the BCIP to the following objectives were set:				
1. To evaluate the general usefulness of the BCIP	Response Form III Informal discussions	Response Form III asked nurses if they found the BCIP helpful. The usefulness of the BCIP was also discussed informally during lunchtime and tea breaks.	100% of the nurses stated that they found the BCIP useful, with 93% indicating that it should be included in the regular nursing curriculum. Informal discussions revealed their enthusiasm and eagerness to implement the BCIP as they said that they had needed something of this nature for a long time.	No changes to the BCIP recommended. Minor modifications will be described individually under the relevant headings.
2.To determine the relevance of the communication functions included in the BCIP	Handout Training material	Before providing nurses with the communication functions included in the BCIP they were asked what they regarded as the most important messages that children had to communicate.	High correlation between list of communication functions nurses generated and those included in the BCIP was noted. The only function that nurses did not include was requesting interaction (e.g. seeking a partner to play with) but after explaining this function general agreement on its importance was reached. This high correlation is possibly due to the fact that the list of functions were based on information from the focus groups with primary caregivers of typically developing children and CSDs respectively.	These communication functions should be revisited every morning during the main study, as nurses became confused when the terminology increased, e.g. means, functions and temptations. Use the same method of asking nurses to generate a list of what they regard as the most important functions, before providing them.
3.To evaluate the appropriacy of the communication means included in the BCIP	Handout Training material Role-play	Before discussing the different aided and unaided communication means nurses were asked to brainstorm on all the possible ways in which a message could be conveyed. All the different means were then demonstrated (e.g. explained concept of elephant through mime) and nurses were asked if they had ever observed this.	Nurses were aware of unaided communication means, which might be attributable to the strong oral tradition in their culture. Initially they were unaware of the difference between natural gestures and sign language, but they grasped these concepts once they were explained. With prompting, nurses were able to identify the greatest disadvantages of the different means (e.g. inability to convey abstract concepts with facial expressions). Frequent use of manual signs during tea times! Traditional orthography and pictures were the only aided means they could identify with the use of objects, symbol systems and digital voice output devices being novel. After discussion and demonstration their function was clear.	The same teaching methodology for teaching communication means should be followed in the main study. Nurses did not find it threatening and consequently actively participated, e.g. when asked to demonstrate all the natural gestures they knew. The length of time provided for role-play can be extended in the main study as one complete day will be dedicated to communication means.
4.To test the ease of use of the BCIP	BCIP Training material Response Form III	Nurses were observed during role-play activities when they were actively using the BCIP and were also asked to rate the ease of using it.	13 of the 15 nurses found the BCIP easy to use and two found it difficult. However, all stated that they would be able to use the BCIP independently. During the training it also became clear that skills and the ease with which they handled the different BCIP elements increased over time as their confidence grew.	No adaptations to the BCIP. In order to increase the ease of implementation of the BCIP, the importance of using it should be emphasised in training.
5.To assess the ease of using	Handout Training material	The ease and naturalness of including different	The idea of deliberately creating communication opportunities (i.e. choice-making, naming, making desired items	Provide more opportunity to practise this during the main study. Additionally include a more

communication temptations to facilitate the acquisition and expansion of communication functions	Role-play	communication temptations in interaction was observed during the role play activities.	inaccessible, selecting materials that require assistance, providing small or brief turns, offering non-preferred items, asking yes/no questions and violating expectations) was novel. These strategies were demonstrated and practised in small-group sessions with role-play. As this concept was new, little creativity was seen with nurses copying the exact example that was demonstrated, resulting in few original examples.	complete differentiation between the communication functions and temptations should as nurses tended to become confused between these two concepts, e.g. when teaching the concept "*more*" (communication function) the communication temptations that can be used are providing small portions or brief turns.
6.To test the applicability of the BCIP in planning services for a specific CSD and his/her caregiver.	Case studies Response Form III	The training was conducted in problem-based format with ample opportunities for planning services for a particular individual which was observed during the feedback sessions. In addition, nurses were asked to rate the applicability of the BCIP.	All the nurses reported that the BCIP enabled them to plan intervention independently. This was also evident from the feedback sessions when each group had to plan an intervention programme for a particular case. Recommendations included the involvement of more communication partners, observing all the different communication attempts, to expect not only speech as communication and how to deliberately create communication opportunities. Facilitating the development of specific communication functions was still difficult.	As stated in recommendation four of this section the relationship between the communication functions and temptations should be made clearer, e.g. that a particular temptation is used to elicit a particular function. More time should be spent on this aspect. This will be possible in the main study due to the fact that the training is one day longer.
7. Suitability of physical presentation of BCIP (black bag)	Observation Informal discussion	The physical appearance of the BCIP content at the end of the four day training period was observed as well as the nurses' reaction when the BCIP was first handed out.	All the nurses felt that the BCIP looked smart and that they were keen to carry it. They also said that their colleagues and friends were inquisitive about the contents, providing them with the opportunity to discuss it. It was also noted that the bag provided protection for the BCIP elements and that nothing was damaged.	The BCIP should be presented in the same physical format as for the main study.
With respect to the training procedure the following objectives were set:				
1.To determine nurses' understanding of, and familiarity with the terminology used	Transparencies Handout Training manual	Nurses received training in the BCIP in exactly the same way as was planned for the main study. Questions were asked throughout to determine if terminology was clear.	As terminology had been adapted after the focus groups to suit the terms most frequently used by nurses, they indicated that they found the content and terminology easy to understand. However, some concepts were difficult and caused confusion. It was anticipated that some concepts were new, and after they were explained, they proved not to be problematic. Nurses understood these concepts and used them correctly.	Difficult terminology was changed, e.g. "*traditional orthography"* was replaced by "*normal writing*", *"tangible objects"* by "*real objects*" and "*nurturance*" by "*care*". Novel concepts were explained, e.g. *AAC, severe disability, multi-skilling, communication means, functions, communication temptations* and *ADL.*
2.To test the clarity of instructions given during the training	Training manual Handout	All instructions pertaining to workshops and opportunities for hands-on practise was given in exactly the same format as was planned for the main study.	Although nurses understood the instructions and were independent in answering questions posed during the workshops, they needed reminding that they had to apply the workshop to the specific case study. Furthermore, nurses reported that the instructions provided with the "Progress Checklist" were clear and logical.	State the importance of referring to the case study more explicitly in the main study, e.g. "*Think of Busi when you answer the following questions".* No changes to the Progress Checklist were recommended.
3.To evaluate the appropriacy of the specific case studies	Case studies Handout	Case studies were based on facts obtained after the focus groups with primary caregivers of both	Nurses reported that they could relate to and identify with the specific cases, and frequently remarks such as "*There's one at our clinic just like this one*" (referring to the case study) were	Some information on the way to answer case studies should be included in the main study (e.g. a 5-point plan to answering case studies).

and the use of a problem-based format	Training manual Response Form III	typically developing children and CSDs, and from the researcher's clinical experience. Cases were varied to include the whole spectrum of severe disability. In Response Form III (evaluation of the training), nurses were asked whether they could identify with the case studies.	heard. Nurses also reported that they found the problem-based format useful, as they felt that it equipped them with the necessary skills to apply their knowledge to their caseloads. However, it was seen that nurses had not previously received any training in the use of a problem-based methodology, therefore they found it difficult initially to apply their knowledge to the specific case. Response Form III indicated that 100% of the nurses felt that they could identify with the case studies, and 93% of the nurses enjoyed working in a problem-based format.	a 5-point plan to answering case studies). No changes to the use of a problem-based format or to the specific case studies.
4.To test the relevance of the video cases (i.e. were the nurses able to relate to the cases presented?)	Video cases Training manual	A number of different case studies were shown on video. Video cases were also used to demonstrate the concept of "***severe disability***" and covered the following aetiologies: spastic quadriplegia, severe intellectual impairment, challenging behaviour, CP and intellectual impairment, autism, intellectual impairment and visual problems, and acquired disabilities (burn wounds).	As with the written case studies it was clear that nurses could identify with the video cases. The video depicting all the different aetiologies was shown during the first hour of training, and resulted in everybody having the same understanding of the concept of "*severe disability*". Especially the child with challenging behaviour caused a lengthy discussion. Three of these cases were also used on the last day of training to complete the "Progress Checklist". One nurse commented on the last day that she was looking at the child with new eyes and that she now saw that he could do many more things than she had initially observed on the first day. During workshops, nurses also referred back to these video cases, e.g. "*Remember that other one who could not sit…*"	The same videos should be used in the main study. The video depicting the child with burn wounds should be shown last as this was the most emotionally upsetting. Also recommended that a short discussion time should be given after each video so that nurses could share experiences and debrief as some of the video cases raised concerns and questions e.g. watching a child with challenging behaviour if one has not had prior exposure.
5.To test the use of teaching aids (overhead projector and video)	Overhead projector and transparencies Video	The same teaching aids that were to be used in the main study were used in order to determine the impact on training and well as its effectiveness.	As a result of power failures the video and overhead projector could frequently not be used, forcing the researcher to rely on the handouts. During times when the overhead projector and video were used, a noticeable improvement in the quality of participation was noticed. This might be because it was easier to follow the discussion and also that nurses did not feel insecure when they could not find the section that was discussed. This also led to increased concentration.	The use of these teaching aids is essential in the main study. Electricity problems are not anticipated. The size of the training venue for the main study necessitates the use of a large font type for transparencies to facilitate easy reading.
6.To evaluate the adequacy and usefulness of the handouts	Handouts Training manual Response Form III	Response Form III asked if the information provided in the handout was useful. Opinions about the handouts were also obtained during informal talks.	It was noted that nurses were proud of their handouts, and wrote their names on it, as well as additional notes and comments. They kept all their notes tidy and brought them with to the training every day. Results indicated that 93% felt that the handout was useful.	No changes to the content of the handouts, although changes in the layout are necessary. Include more space that nurses have more space for own comments. In addition, handouts should not be photocopied back-to-back.
7.To obtain feedback regarding the scope of the content covered	Training manual Handout Response Form III	This sub-aim relates closely to the previous sub-aim. Response Form III asked if nurses thought that important information missing was missing from the	Results from Response Form III indicated that 93% felt that there was no important information missing which closely relates to the 93% who indicated that they found the handouts useful. The questions asked during training did not pertain to content that was not covered in the handout, but were rather	No additional information will be included. The trainer should continue to encourage nurses to ask for clarification and explanation if they feel that any information is lacking or not well understood.

		BCIP training.	questions to clarify aspects in the handout.	
8.To test the usefulness of the method of presentation in adopting a non-threatening learning environment	Response Form III Discussions	A number of close-ended questions pertaining to this aspect of the training were included in Response Form III. Nurses had to reply with a "*Yes*", "*No*" or "*Uncertain*". Regarding the overall rating of the training, a 5-point Likert scale was used.	All the nurses (100%) indicated that they enjoyed the training, with 33% rating it as "*very good*", and 67% as "*excellent*". Their positive attitude towards the training and their enjoyment thereof is also reflected in the fact that 93% felt that the training should be compulsory and included in the general training curriculum for community health nurses. Shortly after the training a nurse who had been unable to attend phoned the researcher to enquire when a second training would be conducted as she felt that her junior now had more skills than herself in dealing with CSDs. One of the nurses also phoned to request further training for a group of 10 volunteers that she had assembled. One nurse commented "*The training was very much interesting and I think it is going to be of more use to me as a nurse, because usually when you come across a CSD you don't know what to do, to say "shame" to the mother or what, but now I know."*	No changes recommended. The trainer should continue to be enthusiastic toward training and reflect her own positive attitude towards CSDs and their caregivers. The emphasis on **a**bility as opposed to **dis**ability should also be maintained.
9.To test the effectiveness of small group workshop sessions with opportunities for hands-on experience	Response Form III Feedback from workshops	For the workshops nurses were grouped in small groups of three with one acting as a CSD, one as a primary caregiver and one as nurse. Response Form III included an open question *"Which 3 aspects of the training did you enjoy most?"*	40% of the nurses rated the use of small groups and role-playing as one of the three training aspects that they enjoyed most. Comments included "*... the role-playing and practise helped me to adopt a positive attitude towards rendering of service delivery at my clinic" ; "I gained a lot from it, being a child with disability*" and *"I enjoyed the grouping and sharing of ideas"*.	Recommended that small groups of three participants be used throughout the main study as this provides all nurses with the most opportunity to experience all three possible roles.
10.To test the applicability and usefulness of the "*Progress Checklist*"	Progress Checklist	Training concluded by discussing the importance of monitoring progress and completing a Progress Checklist.	Nurses commended that the Progress Checklist is an applicable and useful tool that will enable them to plan better services for CSDs and also to assist them to be more accountable as they would be able to show the changes taking place. However they felt that three cases were not sufficient to make them proficient in completing it.	More time should be allocated for completing Progress Checklists in the main study, and five cases (instead of three) should be used. Provide each nurse with at least six Progress Checklists so that five can be used in training and one kept as a resource.
11. To assess the pacing and the sequence of the training programme	Programme Handout Training manual	Each day commenced with revisiting the important aspects, followed by an explanation of the aims for the current day.	The sequence of the training was effective, and there was a logical flow of information. When all four of the major dimensions of communication were explained, some confusion arose.	
12.To determine if the length of time required for the training is sufficient	Response Form III Discussions	Training was conducted over a four day period, starting at 08h30 and ending at 15h30 daily. Three close-ended questions regarding the time-related issues were included in	Results indicated that 53% felt that the length of training was insufficient despite the fact that 87% felt that the time for questions and answers were adequate, and 93% felt that the time to practise using the BCIP was adequate. It is therefore unclear why more time was recommended. However, it might reflect a general feeling of too much new information being	The large proportion of nurses who felt that training was too short might be attributed to the fact that the majority of nurses were nursing assistants who require a longer time to learn new information due to a limited training background. Time is not expected to be a major factor during

		Response Form III. Nurses had to reply with a "*Yes*", *"No*" or *"Uncertain*".	presented in too compact a form. It is also interesting to note that 53% of the nurses responded to the open-ended question "*Suggestions on how to improve training*" by referring to time issues. Comments ranged from extending training by at least eight hours or more to at least two weeks. One participant requested yearly follow-ups.	the main study as training will be conducted over a five day period and the majority of the nurses will be professional nurses.
With respect to the measuring instruments the following objectives were set:				
1.To evaluate familiarity with and understanding of the terminology used in the measuring instruments	Response Form I Response Form II Response Form III	Interviewers completed Response Form I after structured interviews with the nurses. Nurses completed Response Forms II and III in a group, without discussing questions with each other. The researcher was available throughout.	**Response Form I** Some terminology and coding format was difficult to use. Some data were lost, as it could not be coded. Some questions were repetitive. Interviewers used their own examples and despite attempts not to, this did lead the nurses and biased the results. **Response Form II** One nurse is the mother of three CSDs, consequently she had much more knowledge and skills than her colleagues which impacted on the quality of her answers. A question indicating this is important for descriptive purposes but was not included in Response Form II. This fact was only discovered during informal discussions. Some terminology concepts proved to be difficult. **Response Form III** Only one question was raised when a nurse asked what the training manual was.	**Response Form I** Change "*acquire*" to "*still learn*". Change matrix format to table format where questions are asked separately. Include more coding categories, e.g. "*crying*" or "*clapping hands*" to include all the possible answers that were provided during the pilot study. Provide more examples, e.g. "*speech*" is described as "*words like Mama*". Include "*providing opportunities*" under the recommendation section. **Response Form II** Include the question "*Do you have a close friend or a relative with a disability?"* Replace "*traditional orthography*" with "*normal writing*". Add example, "*line drawings, e.g. PCS"*. **Response Form III** Replace "*training manual*" with "*handout*".
2.To test the clarity and preciseness of instructions	Response Form I Response Form II Response Form III	Interviewers completed Response Form I after structured interviews with the nurses. Nurses completed Response Forms II and III in a group, without discussing questions with each other. The researcher was available throughout.	**Response Form I** Nurses frequently asked if their answers had to be related to the specific case study that was provided. **Response Form II** All the nurses found it difficult to rank the different items in levels of representation. Nurses tended to not apply their answers to the matrix question (Question 8) to the case study. **Response Form III** No problems were found with marking more than one option if only one option was requested. No questions were left unanswered due to unclear instructions.	**Response Form I** Remind nurses to relate their answers to the specific case study. **Response Form II** Add a sentence to Question 8 "*Answer the following questions pertaining to Emily…*" Complete Question 9 as a group. Researcher will ask all nurses to stop before answering it, and explain the question to the whole class. **Response Form III** Instructions are clear. No recommendations are made.
3.To test for ambiguous or misleading questions	Response Form I Response Form II Response Form III	Interviewers completed Response Form I after structured interviews with the nurses. Nurses completed Response Forms II and III in a group, without discussing questions with each other. The researcher was available throughout.	**Response Form I** Problematic questions were identified, e.g. it was difficult to explain the concept of communication functions before training. **Response Form II** Only Question 7 seemed to be problematic, as many nurses guessed the correct option before training. This was problematic, as results from post- training would not indicate a gain in knowledge. **Response Form III** No ambiguous or misleading questions were reported.	**Response Form I** Clearer description of questions should be given in order not to be misleading. Change Question 2.3 "*What different things would you encourage Maria to communicate?"* to *"Which reasons for communication will you encourage Maria to learn? (e.g. what does she want to say with what she does?)*

		was available throughout.		**Response Form II** Alter questions so that they are slightly more difficult and less easy to guess, e.g. "*Communication functions refer to the way in which the environment is structured to provide opportunities for interaction*" was changed to *"Speech is an example of a communication function."* **Response Form III** No changes are needed.
4.To test the length of time required to complete Response Forms I – III	Response Form I Response Form II Response Form III	Interviewers completed Response Form I after structured interviews with the nurses. Nurses completed Response Forms II and III in a group, without discussing questions with each other. The researcher was available throughout.	**Response Form I** Pre-training it took 25 minutes on average to complete and after training 30 min. This might be due to the fact that nurses had more information that they wanted to provide. However, the time provided for the practical demonstration remained consistent at 7 min. The length of time is crucial for this response form as it was video recorded, and arrangements pertaining to the number of videotapes required are important. **Response Form II** Before and after training the group of nurses all required 30 minutes to complete. **Response Form III** Although it is only two pages long, it contains four open questions, e.g. *"Which three aspects of the training did you enjoy most?*" This resulted in nurses needing 22 minutes on average to complete.	With clearer definitions of some of the terminology, the length of time needed to complete Response Forms I – III might be reduced. Use allocated times as the minimum time required and allocate sufficient time during the main study.
5.To test the availability of all the information required by Response Forms I - III	Response Form I Response Form II Response Form III	Interviewers completed Response Form I after structured interviews. Nurses completed Response Forms II and III in a group, without discussing questions with each other. The researcher was available throughout.	**Response Forms I, II and III** All questions included provided valuable information and nurses were able to complete all the questions. Problematic questions were not due to the fact that they did not have the correct information, but because of a lack of knowledge regarding disability and communication.	Include all the questions in the main study.
6.To test the suitability of using date of birth as an identifying factor	Response Form I Response Form II Response Form III	As each participant will be compared with him/herself, it is essential that an identifying question should be included on all three measuring instruments before and after training.	In order to ensure anonymity, birth date was asked as identifying factor. Day, month and year were included and it appeared that all three these variables were needed as three nurses were born in the same year, and two had their birthdays on the same date. However, when all three the variables were included, no duplications were found.	Use three digit birth date as identifying factor (Day-Month-Year).
7.Suitability of the video recordings to evaluate skills demonstration	Response Form I Video recordings	Each interviewer rated Response Form I whilst conducting the interview. Afterwards the researcher and at least one other interviewer also rated the video.	Results indicated that a high inter-rater reliability was found on the structured interview section but a low inter-rater reliability for the practical demonstration section. On the whole it was noted that video recordings are suitable in providing the necessary information. However, in some instances the video had run out of tape without the interviewer noticing.	Specific guidelines are needed for the scoring of the practical demonstration in order to facilitate a higher inter-rater agreement. It is recommended that only one interview per videotape should be recorded, as V-8 videotapes have a maximum length of 45 minutes.

8.To evaluate the ease of coding Response Forms I – III	Response Form I Response Form II Response Form III	The researcher coded all three the measuring instruments before and after training to ensure the ease of encoding.	**Response Form I** Problems were encountered with coding in cases where provision had not been made for an open "*other*" category, e.g. communication means and functions. Inter-rater reliability was low as no specific descriptions for each category was available for the demonstration of skills section. **Response Form II** The matrix question (Question 8) proved difficult as the different sets of data were mixed-up. **Response Form III** No coding difficulties were experienced.	**Response Form I** The encoding form needed revision in order to be applicable for double-digit scores in appropriate cases. In the demonstration section, a specific description for each category had to be added to heighten the inter-rater reliability. **Response Form II** To keep the different categories apart, a letter was added before the numeral, e. *"communication partners"* was scored as a *"P1"* **Response Form III** No adaptations required.
9. To test the intended analysis of the data	Response Form I Response Form II Response Form III	Basic descriptive statistical procedures were performed, e.g. frequency counts, distributions and standard deviations	It was found that some variables had to be grouped together in order to reduce the number of *"missing variables"*.	The data definitions had to be clear for the grouping of variables.

4.4.5 Summary

After completion of the pilot study, minor modifications to the BCIP, the training procedure and the measuring instruments (Response Forms I, II and III) were needed. Results indicated that the BCIP contained the most important beginning communication elements and that nurses could use it with relative ease. Results regarding the training procedures indicated that nurses identified with the use of a problem-based format and the various case studies. They reported that the method of presentation, the materials used and the clarity of terminology and instructions were adequate. The need for a longer training period was, however noted. When evaluating the results from the measuring instruments it can be seen that the use of Response Form I and the video provides a clear understanding of the nurses' skill in applying the BCIP, while Response Form II provides an adequate description of their knowledge, perceptions and attitudes.

4.5 MAIN STUDY

4.5.1 Participant selection and description

The selection criteria for participants as well as their description are provided in this section.

4.5.1.1 Selection of nurses to be trained

Two selection criteria were used for the purpose of this research, namely:

- **Employed by the Moretele Health District** This ensured that nurses from all the different nursing categories were included, and not only professional nurses. It was felt that this is an important consideration for the present research as the training focused on nurses at all the different categories, including auxiliary and staff nurses. It also meant that they were currently working as a nurse and not in a different profession, in-between jobs or retired.

- **Working context** The focus of the training was on PHC and therefore nurses had to be employed at community health clinics or mobile clinics. Nurses who were stationed at the Jubilee Hospital (and providing secondary health care) were excluded. This selection

criterion was important as the training programme focused on PHC.

Two non-probability sampling techniques were used to select the nurses who would receive training. This included purposeful sampling as the Assistant Director of Health in the particular health district (Moretele) selected nurses who were eager to receive further training and who had a positive attitude towards disability (Brink, 1999). As this was the first BCIP training programme it was felt that nurses who were keen to receive training in disability would be useful in refining the programme. As mentioned in the pre-experimental phase, nurses were asked to put their names on a list if they were interested in receiving training. A convenience sample was then taken from this list to ensure that two nurses from the same clinic were not selected (as this could hamper service delivery) and not selecting nurses who were due for leave, time off or night duty. Although these sampling techniques had many advantages for the present research, the sampling bias that limits the generalisability of the results should not be overlooked (Brink, 1999; Leedy, 1993).

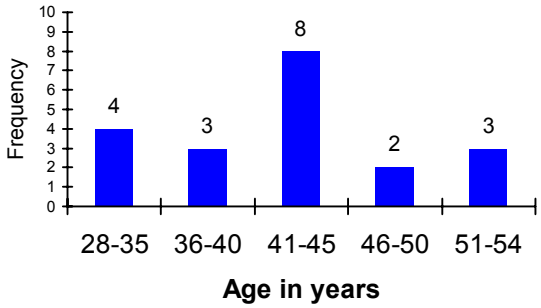
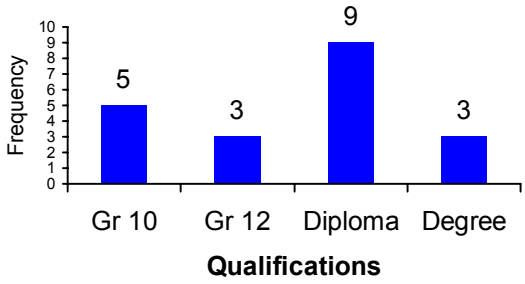
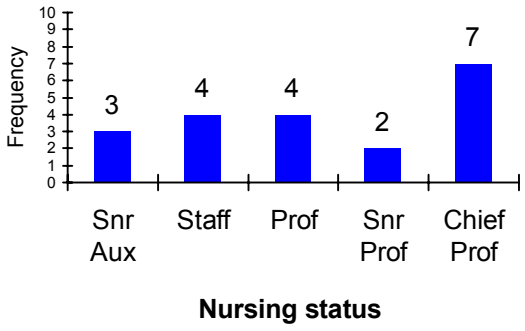
This process resulted in the inclusion of twenty community health nurses from the Moretele Health District. These nurses are representative of the four health clusters (sub-districts) in this area, namely Makapanstad, Syferskuil/Moretele, Temba and Refentse (Map 1). This area was targeted as it is a large, spread out area comprising 25 clinics and 14 mobile points. It is situated in the North West Province (former Bophuthatswana), implying that in the past it was viewed as a deprived area. Despite numerous attempts to uplift this area much more Government support is still needed to ensure equality. The Moretele Health District is also a good example of close collaboration between the Health District which provides PHC and the Jubilee Hospital which provides secondary health care and is relatively close to Pretoria (where tertiary care, i.e. traditional rehabilitation by therapists, is provided). All these factors made this an ideal area in which to conduct the present research.

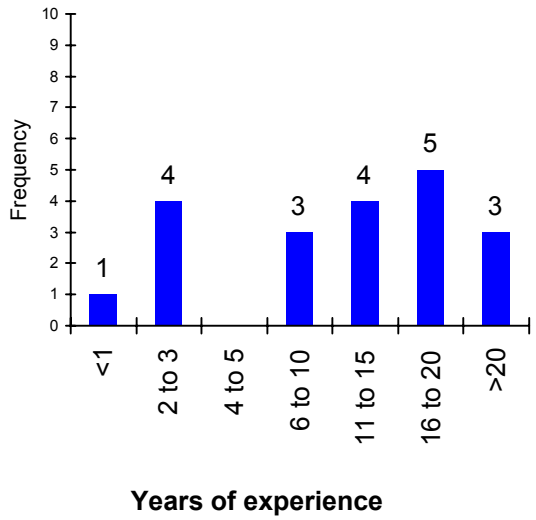
4.5.1.2 Descriptive information on the participants

Except for one nurse all were female and none of them had received any prior training in disability. Two of the participants had a relative with a disability, namely a sister with polio (that had resulted in a deformed left leg) and a sister whose daughter had hydrochephaly. More

detailed information on the participants is presented in Table 4. 15.

Table 4.15 Descriptive information on the participants (n=20)

Description	Results
The nurses' ages ranged from 28 to 54 years and they tended to be older, with the majority being between 41 and 45 years of age. This highlights the fact that this is a group of adult learners and that adult teaching and learning styles had to be taken into consideration with the BCIP training.	
Qualifications covered a broad spectrum, ranging from no formal training after school (Grade 8) to being highly qualified (a nursing degree). Eight of the nurses had no formal training after leaving school and the majority had nursing diplomas (9).	
The majority were professional nurses (including senior professional and chief professional nurses). No auxiliary nurses (nursing assistants) were trained but three senior auxiliary nurses were included. The four staff nurses are receiving in-service training to equip them with the skills to become professional nurses.	

Description	Results
Only five nurses had less than three years experience (including one with less than a year's experience) while three of them had more than 20 years experience.	

When comparing these results with the results obtained after completing the questionnaire in the pre-experimental phase (Table 4.4) similar tendencies prevailed. It can therefore be said that this sample of nurses who were trained is representative of the total nursing corps in the area.

4.5.2 Equipment and Material

The equipment and material used in the research are discussed separately in this section.

4.5.2.1 Equipment

The equipment used for the training of interviewers, data collection and analysis were as follows:

- Sony Combi Video Player
- BASF video cassettes
- Panasonic Video camera
- V-8 video cassettes
- Portable overhead projector
- Transparencies and transparency pens
- Pencils

4.5.2.2 Material

The main material used in the research included the measuring instruments and training programme (the BCIP and handouts). Both of these will be described in more detail.

i.) Measuring instruments

The main aim of the measuring instruments is to answer the research question : *"Which knowledge and skills were acquired by community health nurses post-training in the use of a beginning communication intervention protocol (BCIP)?"* In order to meet the requirements posed by the research question and design, three measuring instruments were developed. They can briefly be described as follows:

a) Response Form I

This structured interview deals primarily with the skills and applied knowledge of the nurses. It was compared during various research phases, namely O_1 (before training), O_2 (directly post-training), O_3 (two weeks post-training), O_4 (six weeks post-training) and finally O_5 (five months post-training). Birth date was asked as the identifying factor which was used to code *"respondent number"* enabling the comparison of each participant with him/herself during the various research phases. Response Form I is based on a specific case study and four similar case studies were used (discussed in Phase O_2). The same case study was used for phases O_1 and O_5 as it was assumed that nurses would not remember the exact details of the particular case study after the long time lapse during which time they were exposed to three other cases. Response Forms 1.1 – 1.4 are provided in **Appendix L**. Response Form I consists of five sections namely the biographic data, the applied knowledge about the current abilities of the particular case study, applied knowledge about recommendations, a practical skill demonstration in using the BCIP with the particular case and finally their exposure to the BCIP.

Basic considerations had to be taken into account when conducting these structured interviews and completing Response Form I as they impact on the reliability and validity of the data. This included the following:

- All interviewers received the same training before the commencement of the structured interviews and the completion of Response Form I. In addition, an external rater, (who also received training) viewed all the structured interviews independently and coded responses on Response Form I. Inter-rater reliability checks were done.

- These structured interviews were conducted in English. Although this was not the nurses' mother tongue, it was seen during the focus groups (pre-experimental phase) that their spoken English was good. It was assumed that this would not impact on the quality of the answers.

- All interviewers had access to Response Form I (containing explicit guidelines) as well as their interviewer notes to ensure that the procedure remained consistent. Eight open-ended questions were used for this purpose, e.g. *"If you were the nurse working with Sibusiso and Mrs Serudu, what advice would you give her?"*

- Due to the specific research design (involving a pre-experimental phase) rapport had already been established, and participants were aware of the aim of the research and were familiar with the researcher. The time series nature of the experimental phase of the research ensured that this rapport was maintained.

- An independent rater was used to code Response Form I in order to check the reliability of data.

- The researcher re-administered response Form I five months later to test the stability of judgements made, checking intra-rater reliability.

Table 4.16 provides a summary of the most important areas covered in Response Form I, with specific reference to the motivation for inclusion. The category, type and number of each question in each category are also discussed.

Table 4.16 Development of Response Form I

Sec-tion	Category	Question #	Total # of questions	Question area	Type of question	Motivation
A	Biographic data	1	1	1. Birth date	1 Open-ended question	Used for coding respondent number (thus to act as identifier) enabling comparison for a specific nurse between different research phases.

Sec-tion	Category	Question #	Total # of questions	Question area	Type of question	Motivation
B	Applied knowledge about current abilities of case study	1.1 1.2 1.3	3	1. Communication means 2. Communication functions 3. Communication partners	3 Open-ended questions coded in matrix format allowing for a "*other*" category	Application of knowledge that relates directly to the three most important aspects highlighted during training. This knowledge is on a higher level of cognitive reasoning, namely Level 3 (application) of Bloom's taxonomy (Wilson, Lanza, Barton, 1988) than results from Response Form II that are on Level 1 (knowledge) of the taxonomy.
C	Applied knowledge about recommendations (advice)	2.1 2.2 2.3 2.4 2.5	5	1.General advice 2. Communication means 3. Communication functions 4.Communication opportunities 5.Communication partners	5 Open-ended questions recorded verbatim on this form	Used open-ended questions were to ensure that relevant information would not be neglected or overlooked. Care was taken to ensure that the most important training principles were evaluated by means of Response Form I. A general question on recommendations was included to pinpoint additional knowledge that nurses might have gained and which was not covered in any other sections.
D	Skill demonstration	3.1 3.2 3.2	3	1. Practical skills demonstration 2. Amount of prompting required 3. Confidence in using the BCIP	Question 3.1 was scored on a 4-point Likert scale while 3.2 and 3.3 were scored on a 3-point Likert scale	Nurses were asked to use the BCIP to teach the particular case to make choices during mealtimes. Performance was scored on a 4-point Likert scale. This question is linked to multiskilling Level 4 (cross-training of clinical disciplines) while Sections B and C deal with Level 2 (cross-training of non-professional, non-clinical skills). Amount of prompting was included to determine if the number of prompts decreased over time indicating that nurses functioned more independently. Likewise confidence was included as an increased in confidence may point to independent use of the BCIP.
E	Exposure	4.1 4.2	2	1. Utilising the BCIP with patients 2. Contact with colleagues about the BCIP	Two Yes/No questions followed by an open-ended question	These aspects directly impact on nurses' skills and knowledge, as it is expected that the more often they use the BCIP, discuss it or demonstrate it the more skilled and knowledgeable they will become.

b) Response Form II

This questionnaire has a total of 17 questions and five categories (biographic information, prior knowledge about disability and communication, attitudes and values, other positive outcomes and self-evaluation). This questionnaire was administered on three different occasions, namely Phase O_1 (directly before training), O_2 (directly post-training) and O_5 (5 months post-training). The complete questionnaire is included in **Appendix M**.

The term "*questionnaire*" was not used on the questionnaires, as it could be threatening seeing that it implies that there are correct and incorrect answers. Nurses might have felt that their knowledge was tested, thus inhibiting them. As a section of the questionnaire involved questions pertaining to attitudes and values, this aspect was of crucial importance. It was decided to rather use the word "*response form*" as this suggested what the participants should do (Mertens, 1998).

Where possible, structured, close-ended questions were used. This format was selected to accommodate time constraints and to assist the auxiliary and staff nurses whose literacy skills were not as well developed as that of the professional nurses. Providing them with a choice of possibilities from which they had to select one acted as a prompt. This enabled the researcher to obtain an idea of what they knew, not merely of what they were able to write and spell as it was noted during the pre-experimental phase (**Appendix D**) that nurses feared to make spelling and grammatical errors. This type of format is also more motivational as it is easier and quicker to complete (Leedy, 1993). In addition, answers were easily scored and analysed due to pre-assigned codes.

The disadvantages of close-ended questions are that they are more difficult to construct and the fact that relevant answers can easily be overlooked (Leedy, 1993). In this research care was taken when reviewing the literature to determine possible answers, a pre-experimental phase was conducted (involving focus groups with open-ended questions to highlight aspects that might not be described in the literature) and finally the questions were tested by means of a pilot study.

Some questions, e.g. Question 15 "*When you think of your skills as a nurse, which three things do you do best?"* was asked in open-ended format, so that the participants were not guided in a direction, and also to allow them to answer in their own words. To a small extent, these questions were also used in an attempt to countercheck some of the other questions and to control bias in the development of the questionnaire (Leedy, 1993). This format was, however, not frequently used throughout the questionnaire.

Section C in the questionnaire, pertaining to the attitudes and values were coded using

structured, close-ended questions due to the fact that some participants might find this type of questioning threatening. Care was taken with the wording and construction of the questions to suggest to participants that it is acceptable to reveal some aspects that might not be socially desirable and to combat the effect of answering in a socially desirable manner (Bless & Higson-Smith, 1995; Mertens, 1998), e.g. Question 10 "*Many people who work in over-populated clinics feel that they become impatient when people give long case-histories."* Research has also indicated that if the participant and researcher build rapport over a longer period (as in the case with this type of research design) the participants are more honest when providing information (Mertens, 1998).

Furthermore, care was taken in Section C to include questions about all three components of attitude namely the affective dimension (how nurses feel about disability), cognitive dimension (what they know about disability) and the action dimension (what they are willing to do) (Mertens, 1998).

A few general guidelines were taken into consideration with the development of the questionnaire:

- Likert scales did not include more than five options (so that the options did not become visually overwhelming and so that participants could remember the options (Brink, 1999).
- Negative wording was avoided e.g. Question 7 "*Speech is an example of a communication function*" (Bynner & Stribley, 1979).
- Items were mostly short e.g. Question 10 "*I feel satisfied with my job*" and care was taken to ensure that each question dealt with only one concept (Brink, 1999).
- Care was taken to avoid any biased or leading questions, jargon and other difficult terminology, and to ensure the clarity of the questions, so that all participants understood the same concepts with the vocabulary used (Bynner & Stribley, 1979; Mertens, 1998).
- An attempt was made to keep the questionnaires as short as possible to ensure that participants did not lose interest and/or become fatigued resulting in the omission of any important information (Leedy, 1993).

- Meticulous care was taken with the visual appearance of the questionnaires. Questions used during the different phases were printed on differently coloured paper to make it visually more appealing and to accentuate the fact that different cases were used, so combating feelings of familiarity. Questions were all numbered, organised in logical sequence and did not have too many items per page. Care was taken to ensure correct spelling and grammar throughout (Mertens, 1998).
- Clear, brief instructions were included at the top of the questionnaires to guide the participants. They were encouraged to complete all questions as incomplete responses would impact on the reliability of the data (Leedy, 1993).

Table 4.17 provides a summary of the most important areas covered in Response Form II, with specific reference to the motivation for inclusion. The category, type and number of each question in each category are also discussed.

Table 4.17 Development of Response Form II

Sec-tion	Category	Ques-tion #	Total # of questions	Question area	Type of question	Motivation
A	Biographic data	1 2 3 4	4	1. Birth date 2. Close relative with a disability 3. Qualification 4. Nursing category 5. Experience at health clinic(s) 6. Training in disability	One Open-ended question, Two Yes/No questions (specify if "*yes*") Three close-ended questions with "*other*" category.	Birth date was used to determine the age of respondents as it has a direct influence on training methodology and also to code the respondent number. Having a relative with a disability influences knowledge, skills and attitudes and thus this variable had to be controlled. Variation of qualification, nursing categories and experience is possible. This data is important for compiling a profile of the nurses as these aspects impact on knowledge and skills as well as on the type of services they provide. Prior training in disability will also impact on these aspects. Nurses with prior experience would, however, not be ruled out as each nurse was compared with herself.

Sec-tion	Category	Ques-tion #	Total # of questions	Question area	Type of question	Motivation
B	Prior knowledge about disability and communi-cation	7 8 9	Three questions that include 23 items	1. Knowledge about AAC 2. Knowledge about severe disability 3. Multiskilling of nurses 4. Communicatio n modes, functions, partners and temptations	One structured close-ended question using true-false-uncertain format. Two close-ended questions where answers are plotted on a matrix for one and graded in terms of difficulty for the other.	Directly relates to the different aspects highlighted during training. Includes a definition of disability as well as the importance of different communication means, functions, partners and temptations. Training aimed at adhering to multiskilling issues and to provide nurses with training on ASHA's Level 2 (cross-training of professional, non-clinical skills) and Level 4 (cross-training of clinical disciplines). This questionnaire focuses on Level 2. During training a problem-based approach was followed as it is the training approach currently used with training health workers in the RSA. This implies that nurses will be required to apply knowledge different case studies. This section starts with true-false questions (as it is less threatening than open-ended questions), followed by four knowledge questions (in a matrix format)and finally a grading question where items are placed according to their difficulty level. This is a crucial element of the training as it provides guidelines of where implementation should start.
C	Attitudes and values	10	One question that includes 20 items	1. Motivation 2. Stress and job satisfaction 3. Attitude towards disability	5-point rating scale for all ranging from strongly agree to strongly disagree a method frequently used in assessing attitudes (Brink, 1999). Question construction was done with caution to avoid socially desirable responses or the so-called "*halo effect*" (Bless & Higsonn-smith,1995 and Guy *et al*., 1987)	The reversal theory of motivation was used to determine the nurses' motivation to work with CSDs. This holds that people are predominantly telic (goal directed) or paratelic (more "*easy going*" and "*go with the flow*"). Determining a person's telic-paratelic focus provides important guidelines in terms of how the person experiences the work environment as it provides an indication of serious-mindedness, planning orientation and arousal avoidance(if certain activities increase or decrease stress (Murgatroyd, Rustiton, Apter & Ray, 1978).It is assumed that nurses in community health clinics who are predominantly paratelic would find BCIP implementation with CSDs who do not make appointments and merely turn up, easier. This is also comparable to Bradshaw's definition of a Type B nurse who is flexible, thinking, problem-solving, autonomous, accountable and self-directing – the qualities of the nurse of the 21st century (Bradshaw, 1989). This is, however, not a psychometric test and these six items were merely included for descriptive purposes and to provide insight to the researcher. The next six items were adapted from the Index of Job Satisfaction (Brayfield and Rothe, 1951). It is related to the amount of stress people experience in their jobs. If stress levels are very high their ability to perform additional creative service

Section	Category	Question #	Total # of questions	Question area	Type of question	Motivation
C *Continued*						delivery (BCIP implementation) may be hampered. Finally, this section deals with attitudes towards service delivery as it directly impacts on knowledge and skills. Negative persons might not want to work with CSDs while very positive persons might overemphasise the care aspect and overlook the training dimension.
D	Other positive outcomes	11 12 13	3	1. Number of CSDs seen 2. Amount of time spent with CSD and caregiver 3. Type of service delivery provided	Three Close-ended questions	As nurses become better acquainted with the training programme, it is estimated that they will start using it with more patients and that the number of CSDs seen, will increase. It is also expected that initially they might spend more time with CSDs as they become more aware of this population and offer direct service to them. As familiarity with the BCIP increases, it is expected that the amount of time spent with CSDs will decrease as knowledge and skills increase. Finally, a change in the type of service delivery is expected away from direct referral as this is problematic (due to limited referral options, poverty and transport problems, little or no feedback to the referring nurse, etc.) using the BCIP nurses can provide a more accountable, affordable and effective service to CSDs and their caregivers.
E	Reflexive self-evaluation	14 15 16 17	Four questions and question 14 has six items	1. Comfortableness in handling disability 2. Effectiveness 3. Enjoyment 4. Opportunity for service delivery to CSDs 5. Case management (rapport and empathy) 6. Self-evaluation of skills	Six structured close-ended items using a 4-point Likert scale and three open-ended questions.	Participants should have the opportunity to reflect on their own knowledge, skills and attitudes. Specific questions were formulated for this purpose, combining close-ended and open-ended questions as both of these could assist with the effective training process. Areas covered relate to the effectiveness of a nurse during service delivery and enjoyment (if she does not enjoy working with CSDs it is assumed that she will not implement the BCIP independently. One disadvantage of self-evaluation is that it is difficult to be objective and to accept one's own strengths and weaknesses (Bradshaw, 1989). It is felt that after the weeklong training nurses would have a clear idea of what was expected of them in so far as service delivery to CSDs is concerned, providing them with the criteria against which they can judge their own performance. It is expected that this section might be difficult prior to training as nurses might not know of any other types of service delivery part from referral, leading them to think that their current knowledge and skills would suffice.

c) Response Form III

This is a short two page questionnaire that deals with the evaluation of training and was completed during the O_2 phase (directly post-training) and during the O_5 phase (at the five month withdrawal period). The complete questionnaire is attached as **Appendix N**. It aimed at obtaining the necessary data in as short a time as possible, as questionnaire length is an important variable that needs consideration. It must also be noted that this questionnaire was completed at the end of the training and consequently fatigue had to be considered. Response Form III consists of eight questions aimed at obtaining information about the training methodology and content.

Table 4.18 provides a summary of the most important areas covered in Response Form III, with specific reference to the motivation for inclusion. The category, type and number of each question in each category are also discussed.

Table 4.18 Development of Response Form III

Sec-ion	Category	Question #	Total # of questions	Question area	Type of question	Motivation
A	Biographic data	1	1	1. Birth date	One open-ended question	Used for coding respondent number enabling comparison between different research phases and measuring instruments.
B	Knowledge gained	2 3 4 5	3	1. Knowledge gained 2. Evaluation of training method and content 3. Enjoyment of training 4. Knowledge still lacking	One 4- point Likert scale rating, Two open-ended questions. One close-ended question (*Yes / No / Uncertain*)	Question 2 required of nurses to indicate on the 4-point Likert scale to which extent they had gained knowledge. Question 3 attempted to qualify the knowledge by probing specific aspects of the training content and methodology. Enjoyment of training impacts on the acquisition and retention of knowledge and a question on the three most enjoyable aspects of training was included. Nurses were also asked which knowledge aspects they felt lacking (implying a meta-cognitive reflection on the training). This information will be utilised to evaluate the BCIP training in terms of effectiveness and appropriateness.

Section	Category	Question #	Total # of questions	Question area	Type of question	Motivation
C	Recommendations	6 7	3	1. Suggestions to improve training 2. Additional comments	Two open-ended questions	The first question allowed nurses to note their suggestions that would improve training while the second was used for additional comments. As the research focused on the development of the BCIP training programme, feedback is essential for further improvement.
Section	**Category**	**Question #**	**Total # of questions**	**Question area**	**Type of question**	**Motivation**
D	Overall rating	8	1	1. Overall rating	One 5-point Likert scale rating, ranging from "*very poor*" to "*excellent*"	Necessary to obtain the nurses' overall impressions of the BCIP training without isolating certain factors, for future improvement. In the literature it is well-documented that the adult learner's impression of a training programme directly influences the gains (i.e. knowledge, skills and attitudinal) achieved.

ii.) Training programme

Equipping nurses with the skills to provide services to beginning communicators constitutes the primary aim of this research. The proposed use of the BCIP with its accompanying handouts and training represents a method through which this can be achieved. During the development of this training programme the concept of multiskilling was addressed as it facilitates change on the knowledge and skill levels. The design and development of the training programme is central to this research and an extensive motivation for the use of this specific training programme is presented in Chapters 2 and 3. This includes the training philosophy, structure and process, consequently these aspects will not be discussed in this section.

As already mentioned the training was conducted over five consecutive days (6 – 10 July 2000) from 08h30 to 16h00 daily. The reasons for the weeklong training were logistical (it was convenient for the nurses to rather be away from their respective clinics for a week than being away at various intervals) and also because the trainer/researcher wanted to follow the principle of total immersion to introduce nurses to these new and unfamiliar concepts. The consecutive training also limited the possibility of forgetting new information as adults forget 50% of what they learn after two hours and an additional 20% after two days (Rosenthal, 1991). July was selected as no other in-service training programmes were presented at that time, nurses did not have to study for any exams and not many were scheduled to take leave.

Training could not be conducted in situ, as none of the clinics had training facilities. However, a venue in the Moretele Health District was selected as its central location provided easy access and reduced travelling time and costs for participants. The training context is

important as a friendly, non-threatening atmosphere is one of the principles of adult learning (Jarvis, 1995). The amount of work with a majority of new concepts, the hands-on teaching method requiring active involvement and the fact that they all wanted to perform well, led to fatigue. It was also anticipated that some nurses could experience stress due to their age or their lack of qualifications (especially the auxiliary nurses)(Merriam & Caffarella, 1991). In order to counteract this, sessions between tea or lunch breaks were never longer than 1½ hours. These

sessions were usually made up of theoretical discussions (lasting approximately 20 – 30 minutes) followed by short video clips, interactive workshops and role play sessions of 60 minutes in line with adult training principles (Jarvis & Gibson, 1997). The effective presentation of theoretical concepts were ensured by the use of various teaching aids, e.g. the overhead projector with transparencies and videos (discussed in detail in Section 4.5.2.1). Case studies shown on video ensured that all participants understood concepts in exactly the same way (e.g. the various manifestations of the concept "*severe disability*"), forming common ground and facilitating insightful understanding of the particular concept. The use of case studies and problem-based learning assist participants in applying new knowledge and skills to real life situations (Blackman, 1995). The trainer's presentation style was informal, incorporating many examples and demonstrations, and encouraging questions and comments. In addition, the training venue was spacious with comfortable seating and few distractions (Jarvis, 1995). It was further enriched by the use of posters depicting various symbol systems, voice-output devices and AAC users in action, book displays, communication boards and voice output devices, flowers, peppermints and water carafes.

At the beginning of each day participants received the complete handout for that particular day. All five handouts are attached as **Appendices O1 – O5**. This enabled them to focus and concentrate on the information that was presented without anxiously trying to write down new information. These handouts also acted as a resource once the BCIP training had been completed. In compiling the handouts meticulous care was taken with the preparation and they were visually pleasing. This entailed that a 12-point font was selected to facilitate easy reading, headings were in bold type so that they stood out, enough space was left for own comments and important concepts were enhanced with pictures and graphics (Caffarella, 1994).
In conclusion a summary of the training procedure including the aim, competencies, equipment and instructional method, theoretical discussion and practical discussion is provided in Table 4.19.

Table 4.19 Summary of the training procedure

#	Aims	Competencies Learning outcomes)	Equipment & instructional method	Theoretical discussion	Practical session
1	1. To contextualise the training within Primary Health Care (PHC) and the human rights of CSDs 2. To highlight the importance of communication 3. To explain the concept "*severe disability*" 4. To discuss "*multiskilling*" and highlight the nurse's role in training beginning communication skills	Nurses will demonstrate their **knowledge** about the human rights of CSDs, the importance of communication for CSDs, the concepts "*severe disability*" and "*multiskilling*" and nurse's role in training beginning communication skills	• Overhead projector • Transparencies • Video recorder • Videos • Handouts for Day 1 • Lecture • Case study • Small group discussion • Feedback	The importance of the BCIP training in terms of PHC, the human rights of CSDs and the importance of communication were discussed. The devastating effect of LNFS was demonstrated by means of video clips. Next the concept "*severe disability*" and the difficulties of working with CSDs as well as the ICIDH-2 that focuses on participation were discussed. Finally disability was integrated into nursing practice by highlighting "*multiskilling*".	Nurses divided into small groups of three and discussed how they would plan a disability campaign to lessen the impact of disability in their health district. Each group addressed one of the following elements: • Awareness • Information • Referral • Feedback & follow-up • Prevention • Identification & screening • Planning services
2	1. To describe the four major areas that impact on communication 2. To discuss the development of communication functions through the provision of deliberate communication opportunities 3. To facilitate the development of skills related to beginning communication functions and the creation of communication opportunities during ADL	Nurses will demonstrate their **knowledge** about different beginning communication functions and deliberate communication opportunities. Nurses will demonstrate the **skill** to deliberately create communication opportunities through the use of communication temptations	•Overhead projector • Transparencies • Video recorder • Videos • Handouts for Day 2 • BCIP • Lecture • Case study • Small group discussion • Feedback	Four main communication domains namely functions, means, content and partners were discussed. The focus was then placed on beginning communication functions (choice-making, labelling, requesting help, requesting more, drawing attention, protesting, "*yes*' concept and showing humour & surprise). Specific strategies to elicit these functions ("*communication temptations"*) were then demonstrated. This included providing choices, making desired items inaccessible, selecting materials that require assistance, providing small portions or brief turns, deliberately with-holding attention, offering non-preferred items and violating expectations. Finally a 5-point plan for answering case studies was given and discussed.	After the discussion and demonstration of a particular communication function and temptation, participants were asked to practise the skill using the BCIP. Finally nurses were divided into small groups and each group had to explain how they would conduct service delivery and then demonstrate their newly acquired skill. All case studies differed to ensure that there was no duplication of facts and that all the different functions that were taught could be demonstrated. An example of a case study is: "*Simon is a four year old spastic boy. He cannot sit unsupported and although he can use his arms he cannot point effectively with an isolated finger. How will you teach him to point?"*

#	Aims	Competencies Learning outcomes)	Equipment & instructional method	Theoretical discussion	Practical session
3	1. To revisit the four major areas that impact on communication 2. To discuss different communication means (aided and unaided) 3. To facilitate the development of skills related to the implementation of aided and unaided communication strategies	Nurses will demonstrate **knowledge** of the various aided and unaided communication means included in the BCIP Nurses will demonstrate **skill** in implementing the various aided and unaided strategies in the BCIP	• Overhead projector • Transparencies • Video recorder • Videos • Handouts for Day 3 • BCIP • Lecture • Object & PCS communication boards • SASL dictionary • Case study • Small group discussion • Feedback	The four main communication domains were discussed, highlighting means. This was followed by a discussion of the concept "*AAC*" after which the aided and unaided strategies included in the BCIP were discussed and demonstrated. The unaided strategies included gestures (e.g. pointing, yes/no headshake, facial expressions, miming and gestures) sign language (SASL) and natural gestures. The aided strategies include real objects, colour photographs, PCS and a 4-option digital speaker. Received PCS communication boards in all 11 official languages (**Appendix Q**). Advantages and disadvantages aided and unaided strategies were highlighted.	After a discussion and demonstration of the various aided and unaided communication strategies included in the BCIP, nurses had the opportunity to practise these skills. All means were first practised in isolation (e.g. "*Make the gesture for "open"*) after which they had to incorporate it with their skills of the previous day (e.g. use a gesture to provide a choice). This was done is small groups where the roles constantly changed between a nurse acting as the CSD, a caregiver and a nurse. Skills were then applied to a specific case.
4	1. To revisit the four major areas that impact on communication 2. To discuss different communication contexts / environments 3. To discuss the inclusion of different partners 4. To highlight general intervention principles	Nurses will demonstrate **knowledge** of the importance of including different communication partners and environments in the intervention process as well as the general intervention principles Nurses will demonstrate **skill** in implementing the BCIP by including intervention principles, contexts and partners	• Overhead projector • Transparencies • Video recorder • Video • Handouts for Day 4 • BCIP • Lecture • Case study • Small group discussion • Feedback	The four major communication domains covered by the BCIP were revisited, highlighting the importance of the communication context (environment) and partners. The importance of these two aspects were highlighted by discussions, demonstrations and video examples. All information was related back to the BCIP by focussing on the three contexts covered, namely bathtime, mealtime and dressing/undressing. To conclude a few general intervention principles that should be adhered to at all times, e.g. the importance of maintaining a "*give-and-take balance*" were addressed.	Small groups were formed where everyone had an opportunity to take on different roles while practising the implementation of the different contexts provided by the BCIP. Participants were asked to specifically address the issues of involving different communication partners. General intervention principles were integrated into these role play sessions. Finally nurses role-played their recommendations with a specific case, e.g. *"Nomsa is 7-years old and spends her days with her 90-year old grandmother who doesn't want her to attend school. Her only toy is a broom that she pushes around aimlessly"*

#	Aims	Competencies Learning outcomes)	Equipment & instructional method	Theoretical discussion	Practical session
5	1. To describe the importance of monitoring progress 2. To complete a checklist designed for monitoring progress 3. To apply the checklist to a case study.	Nurses will demonstrate **knowledge** regarding the importance of monitoring progress Nurses will demonstrate **skills** in applying the Progress Checklist to a particular case study.	• Overhead projector • Transparencies • Video recorder • Videos • Handouts for Day 5 • Progress checklist • Lecture • Case study • Small group discussion • Feedback	The theoretical rationale for monitoring progress was discussed. Following this each item in the Progress Checklist that consists of three sections, namely the child (comprising communication means and functions), the partners and environment (comprising information about the partners and daily living information about the child within the environment) and the nurse's observation (in terms of communication temptations) were discussed.	Three Video cases were shown and a Progress Checklist was completed for each case. This was done in the group as a whole. Each score was then discussed in order to gain consensus and to act as in-service training. This was followed by two more video cases, which nurses completed a checklist in the small groups. Scores were again discussed and nurses were able to objectify their given scores. High correlation was found after the 5th video case. This was followed by a case study discussion similar to the one discussed in Response Form I.

4.5.2.3 Data collection procedures

Specific considerations that had to be taken into consideration with the collection of data to ensure reliability as well as the procedure for data collection follows.

i.) Specific considerations

In order to assure reliability specific considerations had to be taken into account during the collection of data, including the following:

a) All interviewers received the same training and therefore had exactly the same knowledge and skills in conducting the structured interview and completing Response Form I. This was done in an attempt to minimise the personal interpretation of questions, to reduce bias and to clarify any possible problems resulting from terminology (Babbie & Mouton, 2001).

b) All interviews were video recorded and rated by an external rater to check the reliability of the data.

c) In an attempt to minimise the Hawthorne effect, interviewers explained to nurses that there were no correct or incorrect answers before conducting the structured interviews (Babbie & Mouton, 2001; Brink, 1999).

d) In order to enhance co-operation all the nurses were informed that results from the three measuring instruments would be used to adapt the BCIP training and that they were specifically selected as participants. In addition, they received certificates of attendance from the University of Pretoria.

e) As the amount of information and the degree of difficulty demanded close concentration from the nurses, attempts were made to keep the questionnaires as short and as user friendly as possible without sacrificing the quality of the information needed, and to have a break at the end of each questionnaire.

ii) Procedure

The procedure will be described as it pertains to the different experimental phases of the research.

a) Permission to perform the research was obtained from the Assistant Director of Health in the Moretele District. First of all telephonic contact was made and a formal meeting arranged, during which the aim and procedures of the research was discussed. The Assistant Director then held formal discussions with all the matrons and the nurse in charge of continuous education programmes. Written permission to conduct the research was obtained.

b) A pre-experimental phase followed that comprised a needs analysis, determining community nurse's perceptions and exposure to disability utilising focus groups and questionnaires and finally the development of the BCIP (based on literature reviews and focus groups with caregivers of typically developing children and caregivers of CSDs).

c) The experimental phase commenced with the identification of community nurses' knowledge, skills and attitudes (Phase O_1). This was done by means of completing Response Form I and II on the first day of the weeklong training before the formal training commenced. As previously discussed, six interviewers and one external rater who assisted in conducting the structured interviews and completing Response Form I, were trained. In order to heighten the reliability of the data, the structured interviews were video recorded and were viewed by an external rater. For this phase of the research the researcher acted as the second rater while the external rater rated all the structured interviews conducted by the researcher. After all the structured interviews were completed, nurses assembled in the training venue and completed Response Form II. This was followed by a tea break after which the BCIP training commenced.

d) The training (Phase X) in the application of the BCIP was conducted over five consecutive days (Monday to Friday). The training context, procedures and content are summarised in Table 4.19.

e) The same procedures as described for Phase O_1 were repeated for Phase O_2, with the addition of Response Form III. After the training was concluded all the nurses were asked to complete Response Form III (training evaluation). Afterwards the different interviewers conducted the structured interviews and completed Response Form I. Random selections were made, implying that nurses were not necessarily interviewed by the same interviewer pre- and post-training. Finally nurses gathered in the training venue and completed Response Form II. This was followed by the presentation of certificates of attendance. It was felt that these certificates could be seen as a reward that made the nurses feel positive about their newly acquired skills and eager to learn in future (Jarvis, 1995). Training was concluded by 13h00 with an informal braai before participants left for home. All of them stated that an esprit de corps had formed during the week and that they felt a special friendship and bond with fellow nurses who also underwent the training.

f) Training was followed by an in situ follow-up after the initial training (Phase O_3) that lasted three days. This was necessitated by the fact that vast distances between the various clinics had to be covered, making it impossible to conduct this over a shorter time. Blackman (1995) reported that the quality of training is enhanced if it is followed by a training session during which the participants have the opportunity to interact individually with the trainer. These follow-ups were conduced in situ for logistical reasons (nurses did not have to take time off from work and consequently service delivery was only slightly disrupted) as well as the fact that the advantages of in situ training are documented (Bornman & Alant, 1999). Prior to conducting the structured interview nurses were shown photographs that were taken during training and they were handed an EasyTalk 4 Option digital speaker. Due to technical difficulties each nurse could not be equipped with her own device during training. Although this was not ideal, it appeared that the nurses were confident in handling the devices as they had had ample practise with similar devices two weeks earlier. The researcher then conducted the structured interviews and completed Response Form I. All interviews were video recorded by the fieldworker. The external rater then viewed the recordings and completed Response Form I independently. These sessions concluded with

the researcher addressing issues with which the particular nurses still had difficulty (e.g. the implementation of the communication board) and by answering all possible questions. The date for the next follow-up was confirmed. Each session lasted approximately 50 minutes.

g) Phase O_4 was also done in situ and was conducted over four days. It entailed the completion of Response Form I, which was also video recorded. After the data collection procedure, individual questions were again answered. Some of the nurses had arranged for CSDs to be present and the researcher demonstrated some of the principles of the BCIP on these children. In addition, each nurse received five PCS symbols that could be placed on the digital speaker. In order to allow for some flexibility they received five symbols despite the fact that they only needed a maximum of four at a time. The date for the next follow-up was confirmed.

h) The data collection procedure for Phase O_5 was exactly the same as O_4. After all the follow-ups had been conducted, nurses gathered in the initial training venue on the fourth day. The purpose of this meeting was to determine what each nurse felt that she had gained from the training (and if not – why not) and to hear her recommendations regarding the training. This day commenced with nurses completing Response Form II in order to determine their knowledge and attitudes after having been involved in the training programme for five months. A focus group was then conducted to obtain qualitative information on benefits and recommendations. Finally, nurses were asked to complete Response Form III (training evaluation) taking the whole five months into consideration (implying the initial weeklong training and three follow-ups). The day was concluded by lunch, a short message by the Assistant Director of Health and the presentation of small Christmas gifts to each participant for their co-operation during the research.

i) At the end of each phase the main researcher encoded all the measuring instruments.

j) The encoded data was then captured, checked by the researcher for any capturing errors and the statistical analysis started. Finally the interpretation of results followed.

4.5.3 Data analysis and statistical procedures

All the data were documented on the three measuring instruments. A pre-designed column marked "*For official use*" was placed on the right-hand side of all the measuring instruments for encoding the raw data. This was encoded by the researcher according to the data definitions. Subsequently data were computerised for statistical analysis with the SAS and BMDP programs. The data were then analysed using a variety of statistical procedures. This included:

4.5.3.1 Descriptive statistics

- Discrete frequency distribution counts were calculated for all the variables on all three measuring instruments which implied that all variable values were listed and counted each time they occurred (Guy *et al*., 1987).

- In some cases combined frequency scores were calculated for specific variables, e.g. "*List your three best skills as a nurse*". This enabled the researcher to gain a holistic picture of all the possible answers to a specific question.

- Percentages of different variables were determined and compared.

- Mean scores and standard deviations (STD) were calculated in the applicable cases to provide information on the spread of distribution.

4.5.3.2 Contingency tables

A number of contingency tables (mostly 2x2 and 2x3) were included to determine the dependence of specific variables with the chi-square test. In cases where these tables indicated

significant dependency further statistical analysis was done.

4.5.3.3 Inferential statistics : Parametric tests

- The t-test was used to compare the means pre-training and post-training in order to determine whether the differences between the means is significant due to change (Steyn, Smit, du Toit & Strasheim, 1998).

4.5.3.4 Inferential statistics : Non-parametric tests

- Chi-square test was utilised to compare data sets in the form of frequencies (Steyn *et al.*, 1998)

- Wilcoxon test for correlated samples (Steyn *et al.*, 1998)

- Fisher's exact test to determine whether two aspects have a positive or negative affect on each other (Steyn *et al*., 1998)

- The Friedman Test is an extension of the Sign Test and was used for determining whether the difference between the various research phases (e.g. the five data sets of Response Form I) deviate from one another significantly or merely by chance (Brink, 1999).

The results are displayed with bar graphs (especially when indicating change over time when comparing groups of data), histograms, frequency polygons and cumulative frequency graphs (Fink, 1995). Tables are used in cases where a summary of data is required (Fink, 1995).

4.6 SUMMARY

This chapter described the methodology of the research. It included the aim of the research and the objectives necessary to meet it. A description of the pilot study that indicated problem areas and deficiencies followed. Research phases, criteria for selection and a description of the participants, materials and equipment with respect to the main study followed. Finally data collection, recording and analysis were discussed.