IMPLEMENTING INFANT HEARING SCREENING AT MATERNAL AND CHILD HEALTH CLINICS: CONTEXT AND INTERACTIONAL PROCESSES

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ABBREVIATIONS

UNHS:	Universal Newborn Hearing Screening
HPCSA:	Health Professions Council of South Africa
HSPS:	Hearing Screening Position Statement
OAE:	Oto-acoustic emissions
AABR:	Automated Auditory Brainstem Response
NICU:	Neonatal Intensive Care Unit
MCH:	Maternal and Child Health

SUMMARY

Infant hearing screening has become increasingly widespread as research evidence a dramatic benefit when early identification of hearing loss occurs before six-months of age. The Health Professions Council of South Africa (HPCSA) has recently published a hearing screening position statement recommending infant hearing screening in three contexts: the well-baby nursery, at discharge from the neonatal intensive care unit (NICU), and at Maternal and Child Health (MCH) clinics. The well-baby nursery and NICUs are established and internationally recognised screening contexts abundantly reported on whilst MCH clinics have not been investigated as screening contexts previously. The objective of this study was therefore to describe the context and interactional processes during an infant hearing screening programme at MCH clinics in a South African community to ascertain whether clinics provide a suitable milieu for hearing screening programmes. An exploratory descriptive design implementing a qualitative methodology was selected to describe the context and interactional processes experienced during an infant hearing screening programme at two MCH clinics in the Hammanskraal community. Five fieldworkers conducting the screening programme at the clinics documented experiences using systematic field notes and critical reflections for a fivemonth period. The two MCH clinics investigated proved to be suitable contexts to screen infants for hearing loss despite prevailing contextual barriers that are characteristic of primary healthcare clinics in developing contexts of South Africa. Interactional processes between fieldworkers, nursing staff and caregivers revealed that collaborative partnerships fostered by consistent service delivery, maintenance of an open channel of communication and basic courteousness, facilitated an effective initial infant hearing screening at the two clinics. MCH clinics demonstrate promise as a practical contextual solution to achieve widespread screening coverage in South Africa.

OPSOMMING

Tans word gehoorsifting van babas toenemend uitgevoer as gevolg van navorsingsbewyse wat die dramatiese voordele van vroeë identifikasie van gehoorverlies (voor die ouderdom van ses-maande) aantoon. Die Suid Afrikaanse Raad vir die Gesondheidsberoepe het onlangs 'n verklaring oor gehoorsifting gepubliseer waarin hulle drie kontekste vir sodanige sifting aanbeveel: gesonde-baba-sale, by ontslag uit Neonatale Intensiewesorgeenhede (NISE), of by Moeder en Kind Gesondheidsorgklinieke (MKG). Die gesondebaba-eenhede en NISE is gevestigde siftingskontekste wat internasionaal erken word terwyl MKG-klinieke nog nie voorheen as gehoorsiftingskonteks ondersoek of beskryf is nie. Die doel van hierdie studie was om die konteks en interaksieprosesse gedurende 'n siftingsprogram vir babas by MKG-klinieke in 'n Suid Afrikaanse gemeenskap te beskryf om vas te stel of die klinieke 'n gepaste omgewing vir hierdie programme daarstel. 'n Verkennende beskrywende navorsingsontwerp met 'n kwalitatiewe metodologie is gebruik om die konteks en interaksieprosesse wat gedurende die gehoorsiftingsprogram by twee MKG klinieke in die Hammanskraal gemeenskap ervaar is te beskryf. Vyf veldwerkers wat die siftingsprogram by die klinieke toegepas het, het hul ervarings oor 'n vyf-maande-tydperk gedokumenteer deur van sistematiese veldnotas en kritiese refleksies gebruik te maak. Die resultate toon aan dat die twee MKG-klinieke oor potensiaal beskik om 'n toepaslike gehoorsiftingskonteks vir babas te wees ten spyte van voortdurende kontekstuele struikelblokke wat kenmerkend is van primêre gesondheidsorgklinieke in ontwikkelende gemeenskappe in Suid Afrika. Interaksie tussen veldwerkers, verpleegkundiges en sorggewers het daarop gedui dat konstante dienslewering, die daarstel van 'n oop kommunikasiekanaal, en basiese respek, effektiewe vroeë gehoorsifting kan verseker. MKG-klinieke toon belofte as 'n praktiese kontekstuele oplossing om wydverspreide gehoorsifting in Suid Afrika te realiseer.

INTRODUCTION

The internalisation of a language system for communication is perhaps the most important achievement in any child's development. Language is the key to successful communication and social interaction through which people express their feelings, needs, and thoughts and by which we receive and comprehend the feelings, needs, and thoughts of others (Northern & Downs, 2002:127). The first months of life are critical developmental periods for language acquisition through the auditory modality. Infants with hearing loss miss out on these critical periods of auditory exposure to adequate language stimulation resulting in persistent developmental delays (Yoshinaga-Itano, 2003:200). This demonstrates the need for identification and subsequent intervention for infants with hearing loss to commence as early as possible.

The developed world has seen a dramatic growth in such early hearing detection and intervention programmes during the past 15 years (White, 2003:79). This growth is the culmination of more than a hundred years of striving to identify hearing loss in the infant to allow early access to auditory and language stimulation (Mencher, Davis, Devoe, Beresfor & Bamford, 2001:3-4). Over these years the notion of early audi-

tory deprivation and the desire among audiologists to intervene as early as possible have been confirmed by decades of research proving the striking benefits of early identification of hearing loss to the individual and society at large (Yoshinaga-Itano & Appuzo, 1998:380-387; Moeller, 2000:5). It is now clear that those infants who are identified with hearing loss by three-months of age and who receive intervention before six-months of age have a significant and measurable advantage over lateridentified peers (Yoshinaga-Itano, 2003:199-204).

The dramatic benefits of early identification compared to the negative effects of later identification have provided the impetus for the powerful professional and technological Universal Newborn Hearing Screening (UNHS) movement to screen every newborn baby for hearing loss. In countries such as the United States of America (USA) and the United Kingdom (UK), UNHS has already become the de facto medical/legal standard of care (White, 2003:85). Unfortunately the momentum for implementing such widespread early identification programmes has not carried over to the developing world. Although governmental and non-governmental agencies throughout developing countries have begun to initiate programmes to prevent childhood hearing loss or to offer rehabilitation (McPherson & Swart, 1997:3), little and slow progress toward addressing the need for early identification of hearing loss has been reported (Olusanya, 2000:167; Rao, Subramanyam, Nair & Rajashekhar, 2002:105).

A first step toward UNHS in South Africa has recently been taken by the Health Professions Council of South Africa (HPCSA) by publishing a Year 2002 Hearing Screening Position Statement produced by the Professional Board for Speech, Language and Hearing Professions (HPCSA, 2002:1). This statement accepts the Year 2000 position statement of the Joint Committee on Infant Hearing (USA) as the definitive document on infant hearing screening (HPCSA, 2002:1). The South African position statement advocates the use of electrophysiological measures for targeted (risk-based) newborn/infant hearing screening as the first step toward further diagnostic assessments. It also advocates family-centred intervention programmes through integrated, interdisciplinary Provincial and District Health Systems (DHS). It poses targeted screening as an intermediate step towards UNHS of 98% of neonates/infants by 2010. Furthermore, by 2005 the necessary technology was recommended to be available at Maternal and Child Health (MCH) clinics in the community to enable infants who attend their first immunisation to have their hearing screened as part of the total service package (HPCSA, 2002:5).

The South African Hearing Screening Position Statement Year 2002 recommends three contexts wherein screening should be implemented, namely the well-baby nursery, at discharge from the neonatal intensive care unit (NICU) or at MCH clinics, using as platform the six-week immunisation clinics that form part of the MCH service delivery package. The wellbaby nursery and NICUs are established and internationally recognised screening contexts abundantly reported on (for example, Hess, Finckh-Kramer, Bartsch, Kewitz, Versmold & Gross, 1998:81-89; Cox & Toro, 2001:99-104; Finitzo, Albright & O'Neal, 1998:1452-1460). The six-week immunisation clinics, being part of the MCH clinics, have not however been specified as screening contexts previously.

The rationale for including this third screening context is the fact that the South African health care system is based on a primary health care approach which aims to provide an accessible service to the whole population. A unique problem in developing countries like South Africa is that a significant number of births do not take place in hospitals but either at home or in clinics. Reports indicate that the majority (70%) of South African children are born in hospitals, but the actual percentage varies greatly across regions. In the Central Karoo, for example, all births were reported to have occurred in a hospital, compared to the Tambo district where 51% of births were in a hospital, 2% were in clinics, and the other 47% were home births (Statistics South Africa, 2002:65). The use of six-week immunisation clinics at MCH clinics therefore provides a means of reaching the entire population with infant hearing screening.

PROBLEM STATEMENT AND OBJEC-TIVE

Unlike well-baby nurseries and NICU's, MCH clinics have not yet been investigated as a hearing screening context (Kennedy, Kimm, Cafarelli-Dees, Campbell & Thornton, 1998:1963). It is an important priority, therefore, to investigate MCH clinics as a hearing screening context if the benchmarks stated by the South African Hearing Screening Position Statement Year 2002 are to be followed. These early identification programmes for infants with hearing loss at MCH clinics will require an integrated multi-disciplinary team approach to ensure effective and accountable service-delivery. According to Moodley, Louw and Hugo (2000:37, 38), adopting a transdisciplinary team approach is essential to increase the accessibility of hearing screening services and to promote collaboration at different levels of the healthcare system to ensure advocacy and access to these different levels. It is therefore necessary to assess and describe a hearing screening programme at MCH clinics in terms of the context and interactional processes involved.

In terms of the context, MCH clinics are novel screening environments, unlike well-baby nurseries or NICUs, which require an assessment of the assets and barriers presented by these clinics toward infant hearing screening programmes (Kennedy *et al.* 1998:1963). In this case assets are the strengths inherent to the context of MCH clinics which will promote effective infant hearing screening compared to barriers, that are contextual challenges posed by the clinic, which may interfere with effective hearing screening (Pan, Littlefield, Valladolid, Tapping & West 2005:1185, 1186). The interactional processes refer to the interpersonal communicative behaviour and actions between participants within a specific situation (Sheeber, Hops, Andrews, Alpert & Davis, 1998:418; Phillips, Morrison, Steffl, Chae, Cromwell & Russel, 1995:205, 206). The assets in the case of these processes are the strengths observed in the interaction behaviour between the fieldworkers and nurses, caregivers, and infants being screened at MCH clinics, which will promote effective infant hearing screening. The barriers are those challenges posed by the interaction behaviour between fieldworkers and nurses, caregivers and infants, which may interfere with effective hearing screening at these clinics.

A careful identification and description of the contextual and interactional assets and barriers posed by MCH clinics will begin to address the dearth of research on infant hearing screening at these clinics in South Africa, allowing for the development of evidence-based programmes that are contextually relevant. Therefore, the objective of this study was to describe the context and interactional processes during an infant hearing screening programme at MCH clinics in a South African community to ascertain whether clinics provide a suitable milieu for hearing screening programmes.

METHOD

Research objectives

- To describe the contextual assets and barriers towards infant hearing screening at MCH clinics
- To describe the interactional assets and barriers evident in the interactional processes between fieldworkers and nursing staff, caregivers, and the infants at MCH clinics.

Research design

An exploratory descriptive design implementing a qualitative methodology was selected for the current study (Bless & Higson-Smith, 2000:41). The current study investigated a new hearing-screening context in Hammanskraal South Africa, a country and community with a dearth of contextually relevant research on NHS and therefore, is considered to be exploratory. This facet of the research aims to become conversant with basic facts and to create a general picture of environmental and health care conditions (Fouché, 2002:109). According to Mouton (2001:53) the answer to a *what* question represents the aim of an exploratory study and in this case it relates to "what assets and barriers MCH clinics present for infant hearing screening in a South African community?"

Neuman (1997:20) argues that exploratory and descriptive research often comes together in practice. A descriptive study, however, presents a picture of specific details of a situation, social setting or relationship focusing on *how* and *why* questions (Neuman, 1997:19, 20; Mouton, 2001:54). In every case descriptive research is employed to provide an empirical picture of a situation by examining that situation as it is. This approach was selected to reveal aspects in the nature of situations, settings, processes, and relationship systems involved in conducting an infant hearing screening programme at MCH clinics in a South African community over a five-month period (Leedy & Ormrod, 2001:148).

Research context

Two MCH clinics in the Hammanskraal district were selected as research context for collecting research data for the current study. The two clinics were selected according to a convenience sampling method in a community representative of large sections of the South African population (Tshwane 2020 Plan, 2002:2). The Hammanskraal district within Tshwane is home to predominantly, black Africans with the majority of the population (52%) being males with a large percentage (37%) of the population between 0 – 19 years of age (Tshwane 2020 Plan, 2002:28). Hammanskraal, along with three other districts, have the highest percentage (41%) of households earning less than R12 000 per annum in the city of Tshwane (Tshwane 2020 Plan, 2002:28, 29). These same three districts, which include Hammanskraal, are also the poorest supplied of water in the house or on site. Only 50% of households in Hammanskraal have flush toilets and 30% of households are without electricity (Tshwane 2020 Plan, 2002:30).

MCH clinics are an initiative of the Department of Health to ensure the provision of maternal and child health services to all, including immunisation, communicable and endemic disease prevention, screening of children, child health care and counselling (Dennill, King & Swanepoel, 1999:37). MCH clinics are part of primary health care facilities that serve as birthing, immunisation, and general health care centres and are primarily managed by nursing staff (Reagon, Irlam & Levin, 2004:9-15). The total number of these clinics throughout the country amount to approximately 2604 (Kawonga & Knight, 1999:104). The six-week immunisation clinics are one of the service-delivery infrastructures within the MCH clinic. Infants and young children accompanied by their caregivers visit these clinics on a daily basis for maternal and child health services delivered by means of antenatal visits during the week.

Ethical considerations

The researcher has an ethical obligation to protect subjects against any form of physical and/or emotional harm (Leedy & Ormrod, 2001:107). The collection procedures for the current study were non-invasive and to minimise any other possible emotional harm participants (nurses, caregiver-infant dyads, and fieldworkers) were thoroughly informed verbally and in written format beforehand about the potential impact of the investigation providing them with the choice and opportunity to partake or withdraw from the study if they wanted to (Strydom, 2002a:64). Two fieldworkers were fluent in more than three national languages and were able to convey all information in a language native to the caregivers and nurses. This was to ensure that subjects comprehended the investigation and were consequently able to make a voluntary, well reasoned decision about their participation (Strydom, 2002a:65). A letter of informed consent, which was explained and provided to all participants, supplemented this verbal explanation. All participants were informed that all information was confidential and no names would be taken. Caregivers were required to give direct consent for their own participation and that of their infant in the study (Bless & Higson-Smith, 2000:100).

Ethical clearance for conducting the current study was obtained from the Research Proposal and Ethics Committee, Faculty of Humanities, University of Pretoria and the Ethical Committee of the District Health Department of North West Province.

Research participants

Participants in the research project included five fieldworkers, nursing staff at the clinics, and the neonates/infants (younger than 12 months of age) and their caregivers who attended the two MCH clinics in the Hammanskraal district during the extent of the research project. During the research period 510 neonates/infants and their caregivers and 13 nursing personnel (female) were observed at the two MCH clinics during the five-month research period.

Fieldworkers conducted the screening programme and were selected according to the following specified criteria to control for a high degree of internal validity between fieldworkers: 1) at least a bachelor's degree in audiology or a diploma in hearing therapy, 2) experience in screening neonates and infants for hearing loss of at least one week, 3) previous experience in the Hammanskraal district to ensure experience of the cultural and linguistic diversity and socio-economic circumstances of the community which improves adaptation to and functioning in the selected community, 4) experience in cross-cultural interviewing to ensure better collaboration with caregivers and nurses, 5) training in screening tests and screening protocol to ensure each fieldworker was familiar with the equipment and test-protocol. Table 1 provides a description of the fieldworkers.

Data collection material

Data were collected at MCH clinics using descriptive qualitative instruments consisting of field notes and critical reflections made by fieldworkers regarding their experiences and observations. According to Strydom (2002b:286) field notes are ideal for presenting a comprehensive account for participants and their contexts, events taking place, actual interactions, attitudes, perceptions and feelings. Critical reflections are also an important tool for fieldworkers to note their own feelings, speculations and perceptions by relying on memory (Strydom, 2002b:287). This type of field data consists of what researchers have experienced and remember recorded in a format that can be subjected to systematic analysis (Neuman, 1997:361). The fieldworkers were trained by the primary researcher to use field notes and critical reflections effectively as data collection techniques. Fieldworkers were made aware of the possible influence that their own background, perceptions, and prior experience may have on the way

Table 1:	Description	of fieldworkers
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NUMBER OF FIELD WORKERS	GENDER	AGE	QUALIFICATION
1 field worker	Male	25	M. Communication Pathology and registered for a D.Phil. Communication Pathology degree
3 field workers	Female	23 - 25	B. Communication Pathology and registered for a M. Communication Pathology degree
1 field worker	Male	33	Hearing Therapy Diploma Final year B. Communication Pathology student

they observe, interpret and document data (Krefting, 1991:219). The fieldworkers were cautioned against their own biases and were made cognisant of the importance of assuming a neutral self-reflecting role toward the data collection process (Reid & Gough, 2000:71). These data collection techniques aimed to describe the *context* (for example, facilities and environment) and *interactional processes* (attitudes, support, contact, networking, collaboration, and neonate/ infant state) at the MCH clinics as it related to the hearing screening of infants.

Data collection procedures

Qualitative field data were collected throughout the fivemonth research period during which the hearing screening programme was conducted at the MCH clinics in Hammanskraal. During this period screening was conducted three days per week. The hearing screening programme included the following components: 1) caregivers were informed regarding the importance of hearing impairment and the screening process; 2) biographical information and a high-risk register for hearing loss were documented through questioning the caregiver and using the patient file; 3) a middle-ear evaluation was conducted using tympanometry and acoustic reflex measurements; 4) hearing was screened using an Oto-Acoustic Emission (OAE) device on all infants; 5) high-risk infants and infants referring the OAE test received an Automated Auditory Brainstem Response (AABR) screening to cross-check the OAE refer results and to reduce false-positives for sensorineural hearing loss; 6) appropriate referrals were made after the screening protocol was conducted on an infant.

The following procedures were adhered to for the collection of qualitative data during the hearing screening programme at the MCH clinics:

• The researchers were sensitised to watch

and listen carefully during the training of fieldworkers in order to ensure that they are able to observe factors relating to the screening context and interactional processes.

- This was done throughout the five-month data collection period and within this time the researchers became the instruments absorbing all sources of information (Neuman, 1997:361).
- When an observation was made regarding the context or interactional processes this was documented as field notes.
- These notes were examined and elaborated on once the data collection for a given day was completed by the fieldworkers.
- After the five months of empirical data collection the researcher and each research assistant were required to do a critical reflection of their experiences during the period of collecting data at the respective clinics.

Data analysis procedures

Qualitative data analysis was performed as an integral part of the data preparation procedures. The preparation and analysis of qualitative data consisted of organising and grouping field notes and critical reflection data into *context* (barriers and assets) and *interactional process* (attitudes, support, contact, networking, collaboration, neonate/infant state) themes (Neuman, 1997:421). This was done by typing all the field notes and critical reflections onto MS Word format. The steps conducted in analysing the qualitative data involved the following three steps:

- Units of relevance are identified
- The researcher identified units (for example, phrases, sentences) relating to the aims of the

study. The data units relating to the context were marked in a distinctive manner from data relating to the interactional processes (Reid & Gough, 2000:75).

Classification of themes

The researcher identified major themes (context and interactional processes) in the field notes and critical reflections. The data units were compiled according to the two major themes identified in the aims of the study. These sorted themes established a basis for further categorisation of the content where data units in each theme were classified into subthemes in terms of assets and barriers (Reid & Gough, 2000:76).

• Categorisation of supporting material The units identified in step one were subsequently sorted according to the themes identified in step two. This categorisation in themes and sub-themes formed an interpretive representation of responses (Reid & Gough, 2000:76).

Trustworthiness of data

The trustworthiness of the qualitative data collected was ensured to a high degree by the following:

- Combining the field notes and critical reflections from five fieldworkers increases the credibility of the data by utilising experiential data from a group instead of an individual (Reid & Gough, 2000:67).
- Conducting the naturalistic observations in two different MCH clinics increased the credibility and transferability of the data because it was conducted in more than one setting (Reid & Gough, 2000:67).
- During the extent of the research project the primary researcher reflected on the possible influence of his own background, perceptions, experience and interest on the interpretation of findings and was cautioned against bias as a result (Krefting, 1991:219).
- Real life settings (MCH clinics) were implemented from a typical developing South African context and, therefore, do carry transferability toward other MCH clinics in developing contexts.

- A combination of data collection methods, including field notes and critical reflections, and a small number of fieldworkers (n=5), allowing less variability, ensured a higher degree of dependability (Krefting, 1991:220).
- The researchers were reflectively cognisant of assuring an unbiased approach toward the data collection procedure to ensure that inference or conclusions were not made in order to satisfy the confirmability criteria (Reid & Gough, 2000:71).

RESULTS AND DISCUSSION

MCH clinics as hearing screening contexts

A summary of the fieldworkers' descriptions classified in terms of assets and barriers posed by the MCH clinics as a context for hearing screening is presented in Table 2.

The prominent findings indicated both clinics had adequate basic (separate furnished room, toilet and electricity points) and support (gloves and disinfectant) facilities available for the implementation of infant hearing screening programmes. The most prominent barriers included high external noise levels due to patients, nursing staff, sewage trucks and construction. Other barriers were the travelling distance and poor roads with intermittent barriers including no running water, electrical power breaks, and safety issues.

The remote location of many MCH clinics in rural areas with poor roads leading there is a contextual barrier towards effective screening programmes in regards to maintenance of screening equipment and efficient management of the screening programme by personnel at the district level. Apart from the geographical challenges developing communities, such as Hammanskraal, are generally reported to have an absence of proper facilities for newborn and infant hearing screening (Mencher & DeVoe, 2001:19). The quality of primary health care clinic facilities is an important determinant of the satisfaction of patients and staff with the health service and South African health care facilities indicate much room for improvement (Day, Reagon, Irlam & Levin, 2004:343).

CLINICS AS HEARING SCREENING CONTEXT

ASSETS:

- A room with enough space was made available at each clinic. At one clinic the testing room was separate from the rest of the clinic, which allowed for a quiet and controlled screening environment.
- Chairs and tables were available in each screening room.
- Gloves and disinfectant were supplied by clinic personnel.
- Electricity and enough power points were available for the equipment.
- Bathrooms with toilet facilities were available at each clinic although running water was not always present.
- Although facilities were not ideal they were adequate in both cases.

BARRIERS:

- External noise levels were the main problem. Noise was primarily due to mothers talking outside the test room; clinic staff moving through the screening area; nearby construction and a sewage truck which came every other day and halted screening for 30 minutes. If mothers outside were instructed to keep quiet during the screening they obeyed for a period of time and would have to be asked again after some time. It was also noted that noise levels were least early in the morning and became gradually more as noon approached.
- Running water was not consistently available.
- Five electricity failures that lasted between one hour and one day were counted during the 6month screening period.
- A lack of large enough waiting rooms for all the caregivers and infants makes accommodating all persons in poor weather conditions difficult and causes noise levels that are too high to allow hearing screening.
- Distance from Pretoria was noted as a significant barrier for fieldworkers to travel to and fro.
- A poor gravel road had to be travelled on for 1 km before reaching each of the clinics to the one clinic an especially poor road with many potholes had to be driven.
- Safety was a concern at times. Unfamiliar men including an inebriated man illicitly entered the screening area on isolated occasions, alarming fieldworkers and caregivers.

Table 3: Fieldworker interaction with nursing staff

INTERACTION PROCESS WITH NURSING STAFF

ASSETS:

- For the most part nursing staff were cooperative, helpful, friendly and positive toward the screening project.
- Although the nursing staff were initially hesitant about the presence of the fieldworkers, this attitude later changed as the nurses themselves reported that it was reassuring for them to see that the screening project was continuing in a consistent manner for the specified period.
- Personnel were helpful in accommodating the fieldworkers with regard to workspaces and disposables such as gloves and disinfectant.
- Nurses were eager to share information regarding the clinic statistics once a mutual trust developed between the nurses and the fieldworkers over the first month of screening.
- The nurses encouraged the mothers to have their infants' hearing tested and explained the importance to the caregivers.
- Giving feedback to the nurses about the screening results encouraged a collaborative relationship and established an ownership of the screening project among the nursing staff.
- Demonstrating respect toward the nurses by greeting them first thing in the morning and greeting them when leaving in the afternoon was reported by the nurses to be greatly appreciated and fostered a healthy collaboration.
- The good relationships allowed freedom for the researchers in the managing and organising the screening programme within the existing structure of the clinic.
- In a few instances when the one fieldworker fluent in many of the South African languages was not present and a caregiver was interviewed who did not understand English, the nurses were willing to act as interpreters.

BARRIERS:

- Initially nurses were hesitant toward the implementation of a new hearing screening project.
- Only in isolated cases did one or two nurses not cooperate in referring and motivating mothers to come for the hearing
- screening and these instances were for the most part confined to the first few weeks of the research project.
- Once or twice nurses enquired to find out if we were asking a fee for the hearing screening. When they were assured that it was a free service they were very pleased.
- Nurses did not indicate a desire to learn what the hearing screening procedure entailed and did not offer to help screen the infants.

Previous reports indicated that South African clinics and especially rural clinics offer very little in the way of facilities, even though there may be adequate medicine available (Strachan, 1999:1). Although there is substantial variability between provinces a national survey done in 2003 indicated that only 59% of primary health care facilities had adequate consultation rooms, 48% had adequate waiting areas, and only 42% had adequate toilets for patients and staff (Day *et al.* 2004:343). The current study also reported a lack of adequate waiting areas and although toilets were available for staff, running water was not always available. In addition to this, interruptions in electricity were also reported as a barrier. The survey of primary health care facilities indicated that although there has been a substantial improvement in water provision at facilities with 98% having on-site water supply, and electricity supplied to 95% of facilities, interruptions in supply were still far too frequent (Day *et al.* 2004:343). The fact that new hearing screening equipment is battery-operated means that short interruptions in electricity supply need not affect the screening process although longer breaks will certainly be a barrier.

The reported barrier of high noise levels in the current study is primarily due to inadequate waiting areas close to a room without soundproofing. Although this did not make screening impossible there were times in which the noise-levels were too high to screen in. Strategies to address this problem included regularly informing all caregivers in the waiting area regarding the importance of silence in order to conduct the screening and closing all doors and windows. Provision of adequate waiting areas as recommended by the 2003 survey of primary health care facilities (Reagon *et al.* 2004:29) will provide a solution to the barrier posed by excessive noise to the screening of infant hearing.

The reported safety concern at the clinics investigated in this study is also a significant problem identified by the 2003 survey of primary health care facilities (Reagon *et al.* 2004:34). The provision of adequate security measures is essential to ensure the protection and security of patients and staff. Safety concerns may be a general deterrent for screening personnel, caregivers and programme managers which will decrease the efficacy of a hearing screening programme. A call has been made for the improvement of security measures at the majority of these facilities especially those where the incidence of crime is highest (Reagon *et al.* 2004:34).

Interaction process with nursing staff

Table 3 presents a summary of the interaction experience between the fieldworkers and nursing staff at the clinics.

In general a positive collaboration between nurses and fieldworkers was evident with a natural resistance to change only reported in the initial phases of the project (Olusanya, 2000:169). The collaborative relationship was fostered over time by providing a consistent service and maintaining an open channel of communication accompanied by basic courteousness. The only persistent negative aspect regarding the collaboration was the nurses' complacency and lack of interest in learning more about the effect of infant hearing loss and the screening process. According to Olusanya (2000:169) this is a result of a natural resistance to change and an inherent complacency, which is encouraged by the invisible nature of hearing loss. The prospect of implementing widespread hearing screening programmes at these clinics will however, require nurses or volunteers to perform the screening (HPCSA, 2002:5). This therefore emphasises the importance of nurses being collaborative partners in the screening process.

Developing effective collaborative partnerships require that both partners possess common core knowledge and share a common philosophy about the outcome of their services (Moodley et al. 2000:26). Utilising interdisciplinary training programmes to improve nurses' knowledge regarding hearing loss and the hearing screening process are the only means of establishing effective partnerships that share a common philosophy regarding the outcome (Olusanya et al. 2004:302; Gopal, Hugo & Louw, 2001:106; Moodley et al. 2000:37). It is essential to be proactive once the widespread implementation of hearing screening programmes are conducted in South Africa by accompanying this process with interdisciplinary training programmes to raise the awareness and collaboration of nurses. In so doing the effective implementation of screening programmes at these clinics will be ensured to a much greater extent (Moodley et al. 2000:37).

Interaction process with caregivers

The experiences of the fieldworkers with the caregivers are summarised in Table 4.

The interactional processes documented in Table 4 indicate that the caregivers generally had a positive attitude toward the hearing screening programme and demonstrated a certain degree of ownership by actively participating in the screening process. This active participation indicates an important asset in terms of assuming responsibility for the infant's hearing (Louw & Avenant, 2002:147). This is essential for effective transdisciplinary teamwork with caregivers as the primary agents in the process of identification of hearing loss and subsequent intervention (Moodley *et al.*

Table 4: Fieldworker interaction with caregivers

INTERACTION PROCESS WITH THE CAREGIVERS

ASSETS:

- The vast majority of caregivers were very positive about the screening of their infants and indicated a genuine thankfulness.
 Most were at ease after explanation of the procedure and reassurance that the screening is not painful.
- The caregivers were very willing to share most of the information requested regarding identifying information and high risk indicators for hearing loss.
- The vast majority of caregivers embraced a certain degree of ownership in the screening process by often calming ther infants through breastfeeding so that the screening could be performed.
- Waiting in line to have their infants' hearing screened did not seem to be a negative experience for the caregivers.

BARRIERS:

- Language was a persistent barrier. Although most caregivers could speak and understand a little bit of English, many could not. Having two fieldworkers fluent in most of the official native languages in South Africa was an important asset.
- Some of the young mothers were anxious initially about the screening of their infants' hearing.
- The caregivers were sensitive about questions regarding sexually transmitted diseases.
- Among some of the mothers a fatalistic attitude toward disability was experienced. One mother did not want to wait for the hearing screening and stated that "if my child is deaf, he's deaf".
- Caregivers demonstrated very little insight into the implications of hearing loss and the importance of early intervention.

Table 5: Fieldworker interaction with infants

INTERACTION PROCESS WITH INFANTS AT MCH CLINICS

ASSETS:

- Sleeping infants are much easier to test. It was noted that neonates and young infants were easier to screen because they sleep more often and more readily.
- Testing the children who were restless while they breast-fed was an appropriate course of action in many instances.
- If infants were extremely restless, it sometimes worked to send the caregiver outside to calm the infant and bring him/her back once he/she is asleep or more restful.
- A technique that also worked for many infants who were awake was to distract them visually with moving objects in their field of vision (for example, coloured objects and wriggling fingers) to ease the insertion of the probe and occupy the infant for the duration of the test.

BARRIERS:

- Awake and restless infants were a continual challenge. It was noted that older infants were often more difficult to evaluate because they were awake more often.
- Infants visit the clinic for an immunisation. After they received the injection it was near impossible to screen them as they were very uncomfortable and were often crying. All infants were recommended to come for the hearing screening first before they go for immunisation.
- Older children were also more wary to be screened because many of them had not seen a white person before and three of the four fieldworkers were white.
- Although breastfeeding helped to calm the infants in some cases, it was in cases where infants were drinking fervently not possible to screen with OAE as the internal noise from the sucking action was too loud.

2000:26).

A range of barriers were identified with a significant barrier being poor awareness among caregivers regarding hearing loss and the screening process in infants, which is not uncommon in the developing world (Olusanya *et al.* 2004:301). This was also the primary reason for initial anxiousness among some of the younger mothers during the screening even after the process was carefully explained. The poor awareness was also accompanied by a fatalistic attitude toward the possibility of having a hearing loss in a number of cases, which may reflect a cultural perception regarding disability (Louw & Avenant, 2002:146; Fair & Louw, 1999:20). Positive changes will therefore require culturally sensitive efforts towards enhancing public awareness in antenatal clinics and in communities regarding the benefits of early identification compared to lack of timely intervention (Bamford, 2000:365; Louw & Avenant, 2002:147).

Another important barrier was the reluctance of caregivers to report infection with sexually transmitted diseases such as HIV and syphilis which are risk factors for hearing loss. This was probably due to embarrassment and a negative social stigma associated therewith. The accurate documentation of these risks will be an essential part of a targeted screening programme based on screening infants demonstrating a high risk factor for hearing loss as recommended by the year 2002 HSPS (HPCSA, 2002:3). It will therefore be an important priority to (1) develop ways of collaborating

with caregivers in a culturally sensitive manner, to (2) instil awareness amongst caregivers regarding the importance of accurate reporting, and to (3) rely more heavily on information in the clinic files for documenting congenital infections, to ensure accurate documentation of risks for hearing loss.

Interaction process with infants

The experiences of the fieldworkers in regards to the screening of infants between 0 - 12 months of age are summarised in Table 5.

According to the summary of fieldworkers' experiences with screening infants at the MCH clinics, presented in Table 5, breastfeeding was often used as a way of calming infants allowing for subsequent screening. In certain cases, however, the sucking action also proved to be a barrier due to excessive internal noise prohibiting OAE recordings. An important deduction evident from the summary in Table 5 is that in general, neonates and younger infants were easier to test than older infants. This is also the primary reason why the AABR screening did not prove efficient for this group of infants. Similar difficulties in testing older infants have been reported previously and indicated a better success rate for younger infants because older infants became restless faster, were shy of people outside their home and were also more suspicious of tests done by unfamiliar personnel (Palmu, Puhakka, Rahko & Takala, 1999:211). Fortunately the proposed initial screening recommended by the year 2002 HSPS is for young infants attending their six-week immunisation clinic (HPCSA, 2002:2). Follow-up evaluations when they are older may however prove more difficult than the initial screening.

CONCLUSION

The two MCH clinics investigated in Hammanskraal provided a working context to screen infants for hearing loss despite prevailing contextual barriers that are characteristic of primary health care clinics in developing contexts of South Africa. Interactional processes between fieldworkers, nursing staff and caregivers revealed that collaborative partnerships fostered by consistent service delivery, maintenance of an open channel of communication and basic courteousness, facilitated an effective initial infant hearing screening at the two clinics. Screening infants' hearing at MCH clinics could be conducted successfully using the OAE technique although restful infants were easier to screen and breastfeeding often calmed distressed infants which aided more efficient screening.

An important challenge that needs to be addressed is the active involvement of all participants in the screening process. Both the caregivers/parents and the nursing staff at MCH clinics need to be empowered by recognising and building upon the strengths and assets that they exhibit. Culturally sensitive information furthermore needs to be provided to improve their awareness and knowledge of hearing loss and its effects (Beckman, 2002:688). It is essential to establish effective collaborative partnerships where all parties share a common philosophy about the need and consequence of services so as to improve the outcomes of the infant (Moodley et al. 2000:26; Popich, 2003:34). This conviction is based on the premise that any success a child achieves will be through family intervention, and therefore the family must be empowered as an essential and equal partner in a multi-disciplinary hearing management team (Mencher et al. 2001:8).

Primary health care contexts such as the MCH clinics have the potential to serve as practical hearing screening contexts that provide comprehensive coverage of infants in South Africa, especially those from disadvantaged communities (Solarsh & Goga, 2004:121). The recommendation by the year 2002 HSPS, namely to include six-week immunisation clinics at MCH clinics as a major screening context alongside the NICUs and well-baby nurseries (HPCSA, 2002:5) demonstrates promise as a practical solution to achieve widespread screening coverage in South Africa.

LIMITATIONS

The limitations of the study can be summarised as follows:

 Since no hearing screening programme was yet in existence at MCH clinics when the study was conducted, an existing programme could not be investigated. This means that a programme was implemented and conducted over a short period of five months, solely for the purposes of the study. The conclusions drawn are therefore representative of a newly implemented programme and not of any existing programmes.

- During the five-month data collection period it was also not possible to conduct screening every day. Therefore not all infants who visited the MCH clinic during this period were necessarily screened, whereas in an established programme screening would have been conducted more consistently.
- The fieldworkers who conducted the screening were not necessarily representative of the screening personnel recommended by the year 2002 HSPS (HPCSA, 2002:5), namely nurses and/or lay volunteers. Using such personnel may influence the results of the screening programme and as such the current study is therefore not representative of the recommended screening practice at MCH clinics (HPCSA, 2002:5).
- Since, at the time of the data collection, no formal screening programme existed in conjunction with the immunisation programme, all infants between the age of 0 and 52 weeks were included and not only those attending for their six-week immunisation visit. This means that although the MCH and immunisation clinics were investigated, the study was not confined to the six-week immunisation clinics for initial screens as recommended by the year 2002 HSPS (HPCSA, 2002:5). The results therefore do not represent only the six-week immunisation clinics, but rather the broader population of infants younger than one year of age who attended the particular two MCH clinics.

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