CHAPTER 1

Perspectives on the role of the speech-language therapist and audiologist in the neonatal nursery

1.1 INTRODUCTION

Early communication intervention (ECI) is an established field within speech-language pathology in South Africa and has advanced to include neonatal assessment and management (Fair & Louw, 1999:13; Kritzinger, Louw & Hugo, 1995:7). The most recent contexts of early intervention service delivery are the neonatal intensive care unit (NICU) and neonatal high care unit (NHCU) (Rossetti, 2001:171). In South Africa, speech-language therapists are also involved in early intervention services in the kangaroo mother care unit (KMC) as shown by McInroy (2007). Speech-language therapists have a key role to play in the effective treatment of at-risk infants in this unique context (ASHA, 2005:2; Billeaud & Broussard, 2003:83).

Premature and low birthweight infants, and neonates with medical complications who are admitted to the NICU, are at risk for long term medical and neurodevelopmental problems affecting a number of areas, specifically communication and feeding skills (Rais-Bahrami, Short & Batshaw, 2002:85; Rossetti, 2001:5). Comprehensive management in the neonatal nursery includes not only medical treatment of the infant, but also developmental care and the provision of guidance, counselling and information to the family who are part of the decision-making process regarding the infant's care (ASHA, 2005:2; Billeaud & Broussard, 2003:83).

The speech-language therapist who practices in the NICU has a varied role and may provide many specialised services, including guidance to staff, parents and caregivers, as well as direct interventions with the neonates in

the form of either communication interaction or parent-guidance and -training regarding feeding and oral-motor exercises (ASHA, 2005:2; Billeaud & Broussard, 2003:83). Whilst the role of the speech-language therapist in the NICU is clearly described in international literature (ASHA, 2005:3; Billeaud & Broussard, 2003:83; Rossetti, 2001:181; Ziev, 1999:33), a lack of guidelines for service delivery in the NICU in the South African sector currently exists (De Beer, 2003:2).

Speech-language therapists who are employed in South African provincial hospitals are often faced with difficult working conditions, such as a lack of community awareness of services, inadequate instrumentation and tools, limited services of trained interpreters and limited literacy of caregivers (Fair & Louw, 1999:14; Van Rooyen, 2006:56). The diversity of language and culture in South Africa poses a challenge for speech-language therapists in providing family-centred early intervention services (Louw & Avenant, 2002:145).

According to Swanepoel (2004:16) the first step towards addressing such challenges entails a familiarity with the context from which they arise. As a result, the following complex and layered research question arises: what are the perceptions of speech-language therapists and audiologists, working in South African provincial hospitals, regarding *their role* in the neonatal nursery and *their current needs* in terms of clinical instruments/tools for the provision of neonatal communication intervention services in neonatal nurseries, and furthermore, what is needed in terms of clinical instruments/tools in this context, in order to improve family-centred neonatal communication intervention? An in-depth literature review was conducted in an attempt to shed light on the above questions and in order to formulate a rationale for the proposed study.

1.1 THE ROLE OF THE SPEECH-LANGUAGE THERAPIST AND AUDIOLOGIST IN THE NICU

The role of the speech-language therapist in the NICU is established and has been widely discussed in international literature (ASHA, 2005:3; Billeaud &

Broussard, 2003:86; Rossetti, 2001:181; Ziev, 1999:33). The speech-language therapist is described as a consultant and coach, who informs and encourages parents and staff members, as well as an infant specialist, who provides direct treatment to infants (ASHA, 2005:2; Billeaud & Broussard, 2003:87; Rossetti, 2001:181; Ziev, 1999:33). This intervention is provided to neonates through assessment of communication, feeding or general development, as well as treatment of feeding problems and provision of developmental care (ASHA, 2005:2; Billeaud & Broussard, 2003:88; Rossetti, 2001:181; Ziev, 1999:33).

The speech-language therapist provides information to parents on feeding, with regard to oral stimulation, reducing oral and facial tactile-defensiveness, the benefits of non-nutritive sucking, techniques and strategies to improve oral-motor control and preparing the infant to suck (ASHA, 2005:5; Billeaud & Broussard, 2003:88). Speech-language therapists also support KMC, which is a relatively recent technique used in South African neonatal nurseries and is proven to decrease hospital stay, shorten periods of time on ventilation, improve milk-production, improve confidence in caretaking and promotes attachment between parent and child (Feldman, 2004:147; Rick, 2006:58; Rossetti, 2001:191). KMC enhances cognitive development (Feldman, 2004:148) and improves states of alertness, and this results in improved bonding between mother and child and less stress on the mother. This in turn, improves milk production and increases opportunities for social-communicative development of the infant (Dippenaar, Joubert & Brussow Maryn, 2006:16a; Rossetti, 2001:191).

Speech-language therapists and audiologists educate parents and family on the appropriate interactions with the neonate. They inform parents and caregivers how to recognise the neonates' stress behaviours, how to reduce interactional demands, the significance of eye contact and the importance of talking to the infant so as to appropriately stimulate the infant's communication development and prevent communication developmental delays (ASHA, 2005:3; Billeaud & Broussard, 2003:88; Rossetti, 2001:174).

Approximately 5 – 12% of infants are treated in an NICU, but these newborns account for 40 – 70% of all cases of early onset sensorineural hearing loss (Hess et al., 1998:82). The paediatric audiologist's basic role is detection of hearing problems, evaluating hearing and intervention in the form of amplification (Roush, 1991:49). The NICU, together with the well-baby nursery, are established newborn hearing screening (NHS) contexts (Cox & Toro, 2001:99–104; Hess et al., 1998:81–89). According to Swanepoel, Delport and Swart (2004:634) NHS can be justified for the following reasons: the prevalence of hearing loss is higher than other birth defects, undetected hearing impairment leads to irreversible language and cognitive delays with far-reaching socio-economical ramifications, and early intervention yields dramatic benefits for infants identified before six months of age, than for those identified later. Developmental screening and follow-up services are therefore of the utmost importance.

The role of speech-language therapists and audiologists also includes the organisation of follow-up services and the compilation of family-centred early intervention programmes for treatment after the child has been discharged (ASHA, 2005:10; Billeaud & Broussard, 2003:87; Rossetti, 2001:181; Ziev, 1999:33). The speech-language therapist has a responsibility towards staff members of the NICU for continued education and in-service training (Rossetti, 2001:182) especially regarding the relationship between the neonate's early experiences and communication development (Billeaud & Broussard, 2003:88). This professional function implies the involvement of the speech-language therapist and audiologist in a inter- or transdisciplinary team approach where the therapist attends ward rounds, team discussions, ongoing needs assessments and discharge planning (ASHA, 2005:10; Billeaud & Broussard, 2003:92; Rossetti, 2001:182; Ziev, 1999:33). The role of the speech-language therapist and audiologist working in the NICU is therefore complex and varied, and requires a sound theoretical underpinning and as well as experience, such as clinical skills gained from experiences in NICUs.

However, due to a number of reasons, the ideal role described above does not always occur in the South African context as it does in developed contexts. Neonatal communication intervention services in the local context are discussed forthwith in order to illustrate the impact of the context specific challenges on speech-language therapists working in neonatal nurseries.

1.3 ECI IN THE NEONATAL NURSERY IN THE SOUTH AFRICAN CONTEXT

The earliest intervention for infants at-risk for a communication delay is provided in the NICU (Rossetti, 2001:270). In South Africa, in the public health sector, ECI services to neonates are less developed and less comprehensive in comparison to a developed country such as the USA (Kritzinger et al., 1995:7). Whilst international literature provides guidelines on the speech-language therapist's service-delivery in the NICU (ASHA, 2005), the local literature shows a shortage of information on the current service delivery practices and roles of speech-language therapists in the NICU and NHCU in South Africa (De Beer, 2003:2).

In South Africa, neonatal care is provided in both public as well as in private health care institutions. The South African public health structure consists of three levels of health care. The first level, primary health care (PHC), refers to care being provided to patients at community-based clinics by PHC nurses and in some cases, doctors (South African Government Information, 2006). Patients are referred to district or regional provincial hospitals for treatment, which could not be provided at PHC level. The third level, tertiary hospitals, refers to hospitals that provide specialized care such as cardiology or renal dialysis (South African Government Information, 2006).

In the South African public sector, neonatal care is provided at district and regional hospitals in NHCU and KMC units. These units provide intensive care to premature and low birthweight infants as well as other infants who require additional attention (Billeaud & Broussard, 2003:85). Tertiary hospitals, which are also described as teaching hospitals, provide neonatal

care in NICUs that have sophisticated treatment and high-technology equipment (Billeaud & Broussard, 2003:85). As soon as the infant does not need specialist care anymore, he/she is transferred to a step-down unit – usually a NHCU or a KMC unit – until the infant attains full-term age, achieves adequate heart rate and feeds orally adequately (Billeaud & Broussard, 2003:86; Dippenaar et al., 2006:16).

Furthermore, since 2003, it became compulsory for newly graduated allied health professionals such as speech-language therapists and audiologists to provide services in a government facility for a minimum of one year before being allowed to practice independently (South African Government Information, 2006). This implies that newly qualified professionals are providing services in all areas of speech-language therapy and audiology in the hospital and surrounding PHC clinics and consequently also in NICU, NHCU and KMC units. According to Rossetti (2001:174) this area of service delivery requires specialist knowledge in order to provide effective services.

South Africa can be viewed as a continuum of a developed as well as a developing context (Fair & Louw, 1999:13). Professionals providing ECI services in local provincial hospitals, and consequently the neonatal nurseries of provincial hospitals, are therefore challenged by numerous factors unique to this context.

Speech-language therapists and audiologists are faced with large caseloads as there are limited qualified professionals employed in provincial hospitals. According to Fair and Louw (1999:16) a dearth of speech-language therapists exists in South Africa. The introduction of the ‘community service’ year has expanded services as more speech-language therapists and audiologists are now working in the neonatal nurseries in provincial hospitals. However this in itself is not a feasible solution as these speech-language therapists and audiologists have limited clinical experience, and in most cases practice without the supervision of more experienced speech-language therapists.

Another challenge to ECI service provision in the neonatal nurseries of provincial hospitals is multilingualism. The multicultural and multilingual nature of the communities in South Africa poses a challenge in delivering intervention to the clients in their caseload, as more than eleven languages are spoken in South Africa, where each linguistic group has their own cultural practices (Louw & Avenant, 2002:146; Fair & Louw, 1999:16; Ligthelm, 2001:2). Speech-language therapists and audiologists working in this context may find it problematic to communicate effectively with the infant's families and caregivers. The use of interpreters is a possible solution, but currently there is an insufficient number of trained interpreters in the public health sector (Louw, 2007 [b]), which may compromise the quality of ECI services rendered (Lynch & Hanson, 1998:78).

In an attempt to overcome communication and cultural barriers, informal interpreters are often utilised by speech-language therapists and audiologists working in neonatal nurseries. According to Van Rooyen (2006:31) who targeted a sample of speech-language therapists and audiologists performing ECI in their community service year, found most of the respondents had access to informal interpreters only. Informal interpreters may not always have the required knowledge to convey the message accurately and correctly from the speaker to the listener (Lynch & Hanson, 1998:79), which once again impacts on the quality of services provided.

Furthermore speech-language therapy and audiology service delivery in the neonatal nursery is influenced by the fact that written information and home programmes cannot be provided to many families and caregivers (Van Rooyen, 2006:27) as they present with limited literacy skills. Louw, Shibambu and Roemer (2006:52), who explored culturally diverse families' participation in the team approach toward their children with cleft lip and palate and craniofacial anomalies, found that only 54% of the participants in their study were literate. Limited literacy of caregivers is viewed to be an environmental risk for the development of a communication delay for infants in their care (Fair & Louw, 1999:14).

Many infants who receive treatment in the NICU are discharged for follow-up treatment and developmental screening as out-patients. This poses a challenge to speech-language therapists and audiologists who provide services to this population, as many infants and their caregivers have poor return rates for appointments. According to Fair and Louw (1999:13) poor return rates result from a wide geographical distribution of infants with special needs as well as problems with finances and transport (Van Rooyen, 2006:42), which is a hindrance to the implementation of effective ECI services. According to Swanepoel et al. (2004:634) screening programmes in general, especially hearing screening programmes, are not common practice in South Africa and are not meeting the needs of the people.

ECI services by speech-language therapists and audiologists are also influenced by other professionals in the provincial hospital's NICU-team. Limited awareness of the role of the speech-language therapist by other team members compromises ECI service provision in this context. Rakau (2005:40), who targeted mothers of infants in the NICU of a provincial hospital in Pretoria, concluded that there appears to be a lack of multi-professional team involvement in the NICU and that speech-language therapists in her study were not optimally involved in this context. According to Kritzinger (2000:23) all three levels of public health care are based on the principle of a coordinated referral system. Optimal ECI services should be provided through a transdisciplinary teamwork approach (Rossetti, 2001:119). It is clear that neonatal ECI will be unfavourable if team members are not familiar with the valuable role speech-language therapists and audiologists could play in the context of the neonatal nursery.

To further complicate service delivery, the speech-language therapist and audiologist working in the NICU often do not have appropriate instrumentation, e.g. video-fluoroscopy and materials for comprehensive evaluations and intervention. This was also noted by Van Rooyen (2006:50) who found that few of the respondents in her study had access to appropriate audiological equipment for newborn hearing screening and diagnostic hearing testing at the institutions where they were employed as community service

therapists. A shortage of clinical instruments with relevant procedures in ECI exists that can be used in neonatal service provision in the South African context (Kritzinger & Louw, 2003:11).

An exciting development in neonatal communication intervention is that comprehensive undergraduate training is taking place. According to Kritzinger and Louw (2003:5) ECI is included in all undergraduate programmes of universities offering programmes in speech-language therapy and audiology. However, clinical expertise is not always sufficient to meet the complex needs of infants, families and team members. Community service therapists in Van Rooyen's study (2006:57) stated that they received adequate training to fulfil their roles, but indicated a need for further training in working across language barriers and providing services in non-ideal circumstances. Therefore continued professional development has an important role to play for both new and more experienced graduates.

ECI services are expanding to include universal NHS at provincial hospitals. According to Swanepoel et al. (2004:634) a Hearing Screening Position Statement was conceptualised by the Professional Board for Speech, Language and Hearing Professions of the Health Professions Council of South Africa and is based on the Joint Commission on Infant Hearing in the USA Year 2000 Position Statement. This Position Statement proposes screening of high risk infants, using targeted hearing screening before discharge from hospital or at the six week immunisation visit, so as to initiate intervention before six months of age (Swanepoel et al., 2004:634).

In conclusion, it is apparent that although many barriers exist to service delivery of neonatal ECI in provincial hospitals, innovative strategies can be employed to bring speech-language therapy and audiology services closer to the ideal service provision. By providing family-centred services and by working in a transdisciplinary team, neonatal communication intervention services may be improved to the benefit of this vulnerable population.

1.4 ENHANCING NEONATAL COMMUNICATION INTERVENTION SERVICES

ASHA (2005:2) advises that family-centred care is a key principle of neonatal communication intervention and involves compassionate, open and total inclusion of the family in the care and decision-making process for their infant. By following a family-centred approach, a child with special needs is provided with a management plan that involves the entire ecosystem (family and community) in which he or she lives (Billeaud, 1998:77).

A family-centred approach to ECI in the neonatal nursery does not always materialise in the local context, due to certain hindrances. Speech-language therapists and audiologists can utilise innovative methods to make the neonatal ECI services they provide more individualised and family-centred. A study conducted by Packery-Babamia (2001:60) targeted mothers with infants in the NICU of a provincial hospital in South Africa, found that mothers expressed the preference that they would rather interact with interventionists that are of the same religious, cultural and linguistic background as themselves. As this is not always possible, the speech-language therapist can be aware of and sensitive to such needs and provide culturally appropriate education and counselling opportunities to families in the NICU (Packery-Babamia, 2001:67; Rakau, 2005:42). Best practice in early intervention is defined as being family-centred and culturally sensitive (Iglesias & Quinn, 1997:69; Weitzner-Lin, 2004:4) and the application thereof in the context of the NICU of a provincial hospital is therefore indicated.

ECI service provision should be comprehensive, coordinated and team-based (ASHA, 2008:2). A transdisciplinary approach to intervention implies that each team member will retain his/her own disciplinary expertise, while benefiting from the knowledge and experience of the other disciplines (Rossetti, 2001:180). Due to certain challenges speech-language therapists and audiologists face in neonatal nurseries of provincial hospitals, limited transdisciplinary teamwork is taking place. This is indicated by Rakau (2005:40) who found that no speech-language therapists were involved in the

NICU where her study was conducted. De Beer's findings (2003:59) also indicated that speech-language therapists did not effectively fulfil their role within the NICU-team, due to isolated service delivery and limited transdisciplinary teamwork.

Neonatal communication intervention services in provincial hospitals may be improved by providing treatment within a transdisciplinary team and directing intervention at all parties concerned. A transdisciplinary team approach to ECI is highly successful and is the future of early intervention (Rossetti, 2001:119). The development of collaborative partnerships between speech-language therapists and their team-members is imperative for marketing of ECI services for at-risk infants (Moodley, Louw & Hugo, 2000:37). By aiming intervention at the infant, parents and the NICU-staff, a holistic approach to intervention is utilised, which ensures the best results for the infant and family (McInroy & Kritzinger, 2005:33).

1.5 CONCLUSION AND RATIONALE

Local literature shows a shortage of information on the current service delivery and roles of speech-language therapists and audiologists in neonatal nurseries in the South African context. The literature review revealed that the role of speech-language therapists and audiologists in this context is currently different to that described in international literature. While some of the professional functions that speech-language therapists and audiologists fulfil in the neonatal nurseries do materialise according to international guidelines, some of these functions are a challenge to apply to the local context, such as providing parents with information needed and counselling in the preferred languages.

In order to improve the quality of neonatal communication intervention service delivery in provincial hospitals in South Africa, it is necessary to conduct a needs analysis in order to establish whether a specific neonatal communication intervention tool is necessary to overcome some of the barriers mentioned. The main aim of the current study is therefore to compile

a preliminary neonatal communication intervention instrument/tool, which is locally relevant and for use by speech-language therapists in neonatal nurseries of provincial hospitals in South Africa.

1.6 DESCRIPTION OF TERMINOLOGY

A brief description of certain terms used throughout this study is provided in Table 1.1.

Table 1.1: Selected terminology

Term	Description
Neonate	A neonate is an infant who is less than 28 days old (Harrison, 2002:1). For the purpose of this study, a neonate is defined as any infant receiving neonatal care.
High risk infants or neonates	A high risk infant or neonate can be defined as an infant or neonate at biological or environmental risk for a developmental delay and more specifically a communication development delay (Rossetti, 2001:5; McInroy, 2007:12).
Neonatal intensive care unit (NICU)	The NICU is a sophisticated nursery where infants who require specialised surgical or medical interventions, are treated (Billeaud & Broussard, 2003:86).
Kangaroo mother care (KMC)	KMC is an intervention where the mother holds the infant on her chest (skin-to-skin contact) and feeds the infant breast milk on demand. KMC improves the quality of care and mortality rates of low birthweight and premature infants, achieving cost saving in all settings, whether public or private, primary or tertiary, and developing or developed countries (Hann, Malan, Kronson, Bergman & Huskisson, 1999:37; Pattinson, Bergh, Malan & Prinsloo, 2006:1).
Neonatal nurseries	For the purpose of this study, the term *neonatal nurseries* will be used collectively to refer to the neonatal intensive care unit (NICU), neonatal high care unit (NHCU) and the kangaroo mother care ward (KMC).
Developmental care	Developmental care is an intervention strategy used in the NICU to help mediate some of the risks for premature infants and their families. When an infant's cues suggest over-stimulation and disorganisation, caregivers will use strategies such as positioning and reduction of stimulation to help the infant self-regulate (Goldberg-Hamblin, Singer, Singer & Denney, 2007:164).
Early communication intervention (ECI)	ECI is intervention, including both assessment and treatment, provided to families and their children below the age of three years, who demonstrate, or are at risk of demonstrating either a disability or delay involving communication, language, speech or prerequisite oral-motor behaviour, with the aim of establishing an interactive relationship between the infant and his/her environment (Louw, 1997:1; Rossetti, 2001:5; McInroy, 2007:14).
Neonatal communication intervention tool	A neonatal communication intervention tool is a clinical instrument used to conduct assessments or provide treatment of aspects pertaining to the infant, parent/caregiver guidance or staff/team education in neonatal nurseries.
Provincial/public hospital	For the purpose of this study a provincial/public hospital is defined as a secondary or tertiary South African government hospital where medical, surgical and rehabilitation services are provided to patients.

1.7 CHAPTER OUTLINE

The chapters that are contained in this dissertation are summarised in Table 1.2.

Table 1.2: Summary of chapters

Name of chapter	Contents
Chapter 1: *Perspectives on the role of the speech-language therapistand audiologist in the neonatal nursery*	✦ This chapter introduces the topic of ECI services in the neonatal nurseries in South Africa and provides the background from which the research question arose. ✦ The current role of the speech-language therapist in the NICU in recent literature is described. ✦ Neonatal communication intervention in neonatal nurseries in South Africa is reviewed. ✦ A problem statement and theoretical rationale for the study is formulated. ✦ Terminology used in the study is thoroughly discussed. ✦ An outline of all chapters included in the study is depicted in table format.
Chapter 2: *Best practice in neonatal care in South Africa*	✦ A critical review of literature provides current perspectives on ECI in neonatal nurseries. ✦ A clear argument is provided on the reasons why research in the field of neonatal communication intervention in South Africa is necessary.
Chapter 3: *Methodology*	✦ This chapter describes the way in which the research was conducted according to literature. ✦ The research was conducted in two phases and is described as follows: **Phase 1:** Speech-language therapists' perceptions of their role and their needs in neonatal nurseries in South Africa. **Phase 2:** Compilation of a tool for use in neonatal nurseries in South Africa.
Chapter 4: *Results and discussion*	In this chapter the results are documented according to the previously formulated objectives and displayed in tables and graphs. The results are interpreted according to recent literature.
Chapter 5: *Conclusion and recommendations*	✦ This chapter draws conclusions highlighted by the results in the previous chapter and will refer to the research problem statement in Chapter 1. ✦ The meaning and value of this study's contribution is highlighted and discussed. ✦ Recommendations and implications for future research within this field of study are documented.

1.8 SUMMARY

Chapter 1 describes the role of the speech-language therapist in neonatal nurseries in South Africa. A research problem was identified and a research question was posed. The current study aims at contributing to the shortage of information regarding the role of the speech-language therapist and audiologist in neonatal nurseries. ECI within the context of neonatal nurseries in South Africa was depicted and best practice in this context was described. The need for culturally and contextually appropriate tools for use in this context was expressed. A description of terminology as well as relevant concepts are provided together with an outline of the chapters included in the study.

CHAPTER 2

Best practice in neonatal care in South Africa

2.1 INTRODUCTION

Rapid advances in research, as well as new discoveries integrated with existing knowledge, necessitate the continuous adaptation of early communication intervention (ECI) strategies and methods in order to achieve best practice (Kritzinger, 2000:35). Current progress in acute neonatal care has resulted in improved survival rates for low birthweight and premature infants and, according to Rossetti (2001:173), the question is now no longer whether infants can be saved, but rather if we as professionals can improve the survivors' developmental outcome. Speech-language therapists working in the neonatal intensive care unit (NICU) provide a number of services, all of which require specialised preparation (Billeaud & Broussard, 2003:83).

Currently speech-language therapists are called upon to integrate research evidence, clinical expertise and client values into clinical decision-making to demonstrate evidence-based practice (Johnson, 2006:20). According to Johnson (2006:24) evidence-based practice guidelines help practitioners in clinical management of specific health care or mental health issues, by indicating courses of action that are supported by evidence. Guidelines for ECI in South Africa were compiled by SASLHA (Louw, 1997) but currently there are no specific guidelines for speech-language pathology in the NICU in South Africa. The *Roles and Responsibilities of Speech-Language Pathologists in the Neonatal Intensive Care Unit: Guidelines* by ASHA (2005) may be used as a general guide, although many contextual differences prohibit direct application.

The current situation emphasises the need for appropriate guidelines for speech-language therapists providing services in NICUs in South Africa.

Guidelines need to be used by speech-language therapists involved in all contexts to inform assessments and clinical decision-making during intervention. In the NICU speech-language therapists are involved in assessments of, and intervention for the communication as well as the feeding abilities of the infant, as well as parent and caregiver education and counselling (ASHA, 2005:2). Assessment instruments are designed to collect samples of behaviour and are a means of structuring observations and reporting results (Rossetti, 2001:93). A valid assessment of an individual's communicative abilities and disabilities is the foundation on which all future clinical activities are based (Shipley & McAfee, 1998: xiii). ECI assessment tools are utilised to identify risks for a communication delay or disorder as early as possible, to decide on an appropriate course of action for further treatment, to determine the frequency and length of treatment, to identify the need for referral to other professionals, to support evidence-based practice and to monitor change in the infant as well as family or caregivers over time (Rossetti, 2001:88). Once intervention planning for the individual infant and family has been done, the speech-language therapist may also make use of intervention tools for training and guiding other team members involved in developmental care. Speech-language therapists are responsible for caregiver guidance as well as for staff and/or team education within a developmentally supportive care approach in the neonatal intensive care unit-context (ASHA, 2005:2).

NICU-based services should be delivered within a family-centred and culturally appropriate approach (ASHA, 2005:2), which necessitates that tools and programmes used in this context need to be congruent with this approach. Currently few neonatal communication assessment and intervention tools have been compiled or developed specifically for the local context. Available literature has identified limitations regarding culturally appropriate clinical instrumentation

for ECI in public hospitals in South Africa (Kritzinger & Louw, 2003:11; Louw, 2007:66, [b]; Van Rooyen, 2006:50), which hampers the provision of family-centred and culturally appropriate services. The availability of neonatal communication intervention tools for use in public hospitals' neonatal nurseries in South Africa will be reviewed in an attempt to justify the development of a tool in the local context. The following framework was conceptualised for this purpose. The aspects presented in Figure 2.1 were identified as being relevant to the topic and will be discussed forthwith.

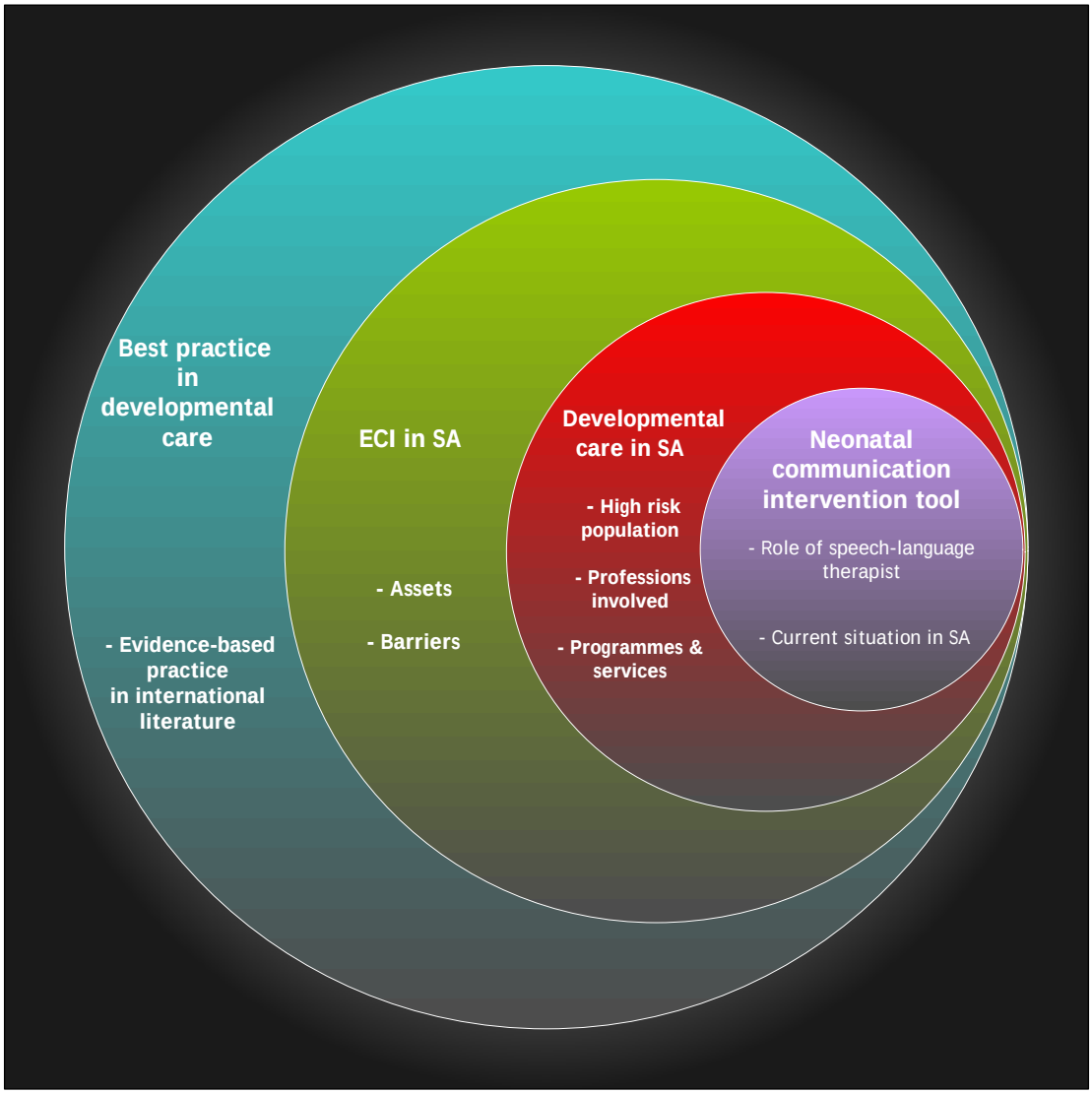

Figure 2.1: Issues that surround the compilation of a neonatal communication intervention tool in South Africa

Clinical tools for neonatal ECI can be understood better and utilised more effectively in clinical practice if their theoretical foundation is investigated. The aim of this chapter is to serve as a theoretical underpinning for the viability of compiling a neonatal communication intervention tool for use in public hospitals in South Africa.

2.2 THEORETICAL UNDERPINNING FOR A NEONATAL COMMUNICATION INTERVENTION TOOL

This section provides the theoretical underpinning for the development of a neonatal communication intervention tool by examining best practice within developmental care as well as ECI in South Africa, using an asset-based approach.

2.2.1 Best practice in developmental care

Kenner and McGrath (2004: xi) describe developmental care as *"…an intuitiveness to observe the infant and family and their interactions with the environment. It is a framework for providing care that supports the neurobehavioural development of the infant."* According to Goldberg-Hamblin, Singer, Singer and Denney (2007:165) common elements of developmental care include neonatal nursery systemic practices as well as individual nursing-infant interactions. This is displayed in Table 2.1 together with parent practices compiled from Rossetti (2001:182).

Table 2.1: Summary of the elements of developmental care

Neonatal nursery practices	Nursing practices	Parent/caregiver practices
1. Lighting dimmed and sound reduced: Preferably utilising natural light, establishing day-night cycles, using isolette covers, elimination of radios, audible heart rate monitors, audible talking, audible cleaning equipment.	**1. Positioning and swaddling:** Infant positioned in flexion during sleep with use of blanket rolls, padding and nests.	**1. Ownership of their infant:** Learn about their infant and the manner in which the environment affects their child.
2. Clustered care: Medical and regular procedures should be clustered together so that infant has longer periods of undisturbed rest.	**2. Assessment of infant state and competencies:** Nurse understands infant's facial expression and motoric cues to know whether infant is stressed. Nurse also observes whether infant can self-regulate when stressed.	**2. Socio-communication interaction:** Identify and interpret infant's unique signals (e.g. stress, avoidance, engagement). Interact at appropriate time by providing language stimulation through use of descriptions or praise.
3. Primary care nursing: Infant is assigned a team of several nurses for the duration of the stay in the unit.	**3. Reducing over-stimulation and stress:** Reducing movement, handling, light, noise. Assisting infant to self-soothe and/or suck on hands/pacifier. Encouraging Kangaroo Mother Care.	**3. Caring for infant:** Caring for, touching and holding infant as much as possible while infant is hospitalised. Assisting infant to self-regulate by using calming techniques (swaddling, positioning and non-nutritive sucking).
4. Family-centred care: Parent involvement, open visiting policy, warm atmosphere, discharge training, and encouraging kangaroo mother care.	**4. Providing appropriate interaction:** Engaging in eye contact and communication with infant when infant is most capable of interacting.	**4. Kangaroo mother care:** Providing tactile-kinesthetic stimulation through skin-skin contact with infant.

Compiled from Goldberg-Hamblin et al. (2007:165) and Rossetti (2001:182).

Best practice in developmental care in neonatal nurseries is described comprehensively in research from the United States of America. According to Bozzette and Kenner (2004:75) more than 80% of 500g – 800g infants are surviving today due to advances in medical care. In spite of improved technology that reduces mortality rates of preterm infants, these infants are exposed to more stressors than full-term neonates and present with stress levels above their ability to cope (Hennessy, 2006:13). These infants are also characterised by difficult temperaments owing to an underdeveloped nervous system, and therefore these infants are easily overwhelmed by the NICU itself (Goldberg-Hamblin et al., 2007:163). Als (1997:47) states that not only should survival of these infants be ensured, but optimal development also has to be fostered as infants born prematurely and with low birthweight may experience a multitude of difficulties including school failure, health problems and disability (Goldberg-Hamblin et al., 2007:163).

NICUs have been involved in profound transformations since the mid-1980s by moving from a task- and teaching-orientated model towards a model characterised by family-centred developmentally supportive care (Als, 1997:55). This is attributed to the importance of establishing an alliance between parents and professionals, which supports the parents' cherishing of the infant (Als, 1997:55). According to Klaus and Fanaroff (2001:224) neonatal nurseries have become concerned about the negative effects of the NICU environment and have started implementing preventative strategies to reduce noxious stimuli and to promote positive development. Rossetti (2001:276) states that researchers have shifted attention from improving survival rates of high risk infants to studying ways to improve developmental outcomes for these infants.

Within the developmental care approach, infants are viewed to be active participants in their own care and are focused on interventions that protect the premature or sick infant's immature central nervous system (Als, 1997:57; Klaus & Fanaroff, 2001:224). According to Hennessy (2006:14) the preterm infant's

developing brain is known to be particularly vulnerable to a stressful environment and the NICU environment may overwhelm the premature infant (Goldberg-Hamblin et al., 2007:163). Negative sequelae of this environment on the infant's developing brain can be reduced through developmental care, as it provides a simple and effective way of reducing complications by modifying the environment to which the infant is exposed (Hennessy, 2006:14).

Several research studies have confirmed the evidence-based practice of developmentally supportive care and have found that a developmentally supportive environment leads to increased weight gain, shorter stays in hospital, shorter time on ventilators (Bozzette & Kenner, 2004:79), improved medical as well as behavioural outcomes, improved brain and motor development (Als, 1997:62). Rossetti (2001:276) concludes that developmental care not only dramatically improves developmental trajectories for infants admitted in the NICU, but also provides improved medical benefits and cost savings. American researchers such as Als (1997:62) have made major contributions to the implementation of developmental care and the provision of high quality evidence of effectiveness as seen from studies mentioned forthwith. Therefore research and applications of developmental care in the United States of America may be viewed as an example of what best practice entails.

A programme that has shown positive results for premature infants is the *Newborn Individual Developmental Care and Assessment Programme (NIDCAP)* (Als et al., 2004). This programme was developed as a framework for the implementation of developmental care for premature infants (Als, 1997:57; Klaus & Fanaroff, 2001:224). NIDCAP is a comprehensive approach to developmentally supportive care as well as care which is individualised to goals that have been set according to each infant's level of stability (www.nidcap.org). Als (1997:57) states that this approach is a systematic method to observe the infant's behaviour and is conducted by a developmental professional, who then provides suggestions for ways to understand and analyse the infant's

physiological stability, behavioural organisation and developmental progression. Evidence of enhanced brain function as well as brain structure in preterm infants between 28 and 32 weeks gestational age was determined and attributed to NIDCAP (Als et al., 2004:846). Kleberg, Hellström-Westas and Widström (2007:409) concluded that mothers of preterm infants who received care according to the NIDCAP approach felt closer to their infants than mothers whose infants received conventional care. The NIDCAP approach requires in-depth training at any of the seventeen NIDCAP training centres in the USA, South America and Europe (www.nidcap.org). Although NIDCAP provides a highly valuable resource in support of developmental care, it typically takes 12 months to complete the compulsory training (www.nidcap.org). It is therefore not readily accessible to developmental professionals in South Africa and as a result it is also not implemented in local neonatal nurseries. NIDCAP is viewed as best practice within developmental care and although few professionals are NIDCAP-trained, all professionals involved still have a responsibility to implement the elements of developmental care in neonatal nurseries where they work, since the results thereof have been proven. Kangaroo mother care (KMC) is a viable alternative for the South African context and it may assist in overcoming the barrier of lengthy and expensive training required by NIDCAP. KMC is a multi-disciplinary developmental care practice that has been researched and found to be effective and safe.

KMC is a developmental care practice and form of tactile-kinesthetic stimulation and is described as early, prolonged and continuous skin-to-skin contact between mother and the low birthweight infant, in hospital and after discharge, with exclusive breastfeeding (Cattaneo, Davanzo, Bergman & Charpak, 1998:279; Rossetti, 2001:190). According to Cattaneo et al. (1998:281) KMC results in savings due to reduced need for sophisticated equipment and an earlier discharge. KMC is also used for rewarming mildly or moderately hypothermic low birthweight infants and for transport between healthcare facilities (Cattaneo et al., 1998:281). KMC has been shown to be a safe

alternative for Third World countries where 96% of the world's premature infants are born (Bergman, Linley & Fawcus, 2004: 784). The effectiveness and safety of KMC is well established and is rapidly becoming an integral part of the care of newborn infants worldwide (Bergman, Malan & Hann, 2003:312) and is regarded as an important developmental care practice for developing contexts also (Bergman et al., 2004:784).

According to Rossetti (2001:276) implementation of the developmental care approach is no longer optional. NICUs choosing not to do so must have clear reasons or they should at least conduct their own trials in an attempt to implement this approach (Rossetti, 2001:276). ASHA (2005:2) stipulates that developmental care is a key principle for speech-language therapists performing their roles and responsibilities in the NICU.

The benchmark for ECI service delivery in neonatal nurseries is neonatal communication intervention within a developmental care approach. A description of the characteristics of general ECI services in the South African context is required in order to identify and understand the differences as compared to the situation in developed contexts. This will serve to illustrate the need for the development of culturally and contextually appropriate materials.

2.2.2 ECI service delivery in South Africa

In order to describe ECI in general within the South African context, assets of service delivery as well as barriers that exist in the local context will be identified. An asset-based approach emphasises positive aspects in this context that can be utilised to improve service delivery. According to Eloff and Ebersöhn (2001:150) the asset-based approach is also referred to as the "half-full glass" approach to intervention. This approach to intervention focuses on what is currently present and what are the capacities inherent to the individuals and environment, without starting with what is lacking or problematic (Eloff &

Ebersöhn, 2001:151). Therefore the differences and similarities between ECI in South Africa and the ideal situation described in international literature will be investigated according to an asset-based approach. This approach will provide a representative overview of South Africa's assets to address barriers within the context of ECI.

Firstly, the fact that the national health care system in South Africa was transformed to a *Primary Health Care (PHC)* system in 1997 is viewed as a positive characteristic of service delivery in South Africa, as it aims to bring health care as close to community members' homes and work settings as possible (Hugo, 2004:7; Swanepoel, 2004:11). The goal of the South African Health Policy is to meet the health needs of the whole population with the focus on health care rather than medical care (Swanepoel, 2004:11). Health care facilities providing primary health care are placed within communities, providing a potential platform from which to launch early intervention services in all communities, both developed and developing (Fair & Louw, 1999:17). According to Fair and Louw (1999:22) the dire need for ECI services in the developing context of South Africa may be met by implementing an integrated model of ECI through community-based intervention.

Another asset of ECI service delivery in South Africa is the institution of a compulsory *community service* year for health care professionals for one year post-graduation, which is contributing to the expansion of ECI services within South Africa (South African Government Information, 2006). This implies that speech-language therapy services are now available in areas that were not reached previously. Research conducted by Van Rooyen (2006:55) and Louw (2007:65, [b]) found that ECI services in the public health care system are expanding and in South Africa more people are being reached due to community service therapists.

A further strength of ECI service delivery in South Africa is that all *undergraduate students* in speech-language therapy and audiology in training institutions in

South Africa are exposed to and trained in ECI. The fact that ECI has been included in all undergraduate programmes in speech-language therapy (Kritzinger & Louw, 2003:5) is viewed to be beneficial to the development of the field within South Africa. The implication is that all newly qualified speech-language therapists and audiologists are better equipped and more adequately prepared than their predecessors to render thorough ECI services. This leads to improved quality of ECI services and increased benefits for children and their families requiring services.

An additional strength of ECI in South Africa is the fact that *local research* is emerging and studies have been conducted on the characteristics of the population requiring ECI (Ligthelm, 2001; Louw, Shibambu & Roemer, 2006; Rakau; 2005) service delivery models (Fair & Louw, 1999; Kritzinger, 2007; Popich, 2003), and assessment protocols (Kritzinger, 1996; Kritzinger & Louw, 2003). This emerging research base is viewed to be a strength as it validates the practice of ECI in the local context and provides guidelines for best practice, even though empirical research data for evidence-based practice in ECI in South Africa is still extremely limited.

From the above discussion it is clear that ECI in South Africa is characterised by certain assets, however, in comparison to best practice described in the literature from the USA, Canada or Britain, ECI in South Africa is still in a developing phase. The section that follows is an asset-based perspective of certain barriers that speech-language therapists may be confronted with when providing ECI in South Africa.

Legislation in the USA (PL 99-457) mandates early intervention services to infants and toddlers with special needs, which resulted in expansion in these early intervention services by placing emphasis on families, coordinating community services and supports, and fostering parent-professional partnerships (Guralnick, 1997:5). Current health care policies in South Africa prioritise care of mothers and young children, as can be seen in recent legislation that

emphasises the provision of free primary health care to children under the age of six years (National Health Act, 2003). Although this includes the provision of ECI, it is still not a health care priority in South Africa. This is not only due to the HIV and AIDS pandemic, but also to the limited knowledge about the benefits of ECI, limited access to ECI facilities, shortage of ECI facilities and early communication interventionists, a limited referral system and poor team-work (Kritzinger, 2000:8). Although the importance of the early years is emphasised in policies such as *The White Paper on Disability* in 1997, which has been adopted to support intervention services to young children (Alant & Harty, 2005:79), there are limited resources available in South Africa. Issues such as unemployment and lack of housing are regarded as funding priorities and this limits the relevance of certain service delivery models, created in developed contexts such as the USA, Canada and Britain, for South Africa (Fair & Louw, 1999:16).

Cultural richness in ECI in South Africa may affect the quality of service delivery. Cultural diversity has a profound impact on the ways in which professionals and families interrelate and participate in treatment programmes (Louw et al., 2006:47). In a study conducted by Louw (2007:65, [b]) regarding ECI service delivery in public hospitals in four provinces in South Africa, it was concluded that some of the high risk infants and families were still not receiving culturally appropriate services. In the United States of America a similar situation arises. Madding (2000:11) reported that there is no state in the USA devoid of linguistically and culturally diverse populations and therefore professionals have been challenged to interact effectively with parents as well as children. Hence cultural constraints are not unique to the South African context, but this aspect still needs to be addressed in ECI service provision. Local speech-language therapists can therefore look to international efforts for guidelines on this aspect.

Professionals need to be aware of and sensitive to belief systems, whether they are scientific or traditional, as a family's views of disability will affect their view of early intervention services and choice of treatment and will affect family

involvement in intervention (Zhang & Bennet, 2001:152). Lynch and Hanson (1998:49) define cross-cultural competence as *"the ability to think, feel and act in ways that acknowledge, respect, and build upon ethnic, (socio) cultural, and linguistic diversity"*. Louw et al. (2006:54) stated that by following an asset-based approach, applying knowledge based on research and recognizing family uniqueness, families of any culture may be empowered to participate in treatment to support their children. In South Africa many opportunities exist for speech-language therapists to become culturally competent in order to effectively reach the infants and young children who are in need of services. However, it is not clear whether therapists are in fact developing these skills by utilising the above-mentioned guidelines.

The diversity of South Africa's population can also be seen in the variety of languages people are using. South Africa has eleven official languages of which Zulu is the most commonly spoken (24%) with Afrikaans third (13%) and English fifth (8%) (Population Census Key Results, 2001). Currently the majority of speech-language therapists in South Africa are from English or Afrikaans speaking backgrounds (Pakendorf, 1998:2). Naturally, therapists are aware of, but not necessarily familiar with the linguistic and cultural background of African cultures, which poses a major challenge in delivering equitable services (Overett & Kathard, 2006:54). The *multilingual nature* of the people of South Africa may be viewed as challenging to ECI service delivery.

Louw's findings (2007:65, [b]) obtained from four South African provinces indicated that ECI service delivery in the public health context did not often occur in the client's language preference, and hospital staff was mainly used as informal interpreters when therapists could not communicate with a patient in his/her language. A shortage of qualified and trained interpreters was identified (Louw, 2007:43, [b]), which presents an obstacle to effective ECI service delivery in public hospitals. Language differences may pose a considerable barrier to effective understanding between professionals and families (Madding, 2000:14).

According to Lynch and Hanson (1998:78) the use of informal interpreters may influence the intervention process negatively, as these interpreters may not always provide accurate information. Despite the impact it may have on treatment, informal interpreters could still be of value to speech-language therapists who have no other means of communicating with their clients.

Madding (2000:14) states that not all speech-language therapists may become bilingual, but many can become culturally competent and linguistically aware and can locate, train and have confidence in using an interpreter. This aspect is part of the undergraduate training for speech-language therapists in South African tertiary institutions, which is positive. It is also encouraging to see that most hospitals have interpreters to assist therapists, although they are not formally trained. Louw (2007:43, [b]) found that 11% of the respondents in her study worked with trained interpreters at their hospitals. Since the multilingual nature of the South African population creates barriers to service delivery, it necessitates different approaches to intervention. Speech-language therapists are therefore obligated to become actively involved in designing programmes adapted to the multilingual needs of this country, in order to render effective and sensitive ECI services.

Early mother-infant-communication provides the foundation for evolving communication skills (Rossetti, 2001:214). Prelinguistic components of communication involve interaction, attachment, play, pragmatics and gesture, which all play an important role in the development of age-appropriate communication (Rossetti, 2001:215). Although these prelinguistic aspects are not yet bound to a specific language, different cultures possess different ways of stimulating these areas. Chan (1998:299) states that in certain Asian cultures, mother-infant-interaction is characterized by close physical contact and not necessarily by vocal stimulation. Lynch and Hanson (1998:70) state that eye contact and facial expression have different interpretations among different cultures. Body language and gestures are also used for different reasons by

different cultures (Lynch & Hanson, 1998:72). This poses an obstacle for speech-language therapists working in the public health context.

Many South African speech-language therapists in hospital settings have shown enthusiasm by compiling and translating their own tools from literature, but this has not necessarily been published. While it is clear that speech-language therapists are aware of the needs in this context, their creativity needs to be harnessed in terms of research participation, in order to provide services that are evidence-based. Robin (1999:194) stated that speech-language therapists need to be creative and in this creativity develop new experiments and clinical procedures. Without controlled studies of treatment, we cannot know if what is being done actually works and whether some unrelated factor has been the cause of the change observed (Robin, 1999:194). Speech-language therapists who work with children are encouraged to adopt evidence-based practice for clinical decision-making (Johnson, 2006:20).

South Africa's limited *number of practicing speech-language therapists* in the public health sector is a major obstacle in the delivery of ECI services. The shortage of speech-language therapists who can provide ECI and initiate prevention campaigns (Fair & Louw, 1999:16; Popich, Louw & Eloff, 2006:677) and the shortage of therapists in the public hospital context result in large caseloads. ASHA (2008) states that early intervention services need to be culturally and linguistically responsive, readily accessible and promote children's participation in their natural environments, in order to ensure that children achieve maximum potential. It is encouraging that therapists in Louw's study (2007:58, [b]) are attempting to address the challenges they face in their working context. This indicates that speech-language therapists are committed to providing better services even though there are few of them in the public health service.

Another challenge to ECI in South Africa is a *dearth of apparatus and materials* for the assessment and treatment of high risk and at-risk infants. Louw's findings (2007:62, [b]) indicate that 93% of community service speech-language therapists employed in Mpumalanga, Western Cape, Kwazulu-Natal and Gauteng in the public health sector expressed the need for more culturally and language-appropriate materials specifically designed to address the unique needs of the South African community. Louw (2007:53, [b]) also determined that few therapists have access to a complete paediatric audiology test battery, which confirms the findings of Kritzinger et al. (1995:7) that there are limited diagnostic tools developed from a speech-language pathology and audiology perspective for neonatal assessment and management.

Therapists have expressed a need to have more appropriate tools and there is sufficient eagerness among speech-language therapists to develop tools. This is clear from unpublished attempts at compiling materials from literature. Therefore the South African context has the potential to overcome the barriers posed to ECI and to address the challenges successfully, provided that this potential is developed.

Swanepoel (2004:16) states that South Africa is unique due to the combination of first world benchmarks within a third world country. This creates exciting research possibilities for the development of different and innovative strategies so as to effectively reach the high risk population of South Africa. While international literature provides an important framework for early intervention, speech-language therapists providing services in the developing context in South Africa need to be creative and critical when providing intervention (Fair and Louw, 1999:17). The importance of compiling and developing contextually appropriate instruments and tools for use in this context is therefore restated.

Previously mentioned barriers and challenges may negatively influence ECI services in South African public hospitals. Therefore speech-language therapists

need to be equipped to provide services to the unique high risk population requiring ECI. In the local context infants and young children requiring ECI display an increased prevalence of risk conditions and are therefore different from those in developed countries (Kritzinger, 2000:13). An understanding of the high risk population in South Africa is essential in order to conduct best practice and improve the effectiveness of ECI.

2.2.3 The population requiring developmental care

The South African context determines the characteristics of the high risk population receiving ECI services in neonatal nurseries. Rossetti (2001:2) states that it is important to understand the population that needs ECI in order to effectively plan and execute treatment. Certain risk conditions associated with communication disorders have a higher prevalence in South Africa than in developed countries such as low birthweight, cerebral palsy and fetal alcohol spectrum disorder (Kritzinger, 2000:13). This is of significance to speech-language therapists as these conditions can be related to many developmental disorders, but more specifically to communication delays and disorders (Kritzinger, 2000:14; Rossetti, 2001:3).

In South Africa, *poverty* is a characteristic of the majority of the neonatal population requiring ECI. According to Ebersöhn and Eloff (2002:78) approximately half of South Africa's 38,8 million population is children, of which 61% live in poverty. Poverty in itself may not be the cause of developmental problems, but conditions associated with poverty in families such as malnutrition, inadequate prenatal care, exposure to infectious diseases and toxicants in utero, unsafe living conditions, living with parents who are addicted to alcohol or drugs and inadequate educational opportunities are all common in poverty circumstances (Thompson, 1992:7). These conditions are high risk factors for health, development, education, emotional and behavioural outcomes in children and place a child at increased risk for a communication development delay

(Rossetti, 2001:6). According to Lequerica (1997:298) early intervention services to low income families must be accessible, community-based, comprehensive and holistic, and need to be provided in a team in order to combat these risk factors. Poverty often results in poor pre-, peri- and post-natal care, which may contribute to the higher prevalence of other risk factors such as low birthweight, cleft lip and palate, cerebral palsy and sensorineural hearing loss (Popich, Louw & Eloff, 2007:65).

It has been documented that 50 percent of women in Sub-Saharan Africa give birth before age 20 (Department of Health, 1998). Adolescent mothers are more likely to have low birthweight premature infants, despite adequate pre-natal care (Rossetti, 2001:25). According to Rossetti (2001:28) teenage mothers also have a lower educational level, implying that maternal involvement may be lower than with adult mothers and therefore infants born to teenage mothers have an increased risk of developmental delay. The high levels of poverty in South Africa highlight the importance of ECI to ameliorate the negative impact of poverty on child development.

Low birthweight and prematurity are often associated with lower socio-economic groups (Rossetti, 2001:19) emphasising the need for comprehensive ECI services in the public health context. According to Pattinson (2003:62) the low birthweight rate in South Africa is two to three times higher than in developed countries. Premature and/or low birthweight neonates present with risks for social, cognitive, motor and behavioural disorders and also display an increased risk for communication disorders, therefore requiring ECI services (Rossetti, 2001:21). Studies have found major developmental disabilities including cerebral palsy, visual impairment, and hearing impairment in about one quarter of children with a birthweight less than 1000 g (Rais-Bahrami et al., 2002:99). This necessitates effective ECI services and the involvement of a speech-language therapist in the neonatal care team.

The incidence of *cerebral palsy* in South Africa is estimated to be higher than in developed countries (Kritzinger, 2000:13). Cerebral palsy is a group of disorders that may affect movement, posture, sensation, cognition, communication, perception and/or behaviour and is attributed to a non-progressive disturbance that occurred in the developing brain (Rosenbaum et al., 2005:572). A study conducted in a rural part of Kwazulu-Natal suggested that the prevalence of cerebral palsy may be as high as 10 per 1000 (Couper, 2002:549). Cooper and Sandler (1997:541) studied the outcomes of 113 very low birthweight infants in South Africa and found that infants weighing below 1000g had a 24% survival rate which could be due to poorly developed intensive care facilities, frequent intra-uterine growth retardation and poor socioeconomic conditions. They also determined that ten percent of the infants in their study developed cerebral palsy (Cooper & Sandler, 1997:542). ECI services in the NICU are therefore essential in order to plan and execute follow-up services to monitor these infants' development from as early as possible to minimise the effects of possible communication disorders.

Another condition which characterises the high risk neonatal population in South Africa is *fetal alcohol spectrum disorder (FASD) and prenatal drug exposure*. FASD is an established risk factor for a developmental delay or disorder and is often present in the population admitted to the NICU (Billeaud & Broussard, 2003:90). Alcohol is a neurobehavioural teratogen that interferes with normal fetal growth and development, but even more important, it significantly compromises the central nervous system leading to a range of problems (Carmichael Olsen, Jirikowic, Kartin & Astley, 2007:173). Prenatal exposure to drugs or alcohol is associated with complex physical, developmental and behavioural problems, including moderate mental retardation, organ damage, growth problems, behavioural abnormalities such as hyperactivity, concentration problems, language problems and poorly developed social skills (Fetal Alcohol Research Initiative; Rossetti, 2001:28).

In South Africa the prevalence rates of FASD are in excess of between 30 and 50 times the rates of previously studied children in developed communities (Fetal Alcohol Research Initiative). A study conducted in the Northern Cape Province demonstrated a prevalence of 12,2% of school entry children, which is reported to be the highest frequency yet reported in one population anywhere in the world (Fetal Alcohol Syndrome Information). This consequently increases the number of children who may present with developmental disorders. The fact that FASD is a preventable disorder necessitates that speech-language therapists fulfil a health promotion and prevention role. According to ASHA (2005:11) the provision of public education and advocacy in order to prevent communication delays and disorders is an important function of the speech-language therapist involved in ECI.

The pandemic of *HIV and AIDS* in South Africa has major implications for ECI service delivery. South Africa is one of the countries with the highest number of children living with HIV and AIDS (Swanepoel, 2004:15). According to Pattinson (2003:63) a pregnant woman infected with HIV has a twice greater risk of pre-term labour. This could indicate an increase of premature infants in South African public hospitals, which increases these infants' risk status.

Children with paediatric HIV and AIDS may show delays in the acquisition of developmental milestones, poor receptive and expressive language, articulation problems, dysarthria, dysphagia as well as fine and gross motor delays (Larsen, 1998:89; Davis-McFarland, 2000:27). According to Larsen (1998:72) various otologic manifestations are associated with HIV. Eustachian tube dysfunction is more prevalent among this population due to the greater risk of recurrent viral opportunistic infections, adenoidal hypertrophy, nasopharyngeal masses or viral-induced allergies. This results in a higher prevalence of serous otitis media, which then contributes to speech and language delays (Larsen, 1998:72; Staley, 2004:11). Otitis media is also a common opportunistic infection among children who are HIV positive and, in addition, the medications used to treat otitis media

may compromise hearing further due to ototoxicity (Davis-McFarland, 2000:24). Oral pathologies are also common among the paediatric population infected by HIV (Screen & Lee-Wilkerson, 2007). According to Lowenthal (1997:193) this population may also present with neurological impairments, motor impairments, sensory problems such as blindness and deafness as well as cognitive involvement. HIV and AIDS in children most frequently causes neurological sequelae (Screen & Lee-Wilkerson, 2007). Studies of HIV-infected children indicate that 78% - 90% present with neurodevelopmental abnormalities such as mental retardation, cerebral palsy and degrees of developmental delay (Cohen, Grosz, Ayoob & Schoen, 1997:195).

According to Bam, Kritzinger and Louw (2003:36) an important difference between the local paediatric HIV and AIDS population and those described in literature is that the majority of infants infected with HIV and AIDS in South Africa are not cared for by their parents. This adds an additional risk for communication delay due to non-optimal caregiver-child-interaction in care centres. It is recommended that infants infected with HIV be assessed at two months and then again every six months in order to monitor and identify any neurodevelopmental delays and regression (Rossetti, 2001:33). This reiterates the importance of the involvement of the speech-language therapist in the follow-up and intervention process of this population.

This high risk neonatal population in South Africa requires a team approach in the neonatal nursery due to the complexities involved in their treatment.

2.2.4 The team involved in neonatal care services in public hospitals

Each team member is important to optimise care for infants admitted to the NICU, and each member works in conjunction with the other members of the staff to contribute unique expertise (Billeaud & Broussard, 2003:92). These team members include any of several professional disciplines, including occupational,

speech and physical therapy, education, social work, psychology, medicine or nursing, and regardless of their primary discipline, developmental care can be implemented with a basic educational and clinical background (Rossetti, 2001:174). Table 2.2 summarizes the ideal NICU team members. Each discipline has a unique role, but all have the responsibility of enhancing the infant's health and development through promising practices of developmental care. The latter has been proven to have several benefits such as decreased hospital stay, decreased medical complications and increased behavioural and motor scores upon assessment (Goldberg-Hamblin et al., 2007:165).

A team as illustrated in Table 2.2 is recommended as best practice. However, this standard is difficult to achieve in developing contexts such as South Africa due to e.g. financial constraints and lack of staff. Furthermore not all public hospitals have NICUs and full teams as described in Table 2.2, as such nurseries are usually located at tertiary or academic hospitals due to the costs involved (Billeaud & Broussard, 2003:86).

Table 2.2: Team members involved in neonatal developmental care and their roles

Profession	Role in neonatal nurseries	Sources
Physician	- Specialised medical and/or surgical treatment of preterm and/or low birthweight infants. - Supporting developmental care.	Billeaud & Broussard (2003) Neonatology on the Web (2007)
Neonatal nurse	- Executing specific nursing care plan for assigned infants. - Implementation of developmental care such as cluster care, positioning, KMC. - Systematic evaluation of infants and preparation of documentation. - Safe and responsible use of technical equipment in neonatal nurseries. - Assisting parents to establish relationship with infant.	Billeaud & Broussard (2003) Neonatology on the Web (2007) Klaus & Fanaroff (2001)
Speech-language therapist specialising in ECI	- Communication evaluation and intervention. - Feeding and swallowing evaluation and intervention. - Parent/caregiver training and education and counselling. - Staff and team education and collaboration. - Supporting developmental care strategies.	ASHA (2005)
Paediatric audiologist	- Screening and assessment of hearing. - Counselling and guidance regarding intervention and follow-up services for infants with hearing loss. - Reduction of environmental noise and implementing noise prevention programmes.	Billeaud & Broussard (2003)
Occupational therapist	- Educating parents regarding positioning, infant development and infant states. - Splinting - Monitoring of motor development. - Developmentally appropriate care such as promoting self-regulating strategies.	Billeaud & Broussard (2003) Neonatology on the Web (2007) Carretto, Topolski, Linkous, Lowman & Murphy (2000) Limperopoulos & Majnemer (2002)
Physiotherapist	- Chest physiotherapy for treatment of respiratory problems - Monitoring of gross motor development. - Promoting sensori-motor development in the preterm infant. - Educating parents regarding infant development.	Billeaud & Broussard (2003) Neonatology on the Web (2007) Limperopoulos & Majnemer (2002) Mahoney & Cohen (2005)
Dietician/nutritionist	Improving nutrition and growth rate of the preterm and low birthweight infant.	Billeaud & Broussard (2003) Neonatology on the Web (2007) Fenton, Geggie, Warners & Tough (2000)
Educational psychologist	Devising preventative strategies and providing parent guidance and counselling in order to better equip parents and caregivers to deal with trauma and stress related to their infant being admitted to a neonatal care ward.	Guldenpfennig (2000)

2.2.5 Programmes and services in neonatal care in South Africa

In South Africa different programmes and services are applied in the public health context in order to provide more encompassing services to high risk neonates. A literature review identified a selection of these programmes and services and they are summarised in Table 2.3. The programmes and services are grouped together according to their application. Certain programmes are implemented nationally while others were developed as part of various research projects and are thus not yet widely applied.

Table 2.3: A selection of programmes and services in the public health sector for the neonatal population in South Africa

National/ specific site	Programme/Service	Profession(s)	Population	Sources
National	*Perinatal Problem Identification Programme (PPIP)*	Neonatology	All neonates	• South African Medical Research Council (2007) • Pattinson (2003)
	Baby Friendly Hospital Initiative (BFHI)	Human nutrition	All neonates	• Department of Health (2007) • Department of Health (1999) • UNICEF (2007)
	Prevention of Mother to Child Transmission (PMTCT)	Neonatology Human nutrition	All neonates exposed to HIV	• Sherman et al. (2004) • Department of Health (2007) • Department of Health (2000)
	Pretoria Pasteurisation Project (PPP)	Neonatology Human nutrition	All neonates exposed to HIV	• South African Medical Research Council (2007) • Jeffery & Mercer (2000)
	Donor Breast Milk Banking	Human Nutrition	High risk neonates	• South African Breast Milk Reserve (2007)
	Kangaroo mother care (KMC)	Neonatology Nursing	All neonates but implementation with full term infants is limited	• South African Medical Research Council (2007) • Pattinson, Bergh, Malan & Prinsloo (2006). • Dippenaar, Joubert & Brussow Maryn (2006) • Hann et al. (1999)
Specific site	*Developmental care (positioning)*	Nursing	High risk neonates	• Hennessy (2006)
	ECI programme for parents in KMC	Speech-language pathology	High risk neonates	• Kritzinger, Van Rooyen & Owen (2006)
	Developmentally appropriate communication intervention programme in the NICU	Speech-language pathology	High risk neonates	• McInroy & Kritzinger (2005)
	Guldenpfennig early intervention programme for parents of low birthweight premature babies.	Educational psychology	High risk neonates	• Guldenpfennig (2000)

Table 2.3 displays a selection of the current programmes and services being rendered by specific early intervention team members. It highlights the need for the development and implementation of neonatal communication programmes such as those developed by Kritzinger et al. (2006) and McInroy & Kritzinger (2005:25) to effectively reach the infants and families requiring neonatal communication intervention.

A nationally applied programme, the *Perinatal Problem Identification Programme (PPIP),* is a computer-based perinatal care audit programme that has been in use for approximately five years and that aims to collect data for ongoing research on peri-natal mortality (Pattinson et al., 2006:1). Institutions that use PPIP submit data, which then is amalgamated and analyzed together with the data from the National Department of Health. It is then sent back to the original sites in reports that are named 'Saving Babies' (Pattinson et al., 2006:1). The PPIP is beneficial as it has supported countrywide research in South African public health sites. According to Pattinson (2003:58) the PPIP was utilised in identifying avoidable factors and missed opportunities in preventing peri-natal death in South Africa. By using PPIP Pattinson et al. (2006:4) established that KMC reduced neonatal mortality of immature infants. Clearly, neonatologists in South Africa have contributed greatly to perinatal care in the local context through their continued efforts to be the driving force of the most important project to reduce perinatal mortality in South Africa.

Another nationally implemented initiative in public health is to prevent the transmission of HIV from mothers to their infants referred to as *Prevention of Mother-to-child Transmission (PMTCT).* As mother-to-child transmission is the overwhelming source of HIV infection in young children, certain prevention methods have been devised by the South African government (Department of Health, 2000). According to Sherman et al. (2004:289) PMTCT includes voluntary counselling and testing, administration of Nevirapine to mother and child, provision of free milk formula for the first six months and follow-up for

infants on prophylactic treatment from six weeks until 12 months of age when their HIV status is determined. It has been found to be highly effective in reducing the mother-to-child transmission rate of HIV (Sherman et al., 2004:289). Coutsoudis et al. (2001:385) report that infants who are exclusively breastfed for three months or more had no excess risk of HIV infection over six months than those who were never breastfed. This may influence policies on feeding options available to HIV-infected mothers in developing communities (Coutsoudis et al., 2001:379). It is clear that the neonatologists and paediatricians involved in the neonatal population of South Africa are implementing extensive preventative services. Speech-language therapists can assist in this prevention drive and provide accurate information as well as intervention to parents and caregivers by being informed about current feeding policies in the public health sector.

A further nationally implemented strategy for all infants in the public health sector that was introduced in South Africa in 1994, is the *Baby Friendly Hospital Initiative (BFHI).* The BFHI was propagated by UNICEF and the WHO and aims to enhance quality of life of all mothers and babies while encouraging breastfeeding as best nutrition for infants instead of formula milk and so preventing diseases such as diarrhoea (Department of Health, 2007). A 'baby-friendly' facility is one that does not accept free or low-cost breast milk substitutes, feeding bottles, teats or pacifiers, and has implemented ten specific steps to support successful breastfeeding (UNICEF, 2007). According to the Department of Health (1999) the BFHI has been associated with a reduced infant mortality rate and cost-efficiency for hospitals. Training courses for health workers and assessments at maternal facilities are conducted by team members from nutrition and nursing (Department of Health, 1999).

Regarding the high risk neonatal population in neonatal nurseries, BFHI poses a dilemma for speech-language therapists since an important function of the speech-language therapist in this setting is to promote oral sensori-motor function including non-nutritive-sucking in infants who are tube-fed. Oral

stimulation using non-nutritive-sucking via a pacifier has been revealed by various studies as being a useful calming technique during invasive procedures, as well as shortening hospital stay, improving state regulation, facilitating oral feeding and shortening transitions from tube to oral feeding (Arvedson & Brodsky, 1993:345; Rossetti, 2001:190). In working with the high risk neonatal population, speech-language therapists who are familiar with the BFHI policy may implement different strategies for oral sensori-motor stimulation, such as using the mother's finger, rather than using a pacifier which is not allowed under BFHI policy.

A valuable service provided to the infant population and their mothers is the *Pretoria Pasteurisation Project (PPP).* Since HIV and AIDS can be transmitted by breastfeeding, a simple and inexpensive method has been devised to pasteurise expressed breast milk in a domestic setting referred to as Pretoria Pasteurisation in order to inactivate the virus by heating the milk (Jeffery & Mercer, 2000:219). According to Coutsoudis et al. (2001:380) the risks of not breastfeeding are great among disadvantaged communities. Pretoria Pasteurization Project has proven that the nutritional value of human milk is maintained while inactivating HIV, and is of value to women who do not have facilities for making up bottle feeds (South African Medical Research Council, 2007). The benefits of breastfeeding are widely recognised (Coutsoudis et al., 2001:380). The PPP is aimed at all infants who have been exposed to HIV, but has specific value for low birthweight and pre-term infants, as the benefits of breast milk are widely recognised and it is viewed as superior nutrition for infants (Coutsoudis et al., 2001:380; South African Breast Milk Reserve, 2007). *Donor human milk banking* is another service implemented nationally to provide infants with donor breast milk to improve their health when their own mothers can not provide them with their own breast milk (South African Breast Milk Reserve, 2007). Although breast milk has been shown to reduce the risk of necrotizing enterocolitis in preterm infants when compared with formula, the role of donor

breast milk in current neonatal practice, specifically for preterm infants, remains to be established and further evidence is deemed necessary (Modi, 2006:1134).

Hospitals countrywide are attempting to implement *kangaroo mother care (KMC)* in neonatal nurseries. KMC is a caring method for immature neonates that was introduced in South Africa in the early 1990s, whereby the mother holds the infant on her chest (skin-to-skin contact) and feeds the infant breast milk on demand (Pattinson et al., 2006:1). KMC is an important nursing intervention in South Africa as it has been proven to have many benefits for pre-term infants, such as reduced neonatal mortality and improved health, enhanced opportunity for mother-infant-attachment as well as cost-efficiency that benefits the health system (Hann et al., 1999:37; Pattinson et al., 2006:3). Furthermore it has been determined that KMC can safely be rendered at any primary health care setting in South Africa (Dippenaar et al., 2006:16b). Apart from medical research, research has also been conducted within the field of speech-language pathology and KMC such as Kritzinger, Van Rooyen and Owen (2006). It was found that an ECI training programme for mothers adds value to the evidence-based practice of KMC (Kritzinger, 2007). According to Rossetti (2001:1) many studies show that communication skills are the most prominent feature of developmental delay and many studies have pointed to communication delay in low birthweight infants. Speech-language therapists must therefore intervene as early as possible to minimise communication delay.

Hennessy (2006:16) implemented a *developmental care* programme in the NICU of a tertiary hospital in Gauteng, South Africa and found that many factors influence the implementation of developmental care, such as staff's resistance to change, negative attitudes from team members, a lack of knowledge and training about developmental care, financial restraints and unfavourable working conditions. As part of the programme Hennessy (2006:208) compiled an intervention plan as well as guidelines for the implementation of developmental care in a public hospital's NICU in South Africa. This led to an improvement of

the working environment of the team involved in this specific site, an increase in the staff's knowledge and skills, and an improvement of their morale and job satisfaction (Hennessy, 2006:208). This research project in developmental care confirms international literature findings and recommendations regarding the implementation of developmental care in an NICU. According to ASHA (2005:2) developmental care is a key principle for performing the specific roles of the speech-language therapist in the NICU. Therefore the speech-language therapist can gain valuable information from such a developmental care programme.

The developmentally appropriate communication intervention programme for the NICU compiled by McInroy and Kritzinger (2005:25) is an example of how speech-language therapists may implement neonatal communication intervention in South Africa. This programme is designed on the principles of Willemse (2003) and Rossetti (2001:184) that promote individualised care of the neonate and family-centred care that views the infant within the family context. The aims of the programme are to protect and promote developmental progress, to avoid harmful environmental stimulation and to ensure the best possible outcomes for the infant and family (McInroy & Kritzinger, 2005:34). The programme comprises direct intervention with the neonate, parents and NICU staff and embraces all developmental care principles, but adding an early communication developmental perspective. It furthermore consists of an individualised care plan which is compiled weekly to provide parents with knowledge on the infant's cues of contentedness and stress, as well as activities that may lower stress levels and optimise growth and development. The programme also utilises pamphlets, information brochures and handouts to provide information to the neonate's parents regarding hearing, guidelines on handling, swaddling-bathing, caring for the high risk neonate at home, discharge criteria, the physical NICU environment, KMC and communication stimulation (McInroy & Kritzinger, 2005:34). This programme is a valuable tool for use by speech-language therapists working in the public health context.

Another innovative neonatal communication programme that has been successfully piloted in the public hospital context is the *Early Communication Intervention Programme for very low birthweight infants and their mothers in KMC* (Kritzinger et al., 2006). This programme was implemented in a KMC unit in a large peri-urban hospital in Pretoria and aims to establish a pattern of responsive communication interaction between the mothers and infants (Kritzinger, 2007). According to Kritzinger (2006) this programme facilitates infants' communication development as early as possible, by guiding mothers to use graded sensory input in a responsive interactive manner while doing kangaroo mother care. The programme recognizes language and cultural differences and allows for strategies to be used in order to be culturally sensitive, communicate effectively, demonstrate desired behaviours and allow trust and spontaneity to develop (Kritzinger, 2007). Kritzinger (2006) found that this programme provides speech-language therapists with guidelines regarding their role in the KMC unit. Evidence exists that the programme is effective, as improved mother-infant communication-interaction was found among mothers who applied the programme, compared to those who did not. This programme may therefore be used as an example for the development of further training programmes for parents in this context (Kritzinger, 2006).

The *Guldenpfennig early intervention programme for parents of low birthweight premature babies (Guldenpfennig, 2000)* is another locally developed early intervention programme. It was developed from an educational psychology perspective and aims to provide parents of low birthweight infants support and counselling (Guldenpfennig, 2000:i). The programme is cost-effective and developed specifically for the South African context, but is also implemented in Egypt, another developing context. The programme focuses on counselling and empowerment of parents as a strategy to prevent emotional, behavioural, developmental and learning problems later on in the child's life (Guldenpfennig, 2000:179). Guldenpfennig's research (2000) is an excellent example of how new strategies may be used to overcome known problem areas in service

delivery in the South African context as well as other developing contexts such as Egypt.

These strategies are valuable for speech-language therapists to use in the further development and validation of tools for neonatal communication intervention in neonatal nurseries in South Africa.

2.2.6 Neonatal communication intervention: Role of the speech-language therapist

Neonatal communication intervention within the neonatal nursery is the most recent application of the concept of early communication intervention (Rossetti, 2001:171). According to ASHA (2005:2) the speech-language therapist's role in the NICU is comprehensive and dynamic and may vary with the specific characteristics and needs of the infants and families being served. This is captured in Figure 2.2.

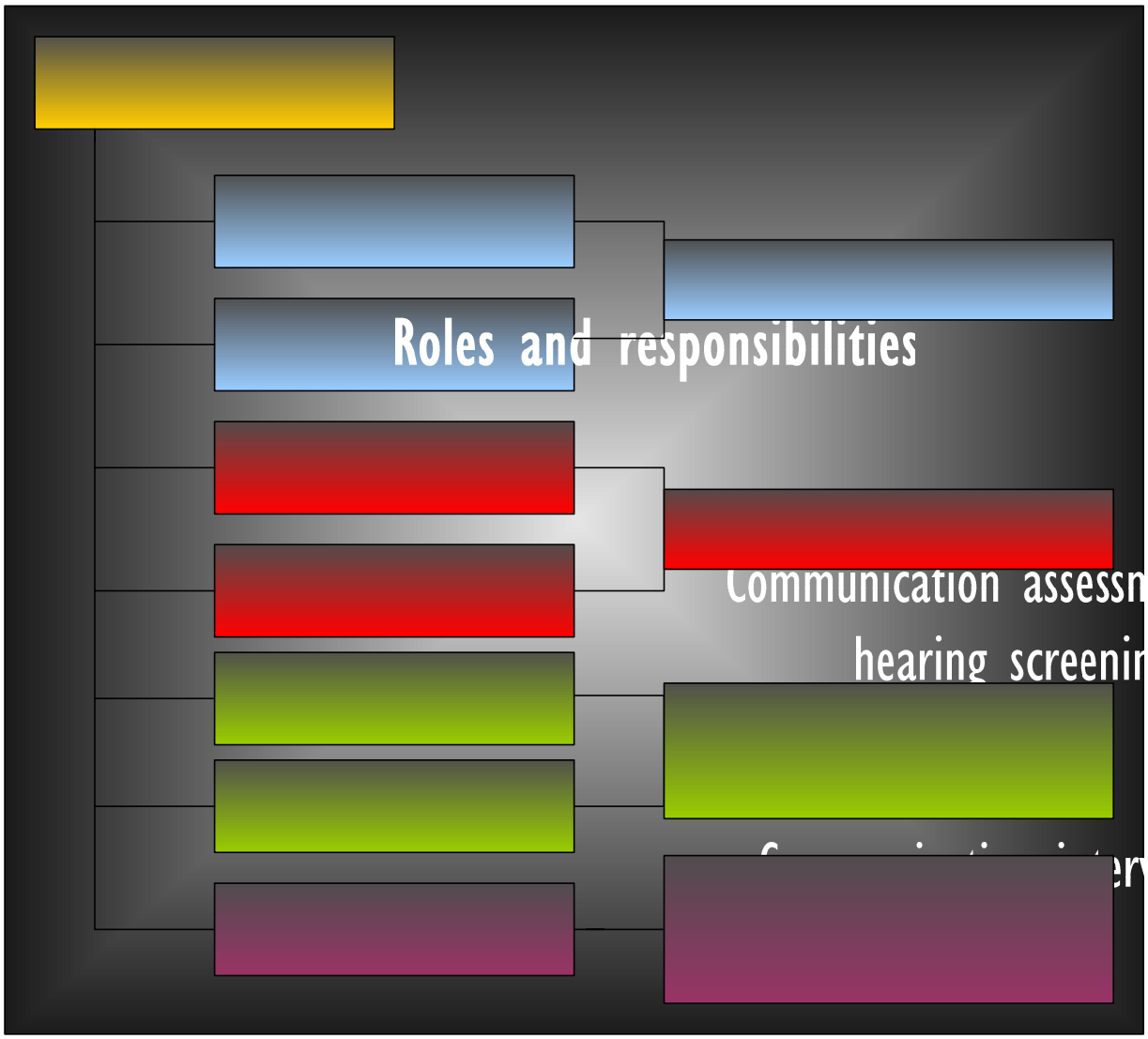

Figure 2.2 Roles and responsibilities of the speech-language therapist in the NICU (ASHA, 2005; Rossetti, 2001)

ASHA (2005:12) furthermore states that speech-language therapists have the responsibility to fulfil these roles using practices that are based on research, family-centred, culturally and linguistically appropriate, developmentally appropriate and collaborative. The execution of these responsibilities and functions is dependant upon a well-developed theoretical as well as clinical foundation.

A theoretical underpinning is vital as speech-language therapists are required to prove that the services they are currently providing in ECI are effective (Louw, 2007 [a]). Bernstein-Ratner (2006:257) states that in order for practice to be effective, information must be updated constantly and the clinician must consistently seek out new information to improve therapeutic effectiveness. According to ASHA (2005:12) speech-language therapists are responsible to provide services that are research-based. Evidence-based practice is a framework for clinical decision-making that entails the integration of best research evidence with clinical expertise and patient values (Johnson, 2006:20). According to Louw (2007 [a]) basing clinical decisions on scientific research is fundamental to ethical practice in ECI.

In order to fulfil the roles and responsibilities in neonatal communication intervention demonstrated in Figure 2.2 effectively, the speech-language therapist requires certain tools. ASHA (2005:6) states that instrumental methods for evaluating swallowing function such as video-fluoroscopic swallow study answer specific diagnostic questions and guide management decisions, and will therefore aid in formulating the speech-language therapist's recommendations.

Examples of low technology tools are pictorial depictions, written handouts and videos when therapists provide guidance to parents and caregivers. Gani (2004:61) and Strasheim (2004:48) found materials based on The Hanen Programme (Pepper & Weitzman, 2004) to be useful in training a group of caregivers in communication stimulation in a care centre and a positive effect on caregiver-child-interaction patterns was determined. According to McConkey (1995:80) video material is a convenient tool when training parents, as this provides them with a visual representation and it is repeatable. Tools are therefore also required when providing ECI services to parents as they assist the speech-language therapists in fulfilling their roles as illustrated in Figure 2.2.

2.2.7 Neonatal communication intervention tools in South Africa

The early communication intervention process consists of a series of procedures. According to Sandall (1997:211) assessment and intervention are both early intervention services and are intertwined and interdependent. Assessment is crucial to the effectiveness of intervention programmes (Sandall, 1997:211). No clear line exists between assessment and intervention as both are part of the intervention process. Portions of each are found in the other and this should be an ongoing process (Owens, 1999:58). Within neonatal communication intervention speech-language therapists are involved in assessment of readiness for feeding, swallowing function, developmental aspects such as communication, sensory, motor, state and physiological behaviours (Ziev, 1999:33).

Intervention programmes serve to identify at-risk infants as early as possible (Moodley et al., 2000:25). According to Kritzinger (2006) applying neonatal communication intervention programmes during the peri-natal period, such as a training programme for low birthweight neonates and their mothers in a KMC ward, offers unique opportunities to intervene early as the mothers are available during this time.

Popich et al. (2007:68) found that a need exists for instruments and strategies that are specifically designed to address the communities' needs in the unique context of South Africa. Consequently it is critical to review the availability of neonatal communication intervention tools in the South African context in order to justify, to a certain extent, the need to develop a contextually appropriate tool.

An in-depth literature review led to the compilation of a list of tools that are being used in the South African context. Only tools that are formally documented were included. Table 2.4 illustrates tools for the *assessment of the high risk neonate's communication and feeding abilities*. Each tool is summarised according to its aim and whether it was developed internationally or for the local population. It is

also necessary to distinguish between assessment tools and intervention programmes or tools and therefore this information is displayed separately. A selection of *neonatal communication intervention programmes* developed for the local context is reflected in Table 2.5 and is summarised according to its aim and whether it is published or not. This information serves to point out that although not all research attempts are published, many researchers and clinicians are attempting to fulfil a need on a small scale. This serves to illustrate that many speech-language therapists in South Africa have the interest and creativity to produce adapted materials even though these tools' use and clinical applicability may not have been formally researched yet.

Table 2.4: A Selection of tools available for assessment of the high risk neonate's communication and feeding abilities

Name of tool	Aim	Reference	Developed internationally or locally
Observation of Communicative Intent (OCI)	Mother-child-communication-interaction	Klein & Briggs (1987) Kritzinger et al. (2006)	Internationally and adapted for neonatal use by Kritzinger et al. (2006)
Oral-Motor/Feeding Rating Scale	Feeding	Jelm (1990)	Internationally
Genetic Screening Checklist	Visual screening of genetic anomalies	Kritzinger & Louw (1998)	Locally
Neonatal Communication Assessment Guide	Developmental delays that may influence communication	Swanepoel (2000)	Locally
Data collection protocol for high risk neonates	Communication development and feeding	McInroy (2007)	Locally
Clinical Feeding Evaluation of the Infant	Feeding	Kritzinger (1996)	Locally
Neonatal Communication Assessment Instrument	Communication development and risk factors	Kritzinger & Louw (2003)	Locally
CHRIB Risk Assessment	Risk factors	Kritzinger (1994) revised (2003)	Locally
Feeding Evaluation Form for At-Risk Infants (FEFARI)	Feeding	Uys (2000)	Locally
Developmental Care Plan (Medforum Hospital)	Neonate's development including sleep-awake states, behaviour and environment.	Willemse (2003)	Locally

Compiled from Kritzinger (2007) and McInroy (2007).

Table 2.5: Locally developed neonatal communication intervention tools

Programme	Aim & content	Reference	Published or unpublished
Developmentally appropriate communication intervention programme in the NICU	- Promote developmental progress - Avoid harmful environmental stimuli - Ensure best possible outcomes for neonate and family	McInroy & Kritzinger (2005)	Published
Verpleegkundiges se persepsies van ontwikkelingstoepaslike sorg voor en na opleiding	- Training of nurses in developmentally appropriate care	Van Jaarsveld (2004)	Unpublished
Verpleegkundiges se kommunikasiestimulasie van hoërisikobabas in die neonatale sorgeenheid	- Providing nurses with basic information and guidelines regarding communication stimulation with high risk infants in the NICU as well as associated behavioural responses	Kraamwinkel & Louw (1998)	Published
KMC Training Programme	- Providing training to nurses regarding KMC in order to facilitate effective application of this technique as a developmental care strategy	Payne (2000)	Unpublished
An ECI training programme for low birthweight infants and their mothers	- Providing training to mothers of high risk infants in KMC	Kritzinger, Van Rooyen & Owen (2006)	Unpublished

Tables 2.4 and 2.5 demonstrate that clinical needs have been identified by local researchers and clinicians and that small-scale research projects have been conducted, but have not necessarily been published or disseminated amongst professional peers. This clearly limits their use and application, because evidence-based practice is the use of high quality research evidence that is integrated with client-specific goals, and clinical experience that is used to shape clinical decision-making (Louw, 2007 [a]). These speech-language therapists attempt to meet the needs of the local context by developing contextually relevant tools and therefore their contribution should not be ignored. Bernstein-Ratner (2006:262) states *"no evidence that something works YET is not the same as evidence that it does not work".* It is important to note that these tools may not yet have high quality evidence of effectiveness and therefore the application is limited and should be researched further.

Best practice in developmental care in neonatal nurseries needs to be encouraged and facilitated, which necessitates the development of appropriate tools for the local context. According to ASHA (2005:2) speech-language pathologists need to develop culturally appropriate programs that meet the needs of ethnically and linguistically diverse families. Therefore culturally and contextually appropriate tools and programmes for neonatal communication intervention need to be developed for the South African context, in order to serve the unique high risk population in South Africa in an effective and ethical manner.

The unique contextual reality of South Africa should be taken into account when neonatal communication tools are developed. These tools should be based upon an expressed need within this context and should be contextually relevant. Therefore, if they are based on western models of communication stimulation, these tools should be adapted appropriately for the South African context. Due to the diversity of cultural groups in South Africa, overseas tools and programmes cannot merely be translated (Visser, 2005:57). The interdependent relationship between culture and language must be taken into consideration

during cross-cultural service delivery, otherwise the tool will still not be suitable even though it was translated (Pakendorf, 1998:2).

It may also be beneficial to consider contextual adaptations in order to bridge other challenges such as limited literacy among caregivers. According to Louw et al. (2006:53) literacy issues may be overcome by using visual sources such as pictorial depictions as well as demonstrations, as written materials are not necessarily viewed to be important, especially by individuals with low literacy levels. Strasheim (2004:15) compiled and applied a training programme based on the principles of The Hanen Programme (Pepper & Weitzman, 2004) in communication stimulation for caregivers of infants and young children between birth and three years with HIV and AIDS in a local care centre. Findings showed that, even though the caregivers felt positive about the training, they indicated a need for training material such as videos and posters to be culturally appropriate and relevant to their working context (Strasheim, 2004:42). These findings confirm the need for appropriate early communication intervention tools and programmes adapted for the culturally and linguistically diverse population in South Africa.

By using the general considerations of communication-based intervention described by Rossetti (2001:182) and adapting it to the linguistic, cultural and contextual needs of the South African high risk neonatal population, parent and caregiver guidance in communication stimulation may be readily and efficiently facilitated, as seen in the programme developed by Kritzinger et al. (2006). Furthermore, by using internationally published intervention programmes in compiling or developing a locally relevant tool, the dearth of materials and programmes may be overcome while international trends in early intervention are still followed, provided that these programmes are researched to confirm their effectiveness.

2.3 CONCLUSION

Best practice in ECI is to provide services as early as possible to increase the benefits to both the infants and the families (Rossetti, 2001:270). Therefore speech-language therapists have an integral part to play in the neonatal nurseries, as this being the context for the earliest intervention (Rossetti, 2001:171). ECI is of utmost importance in a country such as South Africa, where there is an increased prevalence of infants who are at risk for disabilities and where the majority of these infants live in poverty (Kritzinger, 2000:9).

The literature review clearly indicated that speech-language therapists fulfil an essential role in the neonatal nursery and are an integral part of the team involved with the high risk neonatal population. From an asset-based perspective it appears that the South African population receiving services in neonatal nurseries have unique characteristics, which provide speech-language therapists with ample opportunity to intervene, providing that intervention is well-timed in the neonatal nursery context. Furthermore it is apparent that speech-language therapists in South Africa are involved in and committed to ECI, but have specific needs regarding their working conditions, experience, interpreters and tools. Local speech-language therapists are dedicated to overcome barriers in their working context and have enthusiasm to improve the services they render to this population. This is clear from undergraduate research projects as well as clinicians' attempts to translate and compile materials from current ECI literature that have not yet been published or researched further. In order to propose a solution to address the shortage of tools in the public health context, this research aims to establish how widely speech-language therapists are utilising existing tools. Thereafter a neonatal communication intervention tool will be developed to be used by speech-language therapists in the public hospital context.

2.4 SUMMARY

In this chapter issues relevant to the development of a neonatal communication tool were identified and described. A review of best practice in developmental care and ECI in South Africa initiated the discussion. The South African context was described according to assets thereof, as well as the barriers to service delivery in this context. Developmental care in South Africa was illustrated in terms of how it differs from the preferred practice described in literature from USA, Britain and Canada. The characteristics of the high risk population that requires ECI services were identified and discussed. The team involved in developmental care in neonatal nurseries, as well as the services and programmes sustained in the public health context, were described. The dilemma regarding the availability of appropriate tools and programmes for neonatal communication intervention in South Africa was highlighted. Aspects to be considered in the development of a neonatal communication intervention tool were identified and described. It was argued that the development of a contextually appropriate tool might be a possible solution for the shortage of tools and programmes for use in neonatal nurseries in the local context.

CHAPTER 3

Methodology

3.1 INTRODUCTION

Clinical and research practices are not separate entities, but are rather combined disciplines that serve a common goal (Robin, 1999:194). Research plays a critical role to determine the efficacy of a given treatment and clinicians cannot hope to evolve clinically without convincing documentation that their clinical procedures are effective (Robin, 1999:194).

South Africa has an increased prevalence of infants who are at risk for disabilities, with the majority of these infants living in poverty, as well as an increased incidence of low birthweight and premature infants among pregnant women with HIV and AIDS (Kritzinger, 2000:9; Van Rooyen, Pullen, Pattinson & Delport, 2002:7; McInroy & Kritzinger, 2005:33). Therefore knowledge about high risk infants and their families is now more important than ever and requires the attention of all early interventionists (McInroy & Kritzinger, 2005:33). Speech-language therapists providing ECI services to the high risk neonatal population appear to have specific needs regarding interpreters, tools and materials, their working conditions and experience. Therefore the aim of this study was to compile a locally relevant instrument/tool for use by speech-language therapists in neonatal nurseries.

The aim of this chapter is to provide a systematic and detailed description of the research process that was followed during the execution of this study. The chapter provides information on the aims, research design, participants, materials, data-collection and analysis, which allows for duplication of the study.

3.2 AIMS

The overall aim of this study was to compile a locally relevant neonatal communication intervention instrument/tool for use by speech-language therapists in the neonatal nurseries of public hospitals.

The following ***objectives*** were formulated in order to reach the main aim:

- To describe the perceptions of speech-language therapists and audiologists providing early communication intervention (ECI) services in provincial hospitals in South Africa regarding their role in the neonatal nurseries.
- To identify participants' needs in terms of neonatal communication intervention instruments/tools.
- To select and justify a specific need of the participants in terms of neonatal communication intervention instruments/tools in the public hospital context.
- To compile a preliminary instrument/tool based on the selection of one of the perceived needs of the participants.
- To pre-test the completed instrument/tool and make changes if necessary.

3.3 RESEARCH DESIGN

According to De Vos, Strydom, Fouché and Delport (2005:137) a research design focuses on the end product of the research, formulates a research problem as a point of departure and focuses the logic of the research. For the purpose of this study a *descriptive, exploratory study within the quantitative and qualitative frameworks* of research design was selected.

Descriptive research is used to provide a detailed picture of a specific situation, relationship or social setting (De Vos et al., 2005:109). The goal of *exploratory research* is to gain insight into a situation, phenomenon, community or person that is not well known (De Vos et al., 2005:109). These

research objectives are therefore appropriate for this particular study that will explore and describe the needs of the specific population of speech-language therapists providing ECI in neonatal care nurseries of public hospitals.

A descriptive survey was deemed to be appropriate for compiling an overview of the speech-language therapists' perceptions and needs regarding their early intervention service provision in the specific context of the neonatal nurseries in public hospitals. The study was conducted in two phases and is illustrated in Figure 3.1.

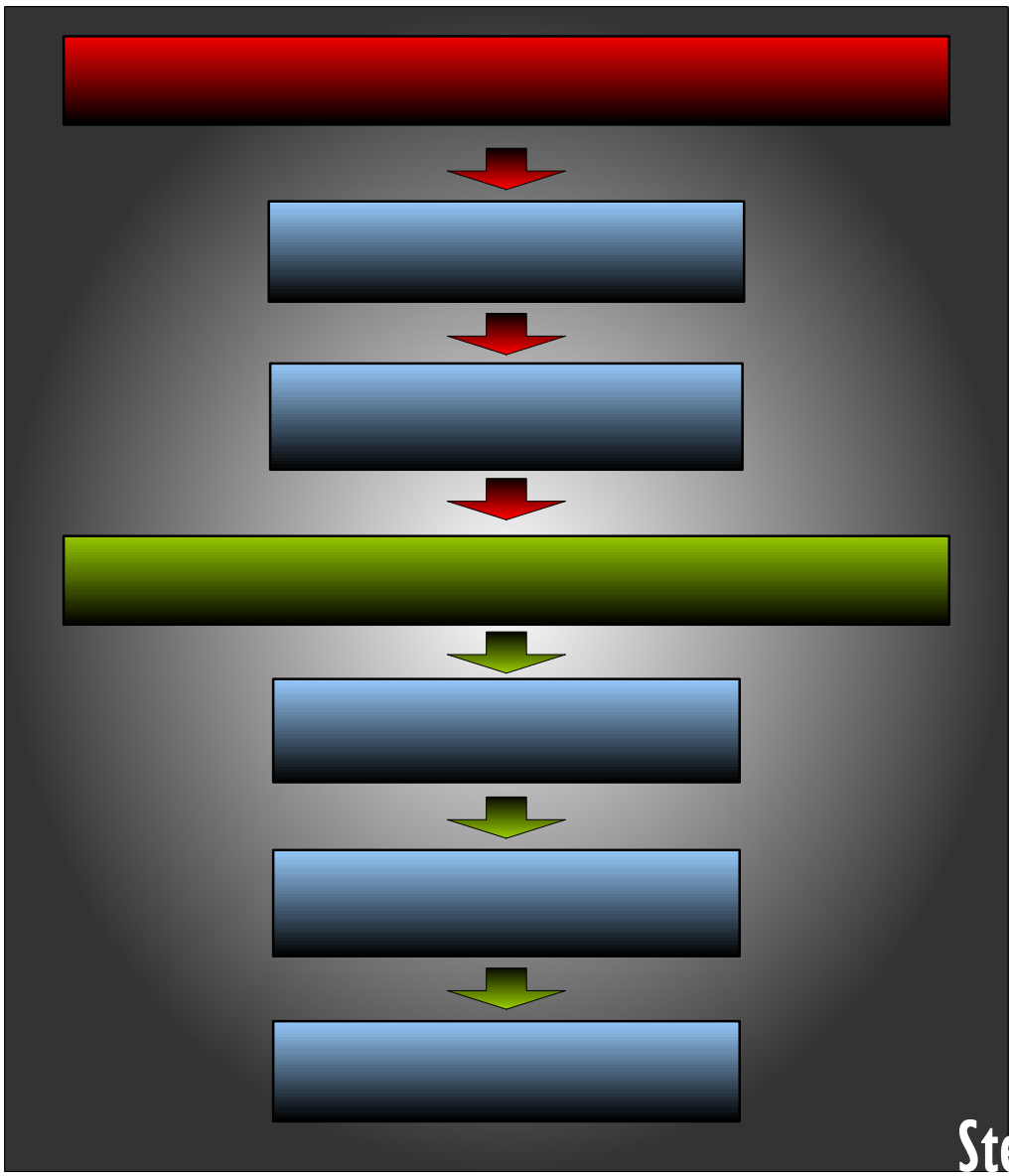

Figure 3.1: Phases of the research project

Phase 1 entailed an exploratory descriptive survey, where the researcher made use of a self-designed questionnaire to obtain the information regarding the perceptions and the needs of speech-language therapists, whereafter the data was analysed quantitatively. Phase 2 entailed the compilation and piloting of a neonatal communication intervention instrument/tool for speech-language therapists working in the neonatal nurseries in public hospitals. The compilation was based on a comprehensive literature review, as well as information gained from the participants in Phase 1. The compiled instrument/tool was piloted in order to validate it. The two phases will be presented separately as the results of Phase 1 determined the content of Phase 2.

A *quantitative* as well as *qualitative framework* was selected for this research. Quantitative research includes surveys and content analysis and is therefore appropriate for this research project as the first phase entailed a survey to investigate the perceptions of a specific population (De Vos et al., 2005:138). According to Leedy and Ormrod (2005) qualitative research is used to answer questions about the complex nature of a phenomenon, in order to describe and understand it. The results of Phase 2 entailed the compilation of a neonatal communication intervention tool that was also described qualitatively.

3.4 RESEARCH ETHICS

Research ethics is important in order to protect the rights and safety of research subjects (Maxwell & Satake, 2006:214). The three basic ethical principles, namely *autonomy, beneficence and non-maleficence,* and *justice* (Leedy & Ormrod, 2005:101) were applied as follows:

***Autonomy**:* The participants were informed of what the study entailed and their voluntary participation was requested (Leedy & Ormrod, 2005:101). The researcher made use of a cover letter (see Appendix C) to describe the nature of the research and the rights of the participants, and to obtain their

informed consent. The participants' confidentiality was ensured in order to encourage them to express their thoughts and feelings openly (Maxwell & Satake, 2006: 216).

Beneficence and non-maleficence: The risks involved in this study were minimal (Maxwell & Satake, 2006: 216). One of the possible risks was that the participants might be requested to provide information and share opinions about their work contexts and service delivery. As this kind of information might be confidential, it could jeopardise their employment. Confidentiality was ensured by allocating a number to every participant, in this way protecting their identity (Maxwell & Satake, 2006: 216). The researcher acted in the participants' best interest and their rights were respected by presenting the results in a manner that would not allow others to identify specific participants.

Wherever human beings are the focus of investigation, the researcher must look closely at ethical implications of the proposed research (Leedy & Ormrod, 2005:101). The researcher attempted to comply with the prescriptions for ethical research. The research proposal was granted ethical clearance by the Research Proposal and Ethics Committee, Faculty Humanities, University of Pretoria and the researcher adhered to the committee's recommendations (see Appendix A [i]). Permission to conduct the research was also obtained from the departments of health in Gauteng, Eastern Cape, KwaZulu-Natal, Mpumalanga, Northern Cape and North West being the employers of the participants (see Appendix A [ii]).

The two phases of the research are presented separately for clarity.

3.5 PHASE 1

3.5.1 Objectives

The objectives of Phase 1 were:

- To describe the perceptions of speech-language therapists and audiologists providing ECI services in provincial hospitals in South Africa, regarding their role in the neonatal nurseries.
- To identify participants' needs in terms of neonatal communication intervention instruments/tools.

3.5.2 Sample

Neonatal communication intervention is a specialised field within the professions of speech-language therapy and audiology and therefore the population available for this study was limited. Permission for this study could only be obtained from six of the nine provinces, which further reduced the population available for the research. All the participants who met the selection criteria and who returned a questionnaire, were therefore included in the study.

3.5.2.1 Population

The population from which the participants were selected were qualified speech-language therapists and audiologists working in public hospitals in South Africa.

3.5.2.2 Criteria for the selection of participants

The following criteria were applied in the selection of the research participants.

- ***Occupation***

Each participant had to be qualified and practicing as either a speech-language therapist, an audiologist or a speech-language therapist and audiologist. As an objective of this study was to investigate the roles of

speech-language therapists and audiologists currently providing services in neonatal nurseries, it was deemed important that only *qualified and practising* professionals be included in the study.

- ***Employer***

All the participants had to be employed by the provincial departments of health in South Africa. An objective of this study was to determine speech-language therapists/audiologists' needs, specifically relating to their service delivery in *public* hospitals in South Africa. ECI services to neonates in the South African public health sector are less comprehensive and less developed in comparison to developed countries (Kritzinger et al., 1995:7). Therefore knowledge of the needs of early communication interventionists in the public health sector is essential in order to reflect the unique characteristics of ECI in this context and to furthermore compile a tool that is relevant for clinical use in this context.

- ***Work experience***

All the participants in this study had to provide ECI to infants in a neonatal nursery such as an NICU, neonatal high care ward or KMC ward, as this study specifically focused on the participants' needs regarding *neonatal* ECI. The early interventionist providing developmental care in the NICU requires specialised knowledge and therefore current practices directed at infants differ from those directed at older children (Rossetti, 2001:176). Not all provincial hospitals have NICUs, but many hospitals have either neonatal high care wards or KMC wards. Therefore participants providing intervention in any of the specified neonatal nurseries (NICU, neonatal high care ward or KMC ward) were included in the study.

3.5.2.3 Selection procedures

The following procedures were applied during the selection of the research participants:

- The provincial departments of health were contacted telephonically regarding the study. The relevant persons were requested permission

to involve the speech-language therapists and audiologists in the research (see Appendix B).

- They were also requested to provide statistics regarding the number of speech-language therapists and audiologists employed at the hospitals in their province, as well as each hospital's contact details.
- Written permission was obtained from six of the nine provinces namely Gauteng, KwaZulu-Natal, Eastern Cape, Northern Cape, North West and Mpumalanga (see Appendix A [ii]). The provincial departments of health of the Free State, Western Cape and Limpopo did not respond.
- The potential participants targeted for the study in the six provinces that responded, were contacted telephonically to explain the aim of the study and discuss whether they would be willing to participate in the study. The researcher also asked participants how they would prefer to receive the questionnaire (e.g. via post, e-mail or facsimile).
- A cover letter and consent form (see Appendix C) and the questionnaire (see Appendix D) were sent to potential participants via facsimile or e-mail, who indicated that they were willing to participate in the study.

3.5.2.4 Description of the participants

Table 3.1 displays the number of speech-language therapists and audiologists employed in each province. This number was calculated from lists received from the provincial departments of health prior to the commencement of the study.

Table 3.1: Number of speech-language therapists and audiologists in provincial hospitals in South Africa

Province	Number of professionals	Number questionnaires sent	Number questionnaires returned	%
KwaZulu-Natal	60	60	11	18.3
Gauteng	51	51	3	5.8
Limpopo	-	-	-	-
Mpumalanga	32	32	12	37.5
Western Cape	-	-	-	-
North West	14	14	2	14.2
Northern Cape	16	16	11	68.7
Free State	-	-	-	-
Eastern Cape	2	2	2	100
TOTAL	**175**	**175**	**41**	**23.4**

(Source: provincial departments of health, 2007)

A total of 41 out of 175 speech-language therapists and audiologists returned completed questionnaires rendering the return rate of questionnaires to be 23%. According to Leedy and Ormrod (2005:193) the average return rate for a mailed questionnaire is 50% or less and has declined in recent years. The return rate in this study was less than the adequate rate of 50% that is stipulated in the literature (Babbie, 1995: 262). This was ascribed to participants' lack of time and large caseloads being, and in many cases due to being the only speech-language therapist or audiologist at the hospital. The poor return rate could also be explained by the fact that few professionals provided neonatal communication intervention in their hospitals.

The responses obtained from the 41 participants are therefore not representative of speech-language therapy and audiology services in the public health sector in South Africa. Due to the fact that approval for the study the provincial departments of health of the Free State, Limpopo and Western Cape could not be obtained in time for completion of Phase 1, those therapists did not participate in the study.

The characteristics of the participants are provided in Figure 3.2 to Figure 3.10. As one participant did not complete Section A entirely, certain figures

represent only 40 participants. Figure 3.2 displays the participants' **professional qualifications**.

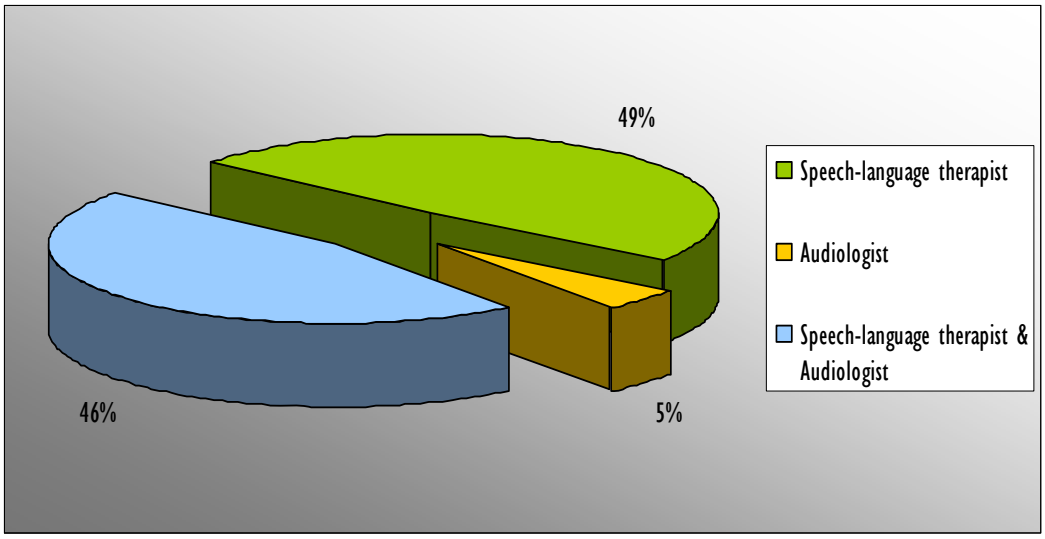

Figure 3.2: Professional qualifications (n = 41)

The large number of participants qualified only as speech-language therapists, could be explained in the light of Figure 3.6. A total of 27% of the participants completed their highest qualification at the University of Stellenbosch, that currently does not present a degree course in Audiology. The minority of participants were qualified as audiologists only. This could be due to the fact that the questionnaire targeted service delivery in neonatal nurseries. When the questionnaire was received at the targeted hospitals, it may have been given to the speech-language therapists or dually qualified therapists to complete rather than to the audiologists. This implies that the results of the study, and the resultant tool, will reflect the needs and preferences of speech-language therapists rather than audiologists.

Figure 3.3 displays the **provinces where participants are currently employed**.

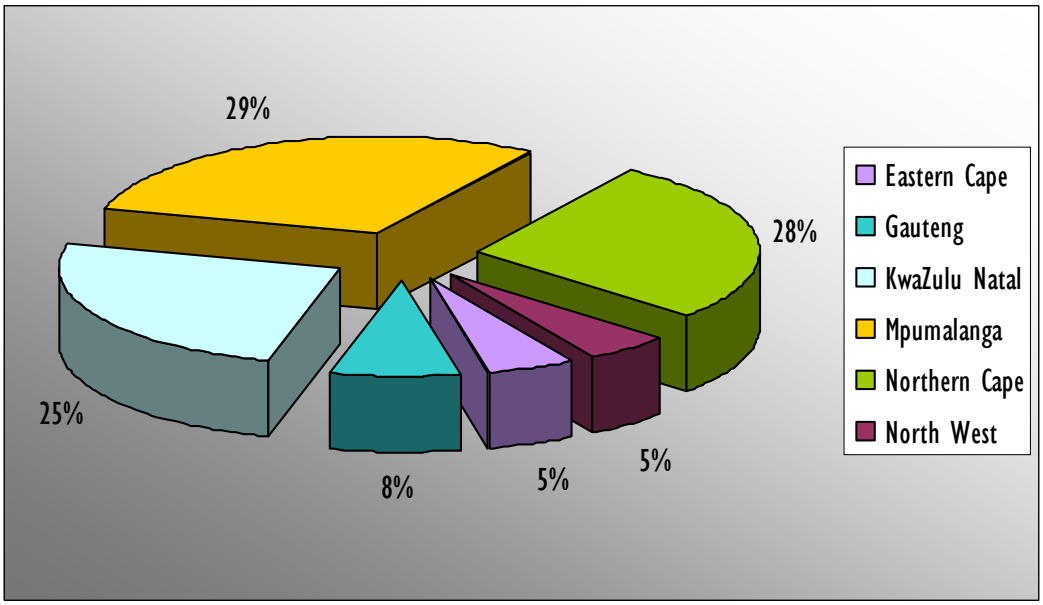

Figure 3.3: Provinces where participants are employed (n = 40)

The majority of participants were providing services in Mpumalanga (29%) and the Northern Cape (28%). A few participants were employed in Gauteng and the Eastern Cape (5%) respectively. This could be ascribed to the fact that only a few speech-language therapists and audiologists are employed in the Eastern Cape. The participants' **years of experience in the government sector** is depicted in Figure 3.4.

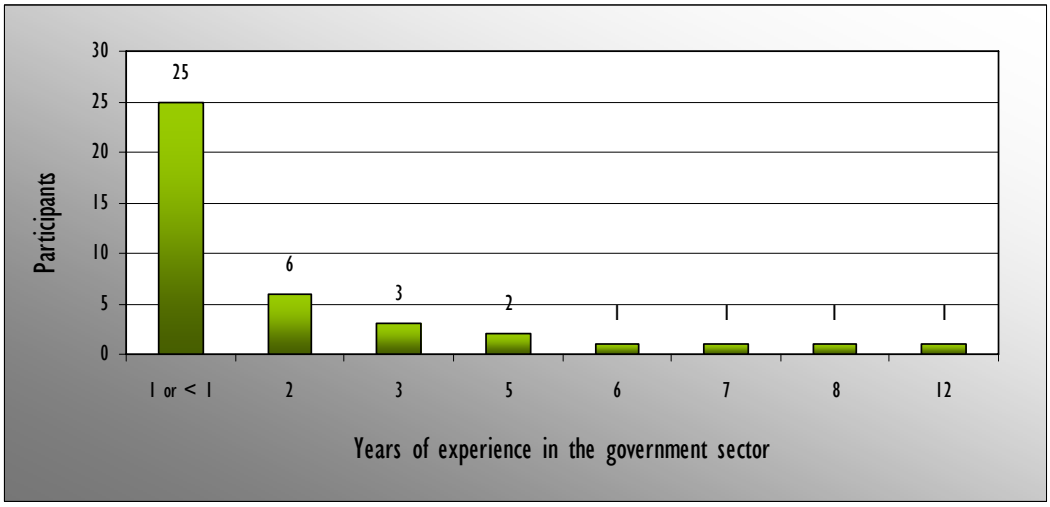

Figure 3.4: Years of experience in the government sector (n = 40)

The majority of the participants was relatively inexperienced in this working environment. Only nine of the 41 participants (36%) had two or more years of experience. This implies that the results of this study, as well as the resulting tool, will reflect the opinions and needs of inexperienced professionals. The fact that few experienced professionals completed the questionnaire indicates that the tool will probably be more applicable to the younger, inexperienced professionals.

The participants' **highest qualifications** and the **universities where these qualifications were obtained** are illustrated in Figure 3.5 and 3.6.

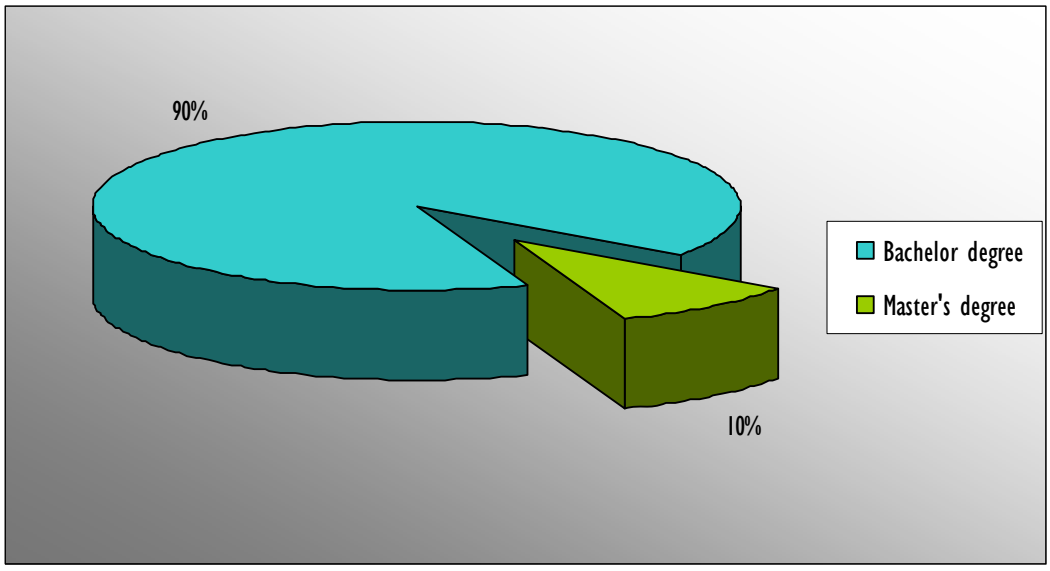

Figure 3.5: Highest qualifications (n = 41)

Figure 3.5 illustrates that only four participants (10%) had Master's degrees. This is attributed to the fact that the majority of participants were newly qualified therapists who recently commenced their professional careers and had not yet completed post-graduate studies (see Figure 3.4). This implies that few participants may be skilled in the specialised area of neonatal communication intervention in the neonatal nursery.

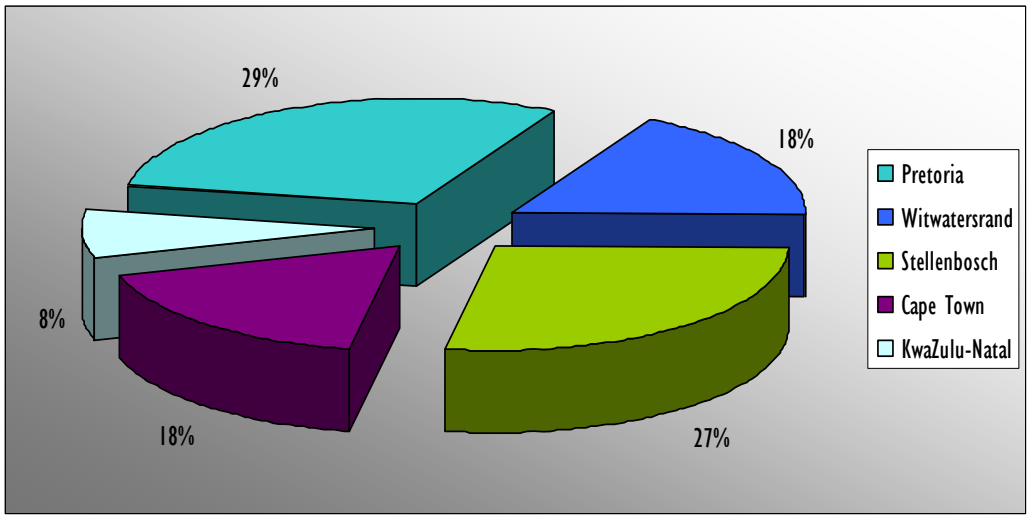

Figure 3.6: Universities where highest qualifications were obtained (n = 40)

The majority of participants obtained their highest qualifications from the University of Pretoria (29%) and the University of Stellenbosch (26%). When compared to Figure 3.3, it is clear that the participants were not employed in the same province where they obtained their qualifications.

The **contexts where participants rendered services** are displayed in Figure 3.7.

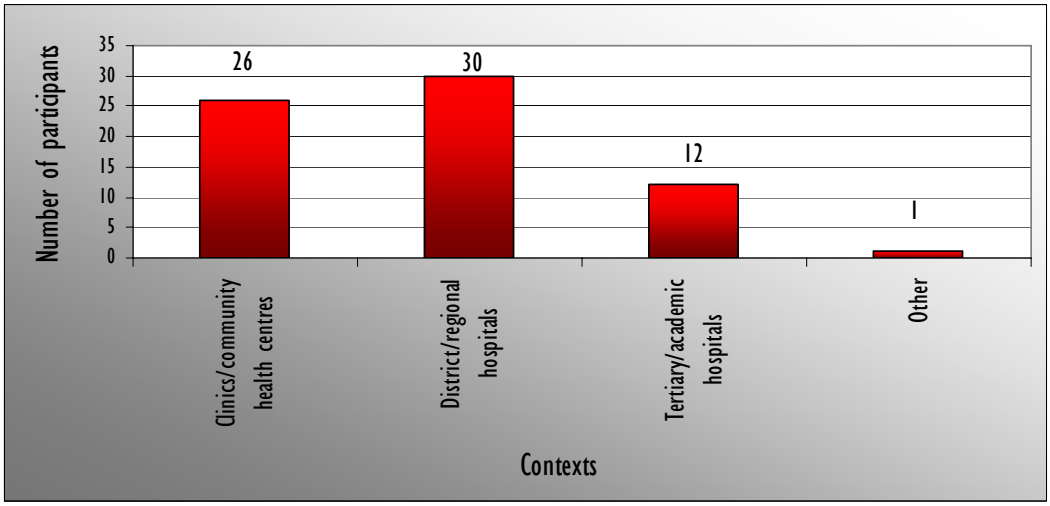

Figure 3.7: Contexts of service provision (n = 41)

As previously, participants indicated more than one working context. The majority of participants worked at district or regional hospitals. Many participants provided services at community clinics or health centres, indicating that the participants employed at regional or district hospitals were also rendering services at clinics in their respective communities. This is attributed to the large number of participants that were employed in their community service year at district or regional hospitals.

Figure 3.8 depicts information on the **wards where ECI was provided**. As before, the participants indicated more than one type of ward.

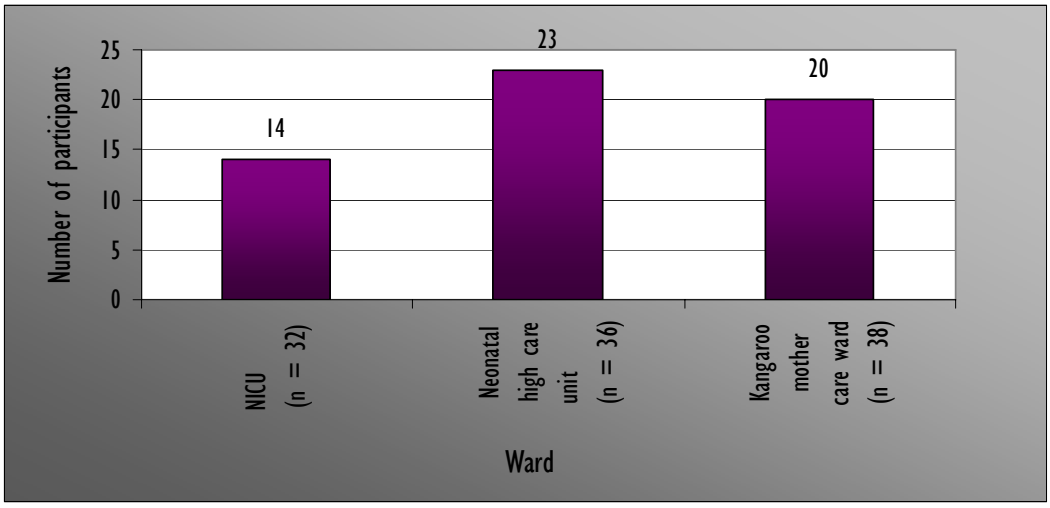

Figure 3.8: Wards where ECI was provided

According to Figure 3.8 most of the participants provided ECI in a neonatal high care unit while approximately half of the participants were working in a KMC ward. Few provincial hospitals have NICUs and these specialised wards are usually located at tertiary or academic hospitals, which explain why few participants are exposed to this context (refer to Figure 3.7).

Figures 3.9 and 3.10 display information regarding **number of speech-language therapists or audiologists** and **trained interpreters and assistants** in the department where the participants worked.

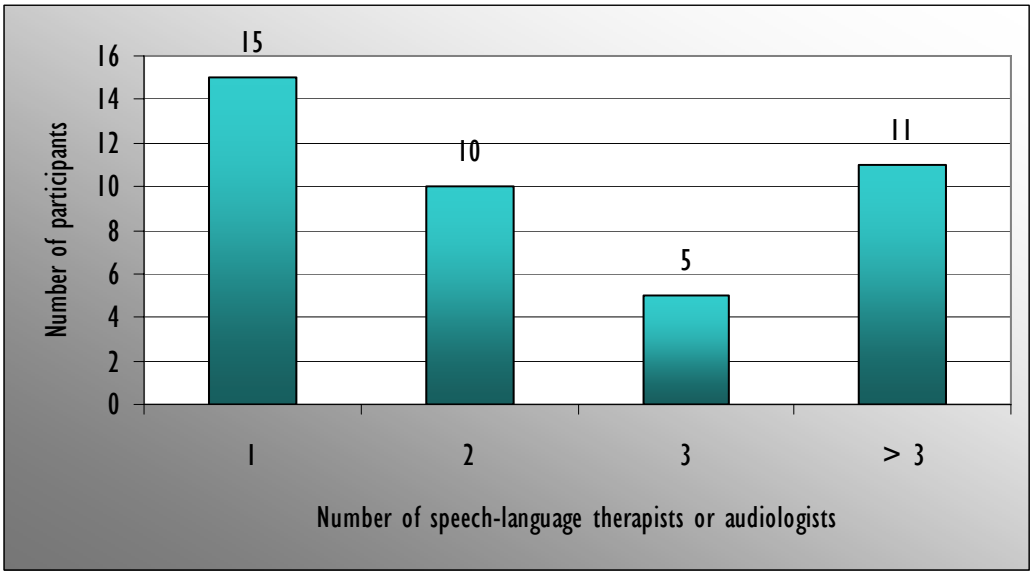

Figure 3.9: Number of speech-language therapists or audiologists in the speech-language therapy and audiology departments (n = 41)

Figure 3.9 illustrates that 15 of the participants were the only speech-language therapist or audiologist employed in their department implying that they had neither supervision nor assistance. This could impact negatively on their service delivery as they probably had large caseloads to manage on their own, leading to work stress and feelings of incompetence.

According to Figure 3.10 only 10% of the participants had trained interpreters or assistants in their departments. Limited funding for posts as interpreters and assistants in the public health sector may be a possible explanation for this finding. This is problematic as language differences may impede on the relationship between the professional and family and influence the intervention process negatively (Madding, 2000:14). This challenge can be addressed by collaboration with trained interpreters in this context.

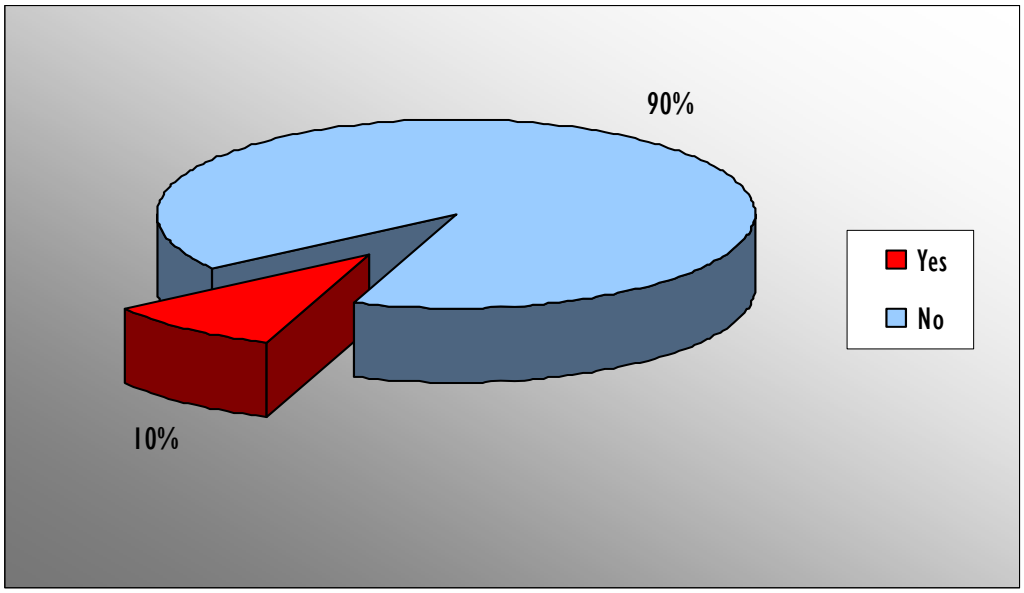

Figure 3.10: Trained interpreters and/or assistants

In summary, the majority of participants worked at district or regional hospitals as well as community outreach clinics. They provided ECI in the neonatal high care unit and KMC unit of their hospitals. Most participants appeared to be inexperienced in providing neonatal ECI services. They may have been without supervision as most participants were the only speech-language therapist/audiologist employed at their hospital and had limited access to interpreters and assistants.

3.5.3 Materials

The following materials were used for data collection.

3.5.3.1 Cover letter

A cover letter (see Appendix C) was attached to the questionnaire, explaining the aims of the study and the importance thereof. The cover letter provided the participants with a brief description of the nature of the study, a description of what participation would involve, a list of potential risks or discomforts, a guarantee that all responses would remain confidential, a means to reach the researcher in case they needed clarity on certain questions and also ensured the participants' anonymity (Leedy & Ormrod,

2005:102). A request for informed consent from the participants was also included in the cover letter.

3.5.3.2 Self-designed questionnaire

A self-designed questionnaire was selected as data collection tool to conduct the survey (see Appendix D).

a) Justification for the use of a questionnaire as data-collection tool

Survey research is one of the best methods available to describe a population that is too large to observe directly (Babbie, 1995:257). A questionnaire allows the participants a high degree of freedom in the completion thereof and information can be gathered from a large number of participants within a brief period of time (De Vos et al., 2005:172). It is also a cost-efficient method to reach participants who are spread across a wide geographical area (De Vos et al., 2005:172). This made it suitable for the current study as participants were spread across six provinces in South Africa.

A questionnaire was selected in preference to structured interview schedules and focus groups, as the data-collection tool of choice for a number of reasons. Research interviewing entails recording and managing large volumes of data even after relatively brief interviews (De Vos et al., 2005:293) and as this research was intended to be a national study, the number of participants involved would make interviews time-consuming and expensive. Focus groups are especially effective in obtaining data on perceptions regarding a defined area of interest in a short period of time (De Vos et al., 2005:306). Focus groups would have been logistically difficult to implement as the participants were distributed countrywide.

The researcher took cognisance of the pitfalls and limitations of using questionnaires in the compilation thereof. According to De Vos et al. (2005:172) questionnaires that have many open-ended questions that take long to complete, often have a low response rate. Some questions may also be left unanswered or wrongly interpreted as there is no fieldworker to assist

the participant (De Vos et al., 2005:173). The design reflects these considerations.

b) Aim of the questionnaire

The aim of the questionnaire was to determine the perceptions of speech-language therapists and audiologists regarding their role in the neonatal nurseries in the hospitals they worked in. The questionnaire also aimed to determine the speech-language therapists' and audiologists' needs in this context regarding clinical instruments or tools for assessment and intervention directed either at the parents or staff.

c) Design of the questionnaire

- **Guidelines followed in compiling the questionnaire**

Published guidelines were followed in the compilation of the questionnaire, thereby enhancing the validity and reliability thereof (Leedy & Ormrod, 2005: 190). The language used in the questionnaire was simple and unambiguous, questions were short and clear instructions were provided (Leedy & Ormrod, 2005:190). A pilot study was conducted to pre-test the questionnaire (Leedy & Ormrod, 2005:192).

- **Types of questions included in the questionnaire**

The questionnaire was comprised of both open- and closed-ended questions.

Closed-ended questions: The following questions were closed-ended: A1 - A9, B1 – B6, B9 – B11, C1, D1 – D3. Closed ended questions are preferable to open ended questions as they are less time-consuming to complete and make the data analysis less complex (De Vos et al., 2005:180).

Open-ended questions: The following questions were open-ended: B7 – B8, B12, C2 – C3, D4 – D5. Although open-ended questions lengthen the time spent to complete the questionnaire, these questions will enable the researcher to obtain a better idea of the spectrum of possible responses and to explore the aspect being researched in more depth (De Vos et al., 2005:179).

- **Content of the questionnaire**

The questionnaire is comprised of four sections containing a total of 27 questions. The inclusion of each section is justified in Table 3.2.

Table 3.2: Content of the questionnaire

Section	Themes	Justification for inclusion	References
A	**Biographical data (9 questions):** - *Profession* - *Qualifications* - *Province employed* - *Years experience* - *Number of employees in department*	The biographical data was used to interpret the data from other sections of the questionnaire.	De Beer (2003) Van Rooyen (2006)

Table 3.2: Content of the questionnaire (continued)

Section	Themes	Justification for inclusion	References
B	**Service delivery (11 questions):** - *ECI in the hospital* - *Task allocations* - *Contexts for ECI (NICU, neonatal high care, KMC)* - *Functions and roles:* *Assessment:* Feeding, utilising video-fluoroscopic studies, communication development, mother-child communication interaction, hearing screening. *Treatment directed at infant and parents:* Direct treatment of the infant [e.g. oral-facial stimulation], intervention for feeding problems and prevention of communication delays in the form of parent guidance, developmental care, KMC, discharge planning and planning of follow-up treatment, informing parents/caregivers of infant's condition, progress and future expectations, counselling and support of parents. *Treatment directed at staff/team members:* Consultation with team, attendance of ward rounds with other team members, in-service training of staff/team members. - *Work satisfaction and competency*	Task allocations are justified by the fact that a speech-language therapist's high caseload is directly related to increased stress, while mentoring at work offers support and guidance (Lubinski, 2007:537). It is therefore important to identify participants' task allocations. Few hospitals have NICU nurseries due to costs involved in maintaining their services (Billeaud & Broussard, 1998:86) and thus it is important to enquire about participants' contexts of service delivery. In South Africa, the KMC ward is often used as a step-down unit for neonates (Kritzinger, 2007). Neonatal ECI services can be directed at the neonate, the parents/caregiver or the staff members (Rossetti, 2001:270) and therefore the participants were asked about their specific functions in the neonatal nursery. Functions and roles included in the questionnaire were compiled from Rossetti (2001:181), ASHA (2005:2) and Ziev (1999:33). People who are more focused on the characteristics of their work (such as the challenges and how interesting the work is) tend to demonstrate more personal involvement, motivation and enthusiasm for their work (Louw, Van Eede & Louw, 1998:538). Speech-language therapists and audiologists require work satisfaction in order to excel in their professions and therefore the questionnaire should investigate participants' perceptions of their competence and work satisfaction in the neonatal nursery.	ASHA (2005) De Beer (2003) Billeaud and Broussard (2003) Kritzinger (2007) Louw, Van Eede & Louw (1998) Lubinski (2007) Rossetti (2001) Ziev (1999)

Table 3.2: Content of the questionnaire (continued)

Section	Themes	Justification for inclusion	References
C	**Needs in terms of the following (3 questions):** **-** *Service delivery:* Referrals from other professionals, screening equipment or materials, assessment equipment or materials, treatment equipment or materials, counselling methods, team members, time management, resources, in-service training, continued professional development. - *Perceptions of culturally appropriate tools* - *Perceptions of user-friendly tools*	In the South African context speech-language therapists and audiologists are faced with a multitude of challenges in providing ECI (Fair & Louw, 1999:16). In order to fulfil their roles and responsibilities in the neonatal nursery, speech-language therapists and audiologists require certain equipment and tools. It is thus important to enquire about participants' opinions of improvements to future service delivery in the neonatal nursery. Popich et al. (2007:68) found that a need exists for strategies that are specifically designed to address the communities' needs in the unique context of South Africa. Speech-language therapists working in the NICU need to provide culturally appropriate care as cultural factors shape family responses to information and intervention (ASHA, 2005:2). Therefore it is important to enquire about participants' opinions of culturally relevant and user-friendly tools in their work context.	ASHA (2005) De Beer (2003) Billeaud and Broussard (2003) Rossetti (2001) Van Rooyen (2006) Ziev (1999)

Table 3.2: Content of the questionnaire (continued)

Section	Themes	Justification for inclusion	References
D	**Needs in terms of tools (4 questions):** - *Assessment:* Neonate's communication development, feeding, mother-child interaction, NICU environment. - *Treatment directed at parents/caregivers:* Normal communication development and neonate's capabilities, NICU environment & staff, paediatric dysphagia and feeding therapy, identification of infant's stress behaviour, developmental care, KMC, communication interaction with infant, developmental milestones & follow-up after discharge. - *Treatment directed at staff/team:* Developmental care, KMC & ECI, role of speech-language therapist in neonatal nurseries.	Speech-language therapists play an integral role in facilitating communication development, appropriate assessment of prelinguistic and socio-communicative interactions and performing developmentally appropriate clinical assessments of feeding and swallowing (ASHA, 2005:3). It is therefore essential to establish whether participants have tools to use in this regard, as this information will be used when compiling the tool in Phase 2. The following is the role of the speech-language therapist in the NICU: parent education and counselling, staff and team education and collaboration (ASHA, 2005:9). This includes information on developmental expectations, communication interaction patterns, as well as feeding and swallowing, and contributing to the supportive and nurturing environment in the NICU to prevent negative sequelae (ASHA, 2005:9). Consequently it is important to find out whether participants have a need for tools directed at parents or team members in this regard, as this information could be used in compiling the tool during Phase 2.	ASHA (2005) Billeaud and Broussard (2003) Rossetti (2001) Van Rooyen (2006) Ziev (1999)

3.5.3.3 Pilot study

A pilot study was conducted to pre-test the questionnaire and to determine the efficacy and practicality thereof. A pilot study provides the researcher with the opportunity to modify the questionnaire and correct any errors at low cost before the main study is conducted (De Vos et al., 2005:177). The main value of a pilot study is that it aids in solving problems that otherwise might not have been anticipated in the course of the actual study (Maxwell & Satake, 2006: 102). The pilot study is described in Table 3.3.

Table 3.3: Description of the pilot study

Aims	Participants	Materials	Procedures	Results
• To determine the amount of time needed to complete a questionnaire. • To determine whether the terminology and questions are clear and unambiguous. • To determine whether there are sufficient options provided in the questions. • To determine whether there are errors that the researcher should rectify before commencing the study.	The pilot study was conducted using three speech-language therapists who met the selection criteria. These therapists were not included in the main study.	The questionnaire (Appendix D) was provided as well as a checklist to evaluate the questionnaire (Appendix E).	• Informed consent was obtained and the aim of the study was explained verbally and in writing. • Thereafter the participants were informed of the fact that the information would be handled in a confidential manner and that their names would not be revealed. • The participants were provided with the questionnaire by facsimile and by e-mail. They were given enough time to complete it.	• *Participants agreed that the questionnaire could be completed within a reasonable time.* • *The numbering of the questions was incorrect and was changed subsequently. Terminology and questions were found to be clear and easy to understand.* • *The questions were found to have sufficient options.* • *The questionnaire's format was found to be functional, but it was felt that the tables included should not flow over two pages. The researcher made the necessary corrections to the layout before commencing the study.*

3.5.4 Validity and reliability of the questionnaire

Validity is the extent to which an instrument measures what it is intended to measure (Leedy & Ormrod, 2005:92). The following strategies were used in ensuring validity in this study:

Construct validity: Construct validity is the extent to which an instrument measures a characteristic that cannot be observed directly but has to be inferred from patterns in people's behaviour (Leedy & Ormrod, 2005:92). In this study speech-language therapists' and audiologists' perceptions of their roles, their competence, work satisfaction and their needs were constructs that could not be measured directly. The construct validity could therefore be influenced by the participants' subjective opinions and by the wording of questions in the questionnaire.

Content validity: Content validity refers to the degree to which a measure covers the range of meanings within a concept (Babbie, 1995:128). A thorough review of relevant literature in the field of neonatal communication intervention served as theoretical underpinning for the questionnaire. Therefore it was assumed that the questionnaire measured the concepts that it should (De Vos et al., 2005). The content of the questionnaire was reviewed by a statistician to determine whether the questions were relevant and appropriate for statistical purposes.

The construct and content validity of the questionnaire was determined by making use of a pilot study, and certain changes were implemented according to the recommendations made. The pilot study thus contributed to the study's content and construct validity as it evaluated whether the questionnaire's language was clear and unambiguous (De Vos et al., 2005:167).

External validity: Participants in a research project need to be a representative sample in order to draw certain conclusions about this population (Leedy & Ormrod, 2005: 100). Due to the small sample size, the results of this survey were not representative of the perceptions of all speech-

language therapists and audiologists employed in government hospitals. Therefore no attempt will be made to generalise the findings.

Reliability: The reliability of an instrument is the extent to which it yields consistent results when the characteristic that it measures hasn't changed (Leedy & Ormrod, 2005:93). The questionnaire was piloted to determine whether any items were misleading or unclear, which could result in participants misinterpreting some of the items. The pilot study therefore also contributed to the reliability of the questionnaire. The data collection procedures were described in detail, contributing to the repeatability of the study and thereby increasing its reliability.

3.5.5 Data collection procedures

The following procedures were followed in the data collection:

- Conditional ethical clearance was obtained from the Research Proposal and Ethics Committee, Faculty Humanities, University of Pretoria to conduct the research and to gain permission from the provincial Departments of Health to conduct the study. Once proof of permission from the provincial departments of health was submitted, final ethical clearance was obtained.
- After contacting the provincial departments of health telephonically, permission was obtained in writing from the provinces of Gauteng, KwaZulu-Natal, North West, Mpumalanga, Northern Cape and Eastern Cape to perform the study. A list of the speech-language therapists and audiologists employed at hospitals together with their contact information was also obtained.
- The targeted participants were contacted telephonically and the aim of the study was explained. The contact information of the participants who were interested in participating was verified and the researcher established whether they would prefer receiving the questionnaire by facsimile or e-mail.
- The selected participants who agreed to participate were sent the cover letter and questionnaire by facsimile or e-mail.

- Follow-up telephonic contact was used to increase the return-rate of the questionnaires. The participants were contacted telephonically two weeks after the materials had been sent. In cases where there was still no response after four weeks, contact was made again, telephonically or via e-mail. Final contact was used six weeks after the questionnaires had been sent out, in order to increase the return rate. No further requests were made hereafter, as participation in the study had to be voluntary.

3.5.6 Data analysis and statistical procedures

The following procedures were followed during data analysis:

- The 41 returned questionnaires were coded and edited for obvious errors.
- The data was processed utilising a statistical analysis computer package, namely *SAS* (SAS Institute Inc., 2000). Frequency distribution was set up from the raw data to obtain an overall view of the data (Maxwell & Satake, 2006:285). Descriptive statistics were used to examine and graphically display the data (Maxwell & Satake, 2006:280). *MS Excel* ™ was used to create graphical depictions of data as it allows the researcher to manipulate the displayed data easily (Leedy & Ormrod, 2005:249).
- The *chi-squared test* was performed in order to determine the independence between two or more nominal variables (Maxwell & Satake, 2006:337). The test consists of setting up contingency (two-way) tables to explore the possible relationships between variables in the questionnaire (see list of variables in Appendix F).
- An expected cell frequency of less than five was found, possibly due to the small sample size. The small sample size is partly due to the specialised nature of this study, but also because only six of the nine provinces granted permission for the study. In order to overcome this problem the data had to be regrouped by combining specific columns that belong together. After regrouping the columns, the expected cell frequency still did not comply with the validity rule. Therefore the chi-

squared test was not a valid test and was not utilised during data analysis in this study. The rule of five requires that the expected frequency for each cell be at least five in order for the discrete distribution of the test statistic to be adequately approximated by the continuous chi-squared distribution (Keller & Warrack, 2000:548). Only descriptive statistics were used to describe and interpret the results.

- The qualitative data was presented as detailed textual descriptions and Phase 1 included direct quotations from participants (Fossey, Harvey, McDermott & Davidson, 2002:730). The findings were discussed and interpreted in such a way that it is visible and comprehensible to the reader (Fossey et al., 2002:730).

3.6 PHASE 2

3.6.1 Objectives

The objectives of Phase 2 were:

- To select and justify a specific need in terms of neonatal communication intervention instruments/tools in this context.
- To compile a neonatal communication intervention instrument/tool based on the selection of one of the perceived needs of the participants.
- To pre-test the completed instrument/tool and make changes if necessary.

3.6.2 Data collection procedures

The needs analysis in Phase 1 informed the nature and the format of the instrument/tool, which was compiled during Phase 2. Therefore the compilation of the instrument/tool could only be performed after the results of Phase 1 were obtained. For this reason, the instrument/tool was pre-tested in a pilot study as part of Phase 2 and presented in Chapter 4.

The compilation of the tool involved a series of procedures and decisions (Popich, 2003:31). The following procedures were followed during Phase 2 for determining the neonatal communication instrument/tool to be selected and for the compilation thereof:

- The needs expressed, as well as the roles performed by the speech-language therapist participants as determined in Phase 1 of the study, were arranged according to the frequency of their selection and collated in tables.
- These results, together with the current literature on the topic, were used to inform the selection of a need expressed by the participants to be addressed in the development of the instrument/tool.
- The researcher subsequently determined goals and purposes for the instrument/tool (Popich, 2003:31).

- The researcher compiled the content of the neonatal communication intervention instrument/tool by developing a new tool based on current ECI literature (see Table 4.6 in Chapter 4).
- The instrument/tool was pre-tested in a pilot study (see Table 4.7 in Chapter 4) after it was compiled, in order to determine its clinical applicability and assist the researcher in refining the instrument/tool.

3.6.3 Trustworthiness issues

The trustworthiness of the preliminary compiled instrument/tool was important as it was necessary to determine whether this instrument/tool is authentic, sound and representative of the context from which it was derived (Fossey et al., 2002:723). ***Dependability*** is an alternative to reliability and reflects whether there was consistency in the procedures that were followed (De Vos et al., 2005:346; Popich, 2003:60). By providing a detailed description of the procedures followed during the compilation of the neonatal communication intervention instrument/tool in Phase 2, the instrument/tool's dependability was enhanced. The meticulous planning of the compilation of the instrument/tool therefore increased the trustworthiness of the study. Piloting the neonatal communication intervention instrument/tool also contributed to the trustworthiness, as it evaluated whether the language, terminology and content of the instrument/tool was appropriate for the population it was intended for.

The goal of ***credibility*** is to demonstrate that the inquiry was conducted in such a manner as to ensure that the subject was accurately identified and described (De Vos et al., 2005:346). The instrument/tool was compiled after completing a comprehensive review of relevant ECI literature prior to the development thereof. The trustworthiness was therefore enhanced as the instrument/tool had a strong theoretical basis.

Confirmability is the extent to which another individual can confirm the findings of the study (De Vos et al., 2005:347). Confirmability was established by consulting two professionals and lecturers at the Department Communication Pathology, University of Pretoria in this particular field of

interest to gain insight from their expertise (Popich, 2003:61) to enhance trustworthiness.

3.7 CONCLUSION

The research problem that was identified was addressed by the preliminary compilation of a neonatal communication intervention instrument/tool for use by speech-language therapists working in local neonatal nurseries of public hospitals. This study entailed descriptive, exploratory research to provide a detailed picture of a situation or phenomenon that was not well-known, namely speech-language therapists' and audiologists' perceptions of their roles and needs in the context of the neonatal nursery. The questionnaire, which was used to gather participants' perceptions of their roles and needs in this context during Phase 1 of the research, had a sound theoretical base as it was developed with careful consideration of current literature. The methods and procedures utilised in Phase 2 was described in a transparent manner so as to enhance the trustworthiness of the results. The speech-language therapists and audiologists contributed by providing their opinions on how to fulfil their real needs in this context, which resulted in the compilation of an instrument/tool for use by this population. The current literature on neonatal ECI served as theoretical underpinning for the development of a neonatal communication intervention instrument/tool for use in local neonatal nurseries.

3.8 SUMMARY

Chapter 3 provides a framework for the planning and the implementation of the study. The researcher performed a needs-analysis among speech-language therapists and audiologists and subsequently selected a need for which a neonatal communication intervention tool was compiled. Ethical implications pertaining to this study were discussed. The participants were described in terms of their qualifications, years experience in the government sector and province of employment to interpret the findings accurately. The process of developing the materials used for this study was explained. Issues

relating to reliability, validity and trustworthiness were discussed. Procedures for data-collection and data-analysis were documented. A detailed description of the method used in this study provides a structure for the description of the results.

CHAPTER 4

Results and discussion

4.1 INTRODUCTION

Approximately 15% of infants born in South Africa are born prematurely (Lubbe, 2008:23) and those admitted to the NICU are cared for by many different professionals (Billeaud & Broussard, 2003:84). Speech-language therapists and audiologists play a critical role in the treatment of these at-risk infants in the NICU (ASHA, 2005:2; Billeaud & Broussard, 2003:83). However, they require certain tools in order to perform their roles and responsibilities effectively. Furthermore, professionals who provide neonatal communication intervention in local provincial hospitals are challenged by factors such as large caseloads, limited access to trained interpreters and a lack of culturally and contextually appropriate assessment and intervention tools. ASHA (2005:2) states that speech-language therapists need to develop culturally appropriate programmes that meet the needs of ethnically and linguistically diverse families. Therefore best practice in developmental care in South African neonatal nurseries needs to be facilitated through contextually appropriate tools. Basing clinical decisions on scientific research is fundamental to ethical practice in ECI (Louw, 2007 [a]).

Against this theoretical background the current study aimed to compile a locally relevant neonatal communication intervention tool for use by speech-language therapists/audiologists. A needs analysis was conducted in order to establish whether a specific neonatal communication intervention tool is necessary to overcome some of the mentioned challenges. The aim of Chapter 4 is to present the results of this study in graphs and tables and to interpret these findings in answering the research question posed. The results of the two phases will be

discussed separately as the findings of Phase 1 determined the type and format of the instrument/tool discussed in Phase 2.

4.2 RESULTS OF PHASE 1

The results of Phase 1 reflect the information obtained from the self-designed questionnaire which was completed by 41 participants. Two participants were qualified as audiologists only and therefore their responses are discussed separately. Due to the fact that audiologists perform a different role to speech-language therapists in the neonatal nursery, their responses would have impacted upon the results from the rest of the participants and were therefore kept separately. Specific variables utilised in data-analysis are referenced with variable numbers (e.g. V1, VV1), which are included in the list of variables in Appendix F.

4.2.1 Objective 1: To describe the perceptions of speech-language therapists and audiologists providing ECI services in provincial hospitals regarding their roles in neonatal nurseries

Speech-language therapists' perceptions of their roles where obtained from question B11 in the questionnaire regarding screening and assessment of the infant, intervention directed primarily at the infant and parents/caregivers, and intervention directed primarily at the staff/team members.

4.2.1.1 Screening and assessment of infants

According to Figure 4.1 the role in terms of screening and assessment, which were performed by the majority of participants, were *assessment of the infant's feeding and oral sensori-motor functioning*. This finding concurs with ASHA's (2005:5) description that the assessment of feeding and swallowing behaviour, including pre-feeding skills and promotion of readiness for oral feeding is an important role of the speech-language therapist. Goals of assessment include

identification of family concerns, priorities and resources, identification of the infant's strengths and needs, identification of the focus of intervention, reinforcing parents' feelings of competence and worth and developing ownership of decisions and plans by all parties concerned (Weitzner-Lin, 2004:25).

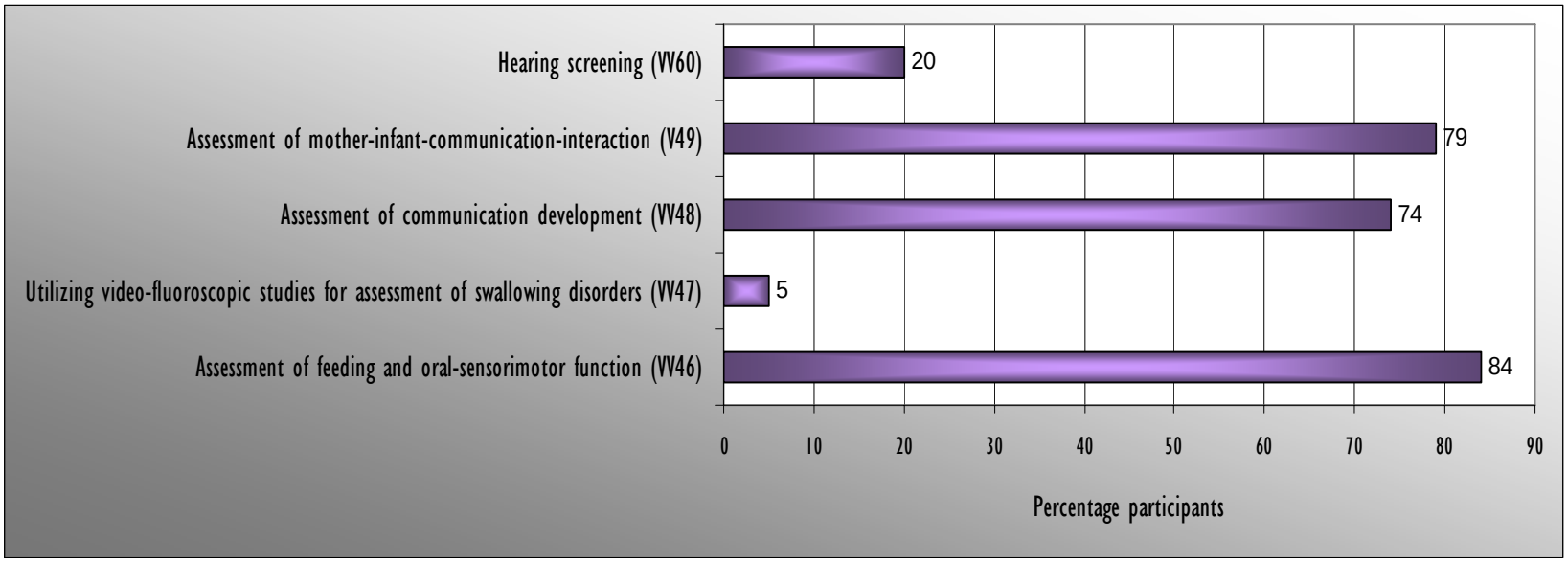

Figure 4.1: Speech-language therapists' indication of their roles regarding screening and assessment of the infant (n = 39)

According to Figure 4.1 other roles that were performed by most of the speech-language therapists were the *assessment of mother-infant communication interaction* and *assessment of communication development*. Speech-language therapists need to monitor mother-infant interaction closely, as it is important for the development of cognitive, social and linguistic skills in children (Rossetti, 2001:12). Assessment should provide baseline information that can be used to determine effectiveness and accountability of intervention programmes (Wolraich, Gurwitch, Bruder & Knight, 2005:136).

The role that was least performed was *video-fluoroscopic studies for the assessment of swallowing problems,* as illustrated in Figure 4.1. These results confirm those of Louw (2007:51, [b]) who studied the ECI service delivery of a group of community service speech-language therapists in four provinces and found that only one of 28 participants in her study utilised video-fluoroscopic studies as a diagnostic tool. Video-fluoroscopic instrumentation is not readily available at all hospitals and is usually only found in tertiary or academic hospitals, due to the costs involved. This finding can be explained by the fact that most of the participants were employed at district or regional hospitals that would not have specialised equipment such as video-fluoroscopy (refer to Figure 3.7).

Hearing screening was also performed by a small number of speech-language therapists, according to Figure 4.1. It appears that only a small percentage of participants fulfil the role of audiologist in the neonatal nursery, although many (46%) of the participants were qualified as both speech-language therapists and audiologists (refer to Figure 3.2). This may be attributed to the limited availability of audiometric equipment, which is a recognised challenge in the South African public health sector. The results confirm the findings of Theunissen and Swanepoel (2008:27) who determined that a lack of appropriate equipment was the most frequent reason for the absence of neonatal hearing screening programmes in the public health sector.

Apart from performing roles that require specialised equipment such as hearing evaluation and video-fluoroscopy, speech-language therapists appeared to be performing multidimensional professional roles relating to screening and assessment, which is attributed to their awareness of the risks of development problems in the areas of attachment and communication development.

4.2.1.2 Intervention directed at the infant and parents/caregivers

The speech-language therapist's role in the neonatal nursery includes providing feeding and swallowing intervention and communication intervention by guiding, educating and counselling parents/caregivers, developing programmes and advocacy, e.g. regarding developmental care (ASHA, 2005:2; Rossetti, 2001:174). According to Figure 4.2, it is encouraging to note that the majority of the participants in this study (82%) indicated that they were performing these roles in their hospitals.

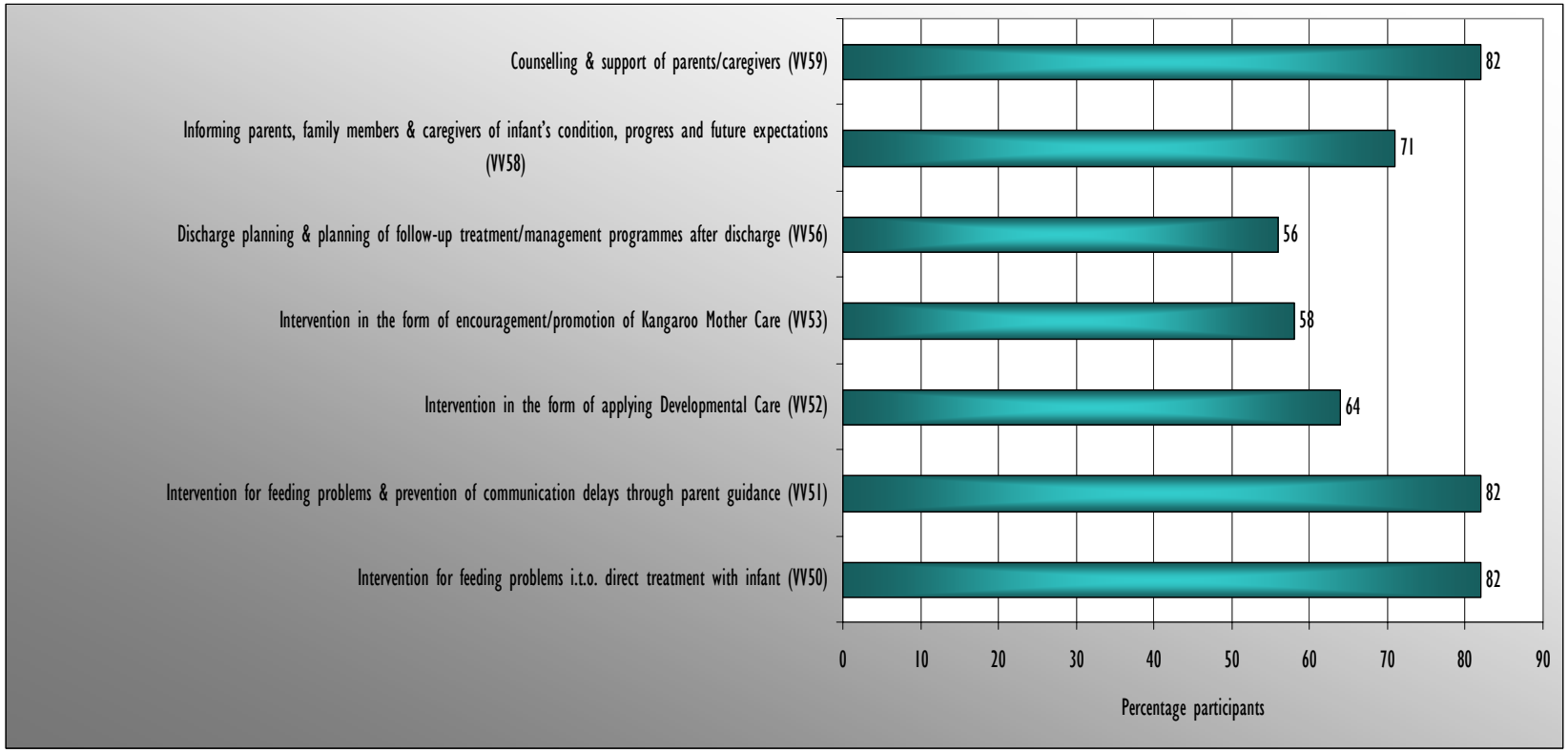

Figure 4.2: Speech-language therapists' roles in intervention specifically directed at the infant and parents/caregivers (n = 39)

The role least performed was *discharge planning and planning of follow-up treatment after discharge*. Most speech-language therapists were the only speech-language therapist/audiologist employed in their department and had large caseloads (refer to Figure 3.9), which possibly did not leave time to engage in discharge planning and planning of follow-up services. Due to patients living across a wide geographical area and having limited finances and transport to return to the hospital or clinic, regular follow-up services are problematic in the South African public health sector (Fair & Louw, 1999:13; Van Rooyen, 2006:42). Early interventionists, however, need to be sensitive to family needs during an infant's transition home, as efficacy of early intervention services is greatly enhanced if careful hospital discharge is completed before the infant goes home (Rossetti, 2001:277).

Intervention in the form of the *promotion of kangaroo mother care (KMC)* was performed by only 58% of the participants. The benefits and cost-effectiveness of KMC have been proven in the literature and it is successfully implemented in a number of public hospitals in South Africa (Bergh & Pattinson, 2003:709). KMC leads to more efficient use of staff and can successfully be implemented in provincial hospitals (Cattaneo et al., 1998:281; Dippenaar et al., 2006:16a). Many hospitals in the public sector, however, have not yet embraced the approach of KMC and in such contexts it may have been difficult for the participants to promote KMC. It is also possible that not all participants had received training in KMC, either on an undergraduate level or through continuing professional development, which could have prevented the participants from performing this role. This is evident from a participant's comment in an open question (D5):

"…therapists need to become more aware of effectiveness of KMC."

In conclusion, the majority of the participants reported that they fulfil a number of roles in direct intervention with infants and parents. Given the nature of the

South African context, the roles performed by the participants need to be expanded and adapted to meet local needs to improve neonatal communication intervention service delivery.

4.2.1.3 Intervention directed at staff/team members

According to Figure 4.3 *consultation with other professions in a multi- or transdisciplinary team* was a role that appeared to be performed the most frequently. It is positive that most participants (74%) were working as team members with other professionals, as this is preferred practice because of the benefits for the infant, family and the speech-language therapist. Early intervention in the NICU should follow a transdisciplinary team approach (Rossetti, 2001:180). ASHA (2005:9) states that speech-language therapists may contribute to the NICU team's developmental care plan with a focus on communication and feeding/swallowing.

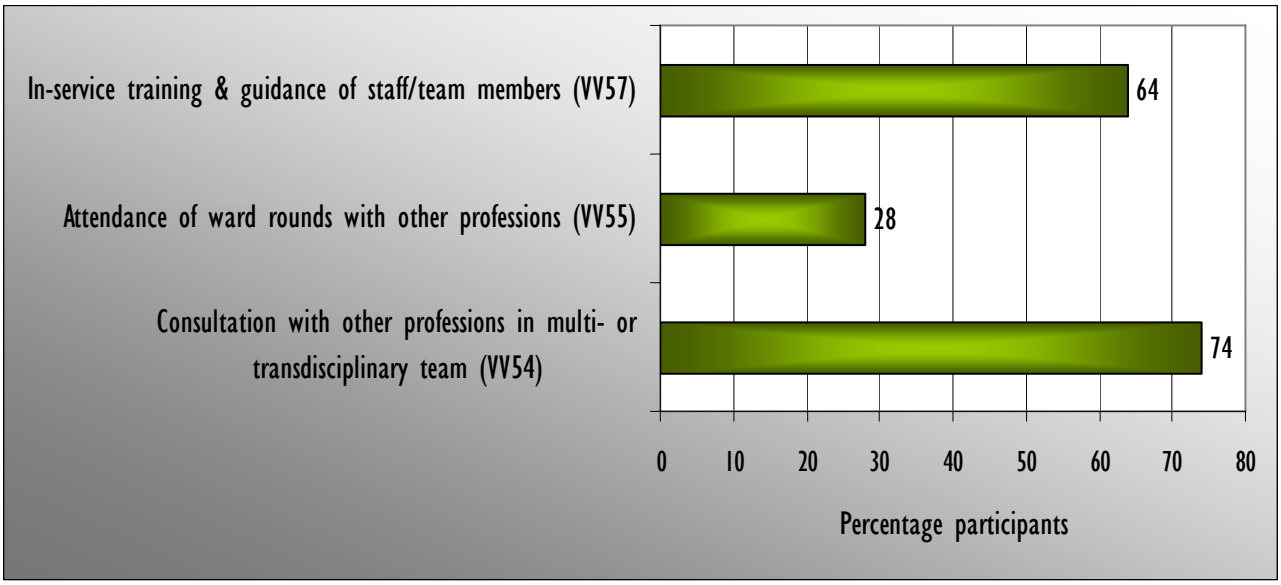

Figure 4.3: Speech-language therapists' roles in intervention specifically directed at staff and team members (n = 39)

In-service training and guidance of staff and team members were performed by only 64% of participants according to Figure 4.3. This is unsatisfactory and is

attributed to the fact that the role of the speech-language therapist is still not well known or acknowledged in the neonatal nursery, necessitating more in-service training to improve this aspect of service delivery. Staff/team education regarding developmental expectations, communication interaction patterns and feeding and swallowing behaviours is described as being an important role of the speech-language therapist in the neonatal nursery context (ASHA, 2005:9).

The role that was performed the least was *attendance of ward rounds with other professionals* in the neonatal nursery. Ziev (1999:33) describes this function as an opportunity to learn from others and to become a familiar face among team members. It also presents the opportunity to request referrals based on infants' symptoms or histories. As mentioned earlier, many participants were the only speech-language therapist/audiologist employed in their department (refer to Figure 3.9). This could have limited their available time to attend neonatal ward rounds, as they might have been involved in other paediatric or adult ward rounds, clinics or consultations.

Most participants appeared to be aware of the impact they may have in this context through teamwork. However, in-service training of staff members was not yet performed by all and their service delivery was limited by poor attendance of ward rounds. This is problematic as many participants had limited experience, which resulted in missed opportunities in the neonatal nursery.

4.2.1.4 Audiologists' perceptions of their roles in neonatal nurseries

Two of the participants in this study were qualified as audiologists only and the results of their responses are summarised in Table 4.1.

Table 4.1: Audiologists' roles in neonatal nurseries (n = 2)

Roles		Audiologists
Screening and assessment	Assessment of neonate's communication development (VV48)	1
	Assessment of feeding and oral sensori-motor function (VV46)	0
	Utilising video-fluoroscopic studies for assessment of swallowing disorders (VV47)	0
	Assessment of mother-infant communication interaction (VV49)	2
	Hearing screening (VV60)	1
Intervention directed at parents	Intervention for feeding problems in the form of direct treatment of infant (VV50)	0
	Intervention for feeding problems and prevention of communication delays in the form of parent guidance (VV51)	0
	Intervention in the form of applying developmental care (VV52).	1
	Intervention in the form of encouragement/promotion of full-time or intermittent kangaroo mother care (VV53)	1
	Discharge planning and planning of follow-up treatment/management programmes after infant is discharged (VV56)	2
	Informing parents, family members and caregivers of child's condition, progress and future expectations (VV58)	2
	Counselling and support of parents/caregivers (VV59).	0
Intervention directed at staff/team members	Consultation with other professions in a multi- or transdisciplinary team (VV54)	2
	Attendance of ward rounds with other professions (VV55)	0
	In-service training and guidance of staff/team members (VV57)	1

Only one of the two audiologists performed hearing screenings, which is ascribed to the fact that hearing screening equipment is not readily available in government hospitals (refer to Figure 3.1) (Theunissen & Swanepoel, 2008:27). Both audiologists worked as part of a team and consulted with other team members in accordance with ASHA's guidelines for audiologists (2004:5 [a]). Current literature emphasises the importance of ongoing audiological and medical monitoring of any child who demonstrates risk indicators for delayed onset or progressive hearing loss for at least three years (Northern & Downs, 2002:269). Interestingly, both audiologists also assisted in discharge planning and planning of follow-up treatment/management after discharge while only half of the larger group of 39 speech-language therapist participants performed this

role. This may be due to a lack of infant follow-up clinics at many district or regional hospitals. Families need information, consistent encouragement, reassurance, and positive feedback regarding their competency and ability to cope with the birth and hospitalisation of their critically ill newborn (Cone, 2007:37; Northern & Downs, 2002:152). It is therefore encouraging that both audiologists were involved in the planning of follow-up services.

According to Table 4.1 the role of the audiologist in the neonatal nursery is clearly defined by his/her profession and differs from the role of the speech-language therapist. ASHA (2004:5 [a]) describes the practice of audiology as prevention of hearing loss, identification of dysfunction in the auditory system, assessment of auditory function and referral to other professionals, rehabilitation, advocacy and consultation with other team members. The audiologist participants appeared to perform their expected roles, as indicated in literature, except for the one audiologist who did not perform hearing screening. This could be explained by the possibility that he/she did not have adequate testing equipment to perform this role.

4.2.1.5 Participants' perceptions of competence and work satisfaction

The following information was obtained from all 41 participants in response to questions B6 – B10 in the questionnaire regarding their competence and work satisfaction.

a) Participants' perception of their competence in the neonatal nursery

According to Figure 4.4, 53% of the participants indicated that they *"sometimes"* felt competent working in the neonatal nursery, which is disturbing considering the current emphasis on competent, well-trained speech-language therapists and audiologists in the context of the neonatal nursery (ASHA, 2004:159 [b]) and on the provision of quality care. Incompetence among speech-language therapists and audiologists may result in lost opportunities to provide intervention for the high risk neonatal population.

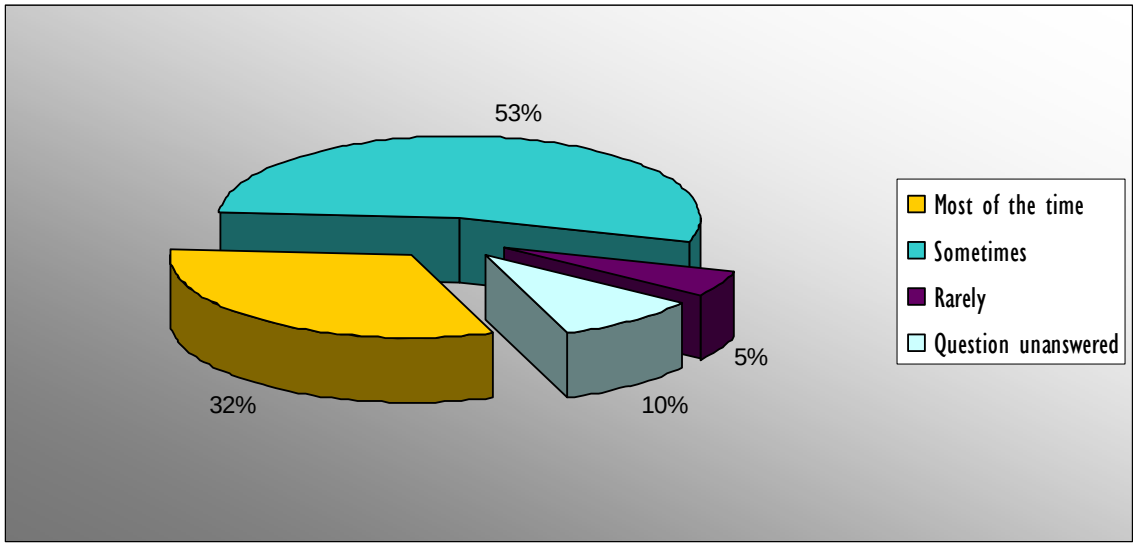

Figure 4.4: Participants' perceptions of competence in neonatal nursery (n = 41)

The participants' perceptions of their competency are displayed in Figure 4.5. Participants could select more than one option and therefore the total of responses is more than 41.

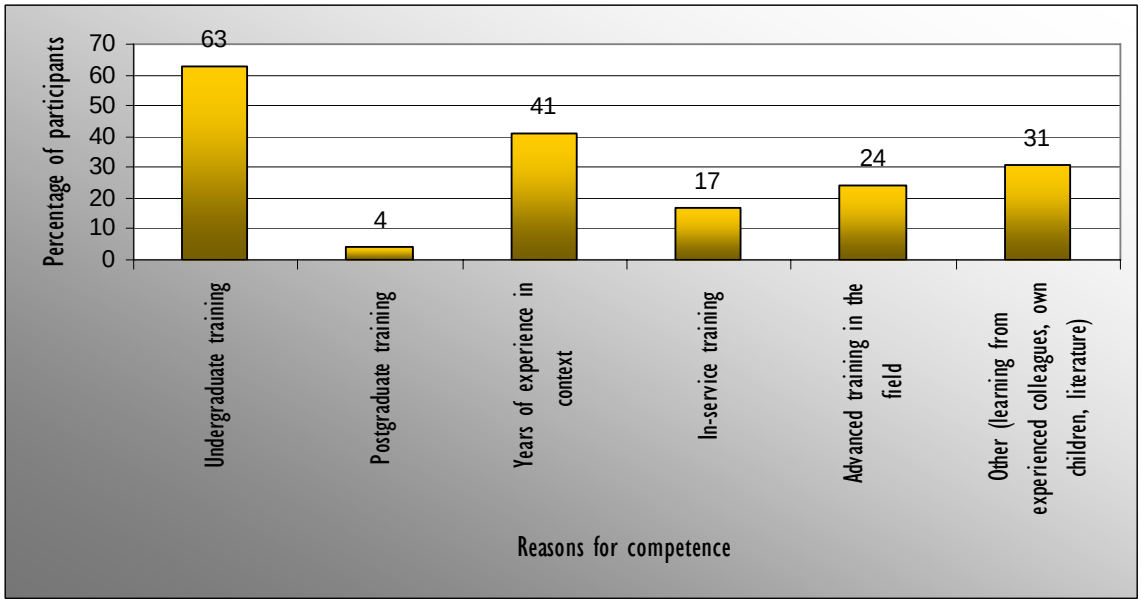

Figure 4.5: Participants' reasons for competence (n = 41)

Many participants attributed their feelings of competence to their undergraduate training, which confirms Louw's (2007:62 [b]) findings that 57% of the respondents in her study felt that they had sufficient undergraduate training to provide ECI.

Few of the participants (24%) attributed feelings of competence to advanced training in the field. As 60% of participants were recently qualified and had not yet had the opportunity to undergo advanced training (refer to Figure 3.4) this finding was to be expected. De Beer (2003:52) investigated the roles of speech-language therapists in the NICU and found that most of the speech-language therapists in her study had attended continued education seminars and courses on ECI. Speech-language therapists and audiologists have a professional responsibility to develop professionally and are mandated by the HPCSA to participate in CPD (HPCSA, 2002). Participating in CPD activities is therefore strongly recommended for the participants who are concerned about their competency in the neonatal nursery.

Only 2% of participants cited post graduate studies as their reason for feeling competent, which corresponds to the fact that only 10% had postgraduate qualifications (refer to Figure 3.5). Postgraduate qualifications in South Africa are mostly research-based and may improve theoretical knowledge, but not necessarily clinical expertise. Formal academic qualifications are therefore not an optimal strategy to improve clinical competence in neonatal communication intervention.

b) Participants' perceptions of their work satisfaction

The majority of the participants enjoyed their work in the neonatal nursery "*very much"* according to Figure 4.6. Louw, Van Eede and Louw (1998:538) describe work satisfaction according to intrinsic factors and extrinsic factors of work. The characteristics of employment (such as the challenges involved, how interesting

the work is) as well as the specific skills the employment entails, are intrinsic factors related to work satisfaction.

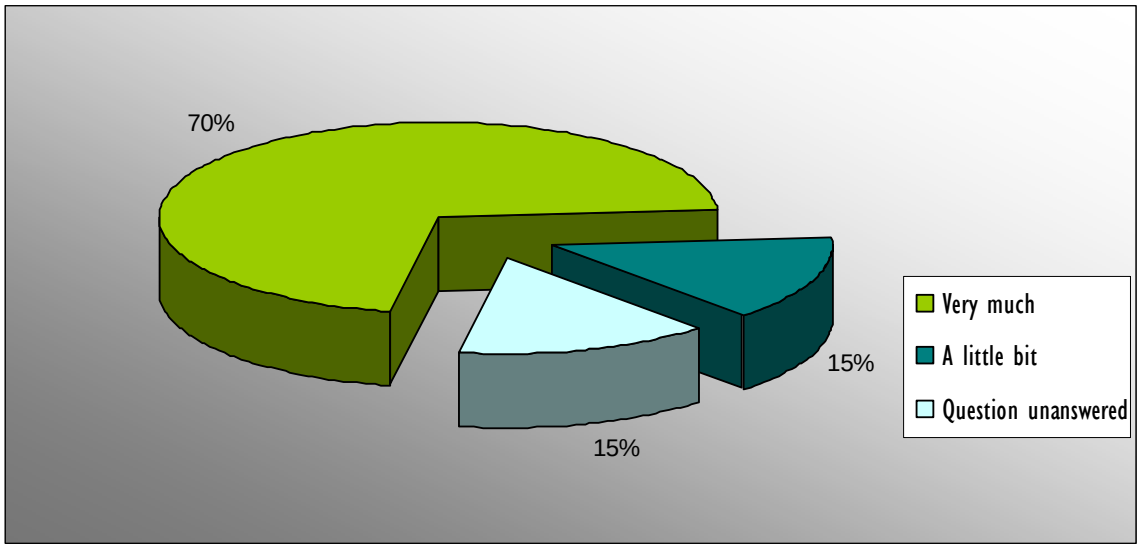

Figure 4.6: Participants' enjoyment of their work in neonatal nursery (n = 41)

Extrinsic factors determining work satisfaction are salary, convenience, working environment and working hours (Louw et al., 1998:538). According to Louw et al. (1998:538) employees who focus on intrinsic factors have more work satisfaction, are more motivated and show more personal involvement in their work. Speech-language therapists and audiologists need to be skilled in working with infants and families, but require work satisfaction in order to excel in their professions. People drawn to helping professions such as speech-language therapy and audiology, tend to be people-oriented and focussed on helping those in trouble (Lubinski, 2008:533). The enjoyment that participants experienced related to their work in the neonatal nursery, could be due to the fact that they were able to provide guidance and support to infants and families who were in need.

An open-ended question (B7) tapped the participants' reasons for their positive experiences. Participants perceived their work in the neonatal nursery to be

challenging, and therefore they appeared to find it enjoyable. Challenges of a specific work are intrinsic factors of employment (Louw et al., 1998:538). Intrinsic factors of a specific work may lead to increased work fulfilment resulting in increased motivation and personal involvement in the work. The following comments of participants attest to this:

"It is a challenging but very satisfying area. You sometimes see good results and happy families. We are always learning."

"I find this a challenging and rewarding area. It is a broad and dynamic area..."

It is encouraging that participants mentioned the satisfaction that they experienced from working in a team, as is clear from their comments:

"...contact with the medical team..."

"Getting to work with other therapists, parents and nurses."

De Beer (2003:53) determined that speech-language therapists enjoyed sharing information within a team, which verifies the current findings. The participants' motivation for being involved in teamwork may be attributed to the fact that many were the sole professionals in their field at their hospital and lacked extensive experience, rendering team involvement to be a supportive and enriching experience.

Participants, however, also commented on their negative experiences in the neonatal nurseries in public hospitals in response to another open-ended question (B8) in the questionnaire. It appears that the role of speech-language therapists and audiologists in the context of the neonatal nursery is not well-known among other team members in all neonatal nurseries. This was also identified as a barrier to ECI service delivery in the NICU by De Beer (2003:53). Due to the introduction of PHC and the institution of community service, speech-language therapy and audiology posts in public health care have increased

(Theunissen & Swanepoel, 2008:28). Some participants may be the first speech-language therapist and/or audiologist employed at their hospital and therefore ECI may not yet be well-known. Furthermore, high turnover of nursing staff in the neonatal nursery is common and necessitates speech-language therapists and audiologists to continuously forge relationships with staff (Rossetti, 2001:274).

Ineffectiveness of co-workers may lead to stress, reduce work satisfaction (Lubinski, 2008:529) and contribute to negative experiences of speech-language therapists and audiologists working in neonatal care. This is illustrated in the comments below:

"...SLT & A [speech-language therapist and audiologist] not regarded as an important member of the team."

"Doctors and staff members not knowing my role as a speech therapist and my scope of practice."

"Our profession is underestimated regarding the role we play in this context."

Some participants mentioned the attitude of staff members regarding their recommendations as a reason why they did not always experience work satisfaction. This may be due to other staff not yet knowing or trusting a new speech-language therapist in their own working context. Participants might also have approached colleagues in a less than optimal manner and failed to impress them, due to their lack of experience. While early interventionists need to be brokers of information, it is important to monitor how information is shared and how quickly changes are expected in the NICU (Rossetti, 2001:275). Negative relationships between speech-language therapists and their co-workers may create situations where stress and burnout are likely to occur (Lubinski, 2008:529). Participants' commented as follows:

"Nursing staff not always compliant with my recommendations."

"Working with team members who are not co-operative or who do not implement your suggestions."

"The battle to implement change: getting other health care providers to understand the importance of positioning and sound reduction etc."

Furthermore, language differences between participants and their patients appeared to be an aspect that influenced participants' work satisfaction in the neonatal nursery. In light of South Africa's multilingual society, as described in chapter 2, this is to be expected. Only 10% of participants had access to services of trained interpreters and assistants (refer to Figure 3.10), which explains the challenges of communicating with patients in their home language. This also confirms Van Rooyen's (2006:25) findings that not all patients in public hospitals received ECI services in their home language and that services are primarily provided in English. According to one participant:

"Language differences make working with mothers difficult."

Participants felt that the environment had an impact on their work satisfaction in this context. The high rate of low birthweight and premature infants in South Africa (Pattinson, 2003:62) may explain the high number of infants and their mothers admitted in the wards. The comments that were shared are worrying:

"Very crowded."

"Cramped conditions."

"Hygiene is a big problem."

Participants' caseloads were described as not being ideal. Some participants had no supervision or support, which affected their work satisfaction. Speech-language therapists can experience stress and burnout resulting from large and

demanding caseloads (Lubinski, 2008:534). This is echoed by the following comments:

"The fact that I am the only speech-language therapist."

"I have no supervision thus I am faced with no support..."

Mentoring is beneficial in preventing stress and burnout, as it provides the opportunity to discuss problem areas and provide feedback, thus leading to increased work satisfaction (Lubinski, 2008:537). Therefore inexperienced speech-language therapists should be provided with ample opportunities to network with more experienced therapists so as to gain confidence in this context.

The following comments indicate that some participants felt that their undergraduate training had not equipped them sufficiently to experience work satisfaction. Due to the fact that most participants were inexperienced (refer to Figure 3.4), they relied heavily on their undergraduate knowledge to guide their services in the neonatal nursery. Their perceptions that undergraduate training negatively affects work satisfaction may be because not all training programmes emphasise ECI during their undergraduate training. Inadequate training to comply with work expectations may contribute to chronic stress (Lubinski, 2008:529) and lead to less work satisfaction, as indicated by the comment below:

"I do not feel that I was exposed to this context at all during varsity."

In conclusion, most participants experienced work satisfaction in the neonatal nursery. There are, however, aspects that challenge service delivery in the neonatal nursery in the South African context. It appears that the participants were more focused on the intrinsic factors of their work than the extrinsic factors,

which indicates that they may have been more motivated and were therefore more involved personally in their work.

4.2.1.6 Improved future service delivery

The participants' responses to Question C1 in the questionnaire regarding their opinions on what is required to improve future service delivery are summarised in Table 4.2 and discussed accordingly.

Table 4.2: Proposed future improvements regarding neonatal communication intervention service delivery (n = 41)

Area	Improvements	Participants	%
Assessment	Screening methods and/or equipment/materials (V66)	28	68%
	Assessment methods and/or equipment/materials (V67)	28	68%
Intervention	Intervention methods and/or equipment/materials (V68)	25	60%
	Counselling methods (V69)	14	34%
	Time management (V71)	13	31%
Staff/team	Team members (more/fewer team members, different specialisation, assistants/interpreters) (V70)	27	65%
	Number and type of referrals from other professionals (V65)	28	68%
	In-service training in hospital or province (V73)	31	75%
Personal improvement	Resources (literature, communication with experts) (V72)	26	63%
	Continued professional development (CPD) (V74)	30	73%

a) Assessment

According to Table 4.2 the participants experienced a great need for audiometric screening equipment. Many participants wanted screening services or equipment to be expanded in their hospital, and this as is clear from their comments:

"We have no OAE or ABR screener."

"Audio screening is needed."

The results confirm those of Louw (2007:66, [b]) namely that few participants in her study had adequate equipment to conduct paediatric hearing screening and assessment in public hospitals.

Many participants wanted greater access to *assessment methods and instrumental assessments* in order to improve their neonatal communication and feeding intervention, as is evident from the following comment:

"Video-fluoroscopy would be very handy!"

Some participants indicated in Table 4.2 that tools and materials for neonatal communication assessments were required to improve their ECI services. A number of locally developed neonatal communication assessment instruments is available (refer to Table 2.5). They are, however, not widely used in the public health sector and therefore not by the participants. These instruments have not been described and published other than in research reports and dissertations, and may therefore not be known to early communication interventionists. This is clearly illustrated by the following comments:

"We only have an informal assessment form."

"I don't have an assessment tool for neonates."

b) Intervention

In Table 4.2 some participants listed that they required time management as a strategy to improve service delivery. This suggestion is related to large caseloads (refer to Figure 3.9) as well as administrative burdens typical of speech-language therapists and audiologists employed in the pubic health sector, and verifies Louw's findings (2007:60, [b]) as well. According to Lubinski (2008:543) speech-language therapists' large and demanding caseloads can lead to stress and a feeling of ineffectiveness. This is evident according to the following statement:

"Lack of time remains an obstacle."

According to Table 4.2 counselling methods were identified by 34% of participants as an aspect requiring improvement. The majority of participants performed counselling as part of the services rendered to parents (refer to Figure 4.3). Effective reciprocal communication is essential to rehabilitative counselling. Given the language and cultural barriers encountered, the use of professional and paraprofessional interpreters is essential during assessments and interventions (Rivers, 2000:67). However, the majority of the participants indicated that they work without the assistance of interpreters (see Figure 3.10). The following statement attests to this:

"Need interpreters to help with counselling."

The following section describes the improvements participants desired regarding their staff and team collaboration.

c) Staff collaboration and teamwork

According to Table 4.2 many participants desired more timely and appropriate referrals from other professionals in this context as indicated by their comments:

"Receiving limited referrals at present."

"Patients are often referred just before discharge for a 'quick fix'."

Medical staff (e.g. doctors and nurses) may be unfamiliar with ECI and uninformed regarding the availability of ECI services in the hospital. The fact that few participants attended ward rounds with team members (refer to Figure 4.3) could be viewed as a missed opportunity for promoting the role of the speech-language therapist.

As seen in Table 4.2, many participants indicated that they required more team members that had completed specialised training, as is clear from one participant's comment:

"We have no paediatricians – rely only on community service medical doctors – it would be nice to work with specialised doctors."

Most participants were employed at district or regional hospitals and also provided services at PHC clinics (refer to Figure 3.7), which possibly explains why the majority of the participants indicated that they worked with community service medical doctors in stead of specialists. As the most specialised neonatal care takes place in NICUs (Billeaud & Broussard, 2003:86) that are mainly located at tertiary or teaching hospitals, this finding could be expected.

A number of participants stipulated that they wanted to improve ECI services by having more speech-language therapists or audiologists in their department as is depicted in Table 4.2. As stated before, many participants were the only speech-language therapist/audiologist at their hospital (refer to Figure 3.9) resulting in large caseloads, which explains their comments:

"Need more SLT's [speech-language therapists] – I am not really coping with the caseload."

"Need audiologist."

Working with interpreters or assistants was mentioned as an area that participants would like to see:

"Need more good interpreters."

"Assistants and interpreters are needed as the bulk of our patients are Tswana-speaking."

The shortage of interpreters could possibly be due to limited funding in the South African public health sector. This confirms the findings of both Louw (2007:43, [b]) and Van Rooyen (2006:31) who reported that there appeared to be a shortage of trained, professional interpreters in certain provinces in the public health context. The absence of interpreters could influence ECI services negatively as language barriers have a significant impact on the relationship between the professional and the family (Madding, 2000:14).

d) Personal improvement

In Table 4.2 many participants indicated that they would like to develop professionally by attending more CPD activities. As discussed earlier, most participants were recently qualified (refer to Figure 3.4) and many were the only speech-language therapist or audiologist employed at their hospitals (refer to Figure 3.9). The limited support and guidance that they experienced created a need to acquire new knowledge and skills through CPD activities. The Health Professions Council of South Africa (2002) mandated that all speech-language therapists/audiologists participate in CPD to ensure that services are of a high standard, relevant, appropriate and up to date. However, CPD is costly and may not be as accessible in the public sector as in the private sector. This is clear from the following comments:

"Need funding for training."

"CPD should be easier accessible."

According to Table 4.2 many participants wanted to improve resources so as to enhance their ECI services in the neonatal nursery. Participants indicated that they required better access to recent literature as well as consultations with more experienced therapists:

"Would like access to journal articles."

"Communication with experts would be nice – not a lot of senior therapists within this province."

This again reflects the participants' inexperience and lack of support, although it does indicate that they are aware of the importance of evidence-based practice. According to Rossetti (2001:177), learning from other professionals providing services in the NICU is a valuable capacity-building exercise.

In conclusion, speech-language therapists' roles appear to be varied, complex and influenced by barriers in the environment. Some participants were inexperienced, which might have prevented them from performing some roles to the full. Participants provided ECI in a context that was characterised by many challenges and provided insightful suggestions to improve ECI service delivery locally.

4.2.2 Objective 2: To identify participants' needs in terms of neonatal communication intervention instruments/tools

Speech-language therapists' needs regarding assessment instruments or tools, intervention tools or materials for use with parents, staff and team members in neonatal nurseries were obtained from Sections C and D in the questionnaire. The 39 speech-language therapist participants' responses are described separately from the two audiologist participants. This is due to the fact that audiologists perform different roles in the neonatal nursery to speech-language therapists and would therefore require different materials or equipment.

4.2.2.1 Assessment instruments or tools

Figure 4.7 shows that, while some participants used tools and materials to conduct assessments, others did not. A clear need exists for assessment tools in the assessment areas of the *neonate's communication development*, *feeding*, *mother-child communication interaction* as well as the *neonatal nursery environment*. This need expressed by the participants indicates that they were aware of the importance of assessing a range of areas and using the results to

improve developmental care in their respective hospitals. According to Sutherland Cornett (2007:294) clinicians must adopt objective criteria for defining necessary services and provide a consistent clinical strategy for decision-making in order to render services that are evidence-based. It is best practice to utilise an appropriate instrument/tool for the assessment of the neonate's communication development and feeding. Many participants were hampered in following best practice guidelines due to the lack of assessment tools.

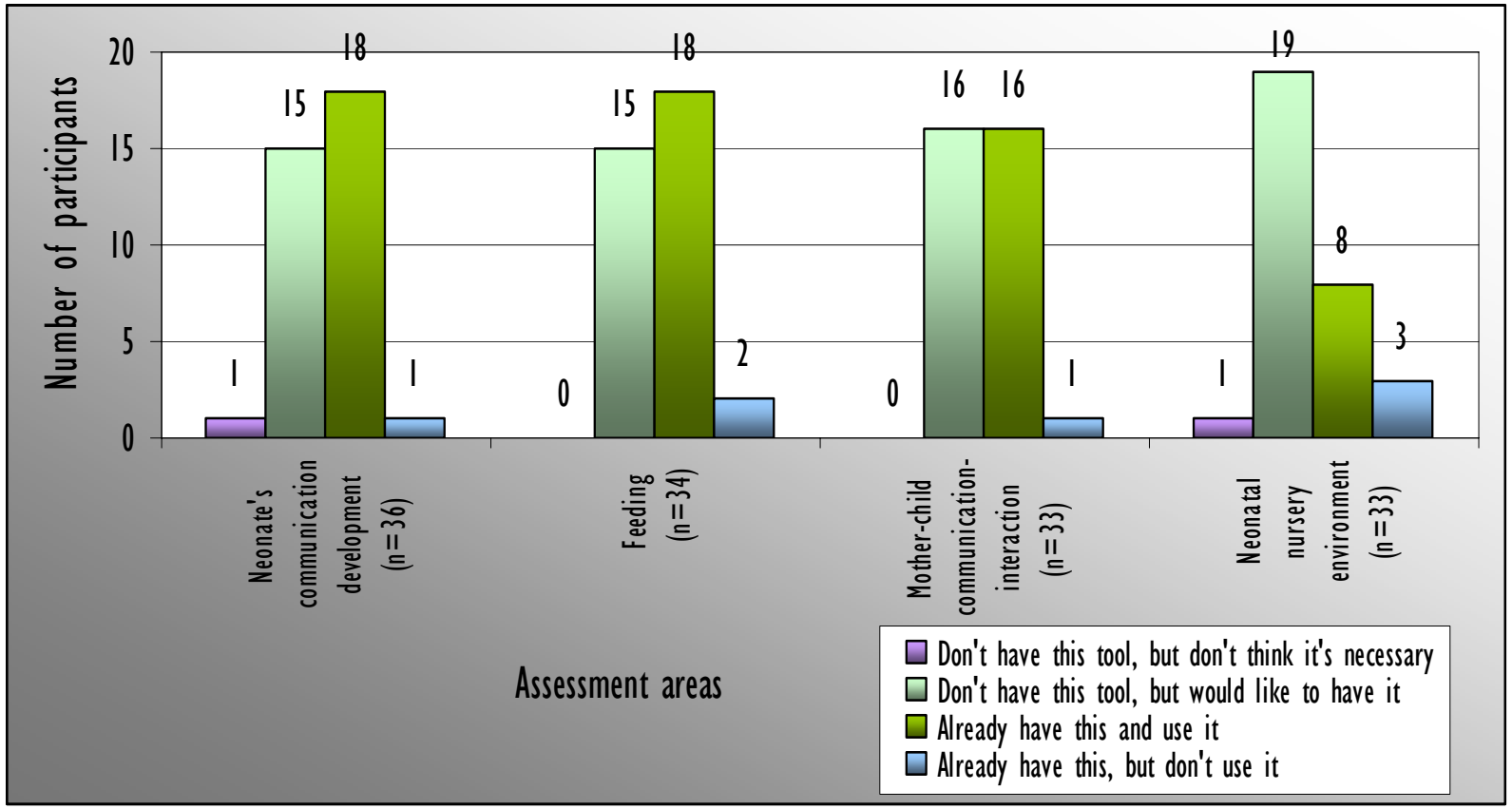

Figure 4.7: Needs regarding assessment instruments/tools (n = 39)

4.2.2.2 Intervention tools/materials for use with parents/caregivers

According to Figure 4.8 many participants used an instrument/tool or materials to provide parent guidance in the areas of *normal communication development*, *developmental milestones and follow-up services*, *KMC*, and *communication interaction with the infant*. Although a number of participants appeared to be well-equipped with resources for parent guidance, there appeared to be a need for instruments/tools in the above-mentioned areas for use in the neonatal nursery by some participants.

Figure 4.8 also indicates that many participants did not have any instruments/tools or materials to use for parent guidance in the areas of the *neonatal nursery environment*, *paediatric dysphagia and feeding therapy*, *over-stimulation and identifying infant's stress cues* and *developmental care,* which is indicative of another need. It is clear that participants cannot follow best practice if they do not have adequate instruments/tools and materials at their disposal.

The ultimate NICU-goal of facilitation and promotion of infant development is achieved by, among others, teaching parents to interpret infant behaviour and promoting parent-infant interaction (Merenstein & Gardner, 2002:234). The multilingual nature of the South African society and the high rate of illiteracy amongst South Africans make parent guidance a challenge. Trained interpreters are an invaluable asset, but most participants did not have trained interpreters at their disposal (refer to Figure 3.10). Tools or materials for parent guidance in provincial hospitals should therefore assist speech-language therapists who do not have access to trained interpreters.

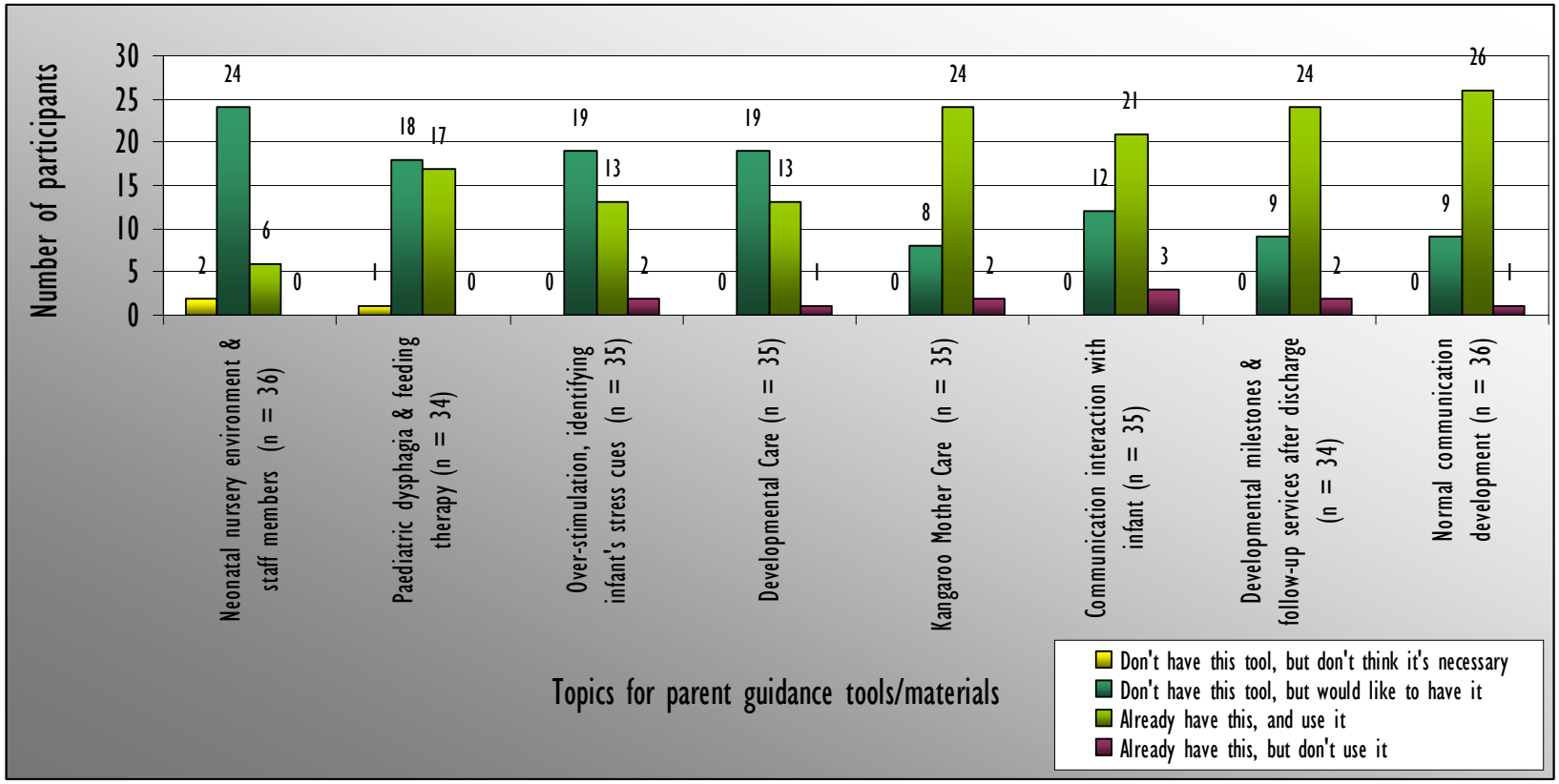

Figure 4.8 Needs regarding intervention tools/materials specifically focused on parents or caregivers (n = 39)

4.2.2.3 Intervention tools/materials for use with staff/team members

According to Figure 4.9 most participants expressed a need for in-service training tools/materials for staff and team members on *the role of the speech-language therapist in the neonatal nursery* as well as *developmental care*. Few participants expressed a need for tools in the areas of *KMC and ECI*, which could indicate that they had sufficient materials to perform staff/team training in these areas.

Speech-language therapists in this study appeared to be enthusiastic about staff/team training as seen in Table 4.2. Participants would have liked to perform more in-service training in the context of the neonatal nursery. According to Kraamwinkel and Louw (1998:46), an integral role of the speech-language therapist in the NICU is the training of staff members such as nursing staff, to move towards a transdisciplinary team approach. It is speculated that participants would possibly perform this function more frequently, and fulfil their role more effectively, if they had been equipped with the appropriate tools and materials to do so.

Figure 4.9: Needs regarding intervention tools/materials focused on staff/team members (n = 39)

4.2.2.4 Audiologists' needs regarding clinical instruments/tools for assessment and intervention

The two audiologists' needs for tools and materials are depicted in Table 4.3.

Table 4.3: Audiologists' needs in neonatal nursery (n = 2)

Area	Instrument/tool	Already have this	Do not have this	Unsure
Screening and assessment	Neonate's communication development (V82)	**Aud2**	**Aud1**	-
	Mother-child interaction (V83)	**Aud2**	-	-
Intervention directed at parents	Normal communication development (V84)	**Aud2**	**Aud1**	-
	NICU/NHCU environment and staff members (V85)	**Aud2**	-	**Aud1**
	Over-stimulation, identification of infant's stress behaviours (V90)	**Aud2**	-	-
	Developmental care (V91)	**Aud2**	-	**Aud1**
	Kangaroo mother care (V92)	**Aud2**	-	**Aud1**
	Communication interaction with the infant (V93)	-	**Aud1**	-
	Developmental milestones and follow-up services after discharge from hospital (V94)	-	**Aud1**	-
Intervention directed at staff/team	Developmental care (V100)	-	**Aud2**	**Aud1**
	Kangaroo mother care (V101)	**Aud2**	-	-
	Role of the speech-language therapist in neonatal care wards (V102)	**Aud1**	**Aud2**	-

Aud1 = Audiologist 1

Aud2 = Audiologist 2

Table 4.3 indicates that only one of the two audiologists was equipped to perform hearing screening, assessments and some aspects of parent guidance in the neonatal nursery. This confirms findings by Theunissen and Swanepoel (2008) who found that only 34% of participating government health care institutions had at least one piece of hearing screening equipment.

According to the *Joint Committee on Infant Hearing (JCIH) Year 2007 Position Statement,* the success of early hearing detection and intervention programmes depends on professionals working in partnership with parents as a well-coordinated team (JCIH, 2007:9). Roush (1991:49) states that the audiologist's traditional role has focused primarily on the technical aspects of hearing measurement and amplification but also includes inter- and transdisciplinary

aspects of early intervention. It appears that services provided by audiologists in neonatal nurseries would be enhanced by the availability of more comprehensive tools for parent guidance and staff/team training.

4.2.2.5 General perceptions regarding instruments/tools

The following information was obtained from open questions C2 and C3 in the questionnaire regarding all 41 participants' perceptions of culturally appropriate instruments/tools and user-friendly instruments/tools.

a) Perceptions of culturally appropriate instruments/tools

Some participants expressed a need for culturally appropriate tools for use in the neonatal nursery, specifically for parent guidance, as is evident from their comments:

> "We need culturally appropriate tools. Most of the tools are British/American and so are not always appropriate for the SA context."
>
> "It would be helpful to have an assessment and intervention tool that is culturally appropriate and sensitive for patients that do not share the Western culture."
>
> "Huge need for educational materials for parents to inform them and assist them with decision-making, also to make them aware of their rights."

This view is verified by Louw's results (2007:62 [b]) who found that most of her participants required culturally appropriate materials for ECI. According to an asset-based approach, the cultural richness of the South African population could enhance early communication intervention services and could be achieved

by compiling culturally appropriate parent guidance tools for use in the neonatal nursery.

Some participants indicated that they had developed and adapted culturally appropriate tools themselves to improve their services in the neonatal nursery, as is clear from their comments:

"I have had to develop my own assessment tool based on a journal article I read."

"We have quite a few adapted tools which work well."

According to Louw (2007:51 [b]) respondents in her study adapted published programmes and developed language assessment protocols in different languages for use in their respective contexts, which confirms the above results. The participants were creative, enthusiastic and determined to provide services in a challenging environment. However, the development and adaptation of the tools were not research-based and their validity and reliability are as yet unproven, which means that evidence-based practice is not followed.

Participants also commented that a need exists for tools in other languages:

"We don't have any culturally appropriate materials and find it very difficult to work with patients that don't understand English or Afrikaans."

"Not only should they be culturally relevant but also translated, or useful across languages."

Multilingualism in South Africa is a barrier to ECI service delivery (Louw et al., 2006:47), which as mentioned earlier, may be overcome by the use of trained interpreters. As mentioned previously, most participants did not have access to trained interpreters. This suggests that participants may have relied on

tools/materials to assist them to provide linguistically sensitive services in the neonatal nursery.

ECI services are required to be family-centred, as well as culturally and linguistically responsive (ASHA, 2008:2 [a]). Neonatal communication intervention services therefore cannot be effective without culturally appropriate tools. An urgent need for culturally appropriate materials for use in the neonatal nurseries of provincial hospitals was identified. Participants were aware of the importance of providing culturally sensitive services, but were hampered by the dearth of tools and materials that could be utilised in clinical practice.

b) Perceptions of user-friendly instruments/tools

The following comments were elicited in response to the open question C3 on the user-friendliness of instruments and tools. Many participants' comments suggested that user-friendly instruments were needed as they were utilising self-developed tools:

"Very much needed! At the moment our hospital is using a self-developed, screening tool that is adapted from text books…"

"There is a lack of assessment sheets specifically created for this environment, so I find myself creating my own."

"An intervention tool is specifically needed especially to address SSB-problems [suck-swallow-breathe-problems] in infants…"

Some participants commented that user-friendly instruments/tools would improve their effectiveness as they had large caseloads:

"We don't have any user-friendly instruments or materials or tools. It would be nice to have a quick/easy assessment tool – because there are many babies in the mentioned wards."

"User-friendly tools help to save time so we can provide a better service to all referrals."

The need for research-based, user-friendly instruments/tools for use by speech-language therapists in neonatal nurseries is evident.

4.2.3 Conclusion of Phase 1

Phase one of the research demonstrated that participants performed different roles in neonatal nurseries, which were determined by the environment, tools, materials and instrumentation available to them. Although many participants were relatively inexperienced, they were resourceful in their attempts to develop and adapt tools and materials. The fact that these self-developed and adapted tools are not published, compromises the quality of services and precludes best practice. The participants expressed a need for culturally appropriate and user-friendly instruments specifically for parent guidance and staff/team training. These descriptive findings justify the compilation and development of a locally relevant instrument/tool for use in public hospitals' neonatal nurseries.

4.3 RESULTS OF PHASE 2

The results of Phase 2 describe the selection, justification and compilation of a tool based on the results of Phase 1. Phase 2 is described according to the sub-aims formulated in Chapter 3.

4.3.1 Objective 3: To select and justify a specific need of the participants in terms of neonatal communication intervention instruments/tools in the public hospital context

The selection of a need was based upon the responses obtained from the 39 speech-language therapist participants in Phase 1 as well as current literature in the field. The two audiologist participants' opinions were excluded from the selection of the need from which an instrument/tool was compiled due to their limited numbers and as their roles in the neonatal nursery differed from the roles of the speech-language therapists.

4.3.1.1 Justification of the selection of a specific need: speech-language therapists' needs and their roles

An overview of the needs of the speech-language therapists as determined in Phase 1 (see Figures 4.7, 4.8 and 4.9) was compiled in Table 4.4 to justify the selection of a specific need.

Table 4.4: Speech-language therapists' needs (n = 39)

Need		Number of responses (n = 39)	Number that indicated need	%	Hierarchy 1 - 14
Assessment tools	Neonate's communication development	36	15	41.6	9
	Feeding	34	15	44.1	8
	Mother-child communication interaction	33	16	48.4	7
	Neonatal nursery environment	33	19	57.5	3
Parent guidance tools	Neonatal nursery environment and staff	36	24	66.6	1
	Paediatric dysphagia and feeding therapy	34	18	52.9	5
	Over-stimulation, identifying infant's stress cues	35	19	54.2	4
	Developmental care	35	19	54.2	4
	Kangaroo mother care	35	8	22.8	14
	Communication interaction with infant	35	12	34.2	11
	Developmental milestones & follow-up after discharge	34	9	26.4	12
	Normal communication development	36	9	25.0	13
Staff/team training tools	Developmental care	36	23	63.8	2
	KMC & ECI	35	13	37.1	10
	Role of the SLT in the neonatal nursery	36	19	52.7	6

The five needs that were indicated most frequently by the speech-language therapist participants are highlighted in Table 4.4, namely *tools for parent guidance* on four topics, a *tool for staff and team training* on one topic and an *assessment tool* on one topic. An overview of the speech-language therapist participants' roles (refer to Figure 4.7, 4.8 and 4.9) was compiled in Table 4.5 in order to justify the selection of a specific need

Table 4.5: Speech-language therapists' roles (n = 39)

Need		%	Hierarchy 1 - 14
Assessment	Hearing	20	10
	Mother-infant communication interaction	79	3
	Communication development	74	4
	Swallowing disorders using video-fluoroscopy	5	11
	Feeding and oral sensori-motor function	84	1
Intervention directed at infant and parents	Counselling and support	82	2
	Informing parents of infant's condition, progress & future expectations	71	5
	Discharge planning, planning follow-up treatment programmes	56	8
	Encourage/promote KMC	58	7
	Apply developmental care	64	6
	Intervention for feeding & prevention of communication delays through parent guidance	82	2
	Intervention for feeding i.t.o. direct treatment of infant	82	2
Intervention directed at staff/team members	In-service training & guidance of staff/team	64	6
	Attendance of ward rounds with other professions	28	9
	Consultation with other professions in multi- or transdisciplinary team	74	4

The five most frequent roles performed are highlighted in the Table 4.5, namely *intervention for feeding and prevention of communication delays through parent guidance, counselling and support* and *informing parents of infant's condition, progress and future expectations.* Three of these five most frequent roles were roles directed at parents/caregivers, which provides a strong indication for the selection of a tool aimed at parents/caregivers.

The analysis and interpretation of the data revealed needs for tools or materials in all of the following areas: assessment/screening, instruments/tools for parent guidance and instruments/tools for staff/team members. The data revealed that there were a variety of topics that the participants preferred for inclusion in a tool or materials.

The need regarding *parent guidance* with the topic of *developmental care* was selected as the tool to be compiled as this was a need indicated by the majority

of the speech-language therapist participants and most participants were also involved in services directed at parents/caregivers in the neonatal nursery. The selection is further justified by current literature on the topic.

4.3.1.2 Justification of the selection of a specific need: current literature

Literature shows that the neonatal nursery environment has a negative effect on the premature infant's development. The NICU is an environment of sensory bombardment with constant noise and light, upset sleep-wake cycles, multiple caregivers and intrusive or invasive procedures, which leads to long-term physiological instability and poor developmental outcomes (Merenstein & Gardner, 2002:233). This environment interferes with an infant's ability to interact with the environment in a normal manner, which could be a potential source of a communication development delay (Rossetti, 2001:1).

Individualised developmental care includes fostering neurobehavioural and physiological organisation of the infant's systems to promote parent-infant attachment (VandenBerg, 2007:438). Developmental care should be consistently carried out by all health professionals during all care-giving across shifts to support the infant and attachment with the parents (VandenBerg, 2007:438). Involving families from an early stage in the developmental care of their premature infant can greatly assist in the attachment process and consequently reduce parental stress (Wyly, 1995:213).

KMC is another intervention that is beneficial to the attachment process. It is specialised care-giving intervention provided by nursing staff. KMC is a developmental care practice and a form of tactile-kinesthetic stimulation through skin to skin contact between the parent and infant (Rossetti, 2001:182).

Communication intervention is a specialised intervention provided by speech-language therapists and audiologists and a component of developmental care. According to Rossetti (2001:275) parents in the NICU require information and

assistance in attaching to their child. Lack of proper attachment between the parent and the infant has long-term implications for children's cognitive and social development (Rossetti, 2001:270). A predictable and responsive environment enables an infant to progress to varied types of communication (not only crying), while inconsistent cues from caregivers distress infants (Merenstein & Gardner, 2002:236).

As previously mentioned in the discussion of the results of Phase 1, most participants were satisfied with their tools and materials on the topics of communication intervention as well as those who performed KMC. They indicated a preferred need for tools/materials to facilitate implementation of a comprehensive developmental care programme in the neonatal nursery.

Rakau (2005:40) studied mothers' needs in an NICU of a public hospital in South Africa and found that most mothers were unaware of the impact of the NICU's high noise levels on their infants' hearing. According to Popich et al. (2007:68) limited parental knowledge regarding risk factors may result in an increased risk for communication disorders. Parents should therefore be empowered with knowledge and information in order to prevent communication delays (Popich et al., 2007:68).

The majority of mothers in Rakau's study expressed a need for further information on their infants' medical and developmental needs and were concerned about future expectations of their infants (Rakau, 2005:41). According to Merenstein and Gardner (2002:238) parents, with the support from professionals, are the ideal planners and providers of developmentally appropriate intervention strategies.

Based on the local need identified by Rakau (2005:42), a tool for parent guidance on the topic of developmental care was developed for use in local neonatal nurseries. Rakau (2005:42) recommended the provision of culturally

appropriate educational and counselling opportunities to families in the neonatal nursery, in order for them to express their needs openly in a non-judgmental arena. However, there is a shortage of published neonatal communication intervention tools/materials aimed at parents in the South African context (refer to Table 2.6). The compilation of tools/materials directed at parents on the topic of developmental care is therefore justified.

Parent education and guidance is challenging for most speech-language therapists due to the multilingual nature of the South African population. The use of trained interpreters is the ideal, but the majority of the participants in this study reported that they did not have these services at their disposal (see Figure 3.10). Having tools/materials to rely on for parent guidance in ECI for use in public hospitals is an alternative for overcoming the barrier of a lack of interpreters.

During Phase 1 it was also established that many participants were relatively inexperienced and in most cases working without the guidance of a senior therapist. Locally relevant neonatal communication intervention tools or materials aimed at parents/caregivers in the neonatal nursery will guide such inexperienced therapists.

Furthermore, it appeared that many participants compiled their own instruments/tools, but that these self-developed tools were not research-based and therefore the recommended best practice was not followed. A research-based neonatal communication intervention tool or materials for parents/caregivers may help to overcome this challenge and address the participants' need for locally relevant tools/materials for the neonatal nursery.

4.3.2 Objective 4: To compile a preliminary instrument/tool based on the selection of one of the perceived needs of the participants

The compilation of the tool, namely a programme, titled ***"Neonatal communication intervention programme for parents"*** (see Appendix G) is described according to it's aim, considerations for the training of adult learners, the structure and content, format and procedures.

4.3.2.1 Aim of the *Neonatal communication intervention programme for parents*

The aim of the programme is to provide speech-language therapists in local public hospitals with a programme to educate and guide parents/caregivers of infants in the neonatal nursery including the NICU, the neonatal high care and the KMC ward, regarding developmental care and the appropriate interaction and stimulation of their infants.

4.3.2.2 Considerations for the training of adult learners

Parents must be well informed and educated if they are to fulfil a central role in the early identification and prevention of communication disorders, as not all parents are equally equipped to facilitate optimal communication development (Popich et al., 2007:68). Malcolm Knowles introduced the term "andragogy" defining it as the 'art and science of helping adults learn'. Knowles derived principles of andragogy, which are utilised as guidelines to teach adult learners who are independent and self-directed (Kaufman, 2003:213). The concept of adult learning was considered in the compilation of the *"Neonatal communication intervention programme for parents"* to ensure that the programme could successfully be used for adult education with parents and caregivers at local public hospitals. The following adult-learning principles were applied from Kaufman (2003), Parson (2001), Popich et al. (2007) and Popich (2003):

- ***Safe and supportive environment:*** Adult learners need support and constructive feedback from teachers and peers to practice newly-learned skills (Kaufman, 2003:215). A safe environment, where every person is respected encourages them to express their ideas freely and therefore more active learning is facilitated (Parson, 2001:30). A "warm-up" activity was incorporated into the introduction section of the programme, as this establishes rapport between the speech-language therapist presenting the programme and the parents/caregivers receiving the training. It also allowed for social contact between the parents/caregivers in order to encourage the sharing of opinions and asking of questions. The parents' trauma of giving birth to preterm infants was considered during the compilation of the programme as this could have affected their learning. According to Rakau (2005:40) mothers of infants in the NICU suffer significant symptoms of depression while their infants are hospitalised. This may influence the mothers' enthusiasm to participate in a training programme. The programme attempted to accommodate mothers who experienced emotional trauma.

- ***Real-life situations:*** Problems and examples that are used in training need to be realistic as the adult must closely relate to understanding and solving real life problems (Kaufman, 2003:215). Photos and images of infants of various races were utilised to depict real situations in a similar setting (e.g. the NICU) to that of the infants of the parents/caregivers in the programme. This ensured that the programme is culturally appropriate and that the parents could identify with the situations depicted in the photos and images (Popich et al., 2007:76).

- ***Recognise prior knowledge:*** The adult learner's current knowledge and experience should be taken into account as it is a rich resource for learning (Kaufman, 2003:215). It was important to consider that while some parents/caregivers may have prior education or training, many

South Africans have limited literacy skills (Fair & Louw, 1999:14; Louw & Avenant, 2002:149). All parents/caregivers were accommodated in the programme by using clear language and terminology as well as images and photos, to augment the written word in the presentation and to explain scientific concepts in the clearest way possible. The handout was also made available to distribute to parents/caregivers in both English and IsiZulu, regardless of their literacy level. By sharing knowledge more effectively in different ways may empower families (Louw et al., 2006:53). Providing parents with information in their home language addresses, to an extent, their feelings of incompetence and lack of knowledge (Louw & Avenant, 2002:147).

- ***Reflection:*** To reinforce the message, important information needs to be highlighted through the use of repetition (Popich et al., 2007:76). Adult learners should be given with time to reflect on their learning in order to reinforce positive behaviours and discourage negative behaviours (Kaufman, 2003:215; Popich, 2003:45). The programme provided time for reflection and feedback during the conclusion. This will encourage the parents/caregivers to comment on their learning and to pose questions to the speech-language therapist providing the training.

4.3.2.3 Procedures followed in the compilation of the "*Neonatal communication intervention programme for parents"*

The following procedures were followed in compiling the programme:

- Participants' perceptions of their roles and needs in the neonatal nursery were used to inform the selection of an instrument/tool.
- *Parent guidance* tools/materials on the topic of *developmental care* were selected and justified based on the results of Phase 1 as well as on current literature on the topic.

- The researcher formulated an aim and outcomes for the programme (Popich, 2003:31).
- Issues relating to adult training and education were studied before compiling the programme.
- Informal terminology was used to make the language more accessible to the parents/caregivers. The term 'baby' is used in the programme instead of 'infant' as this is the term most commonly used by South African parents in conversation (Popich, 2003:39).
- The structure and sequence of the programme was conceptualised and is illustrated in Figure 4.15. The researcher structured a warm-up activity in the first section of the programme as part of the introduction. Time for reflection and questions was planned for the closure of the programme. This structure ensured that the principles of adult learning were applied throughout the programme discussed previously.
- The researcher selected a format for the programme. It was decided that the programme should consist of a Microsoft PowerPoint™ presentation and a handout for the parents. The Microsoft PowerPoint™ presentation was provided in two different formats as it allows each speech-language therapist to select a method that is conducive to his/her working environment. Some speech-language therapists in public hospitals have limited technical resources and therefore the Microsoft PowerPoint™ presentation was provided on a compact disc as well as transparencies.
- Subsequent to an in-depth review of current ECI literature, the researcher decided on the themes of the programme, which are illustrated in Table 4.16.
- The complete programme was compiled thereafter and is contained in Appendix G [i].
- The Microsoft PowerPoint™ presentation was designed by the researcher and copied onto a compact disc and transparencies (see Appendix G [ii]). As there is limited technology in some public healthcare facilities, it will be useful to have a choice between the programme's two formats. Therefore

each speech-language therapist can select the appropriate format that suits his/her needs.

- The handout was designed by the researcher. It is contained in Appendix G [iii]. Handouts were provided to parents during the programme to generalise and reinforce the newly learnt information as well as to actively involve each parent during the presentation.
- The programme was proof-read by an independent speech-language therapist and an occupational therapist that provide early intervention services in an NICU of a private hospital in Pretoria. Comments from the therapists were used to refine the content, terminology and format of the programme.
- The content of the handout was translated from English to IsiZulu by a private translation service appointed by the researcher.
- The programme was pre-tested in a pilot study as illustrated in Table 4.17 to determine its clinical applicability and assist the researcher in refining the programme.
- The programme is also available on compact disc in the sleeve at the back of the dissertation.

4.3.2.4 Sequence and content of the "*Neonatal communication intervention programme for parents*"

The programme is divided into four sections, which include an introduction with "warm-up time" and definitions, information on the behaviours of the neonate, information on how parent should respond to these behaviours and a conclusion that informs parents of options for follow-up services and provides time for reflection and questions. The sequence and content of the programme is schematically represented in Figure 4.10.

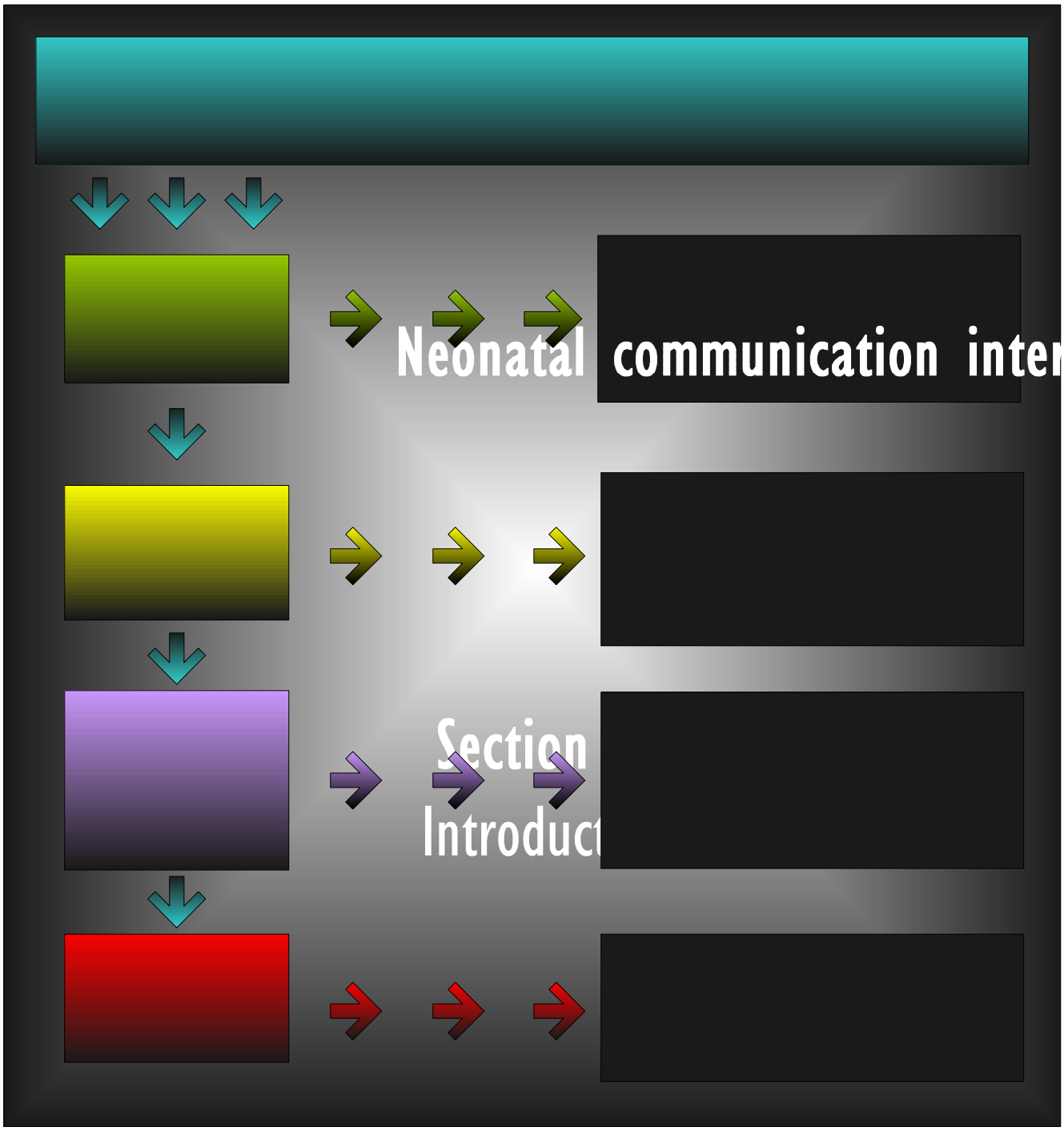

Figure 4.10: Schematic representation of the content of the programme

The content of the programme is described according to the themes and the justification thereof in Table 4.6.

Table 4.6: Themes included in the programme

Topic/theme	Rationale	References
Prematurity and low birthweight	Prematurity and low birthweight are risk factors for a developmental delay and more specifically a communication development delay.	Rossetti (2001) Lubbe (2008) Van Jaarsveld (2004) Wyly (1995)
Infant's senses (tactile, auditory, visual, vestibular, proprioceptive)	Infant's sensory capabilities are the basis for communication development. Therefore it is important to educate parents about the neonate's auditory, visual, tactile, proprioceptive and vestibular systems so that they can respond appropriately to the neonate. Facilitating adaptive parenting helps to overcome difficulties with attachment.	Kritzinger & Louw (2003) Lubbe (2008) Merenstein & Gardner (2002) McInroy & Kritzinger (2005)
Developmental care (general awareness)	Developmental care has demonstrated decreased hospital time, decreased medical complications and increased motor and behavioural scores on assessments for infants treated with developmental care when compared with a control group. General awareness by parents reduces the stressful impact of the neonatal nursery environment on neonate and family and is therefore an important aspect to include in guidance about communication development. Sensory input must be appropriate and individualised to the infant's physiological and neurobehavioural tolerance.	Goldberg-Hamblin et al. (2007) Lubbe (2008) McInroy & Kritzinger (2005) Rossetti (2001) VandenBerg (2007)
Stress behaviour	Stress behaviour or signals are the neonate's body language that is used to communicate that he/she cannot cope with the environment. The infant indicates that he/she needs a "time-out" from stimulation using stress behaviour or signals. Attention to the infant's thresholds for input is essential as care-giving must be infant-centred and not caregiver-centred.	Lubbe (2008) Rossetti (2001) Van Jaarsveld (2004) Wyly (1995) VandenBerg (2007)
Self-regulating behaviour	Self-regulating behaviour assists the infant in calming him- or herself in order to recover from stressful stimuli. Teaching parents about infant cues and how to support the infant during stressful events can help parents appreciate the unique personality of their infant. Kangaroo mother care is included as an appropriate calming technique.	Lubbe (2008) McGrath (2008) Wyly (1995) VandenBerg (2007)

Table 4.6: Themes included in the programme (continued)

Topic/theme	Rationale	References
Noise in the nursery	The NICU environment is filled with atypical high-frequency sound, putting the premature infant at risk for a noise-induced hearing loss. Noise can be an environmental stressor in the neonatal nursery and can lead to physiological instability in the neonate. Premature infants exposed to constant high levels of background noise may have difficulty to discriminate speech in background noise, which leads to disrupted auditory learning.	Kellam & Bhatia (2008) Lubbe (2008) Merenstein & Gardner (2002) Rossetti (2001) Wyly (1995) VandenBerg (2007)
Light in the nursery	Bright light can be an environmental stressor in the neonatal nursery and can lead to physiological instability in the neonate. Infants born prematurely are at risk for visual problems and the harshly lit NICU environment can contribute to this. Reduced illumination increases the infant's stability, reduces the heart rate, blood pressure, respiration rate and motor activity.	Fielder & Moseley (2000) Lubbe (2008) Merenstein & Gardner (2002) Rossetti (2001) Wyly (1995) VandenBerg (2007)
Physical handling of the infant in the nursery	Infant reactions to being touched may yield a series of startles and limb extensions, followed by flailing, arching and uncontrollable squirming, which leads to energy expenditure. Incorrect or excessive handling and invasive procedures can cause long-term physiological instability and over-stimulation in the infant, and affects the infant's sleep-wake cycle.	Lubbe (2008) Merenstein & Gardner (2002) Rossetti (2001) Wyly (1995) VandenBerg (2007)
Adaptations in the nursery to reduce stimuli (noise & light reduction, clustered care)	Environmental factors can be additional risk factors for a developmental delay and should be closely monitored. Excessive noise, light, handling and movement can be overwhelming, which influences the neonate's growth and development. A key element of NIDCAP is the creation of a calm NICU environment with adjustable low levels of light, minimal or low levels of sound and a calm ambience.	Lubbe (2008) McGrath (2008) Rossetti (2001) Wyly (1995) VandenBerg (2007)
Kangaroo mother care	KMC is tolerated well by preterm infants with current and resolving illness. KMC improves temperature, saturation and interaction-attachment between mother and infant. KMC reduces the harmful effect of the environment on the neonate and is an effective way of providing developmental care in South Africa.	Kritzinger & Louw (1999) Lubbe (2008) Merenstein & Gardner (2002) Payne (2000) Rossetti (2001) Van Jaarsveld (2004) Van Rooyen et al. (2002)

Table 4.6: Themes included in the programme (continued)

Topic/theme	Rationale	References
Positioning	Premature infants who are positioned in supine for long periods of time without support can develop shoulder retraction and neck extension, reducing midline orientation. Correct positioning with blanket rolls, padding or loose swaddling facilitates flexor tone and has an organising effect, which decreases stress and enhances comfort.	Goldberg-Hamblin et al. (2007) Hunter (2004) Lubbe (2008) Merenstein & Gardner (2002) Rossetti (2001) Wyly (1995)
Calming techniques (e.g. swaddling, containment)	Calming techniques assist neonates to become more stable and prevent disorganisation, so that the neonate's energy can be used to grow. Body containment and a flexion position increases the infant's feeling of security and enhances physiological stability.	Goldberg-Hamblin et al. (2007) Lubbe (2008) Merenstein & Gardner (2002) Wyly (1995)
Communication stimulation	A newborn infant is able to communicate with his/her parent using body language and eye contact. Communication stimulation within a developmentally supportive approach can elicit positive behavioural responses. A primary goal of developmental care is to foster a positive parent-infant relationship. Responsive interaction prevents over stimulation as the parent acts upon the infant's cues and therefore provides developmentally appropriate input.	Lubbe (2008) McInroy & Kritzinger (2005) Merenstein & Gardner (2002) Rossetti (2001) VandenBerg (2007)
Feeding	Feeding of a premature infant creates a context for communication stimulation and therefore it is included in the parent education. Parents need education and encouragement to successfully support their infant during oral feedings.	Lubbe (2008) McGrath (2007) McGrath (2004)
Follow-up services (general awareness)	Follow-up services are limited in the South African context due to patients' limited finances and problems with transport. Parents need to understand what to expect from their child, the importance of serial developmental assessments and how community health care can support their child's development.	Fair & Louw (1999) Lubbe (2008) McInroy & Kritzinger (2005) Van Rooyen (2006)

4.3.2.5 Format of the "*Neonatal communication intervention programme for parents"*

The programme consisted of two components: a Microsoft Powerpoint™ presentation and a handout. According to Louw and Avenant (2002:150) graphic materials such as home programmes should be used during intervention with families in South Africa so as to be culturally sensitive.

English is recognised as the language of science and commerce in South Africa (Population Census Key Results, 2001) and therefore the content of the handout was compiled in English. Most speech-language therapists are proficient in English and so it was appropriate that the programme was available to them in English. The information in the handout was also translated into IsiZulu to address language barriers. IsiZulu was selected as it is the home language of almost a quarter of South Africans (Population Census Key Results, 2001). IsiZulu is the language most spoken in South Africa and is understood by over 50% of the population (Population Census Key Results, 2001). According to Louw and Avenant (2002:147) an interventionist can empower parents and caregivers by providing them with information in their home language. The programme can be used widely by providing the information in IsiZulu.

The programme was compiled to be a user-friendly tool. The decision was therefore taken not to include references in the text so as not to intimidate parents and speech-language therapists. The complete list of references is provided at the end of the programme and attests to the theoretical underpinnings (Popich, 2003:37).

- ***Microsoft PowerPoint™ presentation:*** According to Rakau (2005:35) participants in her study preferred receiving information in a verbal rather than written format. Therefore a Microsoft PowerPoint™ presentation was compiled of the complete programme and copied onto a compact disc. This allows speech-language therapists in well-equipped institutions to

present the programme orally in a professional manner. However, this could limit the use of the programme, as it only provides for speech-language therapists who have access to technology such as data-projectors and computers. Therefore the Microsoft PowerPoint™ presentation was also provided on transparencies (one slide per transparency), in order to accommodate speech-language therapists with overhead projectors at their disposal (see Appendix G [ii]). Transparencies are useful visual aids in working with a group of parents, but common errors such as having too many transparencies, small print, removing them too quickly or placing them crookedly should be avoided (Curran, 1989:91). These aspects were taken into consideration during the development of the Microsoft PowerPoint™ presentation.

- ***Handout:*** The programme also includes a handout for the parents (see Appendix G [iii]). The handout is a summary of the complete programme and included photos and images to manage literacy barriers. The handout illustrates important information in the programme with images, photos and key terminology. Visual sources such as pictorial depictions can be used to manage language barriers (Louw, et al., 2006:53). The handouts were available in English or IsiZulu. It contained checklists complimented by photographs depicting key concepts and neonatal behaviours for the parents to complete during the presentation, which contributed to the interactive nature of the presentation. Speech-language therapists were advised to provide each parent with a handout, regardless of their literacy level (Kritzinger, 2007). The handout contained many images and photos depicting new concepts so as to aid parents with different levels of literacy. It was also important to show respect to each parent in the group by not discriminating on the basis of their literacy level.

4.3.3 Objective 5: To pre-test the "*Neonatal communication intervention programme for parents*"

The programme was pre-tested using a pilot study, which is described in Table 4.7.

Table 4.7: Pilot study of the programme

<table>
<tr><th>Aims</th><th>Participants</th><th>Materials</th><th>Procedures</th></tr>
<tr>
<td>1. To determine whether the proposed programme is useful and complies with its aim.

2. To determine whether the terminology and language usage are clear and unambiguous for parents/caregivers.

3. To determine the whether the programme's format and presentation are user-friendly, applicable and of a good quality.

4. To determine the quality of the programme's content.

5. To determine which improvements should be made.</td>
<td>The programme was presented at a regional hospital by three speech-language therapist participants who provided ECI in the NICU, neonatal high care and KMC wards. The speech-language therapists at a regional hospital that participated in Phase 1, was contacted telephonically to conduct the pilot study. The speech-language therapy department at this hospital was presented with the programme. The department assigned three speech-language therapists, who were unknown to the researcher, to conduct the programme. Two of these participants graduated from a university in Gauteng and one participant graduated from a university in the Western Cape. The participants had the following experience and qualifications:
<table>
<tr><th>Participant</th><th>Years experience</th><th>Highest qualification</th></tr>
<tr><td>1</td><td>< 3 years</td><td>Bachelor degree</td></tr>
<tr><td>2</td><td>< 2 years</td><td>Bachelor degree</td></tr>
<tr><td>3</td><td>< 1 year</td><td>Bachelor degree</td></tr>
</table>
The programme was presented to two mothers in the KMC ward of the hospital. The participants had the assistance of a staff member as an informal interpreter during the presentation. A laptop computer was available for their use at their institution.</td>
<td>Permission to involve the participants in the research was previously obtained from the provincial departments of health (Appendix A). Participants were provided with a cover letter (Appendix H), the programme (Appendix G), as well as a questionnaire (Appendix H).</td>
<td>• The aim of this phase of the study was explained verbally and in written format.

• The participants were provided with the programme, as well as a cover letter and questionnaire, and were given enough time to study it and use it.

• The participants were requested to provide feedback on the programme by completing the questionnaires and providing comments in the spaces provided.

• The participants sent back the questionnaires with their feedback on the programme.</td>
</tr>
</table>

Table 4.7: Pilot study of the programme (continued)

Results	
1. Aim	The aim of the programme was achieved, namely to provide speech-language therapists in local public hospitals with a tool to educate and guide parents/caregivers of infants in the neonatal nursery on developmental care, early communication interaction and appropriate stimulation. The following comment attests to this: "The moms enjoyed the training and asked questions."
2.Terminology and language	The programme's language and terminology was found to be inappropriate as seen from the comments: "Language in the programme is not appropriate, especially for moms in the government sector." "Would be very difficult to explain the terminology without an interpreter." Supporting the home culture and home language must be the cornerstone of programs that serve infants and toddlers (Madding, 2000:17). The programme's language and terminology therefore requires further refinement in order to be sensitive to the families served.
3. Format	The Microsoft PowerPoint™ presentation of the programme was judged to be good. Participants felt that the programme's different formats were probably useful in assisting with service provision in the neonatal nursery. However, a comment that was provided under the same heading contradicts this finding, as can be seen in the following: "The powerpoint was unnecessary. The slides did not fully correlate with the handouts and was therefore confusing."
4. Content	The content of the programme was viewed to be *adequate* and was *probably useful* in assisting with service provision in the neonatal nursery. Comment regarding the length of the programme was made: "Programme is too long. We conducted it in two sessions. Each session lasted 40 minutes and had to be before/between moms' feeding times. Due to time constraints it would be difficult to conduct such a detailed programme on a weekly basis."

Table 4.7: Pilot study of the programme (continued)

Results	
4. Content (continued)	This finding corresponds with the information obtained in Phase 1 that most participants have time constraints impeding their services in the neonatal nursery. The participants commented on the content pertaining to the infant's capabilities (vision, hearing, tactile, vestibular, proprioceptive). The participants were not sure how and infant's vision may be influenced by oxygen provided in the neonatal nursery, as is evident from the comment: "How does oxygen affect infant's eyesight? Perhaps if the infant is on phototherapy, but even then, the infant's eyes are always covered." This comment could be explained by the participants' limited knowledge about retinopathy of prematurity (ROP) and the negative effect it may have on an infant's vision. ROP is caused by abnormal growth of the blood vessels supplying the retina, which is usually due to an elevated oxygen saturation level for a sustained period of time (Harrison, 2002; Lubbe, 2008:202). According to Lubbe (2008:202) ROP results in poor vision and occurs more frequently in very low birthweight infants admitted to NICUs without oxygen protocols. The participants also commented that: "Not all speech therapists have training in neurodevelopmental care or even paediatrics, therefore would be unfamiliar with the terms used in the programme. Hence a strong need for terms to be defined in an accompanying glossary." This comment confirms Rossetti's statement (2001:175) that a professional requires specialised knowledge to provide services in the NICU. However, ECI has now been included in all training institutions' undergraduate programmes in speech-language therapy (Kritzinger & Louw, 2003:5), which implies that terminology used in the programme should not be unfamiliar to any speech-language therapist. The source of this comment may be found in the participants' limited exposure to the specialised field of neonatal communication intervention. This finding corresponds with the results from Phase 1, which indicated that many participants in the public health sector have limited experience affecting the quality of the services they provide in the neonatal nursery.

Table 4.7: Pilot study of the programme (continued)

Results	
5. Improvements	Participants provided comments on possible improvements that included the use of demonstration: "We used a lot of demonstration. This was of great benefit to the moms and should be considered when using the programme." The use of demonstrations or modelling is essential and makes it easier for parents to apply theoretical knowledge (Louw et al., 2006:53; Popich, 2003:45). It may therefore be useful to incorporate more opportunities for demonstration into the programme. Other comments were related to the parent handout: "Pictures of stress cues must be clearer. Also illustrate each signal." "Please number stress cues." Visual sources such as pictorial depictions aid the speech-language therapist in overcoming language barriers when sharing knowledge with parents (Louw et al., 2006:53). It will be valuable to develop the parent handout further by adding more illustrations. Participants recommended that the programme be applied in the KMC ward rather than the NICU or neonatal high care ward: "Programme is more appropriate for KMC unit as mom is with baby constantly. Not appropriate for NICU or high care wards as moms have higher stress levels due to their child's medical condition. Their moms are also only with babies for feeding times." This confirms Kritzinger (2007) who stated that the KMC ward offers unique access to mothers and their high risk infants and provides opportunities for early intervention as the mothers are available frequently.

From the pilot study in Table 4.7, it is evident that the programme achieved its aim, but certain changes should be made to the language, terminology, content

and length in order to improve the quality and make it more user-friendly. The programme was deemed to be most appropriate for the population residing in the KMC ward as the parents may be more readily available than the parents whose infants are admitted to the NICU and the neonatal high care ward. The pilot study also confirmed the findings from Phase 1 that participants' inexperience may have prevented them from fulfilling their roles effectively due to limited knowledge of the specialised field of neonatal communication intervention.

4.3.4 Conclusion of Phase 2

From Phase 1 it was concluded that participants had a need for *parent guidance tools/materials* on the topic of *developmental care* as this was one of their most frequently identified needs. During Phase 2 a tool/materials for parent guidance titled "*Neonatal communication intervention programme for parents"* was compiled and justified by participants' roles and needs determined in Phase 1 as well as current ECI literature. The programme entailed a package of training aids for use by a speech-language therapist.

The pilot study concluded that the programme was enjoyed by the parents who received the training. It was further determined that the content was appropriate but that the programme should be more concise and shorter so as to be more user-friendly. The parent handout was deemed suitable for the training although contradictory ideas were provided regarding the Microsoft PowerPoint™ presentation. Certain suggestions for improvement of the programme were made during the pilot study such as providing a glossary of terms with definitions for therapists to use, adapting the programme's language and terminology, changing the numbering in the handout and providing more illustrations of stress cues. These improvements were made and therefore the programme is ready for use in further research projects. The pilot study confirmed the results found in Phase 1, which determined that many speech-language therapists who provide neonatal communication intervention in public hospitals are inexperienced. This value of such a neonatal communication programme for use

by this population is therefore restated. The results led to certain conclusions being drawn in Chapter 5.

4.4 SUMMARY

In Chapter 4 the results were discussed according to the objectives. The two phases of the research study were discussed separately. In Phase 1 the results from the survey were described, which described speech-language therapists' and audiologists' roles in local neonatal nurseries. Phase 1 also described the participants' needs in terms of tools for assessment, parent guidance and staff/team training. In Phase 2, a tool for *parent guidance* on the topic of *developmental care* was compiled from ECI literature and was pre-tested. The chapter concluded with the finding that the programme achieved its aim but that certain adjustments should be made to the content and language to improve the quality and applicability of the programme. The improvements were made to the programme.

CHAPTER 5

Conclusion and recommendations

5.1 INTRODUCTION

Healthcare is increasingly focusing on evidence-based practice creating a need to demonstrate the value of health interventions (Clark, Gibb, Hart & Davidson, 2002:121). Clinicians must become proactive in looking for information to support clinical procedures and critical in assessing the available information (Plante, 2004:390).

Neonatal communication intervention is of utmost importance in a country such as South Africa where there is an increased prevalence of infants at risk for developmental problems (Kritzinger, 2000:9). In order to be effective in the NICU, speech-language therapists must provide and promote developmentally supportive, family-centred care (Ziev, 1999:33). Research has shown that the use of developmental care strategies can improve a number of outcomes for premature infants (Goldberg-Hamblin et al., 2007:165).

The current research was conducted to investigate the roles of speech-language therapists and audiologists and their needs in the neonatal nurseries of the public hospitals of South Africa. The aim of this chapter is to reflect on the research, to present conclusions to the research questions stated earlier and to provide an evaluation of the study. Recommendations for further research are provided. The chapter concludes with final comments from the researcher.

5.2 SYNOPSIS OF PREVIOUS CHAPTERS

In ***Chapter 1*** a rationale for the research was formulated. The roles of the speech-language therapist and audiologist in neonatal nurseries were discussed. The discussion emphasised that these roles are challenged by various factors in the South African context.

Chapter 2 provided a theoretical underpinning for the compilation of a neonatal communication intervention tool based on current literature in the field of neonatal communication intervention. Neonatal communication intervention tools and programmes currently used in South Africa were described. Different programmes from various disciplines, and those developed by speech-language therapists for neonatal communication intervention, are implemented to improve neonatal care in South Africa. The country-wide initiative to implement the evidence-based technique of KMC (Pattinson et al., 2006; Dippenaar et al., 2006; Hann et al., 1999; Van Rooyen et al., 2002) indicates that speech-language therapists should recognise its importance and develop communication based materials and tools to complement this successful neonatal intervention. It was argued that a neonatal communication intervention tool for use by speech-language therapists and audiologists would contribute to managing certain challenges in the local context such as limited literacy of caregivers, multilingual and multicultural populations and limited materials and equipment.

Chapter 3 provided a detailed description of the methodology that was used to execute the research. The research was conducted in two phases and was discussed accordingly. The research aim and objectives, research design, participants, materials, data collection and analysis were provided. Issues relating to ethics, reliability, validity and trustworthiness were also discussed.

In ***Chapter 4*** the results of the study were displayed and described. The results from Phase 1 reflected that speech-language therapists and audiologists were performing a variety of roles. Some roles such as video-

fluoroscopic studies and hearing screenings were performed the least. Participants expressed a need for assessment and screening equipment, culturally sensitive and user-friendly tools and materials for intervention, time management, counselling methods, more specialised team members, timely referrals, access to interpreters, access to CPD activities and resources. Many participants did not have tools for parent guidance on the topics of the *neonatal nursery environment*, *paediatric dysphagia and feeding therapy*, *over-stimulation and the infant's stress cues* and *developmental care*. These results were used to determine and select the nature and content of the tool/materials designed during phase two. Phase 2 comprised the selection of a specific need, the compilation of a developmental care programme for parents based on the need identified and a pilot study of the resulting programme.

Chapter 5 aimed to integrate the findings and draw conclusions on which clinical and research recommendations can be based.

5.3 GENERAL CONCLUSIONS

The following conclusions were drawn based on the results obtained from this research:

- The ***overall aim*** of this study, namely to compile a locally relevant neonatal communication intervention instrument/tool for use by speech-language therapists in the neonatal nurseries of public hospitals, was achieved. Based on the results of the survey in Phase 1, as well as ECI literature a tool namely *"Neonatal communication intervention programme for parents"* was compiled during Phase 2.

- ***Objective 1*****:** Speech-language therapists and audiologists in this study were performing varied and complex roles in neonatal nurseries. Contextual challenges, such as language differences, limited supervision by experienced speech-language therapists, limited tools

and equipment for assessment and intervention influenced their service delivery in neonatal nurseries.

- ***Objective 2:*** Most speech-language therapists and audiologists in the study required tools/materials specifically for use during parent education and staff/team training. It appeared that participants would have fulfilled certain roles, had they been equipped with the appropriate tools/materials. Although a need for further tools was identified it was encouraging that participants were using the few tools that were available to them.

- ***Objective 3:*** A specific tool was selected to reflect the needs of the speech-language therapist participants in this study.

- ***Objective 4:*** The resulting tool/material namely *'Neonatal communication intervention programme for parents'* was compiled according to current ECI literature. The programme consisted of a package with different training aids including a PowerPoint presentation and parent handout in English and IsiZulu, complied with the principles of adult learning.

- ***Objective 5:*** The resulting programme was pilot tested and it was found to be useful in service delivery in a neonatal nursery. However, certain recommendations were made regarding the language and terminology, content and the length of the programme in order to make it more user-friendly and improve the overall quality thereof.

5.4 IMPLICATIONS OF THE RESEARCH

Clinical and theoretical implications of the research are depicted in Figure 5.1.

Figure 5.1: Implications of the research

The current research *identified and attempted to fulfil in a need* expressed by speech-language therapists and audiologists. The study managed to achieve the aim of compiling a programme for speech-language therapists for use with parents and caregivers in the neonatal nurseries in South African provincial hospitals. The programme was deemed appropriate in content and

judged to be user-friendly for the context by speech-language therapists in a pilot study.

This study highlighted the role of the speech-language therapist and audiologist in terms of *prevention of communication delays* and disorders. Prevention of communication disorders is a primary professional responsibility of the speech-language therapist and audiologist (ASHA, 1991:16; Hugo, 2004:7). Children in South Africa are at an increased risk for communication disorders due to higher prevalence of low birthweight, Down syndrome, cleft lip and palate, cerebral palsy, fetal alcohol syndrome, HIV/AIDS, multilingualism, poverty and hearing loss (Kritzinger, 2000:13; Popich et al., 2006:676; Swanepoel, 2004:290), which increases the need for prevention and adequate ECI services. This research is an example for speech-language therapists and audiologists in the public health sector on how to use adult education principles in parent training to prevent communication delays and disorders in infants.

The programme could also be used for *raising awareness of ECI services* within a certain community. Marketing and advocacy is a very important professional responsibility the speech-language therapist assumes (Billeaud, 2003:221; Rossetti, 2001:174). Using media for marketing aimed at the public can increase public awareness by reaching a wider audience (Thomas, 1993:46). Marketing ECI services among health care workers can yield increased referrals from professional colleagues, increased visibility of speech-language therapy services in the community and improved use of services for infants and toddlers at risk for communication disorders (Billeaud, 2003:221). South Africa has an increased prevalence of infants at risk for communication disorders (Kritzinger, 2000:13) and therefore marketing of ECI among the general public, as well as health care workers, should be a priority of local speech-language therapists working in the public health sector.

According to ASHA (2008 [a]) ECI services must promote children's participation in natural environments, which include community settings outside of the home environment where children without disabilities

participate. Community work increases the existing professional knowledge on diverse communities within South Africa, which presents therapists with the opportunity to implement prevention programmes such as adult training (Popich, 2003:23). This study emphasised *involvement in community work and not only in the lives of individual families*. The research could be used as an example of caregiver training within a specific community in order to reach more infants and toddlers in need of ECI services and to improve the current services in communities.

This study highlighted *information on the roles of speech-language therapists and audiologists in the neonatal care of high risk infants in the public health sector*. SASLHA compiled guidelines for ECI (Louw, 1997), but currently there are no guidelines for early intervention in the NICU in South Africa. Guidelines by ASHA (2005) are being used although contextual differences hinder the direct application thereof. This research gathered valuable information regarding the roles and responsibilities of speech-language therapists and audiologists in local NICU, neonatal high care and KMC nurseries. It can therefore be used to guide future attempts to compile local guidelines for speech-language therapists in the NICU.

The *"Neonatal communication intervention programme for parents"* is compared to the ASHA (2008 [a]) principles in Table 5.2. According to ASHA (2008:10 – 17 [a]) the following guiding principles constitute best practice for early and effective communication interventions:

Table 5.2: Comparison of ASHA's guiding principles (2008 [a]) and the "Neonatal communication intervention programme for parents"

Guiding principle (ASHA, 2008) [a]	'Neonatal communication intervention programme for parents'
1) Services are family-centered and culturally and linguistically responsive.	The programme was compiled for speech-language therapists working with parents and families. The programme focused on involving the family, rather than only the infant, during intervention. The programme consisted of a parent handout that was available in two languages and incorporated many photos and images reflecting the diversity of parents with their infants in South Africa. The programme attempted to be culturally and linguistically sensitive.
2) Services are developmentally supportive and promote children's participation in their natural environments.	The programme aimed to provide speech-language therapists with materials to guide parents in developmentally supportive interaction and appropriate stimulation of their premature infants. Neonatal nurseries become closer to natural environments when the infant's parents are involved in the treatment.

Table 5.1 continued: Comparison of ASHA's guiding principles (2008 [a]) and the "Neonatal communication intervention programme for parents"

Guiding principle (ASHA, 2008) [a]	'Neonatal communication intervention programme for parents'
3) Services are comprehensive, coordinated and team-based.	The programme covered the topic of 'developmental care'. The information presented was comprehensive. The programme is intended for speech-language therapists who provide neonatal intervention within a transdisciplinary team approach. The programme should be coordinated with medical, nursing and other services rendered to infants and mothers in the nursery.
4) Services are based on the highest quality evidence that is available.	The programme had a strong theoretical underpinning and was compiled from a comprehensive review of recent neonatal care and ECI literature. The programme is based on needs identified in the survey in Phase 1.

According to Table 5.2 the study complied with the guiding principles for best practice in ECI (ASHA, 2008 [a]) and therefore *contributed to neonatal care of high risk infants in South Africa*.

5.5 CRITICAL REVIEW

A critical review of the research is necessary for the researcher to reflect on the extent that the research aims were achieved during this study. A discussion of the strengths and limitations is important as it may guide future researchers to use or avoid similar aspects during research. The two phases are discussed separately.

5.5.1 Critical review of Phase 1

The strengths and limitations of Phase 1 are depicted in Figure 5.2.

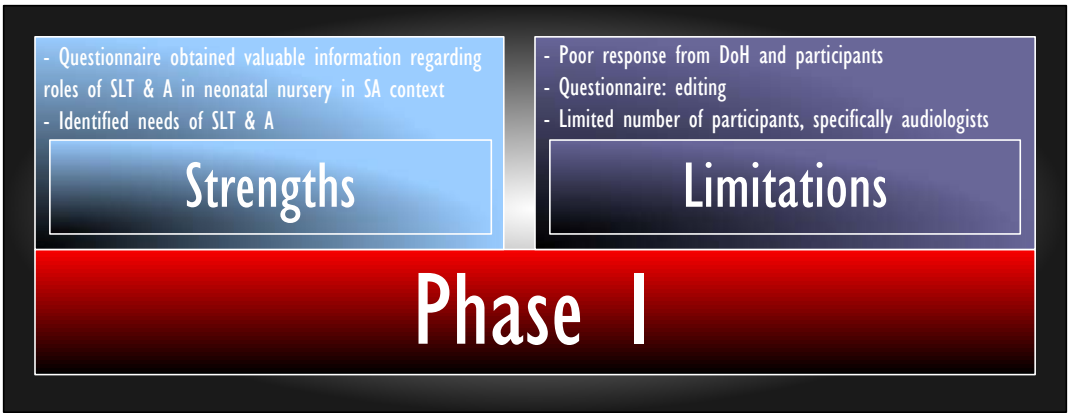

Figure 5.2: Strengths and limitations of Phase 1

- **Strengths**

The value of the questionnaire in gathering information on the roles of speech-language therapists and audiologists in the neonatal nursery in South Africa: A strength of this research is that it obtained information regarding the roles of the speech-language therapist and audiologist in the neonatal nursery in South African provincial hospitals that was previously unknown. A dearth of information exists regarding the role of the speech-language therapist in the NICU in South Africa (De Beer, 2003:2). Currently there are no guidelines available for speech-language therapists working in the NICU in South Africa, but international literature provides guidelines for service delivery in the NICU in the USA (ASHA, 2005). The results of phase one provides valuable information for the future compilation of service delivery guidelines for speech-language therapists and audiologists in the NICU in South Africa.

Identified needs of speech-language therapists and audiologists: A strength of this study is that the results determined the needs of a group of speech-language therapists and audiologists working in provincial hospitals' neonatal nurseries. It not only determined the need for tools and materials, but also identified needs for more accessible CPD activities, resources, interpreters and more qualified professionals e.g. audiologists and paediatricians.

- **Limitations**

Poor response from the Department of Health: A limitation of this study was that only six of the nine Departments of Health responded to the request for permission to conduct the research. The results were drawn from only six provinces in South Africa, which implies that the results could not be generalised to speech-language therapists and audiologists country-wide.

Editing of the questionnaire: Certain questions in the questionnaire could have been worded differently to yield results, which would have been easier to analyse statistically e.g. question B5 enquired about the percentage of time the participants spent in the NICU, NHCU and KMC wards. Many participants answered the question inappropriately by providing a number of hours, minutes or visits per day. This question may have yielded more accurate information if participants were presented with a Likert scale with five options to choose from. According to Leedy and Ormrod (2001:192) a survey must be scrutinised repeatedly to make sure that it addresses the researcher's needs. The questionnaire was, however, pilot tested in advance, which revealed no problems with the wording of any questions. The questionnaire was therefore deemed appropriate to conduct the study.

Limited number of participants, specifically audiologists: A limitation of the research was that there were a limited number of participants for this study. Only two audiologists participated in the study. This could be due to the fact that the questionnaire entailed neonatal communication intervention, which is a specialist field of speech-language therapy. When received at the hospitals, the questionnaire was subsequently rather offered to the speech-language therapists than to the audiologists to complete. Limited information was obtained about the needs of audiologists in the neonatal nursery. The selection of the nature and content of the tool was therefore largely based on the perceptions of speech-language therapists, which resulted in a programme for parents on developmental care to be used by speech-language therapists. The researcher repeatedly made telephonic contact with participants in order to increase the return rate of the questionnaire. After the

third telephonic contact, no further contact was made as participation to the study had to be voluntary.

5.5.2. Critical review of Phase 2

The strengths and limitations of Phase 2 are depicted in Figure 5.3.

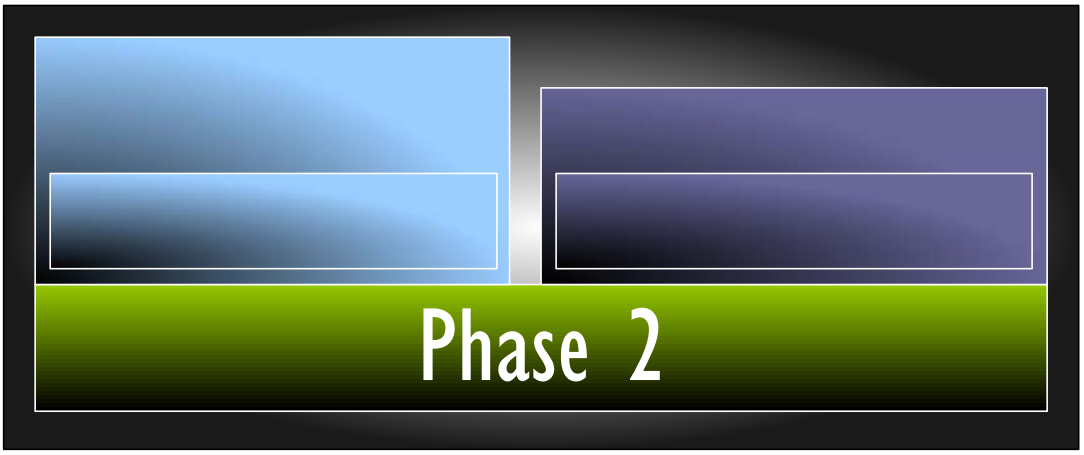

Figure 5.3: Strengths and limitations of Phase 2

- **Strengths**

Tool addressed a need: The compilation of the programme titled *"Neonatal communication intervention programme for parents"* attempted to address a need identified by speech-language therapists in Phase 1. The principles of adult learning were adhered to during the compilation of the programme. This increases the probability that the programme would be used in adult training (Popich, 2003:19), which would improve ECI services in public hospitals.

Theoretical underpinning: The programme was compiled with a strong theoretical underpinning that contributed to its trustworthiness. The programme's content was accurately described (De Vos et al., 2005:346), which enhanced the credibility thereof. Speech-language therapists and audiologists must consistently seek out new information to improve therapeutic effectiveness as they are responsible to provide services that are research-based (Bernstein-Ratner, 2006:257; ASHA, 2005:12).

Accommodated parents with different levels of literacy in two languages: A strength of the research is that the programme attempted to accommodate parents with different levels of literacy by providing a handout with photos and images depicting key concepts with corresponding blocks for responses to be marked with and /x/ or /✓/. The programme is easy to use as it has materials and strategies that were designed to save time and facilitate the presentation thereof. Graphic materials such as handouts assist speech-language therapists and audiologists to be culturally sensitive when working with parents and caregivers (Louw & Avenant, 2002:150). The handouts were available in both English and IsiZulu, which is viewed as both a strength as well as a limitation, as material is also required in the nine other official languages of South Africa.

- **Limitations**

Only pilot tested by a limited number of participants: The programme was pilot tested by only three participants working in a provincial hospital, which is at least the intended context for the programme. This limits the use of the programme as the researcher can not be sure that the programme met the needs expressed by all participants. While it was necessary to pre-test the preliminary programme, the objective was not to validate the programme during this study. Therefore three participants were deemed adequate for the pilot study. It would be valuable to validate the programme in further research using a larger group of speech-language therapists.

Translation of handout: The handout was translated into IsiZulu from English in order to accommodate parents who are not proficient in English. A limitation was that the programme was made available only in two of the eleven official languages namely English and IsiZulu. Culturally appropriate educational and counselling opportunities should be provided to families in the neonatal nursery in provincial hospitals (Rakau, 2005:42). Therefore the application of the programme across different cultural groups is limited.

Based on this discussion, certain recommendations for research were made.

5.6 RECOMMENDATIONS FOR FURTHER RESEARCH

An answered research question leads to a multitude of new research questions to be answered (Swanepoel, 2004:297). Therefore the following recommendations for further research were conceptualised from the current study:

- This study's results highlighted a need for research on *various applicable formats* of the parent guidance programme that was compiled during this research. It could be possible to produce a DVD format of this programme in order to make it more user-friendly for speech-language therapists who have large caseloads and little time to present the programme.

- It would be useful to obtain the perceptions of a *larger group of speech-language therapists and audiologists in a survey* regarding their roles and needs within the local neonatal nursery context. Further research is needed regarding the needs of speech-language therapists in local public hospitals to draw conclusions and generalise the results to a larger community. It may also be valuable to incorporate more experienced therapists into such a survey as their insight into their needs may differ from less experienced therapists. Private speech-language therapists should also be involved in such a survey. It may be valuable to conduct a separate survey to identify perceptions of audiologists.

- Although neonatal communication intervention is a specialised field of service delivery, most of the participants in the current study were inexperienced. Research is needed in terms of *the knowledge and skills of community service speech-language therapists regarding neonatal communication intervention.* This will enable tertiary institutions in South Africa to adapt and enrich their undergraduate ECI curricula in order to prepare future speech-language therapists more effectively.

- The parent guidance programme was only pilot tested by three speech-language therapists. Research on a *larger population* is therefore

necessary to validate the use of this programme across different communities in South Africa.

- Another recommendation is to evaluate the *effectiveness of the programme on mothers' interaction skills with their infants*. Speech-language therapists need to demonstrate that their intervention efforts have and effect (Kritzinger, 2007). According to Plante (2004:389) professional reliance on evidence-based practices sets a verifiable standard for what constitutes an acceptable procedure in a field. By evaluating the programme's effectiveness, evidence-based practice is followed.

- It would be valuable to determine whether the programme meets the *mothers' needs for information and training*. Families need information on child health and development (Kritzinger, 2007) and therefore it may be useful to establish whether this programme fulfils in the parents' needs.

- *Translating the programme* to the other official languages in South Africa should be explored. If the programme is translated into the other nine official languages namely IsiXhosa, Afrikaans, SePedi, SeTswana, SeSotho, XiTsonga, SiSwati, TshiVenda and IsiNdebele it will be useful to more speech-language therapists across a wider geographical area. Consequently the programme will be more culturally sensitive and the range of applicability will be increased.

- As previously mentioned, the use of *surveys as research material* should possibly be *incorporated into undergraduate training* and undergraduate research for speech-language therapists and audiologists. Speech-language therapists and audiologists can become confident in the use of surveys as data-collection instrument on an undergraduate level. This may lead to enhanced quality of research in the field of Communication Pathology.

5.7 FINAL COMMENTS IN CONCLUSION

The increased prevalence of infants at risk for communication disorders in South Africa (Kritzinger, 2000:13) necessitates early interventionists to become involved in clinical and research efforts in developing ECI services for provincial hospitals. Speech-language therapists and audiologists not only have an essential role to fulfil in neonatal nurseries, but also have an ethical responsibility to develop creative solutions for challenges arising from service delivery in the South African public health context. Speech-language therapists and audiologists must contribute to neonatal care of high risk infants to improve infants' chances of survival and facilitate optimal development.

"Attainment of each child's full potential,
irrespective of culture or language,
is the proverbial pot of gold at the end of the rainbow."

- Carolyn C. Madding (2000:17) -