Clinic Based Hearing Screening Protocols: The Feasibility of Implementing the Health Professions Council of South Africa Year 2007 Guidelines

A dissertation submitted to
The Department of Speech Pathology and Audiology
School of Human and Community Development
Faculty of Humanities
University of the Witwatersrand

In fulfilment of the requirements of the degree
Master of Arts in Audiology

by

Luisa Petrocchi-Bartal
8500519

Supervisor: Dr K. Khoza-Shangase

April, 2011
Declaration

I, Luisa Petrocchi-Bartal, hereby declare that this dissertation is my own unaided work. I alone am responsible for the content of this study and the conclusions presented. No part of this dissertation has been previously submitted for a degree at any other University.

Signature: _________________________ Date: _________________________

Luisa Petrocchi-Bartal
In loving memory of my grandmother, Nadia (nee Bethlehem) Koz, whose light shines eternally.
Acknowledgements

My sincere gratitude goes to:

1. Dr. Katijah Khoza-Shangase, whose guidance, expertise and leadership set the gold standard.
2. The Department of Health and all the respondents who allocated time out of their busy work schedules to participate in this study.
3. My daughters, Nadia and Talya, God’s blessings, my Teachers, my Universe.
4. My mother, who radiates with laughter despite incredible hardship.
5. My father, whose sense of honesty, fairness and tenacity in the quest for truth is the archetype.
6. My family, Hilary, Gabe and Marcella, and my friends for their steadfast support and unwavering faith.
7. David Bartal for life’s lessons I could not have learned anywhere else.
8. My Wits Audiology colleagues, whose positive energy and generosity of spirit is an everyday experience.
Table of Contents

Dedication ii
Acknowledgements iii
List of Excerpts ix
List of Figures ix
List of Tables x
List of Abbreviations xii
Abstract xiii

Chapter 1: Background and Rationale 1

Chapter 2: Literature Review 6

2.1 The Importance of Hearing Function in Childhood Development 6
2.2 Prevalence of Hearing Loss 7
2.3 Early Intervention 9
2.4 EHDI Challenges and Recommendations 13
2.5 Sub-Saharan Africa and South Africa Contextualised 16
2.6 South African Social Development, Education, and Health Care Policies 17
2.7 South African Context Specific EHDI Challenges and Suitability 27
2.8 JCIH and HPCSA - A Developed World Versus Developing World 29

Comparison
2.9 South Africa – EHDI Research Review 34

Chapter 3: Methodology 42

3.1 Aims 42

3.1.1 Primary aim. 42
3.1.2 Specific objectives. 42

3.2 Research Questions 43

3.3 Research Design 44
3.4 Description of Participants
   3.4.1 The sample. 45
   3.4.2 Sample size, distribution and sampling procedure. 47
   3.4.3 Participants. 48
   3.4.3.1 Participant selection – inclusion/exclusion criteria. 48

3.5 Test Protocol 50
   3.5.1 Material and apparatus. 50
   3.5.2 Procedures. 52
   3.5.3 Recruitment of participants. 53
   3.5.4 Ethical considerations. 53

3.6 Data Analysis and Statistical Procedures 55

3.7 Reliability and Validity 61
   3.7.1 Pilot project. 61
   3.7.2 Participants. 63
   3.7.3 The interview and questionnaire. 63
   3.7.4 Method of evaluation. 65
   3.7.5 Threats to reliability and validity. 65
   3.7.5.1 Participants, sample and sampling procedure. 65
   3.7.5.2 The interview and questionnaire. 67

Chapter 4: Results and Discussion 68

4.1 Introduction 68

4.2 Participant Demographics 69

4.3 Prevalence of Newborn and Infant Hearing Screening Conducted at MCWH Primary Health Care Immunisation Clinics 72

4.4 Hearing Screening Procedures and Protocols in use at MCWH Immunisation Clinics 76
   4.4.1 Otoscope availability. 76
   4.4.2 Otoscope usage. 76
   4.4.3 Evaluative methods other than otoscopic evaluation to assess risk for hearing loss. 80
4.4.3.1 Environmental sounds incorporating noisemaker and/or verbal stimuli (N=29).

4.4.3.2 Reviewing medical records and conducting caregiver interviews (N=30).

4.4.4 Referrals emanating from evaluative methods/instruments used other than otoscopic evaluation to assess risk for hearing loss.

4.5 Possible Concomitant Personnel Associated Factors which may influence the Implementation of Newborn and Infant Screening Programmes at North West and Gauteng Immunisation Clinics

4.5.1 Community based primary health care workers’ knowledge of hearing impairment.

4.5.1.1 Hearing screening protocol details reflective of respondent knowledge base.

4.5.1.2 Perceived causality of hearing loss reflective of respondents’ knowledge base.

4.5.1.3 Caregiver interviews reflective of respondents’ knowledge base.

4.5.1.4 General factors reflective of respondents’ knowledge base

4.5.2 Community based primary health care workers’ knowledge on ear infections in children.

4.5.3 Community based primary health care workers’ perceptions and attitudes towards hearing impairment.

4.5.4 Community based primary health care workers’ willingness to conduct hearing screening.

4.5.5 Nursing training.

4.6 Other Factors that May Influence Implementation of Newborn and/or Infant Hearing Screening at North West and Gauteng Immunisation Clinics

4.6.1 Patient return rates for immunisations versus return rates for appointments other than immunisations.

4.6.1.1 Patient return rates for immunisations.

4.6.1.2 Patient return rates for appointments other than immunisations.
4.6.2 Logistics.
  4.6.2.1 Immunisation day.
  4.6.2.2 Clinic noise and clinic space.
  4.6.2.3 Clinic booking system.
  4.6.2.4 Infant record documentation.

4.6.3 Workload pressures associated with understaffing.
  4.6.3.1 Burden of disease.
  4.6.3.2 Most common infant medical issues.
  4.6.3.3 Disability.
  4.6.3.4 As burden of disease relates to staffing pressures.

4.6.4 Parental awareness, willingness, and education.

4.7 Comparison of Any Hearing Screening Procedures and Protocols in Use to the HPCSA (2007) EHDI Position Statement Guidelines and Associated Clinic Benchmarks

4.8 Summary

Chapter 5: Conclusions and Implications

5.1 Critical Evaluation of the Study
  5.1.1 Study Limitations
  5.1.2 Study Strengths

5.2 Final Comments

References

Appendices:
  Appendix A: Information and Consent to Partake in a Research Project
  Appendix B: Questionnaire
  Appendix C: Ethical Clearance Certificate - University of the Witwatersrand
  Appendix D: Approval to Conduct the Research - Gauteng Provincial Government
  Appendix E: Approval to Conduct the Research - North West Provincial Government
  Appendix F: Approval to Conduct the Research - City of Johannesburg
Appendix G: Approval to Conduct the Research - West Rand 201
Appendix H: Approval to Conduct the Research - Kenneth Kaunda District 203

List of Excerpts

Excerpt 1: The Primary Health Care Package – A Set of Norms and Standards, Prevention of Hearing Loss due to Otitis Media at Clinic Level (DoH, 2001) 19
Excerpt 2: National Health System Guidelines for the Prevention of Hearing Impairment due to Otitis media at Clinic Level – Acute Otitis Media and Diagnosis Thereof (DoH, 2005) 21
Excerpt 3: National Health System Guidelines for the Prevention of Hearing Impairment due to Otitis media at Clinic Level - Referrals (DoH, 2005) 22
Excerpt 4: National Health System Guidelines for the Prevention of Hearing Impairment due to Otitis media at Clinic Level – Follow-Up(DoH, 2005) 22
Excerpt 5: National Health System Guidelines for the Prevention of Hearing Impairment due to Otitis media at Clinic Level – Voice Test and Swart Questionnaire (DoH, 2005) 23

List of Figures

Figure 1: Distribution of Interviewees According to Official Job Title per District 71
Figure 2: Otoscope Usage on Children Below 5 Years of Age 77
List of Tables

Table 1  Participant Demographics in Relation to District and Deprivational Index Standing [Community Survey (2007), Day & Gray, (2008)] 70

Table 2  Prevalence of Newborn/Infant Hearing Screening (N/IHS) and Rationale (N=30) 72

Table 3  Prevalence of Newborn/Infant Hearing Screening (N/IHS) and Rationale – Human Resource Reasons Provided (N=30) 74

Table 4  Themes Identified Regarding Otoscope Usage on Some Babies (N=23) 78

Table 5  Themes Identified Regarding Participant Knowledge of Hearing Impairment (in infants ≤ 1 year) (N=30) 86

Table 6  Participant Knowledge of Hearing Impairment (in infants ≤ 1 year) as Reflected in Factors which May Negatively Impact a Hearing Screening Programme (N=30) 89

Table 7  Themes Identified Pertaining to Participant Knowledge of Ear Infections in Children (in infants ≤ 1 year) (N=30) 93

Table 8  Themes Identified Pertaining to Participant Views on Hearing Impairment (N=30) 96

Table 9  Themes Identified Pertaining to Participant Willingness to Implement Newborn/Infant Hearing Screening (N/HIS), (N=30) 98

Table 10  Reported Nursing Training Received (N=30) 101

Table 11  Estimated Immunisation Return Rates (N=30) 103

Table 12  Themes Revealed Pertaining to Immunisation Return Rates (N=30) 105

Table 13  Immunisation Day (N=30) 108

Table 14  Themes Revealed Pertaining to Availability of an Appropriate Hearing Screening Area (N=30) 110

Table 15  Prompting Caregivers to Return with Infants for Follow-up (N=30) 112

Table 16  Infant Record Documentation (N=30) 115

Table 17  PHC Most Common Infant Medical Health Issues (excluding Ear Infections) Estimate (N=30) 119
Table 18  
*PHC Most Common Infant Ear Related Medical Health Issues Estimates (N=30)*  
Page 121

Table 19  
*PHC Most Common Infant Disability Issues (excluding Sight, Hearing and Communication) Estimates (N=30)*  
Page 123

Table 20  
*PHC Most Common Infant Sight, Hearing, Communication Disability Issues Estimates (N=30)*  
Page 125

Table 21  
*Perceived Caregiver Factors which May Negatively Impact a Hearing Screening Programme (N=30)*  
Page 132

Table 22  
*Assets for Implementation of HPCSA (2007) EHDI Clinic Hearing Screening Protocols*  
Page 137

Table 23  
*Barriers to Implementation of HPCSA (2007) EHDI Clinic Hearing Screening Protocols*  
Page 140

Table 24  
*Summary of Results according to Specific Objectives*  
Page 143
### List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AABR</td>
<td>Automated Auditory Brainstem Response</td>
</tr>
<tr>
<td>AAP</td>
<td>American Academy of Paediatrics</td>
</tr>
<tr>
<td>ANC</td>
<td>African National Congress</td>
</tr>
<tr>
<td>ASHA</td>
<td>American Speech-Language-Hearing Association</td>
</tr>
<tr>
<td>BCG</td>
<td>Bacille Calmette-Guerin</td>
</tr>
<tr>
<td>BFHI</td>
<td>Baby Friendly Hospital Initiative</td>
</tr>
<tr>
<td>CDC</td>
<td>Centre for Disease Control</td>
</tr>
<tr>
<td>DoH</td>
<td>Department of Health</td>
</tr>
<tr>
<td>DPOAE</td>
<td>Distortion Product Otoacoustic Emissions</td>
</tr>
<tr>
<td>DTP1</td>
<td>Diphtheria-Pertussis-Tetanus</td>
</tr>
<tr>
<td>EHDI</td>
<td>Early Hearing Detection and Intervention</td>
</tr>
<tr>
<td>ENT</td>
<td>Ear Nose and Throat</td>
</tr>
<tr>
<td>EPI</td>
<td>Expanded Programme on Immunisation</td>
</tr>
<tr>
<td>GP</td>
<td>Gauteng Province</td>
</tr>
<tr>
<td>GP-COJ</td>
<td>Gauteng Province - City of Johannesburg</td>
</tr>
<tr>
<td>GP-R/M</td>
<td>Gauteng Province - Randfontein/Mogale</td>
</tr>
<tr>
<td>HPCSA</td>
<td>Health Professions Council of South Africa</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>HR</td>
<td>Human Resources</td>
</tr>
<tr>
<td>IGCH</td>
<td>International Working Group on Infant Hearing</td>
</tr>
<tr>
<td>IMCI</td>
<td>Integrated Management on Childhood Illnesses</td>
</tr>
<tr>
<td>JCIH</td>
<td>Joint Committee on Infant Hearing</td>
</tr>
<tr>
<td>MCWH</td>
<td>Mother Woman and Child Health</td>
</tr>
<tr>
<td>NECP</td>
<td>National Ear Care Programme</td>
</tr>
<tr>
<td>NHS</td>
<td>Newborn Hearing Screening</td>
</tr>
<tr>
<td>NICU</td>
<td>Neonatal Intensive Care Unit</td>
</tr>
<tr>
<td>NIH</td>
<td>National Institute of Health</td>
</tr>
<tr>
<td>N/IHS</td>
<td>Newborn or Infant Hearing Screening</td>
</tr>
<tr>
<td>NW</td>
<td>North West Province</td>
</tr>
<tr>
<td>NW-M</td>
<td>North West - Merafong</td>
</tr>
<tr>
<td>NW-P</td>
<td>North West - Potchefstroom</td>
</tr>
<tr>
<td>OAE</td>
<td>Otoacoustic Emission</td>
</tr>
<tr>
<td>PCEHL</td>
<td>Permanent Early Onset Hearing Loss</td>
</tr>
<tr>
<td>PHC</td>
<td>Primary Health Care</td>
</tr>
<tr>
<td>RtHC</td>
<td>Road to Health Chart</td>
</tr>
<tr>
<td>TEOAE</td>
<td>Transient Otoacoustic Emissions</td>
</tr>
<tr>
<td>UHS</td>
<td>Universal Hearing Screening</td>
</tr>
<tr>
<td>UNHS</td>
<td>Universal Newborn Hearing Screening</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>URTI</td>
<td>Upper Respiratory Tract Infection</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
</tbody>
</table>
Abstract

**Purpose:** This study aimed to assess the feasibility of implementation of the Health Professions Council of South Africa's (HPCSA) clinic-based hearing screening subsection of its 2007 Position Statement on Early Hearing Detection and Intervention (EHDI) programmes in South Africa. Specific sub-aims included (a) establishing the prevalence of hearing screening conducted at Maternal Child Woman’s Health (MCWH) immunisation clinics; (b) determining the hearing screening procedures and protocols in use at MCWH immunisation clinics; (c) determining and exploring the possible concomitant personnel-associated factors which may influence the implementation of newborn and infant hearing screening programmes; (d) determining and exploring other factors that may have influenced implementation of newborn and infant hearing screening; and lastly, (e) comparing any hearing screening procedures and protocols in use to the HPCSA (2007) EHDI position statement clinic guidelines and associated clinic benchmarks.

**Participants:** Thirty primary healthcare immunisation clinic managers/acting managers were interviewed in two South African sample groups, in the North West province (NW) and Gauteng (GP).

**Design:** An exploratory, non-experimental, qualitative research design was employed incorporating both quantitative and qualitative information within the two sample groups.

**Methods and Materials:** An interview using a questionnaire was administered with primary health care (PHC) clinic nursing manager/acting manager, placed within the identified sites. The questionnaire encompassed areas such as work contexts, hearing screening contexts and information management systems, as well as quality control measures in place at these clinics.

**Data Analysis:** Content analysis was used to code emergent themes into specific categories. Frequency calculations of the emergent themes were calculated and results described qualitatively.

**Results:** No PHC clinics placed within the identified sites offered or provided formalised newborn/infant hearing screening and none of these facilities had equipment to do so. Most sites attributed the lack of formalised hearing screening to budgetary and human resource issues, staff training in particular. Non-formalised hearing screening protocols in place demonstrated inconsistencies in application across districts and none complied with HPCSA (2007) clinic
guidelines. Most respondents were willing to implement formalised hearing screening to coincide with their immunisation schedules. The immunisation context was considered favourable for implementation of formalised hearing screening. Other factors such as reduced parental awareness of the importance of hearing screening, and caregiver cultural issues were considered surmountable by respondents.

**Conclusions:** HPCSA (2007) implementation of clinic hearing screening protocols at PHC immunization clinics (level one) does not appear to be feasible based on current evidence. Results from the current study have assisted in identifying procedural and logistical assets and barriers to implementation of HPCSA (2007) clinic guidelines for EHDI at immunisation clinics in South Africa. Future research implications include formal investigations of central directorate versus district differences in PHC Package Integrated Management of Childhood Illnesses (IMCI); Otitis Media, and Road to Health Chart (RtHC) protocols; provincial and district inequities in funding as they impinge on hearing health care service delivery; costing of rudimentary protocols in place versus formalised HPCSA (2007) EHDI service delivery; research into parental awareness, education and willingness in specific reference to certain procedures such as otoacoustic emissions; and replication of the current study throughout the country for quantitave data with increased ability to draw causal inferences and generalize findings.

**Keywords:** Health Professions Council of South Africa; early hearing detection and intervention; primary healthcare immunisation clinics; interview