INFANT HEARING SCREENING
AT MATERNAL AND CHILD HEALTH CLINICS
IN A DEVELOPING SOUTH AFRICAN COMMUNITY

BY

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‘...so that God may be all in all’

1 Cor 15:28b
TABLE OF CONTENTS

LIST OF TABLES ix
LIST OF FIGURES xiii
LIST OF ABBREVIATIONS xv
ABSTRACT xvi
OPSOMMING xviii

CHAPTER 1: INTRODUCTION AND ORIENTATION 1
1.1 INTRODUCTION 1
1.2 DEVELOPMENT OF INFANT HEARING SCREENING 4
1.3 IMPORTANCE OF EARLY DETECTION OF AND INTERVENTION FOR HEARING LOSS 7
1.4 INFANT HEARING SCREENING IN SOUTH AFRICA: A NEW DIRECTION 10
1.5 STATEMENT OF PROBLEM AND RATIONALE 14
1.6 ADDRESSING THE PROBLEM 17
1.7 ORGANISATION OF THE STUDY 18
1.8 TERMINOLOGY 19
1.9 CONCLUSION 23
1.10 SUMMARY 23

CHAPTER 2: PRINCIPLES AND CURRENT PRACTICE OF INFANT HEARING SCREENING 25
2.1 INTRODUCTION 25
2.2 PHILOSOPHY OF SCREENING 27
2.3 PRINCIPLES OF INFANT HEARING SCREENING 31
2.3.1 Disorder-related principles of infant hearing screening 33
2.3.1.1 Prevalence of congenital hearing loss 34
2.3.1.2 Consequences of neonatal hearing loss 36
2.3.1.3 Effect of earlier versus later identification and intervention 38
2.3.2 Process-related principles of infant hearing screening 41
  2.3.2.1 Accuracy of infant hearing screening methods 41
  2.3.2.2 Efficiency of early identification programmes 44
  2.3.2.3 Costs of infant hearing screening 49
2.4 INFANT HEARING SCREENING PRACTICE IN THE DEVELOPED WORLD 51
  2.4.1 Benchmarks and standards for hearing screening 55
    2.4.1.1 From targeted to universal newborn hearing screening 56
    2.4.1.2 Early hearing detection and intervention systems 57
    2.4.1.3 JCIH Year 2000 position statement 61
  2.4.2 Current infant hearing screening issues 65
2.5 CONCLUSION 70
2.6 SUMMARY 71

CHAPTER 3: INFANT HEARING SCREENING: A PRACTICE RELEVANT FOR
THE DEVELOPING WORLD? 73
3.1 INTRODUCTION 73
3.2 HEALTHCARE PERSPECTIVE IN DEVELOPING COUNTRIES 74
3.3 RELEVANCE OF INFANT HEARING SCREENING IN DEVELOPING CONTEXTS 78
  3.3.1 Disorder-related principles in developing countries 78
  3.3.2 Process-related principles of infant hearing screening in developing countries 80
  3.3.3 Context-dependent implementation of infant hearing screening 82
3.4 STATUS OF INFANT HEARING SCREENING IN DEVELOPING COUNTRIES 83
3.5 CHALLENGES TO INFANT HEARING SCREENING IN DEVELOPING COUNTRIES 86
3.6 IMPORTANCE OF INFANT HEARING SCREENING IN DEVELOPING COUNTRIES 89
  3.6.1 Benefits of infant hearing screening in developing countries 89
  3.6.2 Healthcare platforms for infant hearing screening 91
  3.6.3 Targeted and universal newborn hearing screening 93
3.7 CONCLUSION 94
CHAPTER 4: EARLY INTERVENTION FOR INFANTS WITH HEARING LOSS
IN SOUTH AFRICA: A CRITICAL EVALUATION

4.1 INTRODUCTION

4.2 BENCHMARKS AND STANDARDS FOR EHDI IN SOUTH AFRICA
- Principles of the South African Hearing Screening Position Statement
- Roles and responsibilities of EHDI role players in South Africa
- Contextually relevant benchmarks and standards

4.3 EVALUATION OF THE SOUTH AFRICAN CONTEXT
- General characteristics of the population
- Disability in South Africa
  - Epidemiology of childhood hearing disability in South Africa
- Socio-economic infrastructure
  - Socio-economic effects on children
- Effect of HIV/AIDS
- Healthcare system for children

4.4 EVALUATION OF EHDI SERVICES IN SOUTH AFRICA
- Introduction
- Audiological manpower in South Africa
- Status of audiological services to infants and young children
  - Audiology research in South Africa
  - Audiological prevention and screening for infants in South Africa
  - Audiological assessment in South Africa
  - Audiological intervention in South Africa

4.5 SUMMARY OF THE CHALLENGES TO EHDI IN SOUTH AFRICA

4.6 FUTURE OF EHDI SERVICES IN SOUTH AFRICA

4.7 CONCLUSION

4.8 SUMMARY
CHAPTER 5: RESEARCH DESIGN AND METHOD

5.1 INTRODUCTION

5.2 AIMS OF THE STUDY
  5.2.1 Main aim and sub-aims

5.3 CONCEPTUALISATION OF DESIGN AND METHOD
  5.3.1 Research design
  5.3.2 Research method
    5.3.2.1 Quantitative research method
    5.3.2.2 Qualitative research method

5.4 RESEARCH CONTEXT

5.5 ETHICAL ISSUES

5.6 RESEARCH PARTICIPANTS
  5.6.1 Selection criteria
    5.6.1.1 Fieldworkers
    5.6.1.2 Subjects
  5.6.2 Selection procedure
    5.6.2.1 Fieldworkers
    5.6.2.2 Subjects
  5.6.3 Description of participants
    5.6.3.1 Fieldworkers
    5.6.3.2 Subjects

5.7 DATA COLLECTION MATERIAL AND APPARATUS
  5.7.1 Interview schedule
    5.7.1.1 Biographical information
    5.7.1.2 Risk indicator list
  5.7.2 Middle ear analyser
    5.7.2.1 Middle ear analyser: test parameters
  5.7.3 OAE/AABR screener
    5.7.3.1 OAE screener: test parameters
    5.7.3.2 AABR screener: test parameters
5.7.4 Diagnostic ABR

5.7.4.1 Diagnostic ABR: test parameters

5.8 PILOT STUDY

5.8.1 Aim

5.8.2 Participants

5.8.3 Material and apparatus

5.8.4 Procedure

5.8.5 Results

5.8.6 Implications

5.9 DATA COLLECTION PROCEDURES

5.9.1 Quantitative data collection procedures

5.9.1.1 Phase 1: Biographical information and risk indicators

5.9.1.2 Phase 2: High frequency immittance measurements

5.9.1.3 Phase 3: Hearing screening

5.9.1.4 Phase 4: Diagnostic assessment

5.9.2 Qualitative data collection procedures

5.10 DATA PREPARATION PROCEDURES

5.11 DATA ANALYSIS PROCEDURES

5.12 VALIDITY, RELIABILITY AND TRUSTWORTHINESS ISSUES

5.12.1 Quantitative quality criteria

5.12.2 Qualitative quality criteria

5.13 CONCLUSION

5.14 SUMMARY

CHAPTER 6: RESULTS AND DISCUSSION

6.1 INTRODUCTION

6.2 RESULTS AND DISCUSSION OF SUB-AIM #1: MCH CLINICS AS HEARING SCREENING CONTEXT

6.2.1 Presentation and discussion of results for sub-aim #1

6.2.2 Summary of results and discussion for sub-aim #1
7.5 CRITICAL EVALUATION OF STUDY

7.6 SERVICE DELIVERY MODEL FOR INFANT HEARING SCREENING IN MCH CLINICS
   7.6.1 Service delivery structure
   7.6.2 Role players and responsibilities
   7.6.3 Screening protocol

7.7 FINAL COMMENTS

REFERENCES

APPENDICES

APPENDIX A: PRINCIPLES OF NEWBORN HEARING SCREENING
APPENDIX B: DATA COLLECTION SHEET
APPENDIX C: CRITICAL REFLECTION SHEET
APPENDIX D: LETTER TO CAREGIVERS – DESCRIPTION OF THE PROJECT AND INFORMED CONSENT
APPENDIX E: FOLLOW-UP APPOINTMENT LETTER
APPENDIX F: LETTER OF ETHICAL CLEARANCE – ETHICS COMMITTEE, FACULTY OF HUMANITIES, UNIVERSITY OF PRETORIA
APPENDIX G: LETTER OF ETHICAL CLEARANCE – ETHICAL COMMITTEE, DISTRICT DEPARTMENT OF HEALTH, NORTH WEST PROVINCE
LIST OF TABLES

| Table 1.1 | Outline and description of the sections comprising this study | 19 |
| Table 2.1 | Elements of a screening programme (ASHA, 1995) | 28 |
| Table 2.2 | Principles underpinning the practice of HIS | 33 |
| Table 2.3 | Prevalence rates reported for bilateral permanent childhood hearing loss in population-based studies | 35 |
| Table 2.4 | Compelling benefits of early identification versus later identification | 39 |
| Table 2.5 | Summary of the JCIH Year 2000 Position Statement | 62 |
| Table 2.6 | Current EHDI issues in the USA | 69 |
| Table 3.1 | Developing regions and countries of the world | 75 |
| Table 3.2 | Challenges to IHS implementation in developing countries | 88 |
| Table 3.3 | Healthcare platforms for IHS | 92 |
| Table 4.1 | Summary and evaluation of principles and benchmarks specified by the South African HSPS | 102 |
| Table 4.2 | Roles and responsibilities of role players in EHDI programmes | 106 |
| Table 4.3 | Key indicators for South African children | 126 |
| Table 4.4 | Number of community-service* audiologists and permanent audiologists employed by the Department of Health in each province | 131 |
| Table 4.5 | Summary of challenges to EHDI in South Africa | 142 |
| Table 4.6 | Priority challenges to developing EHDI programmes in South Africa | 147 |
| Table 5.1 | Quantitative data collection methods and type of data obtained | 158 |
| Table 5.2 | Qualitative data collection method and type of data obtained | 159 |
| Table 5.3 | Maternal and Child health statistics for Refentse MCH clinic during March and April 2002. | 164 |
| Table 5.4 | Description of fieldworkers | 171 |
| Table 5.5 | Data collection material and apparatus | 173 |
Table 5.6  List of risk indicators for infants 0-1 year as compiled from JCIH 1994 & 2000 lists  175  
Table 5.7  OAE stimulus parameters (DPOAE 2)  180  
Table 5.8  OAE recording parameters (DPOAE 2)  180  
Table 5.9  AABR stimulus parameters  181  
Table 5.10  AABR recording parameters  182  
Table 5.11  Diagnostic ABR stimulus parameters  183  
Table 5.12  Diagnostic ABR recording parameters  183  
Table 5.13  Statistical analyses implemented for sub-aims  199  
Table 5.14  Aspects of trustworthiness  203  
Table 6.1  Summary of qualitative results describing the clinics as screening platforms  209  
Table 6.2  Summary of results and discussion for sub-aim #1  212  
Table 6.3  Number of children borne of mothers (n=503)  217  
Table 6.4  Summary of results and discussion for sub-aim #2  223  
Table 6.5  Summary of the risk indicators for the sample  225  
Table 6.6  Results of 1000Hz Y-admittance tympanograms recorded for both ears in each subject (n=472)  233  
Table 6.7  Mean, standard deviation, range and 5th and 95th percentile of acoustic reflex thresholds  235  
Table 6.8  Presence of 1000Hz probe tone acoustic reflexes recorded at 1000Hz for both ears in each subject (n=440)  235  
Table 6.9  OAE screening results for subjects in which a result was reported for both the left and right ear (n=475)  238  
Table 6.10  AABR screening results for evaluated subjects (n=17)  239  
Table 6.11  Summary of results and discussion for sub-aim #3  243  
Table 6.12  Positive and negative predictive values for OAE, tympanogram, and acoustic reflex results for all ages  247
Table 6.13 Positive and negative predictive values for OAE, tympanogram, and acoustic reflex results for infants 0-4 and 5-52 weeks of age 249
Table 6.14 Predictive values of combined tympanometry and acoustic reflex results for OAE outcome 250
Table 6.15 Predictive values of OAE results for combined tympanogram and acoustic reflex results 252
Table 6.16 1000Hz tympanometry norms for the sample 257
Table 6.17 1000Hz tympanometry norms for neonates 259
Table 6.18 1000Hz tympanometry norms for infants 5-52 weeks of age 260
Table 6.19 1000Hz probe tone acoustic reflex norms for the sample 263
Table 6.20 Summary of results and discussion for sub-aim #4 277
Table 6.21 Summary of fieldworker and nursing personnel collaboration 280
Table 6.22 Summary of fieldworker experiences with caregivers 282
Table 6.23 Summary of fieldworker experiences with the screening of infants 0-12 months 284
Table 6.24 Summary of results and discussion for sub-aim #5 285
Table 7.1 Critical evaluation of the empirical study 300
<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Phases in the Early Hearing Detection and Intervention (EHDI) process</td>
<td>6</td>
</tr>
<tr>
<td>1.2</td>
<td>Problem-solving process used in the research project</td>
<td>17</td>
</tr>
<tr>
<td>2.1</td>
<td>Theoretical and practical construct (Chapter 2) for evaluating IHS in the developing world (Chapter 3)</td>
<td>27</td>
</tr>
<tr>
<td>2.2</td>
<td>Criteria for evaluation of a disorder according to principles of screening</td>
<td>30</td>
</tr>
<tr>
<td>2.3</td>
<td>Early hearing detection and intervention model</td>
<td>59</td>
</tr>
<tr>
<td>4.1</td>
<td>Outline of chapter 4</td>
<td>99</td>
</tr>
<tr>
<td>4.2</td>
<td>Distribution of South African population according to race</td>
<td>110</td>
</tr>
<tr>
<td>4.3</td>
<td>Prevalence of disabilities in South Africa</td>
<td>112</td>
</tr>
<tr>
<td>5.1</td>
<td>Research design and method of study</td>
<td>154</td>
</tr>
<tr>
<td>5.2</td>
<td>Hammanskraal on City of Tshwane map</td>
<td>161</td>
</tr>
<tr>
<td>5.3</td>
<td>Age distribution of Hammanskraal population</td>
<td>160</td>
</tr>
<tr>
<td>5.4</td>
<td>Quantitative and qualitative data collection procedure</td>
<td>188</td>
</tr>
<tr>
<td>5.5</td>
<td>OAE/AABR screening protocol #1 (For all neonates/infants except NICU graduates)</td>
<td>192</td>
</tr>
<tr>
<td>5.6</td>
<td>OAE/AABR screening protocol #2 (For NICU graduates)</td>
<td>193</td>
</tr>
<tr>
<td>6.1</td>
<td>Sub-aims constituting the main aim of the current study</td>
<td>208</td>
</tr>
<tr>
<td>6.2</td>
<td>Age distribution of infants (n=510)</td>
<td>213</td>
</tr>
<tr>
<td>6.3</td>
<td>Frequency distribution of infants younger than 10 weeks (n=252)</td>
<td>214</td>
</tr>
<tr>
<td>6.4</td>
<td>Primary caregivers of infants (n=510)</td>
<td>215</td>
</tr>
<tr>
<td>6.5</td>
<td>Marital status of mothers (n=504)</td>
<td>215</td>
</tr>
<tr>
<td>6.6</td>
<td>Frequency distribution of mothers according to age (n=510)</td>
<td>217</td>
</tr>
<tr>
<td>6.7</td>
<td>Home language of families (n=508)</td>
<td>219</td>
</tr>
<tr>
<td>6.8</td>
<td>Educational qualifications of mothers (n=507) and fathers (n=199)</td>
<td>220</td>
</tr>
<tr>
<td>6.9</td>
<td>Average monthly household income (n=184)</td>
<td>222</td>
</tr>
<tr>
<td>6.10</td>
<td>Distribution of risk indicators identified for the sample (n=127)</td>
<td>226</td>
</tr>
<tr>
<td>6.11</td>
<td>Number of infants with one or more risk factors (n=106)</td>
<td>229</td>
</tr>
<tr>
<td>6.12</td>
<td>1000Hz Y-admittance tympanogram peaks (961)</td>
<td>231</td>
</tr>
</tbody>
</table>
Figure 6.13 1000Hz acoustic reflex thresholds using a 1000Hz probe tone (n=915) 234
Figure 6.14 Percentage of ears with pass and refer results (n=964) 237
Figure 6.15 Comparison of OAE pass, tympanogram peak, and acoustic reflex present results 240
Figure 6.16 Comparison of OAE pass, tympanogram peak, and acoustic reflex present results for neonatal and infant ears 241
Figure 6.17 Positive and negative correlations between OAE, tympanometry (TYMP) and acoustic reflex (AR) results 245
Figure 6.18 Distribution of maximum admittance values for ears with OAE pass and refer results (n=934) 254
Figure 6.19 Distribution of tympanic peak pressure values for ears with OAE pass and refer results (n=916) 255
Figure 6.20 Distribution of peak admittance values for normative sample (n=809) 258
Figure 6.21 Peak admittance and tympanic peak pressure norms 262
Figure 6.22 Coverage of population by HRR and test procedures 265
Figure 6.23 Refer results for procedures in terms of ears and subjects 269
Figure 6.24 Results of the follow-up process 273
Figure 7.1 Service delivery model for infant hearing screening at MCH clinics 303
Figure 7.2 Service structure for infant hearing screening at MCH clinics 306
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AABR</td>
<td>Automated Auditory Brainstem Response</td>
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<td>AAP</td>
<td>American Academy of Pediatrics</td>
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<tr>
<td>ABR</td>
<td>Auditory Brainstem Response</td>
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<td>AIDS</td>
<td>Auto-immune Deficiency Syndrome</td>
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<td>AN</td>
<td>Auditory Neuropathy</td>
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<td>ANHSC</td>
<td>Australian National Hearing Screening Committee</td>
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<td>ASHA</td>
<td>American Speech-Language-Hearing Association</td>
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<tr>
<td>daPa</td>
<td>Deca Pascal</td>
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<tr>
<td>DPOAE</td>
<td>Distortion Product Oto-Acoustic Emissions</td>
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<tr>
<td>EHDI</td>
<td>Early Hearing Detection and Intervention</td>
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<tr>
<td>ENHR</td>
<td>Essential National Health Research</td>
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<td>HIV</td>
<td>Human Immune Virus</td>
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<tr>
<td>HL</td>
<td>Hearing Level</td>
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<tr>
<td>HPCSA</td>
<td>Health Professions Council of South Africa</td>
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<td>HRR</td>
<td>High-Risk Register (for Hearing Loss)</td>
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<td>HSPS</td>
<td>Hearing Screening Position Statement</td>
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<td>IHS</td>
<td>Infant Hearing Screening</td>
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<tr>
<td>JCIH</td>
<td>Joint Committee on Infant Hearing</td>
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<tr>
<td>MEE</td>
<td>Middle-Ear Effusion</td>
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<td>MCH</td>
<td>Maternal and Child Health</td>
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<td>NHS</td>
<td>Newborn Hearing Screening</td>
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<tr>
<td>NICU</td>
<td>Neonatal Intensive Care Unit</td>
</tr>
<tr>
<td>NIDCD</td>
<td>National Institute for Deafness and Other Communication Disorders</td>
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<tr>
<td>NIH</td>
<td>National Institute of Health</td>
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<tr>
<td>OAE</td>
<td>Oto-Acoustic Emissions</td>
</tr>
<tr>
<td>TEOAE</td>
<td>Transient-Evoked Oto-Acoustic Emissions</td>
</tr>
<tr>
<td>TNHS</td>
<td>Targeted Newborn Hearing Screening</td>
</tr>
<tr>
<td>TPP</td>
<td>Tympanic Peak Pressure</td>
</tr>
<tr>
<td>UNHS</td>
<td>Universal Newborn Hearing Screening</td>
</tr>
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<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<tr>
<td>USPSTF</td>
<td>US Preventative Services Task Force</td>
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<td>WHO</td>
<td>World Health Organisation</td>
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</tbody>
</table>
Newborn hearing screening has become an increasingly important element of neonatal care in developed countries whilst only a few fragmented screening programmes are evident in developing countries. The numerous socio-economic, cultural and healthcare barriers in developing contexts do not, however, negate or diminish the need to ensure optimal outcomes for infants with hearing loss through early identification and intervention programmes. South Africa has taken a first step toward addressing this need by publishing a Year 2002 Hearing Screening Position Statement that was produced by the Professional Board for Speech, Language and Hearing Professions of the Health Professions Council of South Africa. Interim recommendations are made toward universal newborn hearing screening programmes in three contexts: well-baby nurseries, neonatal intensive care units (NICU) and Maternal and Child Health (MCH) clinics through their 6-week immunisation programmes. Although these clinics constitute an unfamiliar hearing screening context, they are essential platforms toward widespread screening of the majority of infants in South Africa. An urgent need therefore exists to ascertain the feasibility of hearing screening programmes at MCH 6-week immunisation clinics in order to guide the future implementation of widespread hearing screening services in South Africa.

To attend to this need, an exploratory descriptive design that jointly implements quantitative and qualitative methods in a dominant-less-dominant model of triangulation was utilised to critically describe a screening programme conducted at two MCH clinics in Hammanskraal (a developing, peri-urban South African community). The quantitative methods included a structured interview to compile
biographical and risk information; high frequency immittance measurements; hearing screening with OAE and AABR according to specified protocols, and diagnostic assessment of referred infants. The qualitative methods included field notes and critical reflections describing clinics as screening contexts and elucidating interactional processes involved in sustaining programmes. A total number of 510 infant-caregiver pairs were enrolled as subjects during the five-month research period.

Results indicate that clinics not only provide a suitable context, but also the possibility of effective collaborations toward facilitating effective initial infant hearing screening programmes. The caregivers and infants who attended the clinics demonstrated significant degrees of socio-economic deprivation. They also reported an increased incidence of risk indicators exacerbating the population’s risk for congenital hearing loss, poor participation in the hearing screening/follow-up process, and subsequent poor involvement in a family-centred early intervention process for infants identified with hearing loss. The screening protocol effectively classified infants into risk categories for hearing loss and established useful norms for high frequency immittance in infants. The efficiency of the programme was acceptable considering the short period of implementation, but inefficient coverage with the AABR and poor follow-up return rates were obtained at the clinics.

Despite prevailing barriers, the MCH 6-week immunisation clinics showed promise as platforms for widespread hearing screening programmes for infants in South Africa. The clinical implications and recommendations that emerged from the research conducted in this study were compiled and presented in the form of a preliminary service delivery model for infant hearing screening at MCH clinics.

**Key words:** audiological services, developing countries, early hearing detection and intervention programmes, high frequency immittance, high-risk register, immunisation programmes, infant hearing, maternal and child health, newborn hearing screening, services delivery model, South Africa.
OPSOMMING

TITEL: Gehoorsiftings van babas by moeder-kind-gesondheidsorgklinieke in ‘n ontwikkelende Suid-Afrikaanse gemeenskap

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MEDE-PROMOTOR: Prof B Louw

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GRAAD: DPhil Kommunikasiepatologie

Neonatale gehoorsiftings het ‘n toenemend belangrike element van neonatale sorg in ontwikkelde lande geword terwyl daar in ontwikkelende lande slegs enkele gefragmenteerde siftingsprogramme bestaan. Die uitdagings op sosio-ekonomiese, kulturele en gesondheidsorggebied in ontwikkelende kontekste verminder egter nie die behoefte aan optimale uitkomste vir kinders met gehoorverlies deur middel van vroeë identifikasie- en intervensioprogramme nie. Die Professionele Raad vir die Spraak-, Taal- en Gehoorprofessies van die Suid-Afrikaanse Raad vir die Gesondheidsprofessies het ‘n eerste tree geneem om hierdie behoefte aan te spreek met ‘n Jaar 2002 Gehoorsiftingsverklaring. Interim aanbevelings is gemaak met die oog op universele neonatale gehoorsiftingsprogramme in drie kontekste: gesondebaba-eenhede; by ontsl ag uit neonatale intensiewesorgeenhede en deur die 6-week immuniseringsprogramme van moeder-kind-gesondheidsorgklinieke. Hoewel hierdie klinieke ‘n ongewone gehoorsiftingskonteks is, bied dit ‘n essensiële platvorm vir uitgebreide sifting van die meerderheid babas in Suid-Afrika. Daar bestaan dus ‘n dringende behoefte aan die bepaling van die toepaslikheid van gehoorsiftingsprogramme by moeder-kind-gesondheids- en immuniseringsklinieke om leiding te gee ten opsigte van die implementering van toekomstige uitgebreide gehoorsiftingsdienste in Suid-Afrika.

Ten einde hierdie behoefte aan te spreek, is ‘n eksploratiewe beskrywende ontwerp, wat beide kwantitatiewe en kwalitatiewe metodes in ‘n model van triangulasie implementeer, aangewend om ‘n kritiese beskouing van ‘n gehoorsiftingsprogram by twee moeder-kind-gesondheidsklinieke in Hammanskraal (‘n ontwikkelende,
buitestedelike Suid-Afrikaanse gemeenskap) te verskaf. Die volgende kwantitatiewe metodes is gebruik: ’n gestruktureerde onderhoud om biografiese en risiko-inligting te versamel, hoë-frekwensie immittansiemetings, gehoorsifting met OAE en OBR volgens gespesifiseerde protokolle, en diagnostiese assessering van babas wat verwys is. Die kwalitatiewe metodes het veldnotas en kritiese refleksie aangaande die klinieke en siftingskonteks ingesluit, en ook lig gewerp op die interaktiewe prosesse vir die volhoubaarheid van programme. Altesaam 510 babaversorger-pare is tydens die vyf-maandelange navorsingsperiode as proefpersone ingeskryf.

Resultate dui daarop dat die klinieke nie slegs ’n gepaste konteks daarstel nie, maar ook die moontlikheid bied van doeltreffende samewerking met die oog op die fasilitering van suksesvolle gehoorsiftingsprogramme. Die versorgers en babas wat die klinieke besoek het, het beduidende grade van sosio-ekonomiese agterstand vertoon. Daar was ook by hulle ’n verhoogde voorkoms van risikofaktore wat die bevolking se kans vergroot om aan kongenitale gehoorverlies te ly en om onvoldoende in te skakel by die gehoorsiftings- en opvolgproses, asook by ’n gesinsgesentreerde vroeë-intervensieproses vir babas met gehoorverlies. Die siftingsprotokol was effektief om babas in risikokategorieë vir gehoorverlies te verdeel en het bruikbare norme vir hoë-frekwensie immittansiemetings in babas verskaf. Die doeltreffendheid van die program was aanvaarbaar, gesien dat dit nog maar vir ’n baie kort tydperk geïmplementeer is. Die OBR se bruikbaarheid en die swak terugkeersyfer vir opvolgevaluasies was oneffektief.

Ten spyte van voortdurende uitdagings hou die moeder-kind gesondheidsorg- en immuniseringsklinieke heelwat beloft in as platvorms vir uitgebreide gehoorsfitingsprogramme van babas in Suid-Afrika. Die kliniese implikasies en aanbevelings wat uit die navorsing in die huidige studie voortspruit, is saamgestel en aangebied in die formaat van ’n voorlopige diensleweringsmodel vir gehoorsifting van babas by moeder-kind gesondheidsorgklinieke.

**Sleutelwoorde:** oudiologiese dienste, ontwikkelende lande, vroeë gehooridentifiserings- en intervensieprogramme, hoë-frekwensie immittansie, hoë-risiko register, immuniseringsprogramme, gehoor by babas, moeder-kind gesondheid, neonatale gehoorsifting, diensleweringsmodel, Suid-Afrika.