

**The maintenance and utilisation of government fitted hearing aids**

**By  
Prasha Sooful**

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Pretoria**

**Supervisor: Dr. C van Dijk  
Co-supervisor: Ms C Avenant**

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**Abstract**

**Title:**           **The maintenance and utilisation of government fitted hearing aids**

**Name:**           **Mrs. Prasha Sooful**

**Supervisor:**   **Dr. Catherine Van Dijk**

**Co-Supervisor:** **Ms Carina Avenant**

**Department:**   **Communication Pathology**

**Degree:**         **M. Communication Pathology**

The dispensation of hearing aids in the public sector of South Africa is burdened with problems such as lack of provision of batteries for hearing aids, poor repair services and inadequate follow-up. This affects the maximum benefit derived from the hearing aid.

Hearing loss which affects communication also negatively impacts on speech and language development, cognitive development, pragmatic skills, and employment opportunities i.e. all aspects of daily living. A hearing aid is an example of an assistive listening device that attempts to minimise the consequences of hearing loss. It is a restorative mechanism that amplifies sound to compensate for hearing loss. For the greater part of the population with hearing loss it is the most cost-effective solution. Therefore, the hearing aid must be correctly fitted and used. It is vital that the client knows how the instrument operates, how to handle it, how to care for it, and, most importantly, how to use it. This involves a great deal of information giving, practice, and counselling by the speech-language pathologist and audiologist.

An effective orientation and rehabilitation programme should constitute of the following: a discussion of the types of hearing loss, the facilitation of understanding of the audiogram; information on troubleshooting and using hearing aids effectively; as well as information on the expectations of the hearing aid/s. Speech-reading techniques, coping and communication repair strategies are also important.

It is hypothesized that many individuals who are fitted with government hearing aids cannot adequately utilise and maintain their devices. Furthermore, this problem could be related to the initial hearing aid orientation and lack of follow-up rehabilitation as

this when information regarding utilisation and maintenance is usually disseminated to clients.

This study therefore aimed to examine the maintenance and utilisation of hearing aids given to clients attending provincial hospitals in Tshwane and to probe factors that impacted on the aural rehabilitation and the hearing aid fitting process, in order to contribute to the formation of service delivery guidelines.

Both a qualitative and quantitative research approach was utilised. The type of research was cross-sectional and analytical. The nature of the investigation was a descriptive survey utilising face-to-face interviews. A method of non-probability purposive sampling was employed. Fifty seven adult hearing aid users were interviewed with a structured interview schedule. Quantitative results were analysed using statistics and qualitative data was categorised into main themes and ideas.

Results showed that there was a general consensus about the self-image and wearing of hearing aids, as most participants were embarrassed to wear their devices. This could be due to inadequate and lack of counselling and public awareness. Furthermore, it was found that most government fitted hearing aids and accessories were poorly cared for and maintained. There were several factors which negatively influenced the utilisation and maintenance of hearing aids. One of these factors was finance i.e. the cost of travelling to and from hospitals, the cost of batteries as well as the cost of repairs to hearing aids played a significant role in how the hearing aid was utilised and cared for. Distance from hospitals also impacted on the maintenance as all hearing aid services were only available at tertiary institutions and not at community level. Furthermore, the issue of multilingualism presented an obstacle in terms of utilising hearing aids correctly and to their full benefit, as most participants were not instructed on hearing aid care and use in their first language.

The results from this study were utilised in the development of service delivery guidelines for the dispensation of government hearing aids.

**Key words:** *adults, audiology, government hospitals, hearing aids, hearing loss, service delivery guidelines, South Africa.*

## Opsomming

<b>Titel:</b>	<b>Die onderhoud en gebruik van gehoorapparate wat deur die regering verskaf word</b>
<b>Naam:</b>	<b>Mev. Prasha Sooful</b>
<b>Studieleier:</b>	<b>Dr Catherine van Dijk</b>
<b>Mede-studieleier:</b>	<b>Me. Carina Avenant</b>
<b>Departement:</b>	<b>Kommunikasiepatologie</b>
<b>Graad:</b>	<b>M. Kommunikasiepatologie</b>

Verskeie probleme word ondervind met die verskaffing van gehoorapparate in die Suid-Afrikaanse openbare sektor, soos byvoorbeeld die verskaffing van batterye vir gehoorapparate, swak hersteldiens, en onvoldoende opvolg. Dit het 'n nadelige invloed op die maksimale benutting van die gehoorapparate.

Gehoerverlies bemoelik nie net kommunikasie nie, maar het ook 'n negatiewe uitwerking op spraak- en taalontwikkeling, kognitiewe ontwikkeling, pragmatiese vaardighede, en werksgeleenthede, dit wil sê alle aspekte van die daaglikse lewe. 'n Gehoorapparaat is een voorbeeld van 'n luisterhulpmiddel wat die gevolge van gehoerverlies kan verminder. Dit is 'n klankversterkingstoestel wat poog om vir die gehoerverlies te kompenseer. Vir die oorgrote meerderheid van die bevolking is dit die mees koste-effektiewe oplossing. Die gehoorapparaat moet egter korrek gepas en gebruik word. Dit is van kardinale belang dat die kliënt moet weet hoe die apparaat werk, hoe om dit te hanteer, hoe om dit te versorg, en, die belangrikste, hoe om dit te gebruik. Daar moet gevolglik baie inligting, oefening, en berading aan die kliënt verskaf word deur die spraak-taalterapeut en oudioloog.

'n Effektiewe oriëntasie- en rehabilitasieprogram behoort die volgende te bevat: 'n bespreking van die tipe gehoerverlies, en hulp aan die kliënt om die audiogram te verstaan; inligting oor hoe die probleem opgelos kan word en die effektiewe gebruik van gehoorapparate; asook inligting oor die gehoorapparaat

of apparate se waarborg. Spraak-leestegnieke, aanpassingstegnieke, en strategieë om kommunikasie te herstel is ook belangrik.

Daar word van die veronderstelling uitgegaan dat baie individue nie die gehoorapparate wat hulle van die regering ontvang het behoorlik kan gebruik en onderhou nie. Dié probleem kan toegeskryf word aan die aanvanklike gehoorapparaatoriëntasie en 'n gebrek aan opvolgrehabilitasie, aangesien inligting oor die gebruik en onderhoud van die apparate gewoonlik hiertydens aan kliënte deurgegee word.

Hierdie studie het dus ten doel om die onderhoud en gebruik van gehoortapparate wat verskaf word aan kliënte wat provinsiale hospitale in Tshwane besoek, te ondersoek, asook die faktore wat spraakrehabilitasie en die gehoorapparaatpassingsproses beïnvloed, ten einde by te dra tot die daarstelling van dienslewingsriglyne.

'n Kwalitatiewe sowel as kwantitatiewe benadering is vir die navorsing gebruik. Die navorsing was gebaseer op dwarsnitte en analitiese ondersoeke. Die metode van steekproefneming was onwaarskynlikheidsdoelgerig. Onderhoude is met sewe-en-vyftig volwasse gebruikers van gehoorapparate gevoer. Kwantitatiewe resultate is met behulp van beskrywende statistiek geanaliseer en kwalitatiewe gegewens is in hooftemas en -idees gekategoriseer.

Resultate het 'n algemene konsensus getoon oor selfbeeld en die dra van gehoorapparate, aangesien die meeste deelnemers verleë gevoel het om die apparate te dra. Dit kan toegeskryf word aan onvoldoende of gebrekkige berading en onkunde onder die publiek. Daar is verder gevind dat die meeste van die gehoorapparate en toebehore wat deur die regering verskaf is, swak onderhou en versorg word. Daar is verskeie faktore wat die gebruik en onderhoud van gehoorapparate negatief beïnvloed. Een van die faktore was finansiële onkoste, dit wil sê die koste daaraan verbonde om na en van die hospitale te reis, die koste van die batterye, asook die koste om gehoorapparate te herstel. Die afstande vanaf die hospitale het ook 'n groot invloed op die onderhoud van die toestelle, aangesien dienste vir gehoorapparate slegs by

tersiêre instellings beskikbaar is en nie op gemeenskapsvlak nie. Meertaligheid is 'n verdere struikelblok in terme van die korrekte gebruik van gehoortoestelle en die optimale benutting daarvan, aangesien die meeste deelnemers nie in hulle eerste taal ingelig word oor hoe om die gehoortoestelle te versorg en te gebruik nie.

Die resultate van die studie is gebruik om dienslewingsriglyne vir die verskaffing van gehoorapparate deur die regering, te ontwikkel.

***Sleutelwoorde:*** *volwassenes, oudiologie, regeringshospitale, gehoorapparate, gehoorverlies, dienslewingsriglyne, Suid-Afrika.*

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## CHAPTER ONE

### INTRODUCTION AND ORIENTATION

Aim: The aim of this chapter is to introduce concepts related to hearing loss and hearing aids as well as to discuss the rationale and problem statement of the research study. Furthermore, it provides a description of the terminology used and provides an overview of the organisation of the chapter content.

#### 1.1 INTRODUCTION

*“Health for a better life”*

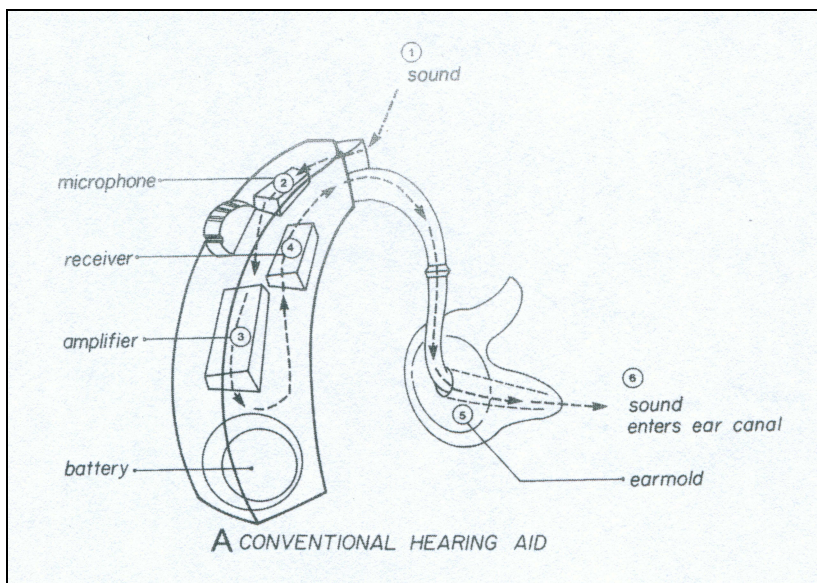
- Vision of Gauteng Provincial Health  
(Department of Health, 1997:2)

Hearing loss affects a person’s quality of life and ability to function in society, as it hinders the most fundamental of all human attributes – social contact and communication (Ross, 1999:1). The effects of a hearing loss has far reaching consequences in that it influences all of those who come into contact with an individual with hearing loss. “While a ‘patient’ may have difficulty hearing, it is society, in its broadest aspect, that has the hearing ‘problem’ ” (Ross, 1999:1). Hearing loss which affects communication also negatively impacts on aspects such as speech and language development, cognitive development, pragmatic skills, and employment opportunities. In other words, it affects all aspects of daily living (Sanders, 1982:7). Only a small number of individuals can be treated for hearing loss using medication or surgical procedures, as the incidence of sensorineural hearing loss is far greater than the incidence of conductive and mixed hearing losses (National Institute for Deafness and other Communication Disorders, 2006:1). Therefore, the majority of people with hearing loss seek to compensate for their difficulty with an assistive listening device (Alpiner & McCarthy, 2000:4-5).

“Assistive devices are any device and ergonomic solution capable of reducing the handicap experienced by an individual” (White Paper on an Integrated National

Disability Strategy, 1997:78). A hearing aid is an example of an assistive listening device. It is an effective restorative mechanism that amplifies sound to compensate for hearing loss (Sanders, 1982:179). For the greater part of the population with hearing loss it is the most cost-effective solution. Other prosthetic devices available for people with hearing loss include cochlear and middle ear implants. These devices, although vital breakthroughs in hearing technology, are expensive and not all individuals with a hearing deficit will qualify as candidates. Hearing aids make it possible for individuals to partake in social, cultural and economic activities of our societies by overcoming the communication obstacle that obstructs access to information. Hearing aids are remarkable devices and for many people indispensable. Without such devices, life would certainly be very demanding and more limited (Ross, 1999:2).

A conventional hearing aid consists of several basic parts i.e. microphone, amplifier, receiver (Figure 1.1).



**Figure 1.1: Parts of a conventional hearing aid (Bess and Humes, 2003:246).**

The function of the various parts of a hearing aid allow for sounds from the environment to be picked up, amplified to a degree and manner that will enable an individual with hearing loss to use his or her residual hearing in an effective manner (Dillon: 2000:384).

According to the National Institute for Deafness and other Communication Disorders, (2006:1), the incidence of unilateral hearing loss is lower than that of bilateral hearing loss, however the majority of people with hearing loss are fitted with one hearing aid. The reason for this can be attributed to funding issues, cosmetic concerns and fitting guidelines of particular institutions (Ross, 1995:1).

Regardless of monaural or binaural fittings, a hearing aid on its own it's not enough. To realise a hearing aid's value, people with hearing loss need and will benefit from a comprehensive aural rehabilitation program (Sanders, 1982:420). A hearing aid is an intricate device and to first-time users, it may also appear to be complex to operate and maintain. Therefore, the device must be correctly fitted and used. The client must acquaint him / herself with how the instrument operates, how to handle it, how to care for it, and, most importantly, how to use it (Sanders, 1982:195-196). This involves a great deal of information giving, practice, and counselling (Sweetow, 1997:87), and speech-language pathologists and audiologists are required to fulfil these tasks (Alpiner & McCarthy, 2000:435). Previous research has shown counselling and follow-up to be an essential factor in the acceptance of hearing loss and hearing aids by reducing unrealistic expectations of the hearing aid (Humes, Wilson, Barlow, Garner and Amos, 2002:430).

Ideally, during the course of the hearing aid selection and fitting process, several follow-up and counselling appointments should be made in order to provide the recipient with a thorough orientation and skills-training programme (Sweetow, 1997:11, 276). This is important in order to ensure that the client is familiar with the hearing aid given to them so that it can be properly used. Individuals with hearing loss require comprehensive aural rehabilitation and counselling, which is essential in order to derive maximum benefit from their hearing aids (Alpiner & McCarthy, 2000:22). According to Sweetow (1997:85-106), an effective orientation and rehabilitation programme should constitute of the following: a discussion of the types of hearing loss, the facilitation of understanding of the audiogram; information on troubleshooting and using hearing aids effectively; as well as information on the guarantee of hearing aid/s. Speech-reading techniques, coping

and communication repair strategies are also important (Sweetow, 1997:87). The above points are also in keeping with the aspects outlined by the International Society of Audiology, with regard to good practice for adult hearing aid fittings and services (ISA, 2004:1-6). However, D’Costa (2004:5) noted that rehabilitation exercises using the hearing aid in different listening environments should also be included as part of aural rehabilitation as this will facilitate carry over of strategies learnt in therapy to real world situations. Additionally, the importance of wax management, legal rights of the client, value of follow-up visits, and family counselling are also mentioned, as most individuals are unaware the above mentioned aspects. The elements of effective hearing aid orientation and rehabilitation are applicable to the international and national context. However, in South Africa the provision of hearing aids has been of recent development.

In South Africa, the provision of hearing aids began in the early 1940s. Table 1.1 provides a summary of the founders of hearing aid companies in South Africa according to three of the major provinces.

**Table 1.1: Outline of the founders of hearing aid companies in the main provinces of South Africa circa 1940-1970 (Allsop, 2006).**

Province	Individuals / Companies involved	Year
Gauteng	- Mr. Needler – had a hearing aid shop located in a bookstore, which later became Needler-Westdene. Western Electric, Zenith and Beltone aids were sold and was later moved to a pharmacy.	-Mid 1940s
	- Percy van Rensburg opened a Hearing Aid Centre in central Johannesburg which later became part of Bonochord. In 1957, Desmond Smith joined Bonochord with Mr. van Rensburg and established Acoustimed Hearing Services in the 1970s.	- 1949
	- Amtronix was established with the help of Ken Southcott.	- early 1970s

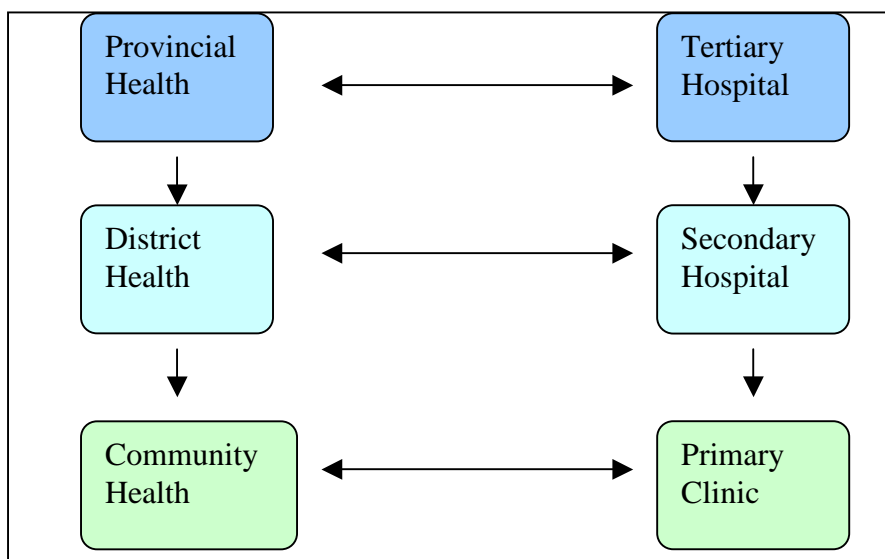
	- Audio Clinic was established with John Carter and Pat de Valence.	- mid 1970s
Cape Province	- Captain Reichenburg opened a private practice which sold transistor hearing aids.  - Bonochord (British hearing aid company) opened offices in 1957 with Jeff Clarke.  -A branch of Acousticon (American hearing aid company) was opened.	- 1940  - 1957  - mid 1950s
Kwa-Zulu Natal	- Philip Kairus became the founder of Natal Hearing Aids which sold transistor hearing aids.	- 1949

It is important to note that hearing aid services were limited in South Africa, and available only in a few provinces i.e. where the major city centres such as Cape Town and Johannesburg were located. As can be seen from the above table, most hearing aids were dispensed at private practices, pharmacies and via hearing aid companies throughout the three main provinces in South Africa. Currently, in South Africa, hearing aids are dispensed nationwide at hearing aid companies, private practices, private hospitals, universities and government hospitals i.e. both the private and public sectors. A large percentage of the South African population utilise the public sector for health care rather than the private sector (Central Statistics South Africa, October Household Report, 1998:192). This is due to the fact that only an estimated 17% of the adult population of South Africa has access to some form of medical or benefit scheme (Central Statistics South Africa, October Household Report, 1998). This can be attributed to the prior health care system in South Africa.

Before the Government of National Unity took office in 1994, there was substantial fragmentation and gross inequalities in the health status, health infrastructure, and health services. Since then, there has been an intensive program of legislative and policy development to reform the service delivery of health care. Priority programs were

outlined in the White Paper for the Transformation of the Health System in South Africa. Rehabilitation services were addressed and stated that it should occur at primary level within the District Health System (Department of Health, 1997:5). South Africa has a population of approximately forty million. Just over half of this population (53%), live in rural areas and 75% of those who live in rural areas live in poverty (White Paper, 1997:2).

According to the levels of health care in South Africa (Refer to Figure 1.2), the highest level of health care is provincial health care which occurs at tertiary institutions. Following this is district health care which occurs at secondary institutions and the lowest level is community health care which can occur at primary institutions i.e. clinics.



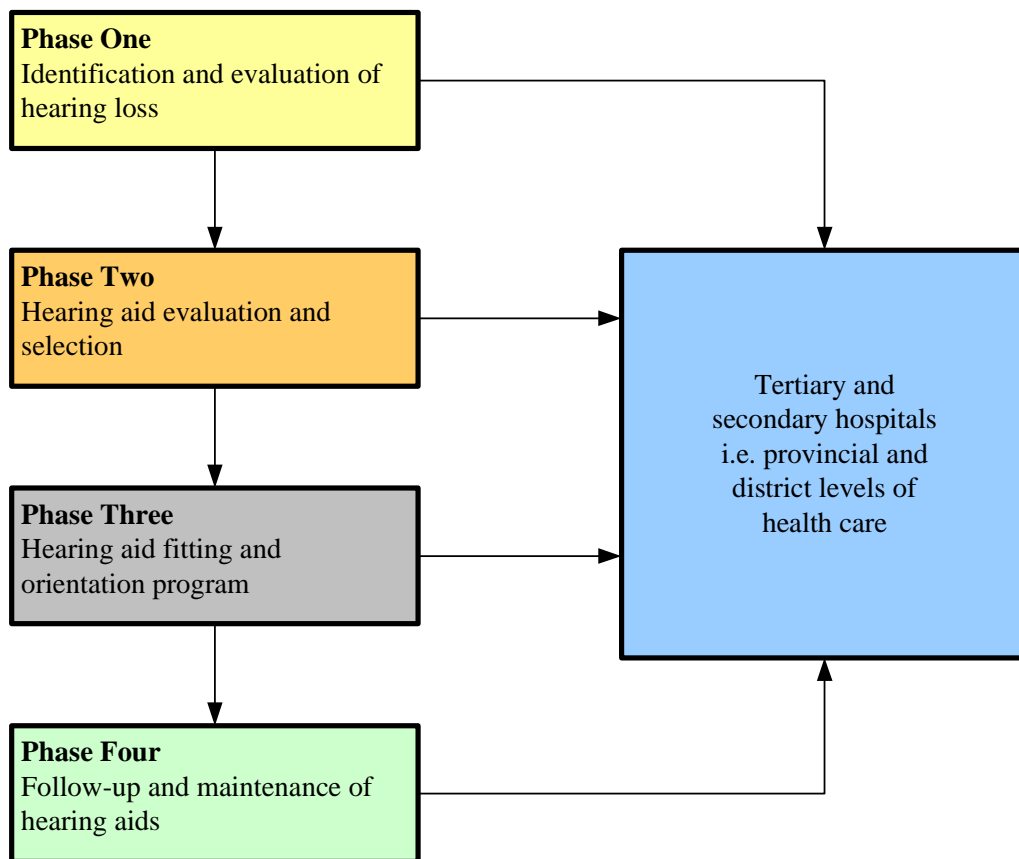
**Figure 1.2: Levels of healthcare in South Africa** (White Paper for the Transformation of the Health System in South Africa, 1997:1-40).

The above figure indicates where the various levels of the public health care system can occur. Provincial health care occurs at tertiary hospitals which are large hospitals, well equipped and well staffed and usually situated in a central location i.e. the city centre, for example: Pretoria Academic Hospital. The next type of health care is district health care which occurs at secondary hospitals. These hospitals are not as large as tertiary institutions, do not have as much diagnostic equipment and are situated close to specific



districts of a province, for example: Odi Hospital in Garankuwa. The last level of health care in the public health system is community health care which occur at primary clinics. These clinics are much smaller than tertiary and secondary hospitals, with minimal equipment, and staff, and are situated in communities within a particular district for example: Soshanguve Clinic (White Paper for the Transformation of the Health System in South Africa, 1997:5-30).

The levels of health care and location of hospitals and clinics are important to consider, especially for the dispensation of hearing aids, as half of the South African population live in rural areas i.e. community settings (White Paper for the Transformation of the Health System in South Africa, 1997:2). However, current hearing services including the dispensation of hearing aids, occur mainly at tertiary and secondary hospitals (Figure 1.3).



**Figure 1.3: Phases of hearing health care (based on Provincial Strategic Plan, 2005).**

As can be observed from Figure 1.3, all hearing services currently occur at provincial and district levels of health care, due to lack of infrastructure, equipment and human resources at community levels (Tshwane Annual Report, 2004:15-20). According to the Tshwane Annual Report (2004:22) the number of private hospitals accounted for 77% of all hospitals in Gauteng and there were only 29 public (tertiary and secondary) hospitals and six community health centers. There is a considerable discrepancy between private and public health care institutions in Gauteng. The cost of health care in the private sector is much higher than that in the public sector, and most of the population who make use of the private sector have medical aid schemes (Tshwane Annual Report, 2004:23).

Only 17% of the Black South African population has a medical aid scheme. Therefore, the majority utilises the public health care sector as cost of assessments, treatment and assistive devices such as hearing aids are less expensive, because it is partly subsidised by the government (Central Statistics South Africa, October Household Report, 1998:192-195).

Funding of government hearing aids occurs via the Government State Tender Board. Various hearing aid companies tender each year to make several of their hearing aids accessible to individuals in the public sector at a lesser cost (Department of Health, Tender Documents, 2006:1). Each hospital has certain criteria which classify its clients according to their annual income (Gauteng Shared Service Centre, Report on the new tariffs, 2006:1-2). The amount of subsidy a client will receive for a hearing aid is dependent on how the client is classified. Most individuals will not pay more than 25% of the total cost of the hearing aid on tender. The hospital will contribute to the rest of the cost from their annual budget (Health Budget Speech, 2003:1).

The dispensation of hearing aids in the public sector of South Africa although aided by government monies, is burdened with problems such as lack of provision of batteries for hearing aids, poor repair services and inadequate follow-up. This consequently will affect the maximum benefit derived from the goals of hearing aid fittings.

Hearing aid prescription has two main goals, to maximise independent communication and to facilitate social integration. It is therefore important to fit a client with a hearing aid that meets all of his / her unique listening and individual needs. Otherwise problems such as non-acceptance of the device and premature breakage (due to lack of care / maintenance) could arise. Other factors such as lack of information, inapt orientation, and language barriers during orientation may also result in misuse and or under use of the device due to the inability of the patient to use the device adequately (Health Technology Assessment, 2000:101-110).

## **1.2 RATIONALE AND STATEMENT OF THE PROBLEM**

A major scope of practice for speech-language pathologists and audiologists internationally as well as locally involves the fitting of hearing aids and the education of clients in the use and care of these instruments (American Speech-Language-Hearing Association, 2004:5 and Health Professions Council of South Africa, 2003:13). Information disseminated during aural rehabilitation is important for the client to learn and remember how to use the hearing aid effectively and independently (Reese & Hnath-Chisolm, 2005: 94).

It is hypothesized that the problem faced by many adult clients who are fitted with government hearing aids is that they cannot adequately utilise and maintain their devices. This is due to the large number of clients who do not return for servicing of hearing aids, batteries and those who return with damaged hearing aids (Dr. George Mukhari Statistics, 2000-2004). Information regarding utilisation and maintenance is usually disseminated to clients during the orientation and rehabilitation programme (Alpiner and McCarthy, 2000: 315-320). Therefore, it is also speculated that that the above problem of utilisation and maintenance could be related to the initial hearing aid orientation and lack of follow-up rehabilitation. The problem impacts largely on the financial resources (i.e. provincial and district budgets) that is spent on the purchase of hearing aids. If devices are not utilised and maintained properly a substantial percentage of this money spent is therefore wasted.

In South Africa, delivery of quality care is a requirement for accountable services for the profession of speech-language pathologists and audiologists. Quality assurance bodies, such as the Health Professions Council of South Africa (HPCSA) govern professional activities, conduct, and clinical decisions in a process of quality assurance. Quality assurance is there in order to evaluate whether the services provided to clients meet the required standards set out by the professional governing bodies. There is a need to constantly assess quality of standards of health care, optimisation of services and the extent to which services are clinically effective and cost effective. According to WHO Guidelines (2004:25) for hearing aids and services for developing countries, service delivery systems must be continuously monitored and regularly evaluated.

Healthcare systems increasingly rely on information from clinical outcome measures to determine effectiveness of services. Clinical outcome measures refer to a process similar to quality assurance, but closely examine consequences of specific clinical procedures / processes and ways in which these can be measured (Gatehouse, 1999:424). According to Cox (2005:419) there is an ongoing concern about the level of effectiveness of fitted hearing aids. Even though technology has vastly improved, the percentage of hearing aid users and overall satisfaction has not changed significantly in the United States. In South Africa, there is a lack of data with regard to service delivery during hearing aid dispensation and rehabilitation services.

To date, there have been no initial or follow-up studies regarding the utilisation and cost effectiveness of hearing aid service delivery in South Africa. This study therefore aimed to examine the maintenance and utilisation of hearing aids given to clients attending provincial hospitals in Tshwane and to probe factors that impacted on the aural rehabilitation and the hearing aid fitting process. The information derived from this study will not only provide the first data regarding the dispensation of hearing aids in South Africa but will also contribute to the formation of service delivery guidelines for the country.

In order for hearing aid service delivery guidelines to be developed and evaluated, it is essential that government officials and speech-language pathologists and audiologists closely collaborate and be made aware of the specific factors that may contribute to why persons fitted do not fully utilise their hearing aids.

### 1.3 ORGANISATION OF THE STUDY

A brief outline and description of the chapters included in this research study is provided in Table 1.2.

**Table 1.2: Outline and description of the chapters.**

<b>Chapter One</b>	This chapter provides the background to the study, the rationale and the statement of the problem. In addition, it provides the outline of chapter content.
<b>Chapter Two</b>	The second chapter comprises of an overview of the principles of hearing aid fittings, aural rehabilitation and service delivery in the developed world. Furthermore, this chapter investigates research conducted in developing countries regarding hearing aids and rehabilitation and examined the South African context in terms of challenges to provision of hearing aids.
<b>Chapter Three</b>	This chapter provides a comprehensive review of the aims of the research, research design, apparatus, collection procedures, and analysis procedures used in the study.
<b>Chapter Four</b>	This chapter forms a presentation and discussion of results from the study.
<b>Chapter Five</b>	The last chapter comprises of specific conclusions drawn from the study, including implications, limitations, and recommendations.

#### **1.4 LIST OF ABBREVIATIONS**

ASHA = American Speech-Language-Hearing Association

CBR = Community Based Rehabilitation

HPCSA = Health Professions Council of South Africa

PHC = Primary health care

SASLHA = South African Speech-Language and Hearing Association

WHO = World Health Organization

#### **1.5 DEFINITIONS OF TERMS USED IN THE STUDY**

##### **Audiologist**

An audiologist is a health care and educational professional who assists in the promotion of normal communication as well as the prevention, identification, assessment, diagnosis, treatment and management of the following disorders in variety of settings ranging from private practices, private hospitals, government hospitals, rural clinics, tertiary institutions, schools, pre-schools, industries, communities and home environments. (SHOUT, 2005:4).

##### **Aural rehabilitation**

Intervention aimed at minimising and alleviating the communication difficulties associated with hearing loss (Tye-Murray, 2004:767).

##### **Community Based Rehabilitation (CBR)**

CBR is a strategy within community development for the rehabilitation, equalisation of opportunities and social integration of all people with disabilities. It is implemented through the combined efforts of the disabled people themselves, their families and communities, and the appropriate health, educational, vocational and social services (WHO & UNESCO, 1994).

### **Communication handicap**

A communication handicap consists of the psychosocial disadvantages such as that result from hearing loss (Tye-Murray, 2004:4).

### **Developed world / country**

A developed country enjoys a relatively high standard of living through a strong high-technology diversified economy. Most countries with a high per capita gross domestic product (GDP) are considered developed countries such as the United States of America (Wikipedia - The Free Encyclopedia, 2006:1).

### **Developing countries**

Developing countries are in general [countries](#) which have not achieved a significant degree of [industrialisation](#) relative to their populations, and which have a low [standard of living](#). There is a strong [correlation](#) between low income and high [population](#) growth, both within and between countries. The term "developing country" often refers mainly to countries with low levels of [economic development](#), but this is usually closely associated with social development, in terms of [education](#), [healthcare](#), [life expectancy](#), etc, such as South Africa (Wikipedia - The Free Encyclopedia, 2006:1).

### **Ear mould**

Component that directs sound efficiently and with the desired frequency response from the receiver to the tympanic membrane (Katz, 2002:666).

### **Hearing aid / instrument**

An electronic device for amplifying sound delivered to the ear, consisting minimally of a microphone, amplifier, and receiver (Hall & Mueller, 1998:929).

### **Hearing aid fitting / orientation**

Process of instructing a client (and a client's family) to handle, use, and maintain a hearing aid (Tye-Murray, 2004:774).

### **Hearing disability**

Hearing disability is a loss of function imposed by the hearing loss (Tye-Murray, 2004:4).

### **Hearing impairment**

A hearing impairment is a structural or functional impairment of the auditory system (Tye-Murray, 2004:4).

### **Hearing loss**

This is measured as the number of decibels that the intensity of a tone must be raised beyond the normal threshold value for that tone to be detected (Hall & Mueller, 1998:929).

### **Indigenous languages**

The term indigenous languages refer to all official South African languages, with the exception of English and Afrikaans (Drennan, 1998:8).

### **Microphone**

Input transducer that picks up the acoustic signal and converts this into an electrical signal (Vonlanthen, 1995:63).



### **Primary Health Care (PHC)**

Essential health care based upon practical, scientifically and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation, at a cost that the community and government can afford to maintain at every stage of development, in the spirit of self-reliance and self-determination (WHO, 1978).

## **1.6 CONCLUSION**

Hearing loss and its wide-ranging effects on individuals' lives is devastating. Hearing aids provide a way in which the person with hearing loss can participate in all aspects of society. The provision of hearing aids in South Africa has vastly improved over the past decade in terms of addressing the needs of the public sector however, there is still an immense need for infrastructure with regard to follow-up and maintenance of devices. This study aimed to investigate factors that influence the maintenance and utilisation of government fitted hearing aids and provide ideas for the improvement of hearing aid service delivery.

## **1.7 SUMMARY**

This chapter explored the nature of hearing aid fittings, aural rehabilitation, and why there is a need for aural rehabilitation and not just a hearing aid. Additionally, the organisation of information in the chapters was briefly summarised and an explanation of the terminology and abbreviations used throughout the study was included.

## CHAPTER TWO

### THE OUTCOMES OF HEARING AID FITTINGS IN DEVELOPED AND DEVELOPING COUNTRIES

Aim: To provide an overview of the principles of hearing aid service delivery in developed countries, and to critically review research and challenges observed in this context. To evaluate the current practices of hearing aid fittings and aural rehabilitation in developing countries, as well as review specific obstacles with regard to the South African context.

#### 2.1 INTRODUCTION

With regard to the practice of hearing aid fittings, presently there is no unanimous concurrence among audiologists and speech-language pathologists as to what constitutes a successful hearing aid fitting. Many audiologists' beliefs on successful fittings often lie with only one of the following levels namely impairment level, activity level, participation level, satisfaction level, health related quality of life and cost benefit (Table 2.1), whereas it should include all. In Table 2.1 the outcomes of a successful hearing aid fitting can be viewed.

**Table 2.1: Outcomes of Successful Hearing Aid Fitting** (Based on WHO's International Classification of Impairment, Handicap and Disability ICIDH-2, 2000 and Tye-Murray, 2004).

Level of Impairment, Handicap and Disability caused by Hearing loss	Potential effects of a successful hearing aid fitting
Impairment Level	Improved recognition / discrimination and perception of environmental sounds and speech (Hall & Mueller, 1998:187).

Activity Level	The person has improved ability to have a conversation in various listening situations including a noisy environment (Katz, 2002:642).
Participation Level	The person has improved ability to find employment where spoken communication is a requirement (participate economically in society) (Hall and Mueller, 1998:529).
Satisfaction Level	Possible increased confidence of the person i.e. ability of the person to participate in social and cultural activities (Sandlin, 2000:564-567).
Quality of life	Possible decreased loneliness, depression and isolation due to hearing loss (Sandlin, 2000:566).
Cost Benefit	Purchase of hearing aid, batteries and servicing is justified because the individual has economic benefit indirectly derived from wearing the hearing aid e.g. the person is now able to earn a salary to pay for hearing aid expenses (Sandlin, 2000:471).

The above table illustrates the various levels of impairment, handicap and disability in relation to potential effects of wearing a hearing aid. This is an important consideration as a successful hearing aid fitting will ensure maximum benefit and utilisation of the hearing aid by an individual. “Stress on ethical practice will emphasize ‘total care’ of the patient. Not only will audiologists assess the magnitude of the hearing loss and select and fit the appropriate hearing aid, but they will also manage the patient over a sufficient period of time to ensure maximum benefit from amplification use” (Sandlin, 2000:746). Hearing aid fittings serve to enhance an individual’s communication in all environments i.e. social, home and work (Sandlin, 2000:748).

Since hearing loss affects the family and social contexts more, the participation of hearing relatives and friends should be encouraged (Alpiner & McCarthy, 2000:275-277). Family involvement is essential with all clients, and requires additional support, such as specific and supplementary counselling about the diagnosis and rehabilitation (Tye-Murray, 2004:16-17). Client and family involvement promotes the active involvement of all individuals concerned in the rehabilitation process.

It has recently become increasingly common to view rehabilitation as a client-oriented problem-based solving process as opposed to a therapist dominated process (Danermark, 1998:125). Communication is intrinsically linked to human nature of social behaviour and it is therefore important to place emphasis on emotions and communication during aural rehabilitation in addition to the hearing aid (Danermark, 1998:126-9). This is significant as it indicates the current trend in hearing aid fittings internationally.

## **2.2 UTILISATION OF HEARING AIDS IN DEVELOPED COUNTRIES**

### **2.2.1 Satisfaction and use of hearing aids**

Studies conducted in developed countries regarding the provision of hearing aids show that even though technology and economic factors are superior, there is still a significant unmet need regarding satisfaction and utilisation of hearing aids (Irwin, 2004:113). Only 4% of the population with hearing loss in the United Kingdom over 17 years of age have or have had at least one hearing aid (Irwin, 2004:110). Similarly, research conducted in New Zealand, which is also a developed country, illustrated that 40% of hearing aid owners do not use their hearing aids at all and approximately 60% used them for less than four hours a day (Jerram and Purdy, 1996:450). It was also suggested by Kochkin (1997:21-22) that 18% of adults who have hearing aids do not use them, and 47% of hearing aid owners are dissatisfied with their devices. Table 2.2 provides a summary of two hearing aid follow-up studies conducted in developed countries.

**Table 2.2: Summary of two follow-up hearing aid studies regarding utilisation and benefit in developed countries.**

Authors	Participants	Aims	Findings
Humes, Wilson, Barlow, Garner and Amos (2002:428-438)	134 adult hearing aid owners	To examine longitudinal changes in hearing aid satisfaction and usage over periods of 6 months, one year and two years post fit.	Multiple self-report measures of hearing aid satisfaction showed that only 49 of the original 134 subjects were completely satisfied and still used their aids.
Gianopoulos, Stephens and Davis (2002:325-471)	116 adult hearing aid owners	To follow-up on individuals who had been fitted 8-10 years earlier to evaluate usage and benefit.	Overall, 50 patients were still using their hearing aids and 66 were not. Of the 66 who were not, 47 accepted the offer of a new hearing aid, and 8 who had stopped using their aids claimed it did not improve their hearing but hoped that the new one would. The other 39 who discontinued hearing aid use cited handling difficulties, cosmetic concerns, feedback, and irritation. These findings suggest that hearing aid fittings alone, without continued support, counseling, and education would result in many people rejecting their hearing aids.

The above table represented two studies conducted in developed countries, findings for both studies indicated utilisation and satisfaction levels were low and this was related to rehabilitation issues.

### **2.2.2 Reasons for under utilisation of hearing aids in developed countries**

According to Irwin (2004:110) reasons for poor satisfaction and under utilisation of hearing aids could be largely due to embarrassment issues and the stigma attached to people with hearing aids. Lack of awareness and information regarding the benefit of hearing aids, previous negative experiences with hearing aids and lack of rehabilitation or

follow-up services may also impact on utilisation of hearing instruments (Jerram et al., 1996:450).

It is therefore important to examine the factors related to satisfaction and dissatisfaction of hearing aids in order to enhance future hearing aid services.

### **2.2.3 Intrinsic and extrinsic factors that impact hearing aid fittings and future maintenance and utilisation in developed countries**

A hearing aid fitting is achieved by firstly accurately selecting and programming the hearing aid (Seewald, 2000:57), and secondly by obtaining measurements with the individual wearing the hearing aid and ear mould and by making the necessary adjustments (Skinner, 1988:267). These adjustments are referred to as verification and validation procedures and can include objective assessments such as insertion gain measurements and subjective assessments such as speech discrimination audiometry (Skinner, 1988:267-270).

Since the fitting and rehabilitation procedure includes objective and subjective assessments, it is evident that there are numerous intrinsic and extrinsic factors which can positively or negatively influence the outcomes of hearing aid fittings, future use and maintenance of hearing aids issued. Table 2.3 and 2.4 briefly outlines all of these factors:

**Table 2.3: Intrinsic factors which may influence hearing aid fittings** (Based on article by Wong, Hickson and McPherson, 2003:127-137).

<b>Intrinsic Factors</b>
<p><b>1. Age</b></p> <p>Adaptation to use of a hearing aid may be affected by age of the user (Brooks, 1996:55). The older clients were shown to have taken longer to adapt to the device. Furthermore, it has been shown that age can affect additional areas such as manipulation, handling and cosmetic preferences (Dillon, 2000:221).</p>
<p><b>2. Gender</b></p> <p>Gender was also shown to play a role in satisfaction and care of the hearing aid, generally females were shown to be more satisfied and maintain their devices to a higher degree than males (Brooks, 1996:64). According to Dillon (2000:212), gender plays a role in the self-image of the hearing user i.e. females tend to have a more negative self-image when wearing the hearing aid.</p>
<p><b>3. Hearing loss</b></p> <p>Adaptation to use of a hearing aid is also affected by type, degree, configuration and duration of hearing loss. Those individuals with flat, mild-moderate sensorineural and with a shorter onset have been shown to adapt to their hearing aids at a faster rate than those who have more severe hearing losses, especially with a high frequency configuration and those who have had a hearing loss for a long period (Wong et al., 2003:128).</p>
<p><b>4. Hearing aid experience</b></p> <p>It has been shown that individuals with no previous experience or those with prior negative experiences are most likely to under utilise their device or not wear it at all. However, those individuals who are experienced users and have had positive experiences with their previous hearing aids are shown to maintain and fully utilise their devices (Kapteyn, 1997 cited in Wong et al., 2003:129).</p>
<p><b>5. Expectations of hearing aid</b></p> <p>According to Bille and Parving (2003:481) the expectations clients have about hearing aids may have a potential adverse impact on satisfaction and use</p>

of the instruments. It was found that novice hearing aid users have especially high expectations about the benefits of amplification resulting in unnecessary dissatisfaction and non-fulfilment of the expectations and may lead to rejection of the hearing aid (Bille & Parving, 2003:488).

#### **6. Attitude and personality**

Research indicated that people who are more self-motivated are often more likely to use and maintain their hearing aids. It was also shown that individuals who were more embarrassed when wearing a hearing aid had less utilisation and satisfaction levels (Hickson, Worrall & Bishop, 1999:20). Furthermore, personality has been shown to affect the self reported handicap of the hearing aid user i.e. those with low self esteem and introverted had a greater self reported hearing handicap (Dillon, 2000:221). A study conducted by Hutchinson, Duffy and Kelly (2005:32) revealed that greater knowledge and understanding of each individuals personality type is crucial to help the audiologist better counsel the adult hearing aid client. It was also recommended that audiologists administer personality tests to future hearing aid clients or include personality related questions in routine case history taking (Hutchinson et al., 2005:28-33).

#### **7. Hours of hearing aid use**

Common findings indicate that those who used the hearing aid for more than two hours a day were more satisfied than low level users (Brooks, 1985:216). According to Brickley et al., (1996:311) group hearing aid fittings and rehabilitation i.e. conducting the hearing aid fitting with several other first time users, improved the hours of usage of hearing aids and overall positive feelings towards wearing the device. The average time period to allow for familiarisation / acclimatisation to the hearing aid was shown to be approximately four – six months after fitting i.e. to become used to changes in hearing aid benefit (Brooks, 1996:62).



Among factors that can affect hearing aid utilisation, some are inherent to the hearing aid user i.e. intrinsic factors. The above table represents all intrinsic factors which can influence a hearing aid fitting and utilisation.

These factors are important to consider as all individuals are unique and differ from each other. Individual characteristics, personality differences and experiences vary according to circumstances and lifestyle. Therefore, individuals with hearing loss react in distinctive ways to a hearing aid and how they utilise and maintain the device.

It is important for the audiologist to be aware and have an understanding of intrinsic factors that are involved and how to address these factors during the hearing aid fitting and rehabilitation.

**Table 2.4: Extrinsic factors which may influence hearing aid fittings** (Based on article by Wong, Hickson and McPherson, 2003:127-137).

<b>Extrinsic Factors</b>
<p><b>1. Type of instrument</b></p> <p>According to Kochkin (1997:21) individuals with newer and smaller instruments i.e. digital In-the-Ear hearing aids, were overall more satisfied and happier to use their hearing aids in various environments.</p>
<p><b>2. Sound quality</b></p> <p>It is suggested by research that digital and binaural fittings had a positive influence on hearing aid satisfaction and usage, as this improved clarity of sound quality, audibility of soft sounds and speech, directionality and overall performance in difficult listening situations (Kapteyn, 1997 and Kochkin, 2000, cited in Wong et al., 2003:136).</p>
<p><b>3. Benefit</b></p> <p>No conclusion can be drawn regarding perceived benefit of a hearing aid to satisfaction and use of hearing aids as research with regard to this aspect is contradictory. Research conducted in this area was dependent on the types of measures used and therefore all studies show contrastive results (Wong et al., 2003:135).</p>
<p><b>4. Listening situations</b></p> <p>Research shows that quiet listening situations have a more positive impact on usage of hearing aids as opposed to noisy situations (Wong et al., 2003:135).</p>
<p><b>5. Counselling and rehabilitation</b></p> <p>Evidence was shown by Hnath-Chisholm (2004: 464, 476) that the inclusion of a counselling oriented rehabilitation program was a more cost-effective approach for adult onset hearing loss than hearing aids alone, as it had important clinical and economic implications since clients were more prepared to accept their hearing loss and reasons for amplification. Furthermore, it was stated by Dillon (2000:322) that by providing suitable counselling to hearing</p>

aid users enhances the probability that the instrument will be fully utilised.

In addition to intrinsic factors which can impact on hearing aids, extrinsic factors also play an important role in hearing aid fittings and rehabilitation. Extrinsic refers to those factors which are externally caused i.e. by influences within the surroundings. The above table represents the extrinsic factors which can influence hearing aid fittings and rehabilitation. Extrinsic factors can have a positive or negative effect on future hearing aid use and maintenance. However, since extrinsic factors are caused by external influences, these may be less complicated to control during hearing aid fittings and rehabilitation than intrinsic factors.

Both intrinsic and extrinsic factors are fundamental in order to maximise hearing aid satisfaction and utilisation.

### **2.2.3 Community-based audiological services in developed countries**

Most research conducted in developed countries investigated adult hearing aid fittings, rehabilitation and satisfaction within a hospital / institution based paradigm. However, a national study conducted in Britain investigated evidence to persuade the National Health System (NHS) to provide hearing aids for adults at community settings (Reeves, Alborz, Hickson and Bramford, 2000:101-107). Emphasis was placed on community-based audiological and hearing aid services, i.e. at locations away from main health centers, practices and hospitals. This was done as a great number of individuals with hearing loss were situated in the rural parts of the country (Reeves et al., 2000:102).

Two national surveys were conducted, which revealed that 81% of all hearing aid departments in government hospitals were found to provide a service at one or more locations away from their main departments, and these community clinics accounted for approximately 30% of hearing aid evaluations and fittings, including follow-ups. This was seen as a low ratio considering a great percentage of the population live in rural areas

(Reeves et al., 2000:105). Audiologists who worked in these community clinics perceived them to be worthwhile, even though the service provided was often seen as of a reduced quality than at a main hospital. The most common problems in the community clinics were cited as background noise and lack of equipment such as diagnostic tests and adequate soundproof rooms. Clients attending community clinics had reduced costs because of the saving in time and distance travelled i.e. they would not have missed out on an entire day of work. The clinics were therefore economical from a societal perspective (Reeves et al., 2000:106).

Hearing aid service delivery in developed countries whether at tertiary or community levels still has several concerns that require consideration in order to be completely effective.

This section examined the factors that influence the outcomes of hearing aid fittings and aural rehabilitation in ideal settings i.e. the developed world. This is important to investigate as these factors will also impact on hearing aid service delivery in South Africa in addition to specific local challenges.

### **2.3 HEARING AID SERVICE DELIVERY AND REHABILITATION IN DEVELOPING COUNTRIES**

South Africa in many aspects is considered to be developed, however, large gaps in the economy and having a dual economy (i.e. significant differences between wealthy and poor) defines it as a developing country (World Bank, 2004:249-271).

According to the WHO Guidelines for hearing aids and services in developing countries, the following aspects should be adhered to and were developed by an expert working group to address the need for affordable and appropriate hearing aid services, taking into account scarcity of skills, training, finance and services in developing countries. These guidelines represent the minimum requirements for the provision of hearing aids

(including supply, pricing, stock, distribution, spare parts, batteries, etc). Table 2.5 provides a summary of these guidelines.

**Table 2.5: Summary of WHO Guidelines (2004:12-23).**

<b>Area of Hearing Aid Provision</b>	<b>Minimum Performance Specification in Developing Countries</b>
- Manufacturing of hearing aids:	Should be in a form that allows for ease of servicing and components must be readily available and costs should be kept to a minimum. Hearing aids must be manufactured or at least assembled locally as this will ensure ease of access to parts and costs will be reduced (WHO, 2004:12-14).
- Ear moulds:	Facilities for the production of ear moulds should be set-up at district level and replacement of ear moulds conducted by a trained Primary Health Care (PHC) worker (WHO, 2004:15, 25)
- Batteries:	Must have a good distributive network i.e. through PHC / Community Based Rehabilitation (CBR) networks and be available at affordable prices (WHO, 2004:16).
- Instructions to the user of the hearing aids:	Hearing aid follow-up sessions must be in a format that is easily understood. Use of a combination of verbal instructions (in the local language) and booklets / written instruction with pictorial representations. Follow-ups must be done in the community i.e. at primary level in the form of outreach for as long the client requires support (WHO, 2004:23-24).

These guidelines are particularly targeted for manufacturers of hearing aids, distributors, policy makers and service providers at all levels (WHO, 2004:8).

“ A hearing aid should be regarded as only one component of a hearing health system that includes the ear mould, batteries, maintenance, repair, instruction, and rehabilitation” (WHO, 2004:10).

Although the WHO document and guidelines were developed recently i.e. 2004, there has yet to be any implementation of aspects provided in the guidelines thus far in South Africa as all the hearing aids available on the Gauteng Tender are from international companies and therefore not manufactured for the specific needs of the South African context (Tender Document #GSSC-81-2004MC). Although ear mould impressions are taken at tertiary and district hospitals - repairs, replacements and re-tubing of ear moulds (maintenance) is still conducted at hearing aid companies, due to lack of proper equipment such as drills, at government institutions.

This can be attributed to the fact that healthcare in developing worlds has been traditionally pre-occupied with mortality indices and life threatening diseases (Olusanya, 2004:563). As a consequence, hearing loss is a low priority for health systems in the developing world, as technology is too expensive and services are restricted (Madriz, 2001:85). It is also one of the world's most neglected sensory disorders and this disregard appears to be more overwhelming in developing countries (Kumar, 2001:219). However, recently as the mortality rate decreases there is an increased awareness of quality of life issues (Olusanya, 2004:563).

An estimated 250 million people worldwide have hearing loss i.e. 4 % of the world's population (WHO, 2001). Two thirds of this population i.e. 165 million live in developing countries and cannot afford the basic price of a hearing aid which is approximately \$300 and equivalent to approximately R1800 (Kumar, 2001:219). It was also estimated by WHO (2001) that developing countries need more than 32 million hearing aids per year. It was also projected that only one out of every eight hearing aids produced worldwide ends up in a developing country (Olusanya, 2004:567).

In 2001, WHO collaborated with several hearing aid companies to reduce the price of hearing aids and to find ways to enable the provision of a large number of hearing aids by 2003/2004 to the populations living in developing countries. There was still however an obstacle with regard to provision of batteries. The cost of a standard pack of six zinc air batteries was too expensive for the average hearing aid user to purchase, therefore new and innovative ideas had to be put into practice.

McPherson and Brouillette (2004:219) did a follow-up of the WHO project and evaluated the GODISA Trust. This is a non-profit organisation situated in Botswana, which utilised European designed hearing aids with a dedicated solar powered battery re-charger. This product is assembled in Botswana by adult individuals with hearing loss and it has worked well in terms of alleviating the need for zinc air batteries. The evaluation of the design for the solar powered battery was seen as a sound and well-engineered construct, since it was easy to manufacture and assemble locally. Furthermore, the battery was created in a way that could resist shock and humidity making it ideal for the African continent. It was also evident from the evaluation that the field tests conducted were successful as all participants were still using the devices.

The findings of follow-up studies of hearing aid recipients conducted in developing countries had different conclusions than those conducted in the developed worlds. Issues that influenced fittings and rehabilitation in the developing countries are provided below:

**1. General service delivery of hearing aids:** This aspect was influenced largely by political struggles of developing countries (Madriz, 2001:87-92). Politics of a country impact on availability of resources, infra-structure and finances. Studies conducted in Latin American countries such as Cuba showed that even though the government subsidised partial cost of hearing aids there were still limitations in hospital budgets, lack of statistical data (incidence and prevalence information on disorders) and accessibility issues with regard to where the majority of the population was situated in relation the where hospitals were located (Madriz, 2001:90). Similarly, research completed in Ghana revealed that distance to hospital / rehabilitation centers presented an enormous obstacle to providing follow-up services for hearing aid recipients and that untreated hearing



impairment in adults prevented economic potential from being reached (Amedofu, Awuah, Ocansey, Antwi & Brobby, 2004:118).

**2. Effectiveness of aural rehabilitation:** A study conducted in Nigeria investigating the effectiveness of aural rehabilitation concluded that people in a developing country can expect to derive the same benefit and satisfaction from use of hearing aids as their counter parts in the developed world, if an enabling environment for efficient service delivery is created i.e. sustainable and effective delivery of hearing aids (Olusanya, 2004:570). Furthermore, the effects of hearing aid fittings and rehabilitation must be evaluated according to the same standards that are employed in developed countries in order to secure the best outcome (Olusanya, 2004:570).

Amedofu et al., (2004:118-120) evaluated the extent to which issued hearing aids in Ghana are used, as a measure of the effectiveness of aural rehabilitation. Results indicated that over 60% of the sample population did not respond to the questionnaire and this was attributed to basic problems in Africa such as low literacy and poverty. The 40% who did respond showed that over half did not use the hearing aids all the time and that 10% who never used the devices named handling problems i.e. not being able to insert hearing aid properly into the ear, or not being able to adjust the volume control, technical problems such as distortion and feedback from the device and lack of motivation i.e. not wanting to wear the device as the reasons.

## **2.4 HISTORY OF HEARING AID SERVICES AND CHALLENGES IN THE SOUTH AFRICAN CONTEXT**

In South Africa, a number of political, linguistic and economic factors have impacted on health and rehabilitation services (White Paper on an Integrated National Disability Strategy, 1997:6). In the past, most health care services have been inadequate, incomplete and hospital-based (National Rehabilitation Policy, 2000:28). With the inception of democracy in the country in 1994, attempts have been made to rectify and alleviate health care for all previously disadvantaged South Africans. This has been

successful for some aspects in health care. However, audiology service delivery to the Black population is still underserved (Louw & Avenant, 2002:145).

Since 1998, each provincial hospital in Gauteng had approximately 48 clients on their waiting list for hearing aids (Wansbury, 2002:21). It was also noted that the demand for hearing instruments far exceeded the supply, as there was an uneven distribution of funds for the provision of assistive devices within the province. Therefore, in response to the lengthy waiting lists (list for clients who require hearing aids but have to wait until funds are available) and the extensive backlog (clients who have been on a waiting list for over a year), finances were made available to provincial government hospitals for a hearing aid budget, and numerous hearing aids were dispensed to the adult and paediatric population. However, none of these clients were followed up on, unless they themselves came in with a complaint or problem regarding the device. This was due to a number of factors such as lack of audiologists and speech-language pathologists at provincial hospitals and audiologists and speech-language pathologists leaving the public sector, making follow-up evaluations difficult.

While there have been significant advancements in the availability of hearing aids and improved technology, many South Africans with hearing loss do not have access to assistive listening devices such as hearing aids, because of a historically disadvantaged South African context. Since the 1990's, numerous people have been fitted with a hearing aid throughout South Africa. The hearing instruments available on government state tender have been reasonably priced. During the 2003-2004 financial year, Gauteng Provincial Government estimated that approximately R1. 837. 775 was allocated to hearing aid budgets for various hospitals (Refer to Appendices A.1 & A.2). Out of this amount approximately 682 hearing aids were purchased to fit clients. Although this is a considerable amount of money, no provision was made to assess the quality assurance of the fittings for both the adult and paediatric population.

The fitting of hearing aids and the provision of counselling and aural rehabilitation in South Africa is complicated by several issues. These issues will be discussed below:

**Multilingualism:** South Africa has 11 official languages – nine of which are Black African indigenous languages (Drennan, 1998:8). The majority of the population served can speak at least two or more of these languages. Audiologists and speech-language pathologists are mainly white, middle class English and Afrikaans speaking (Louw & Avenant, 2002:145). The client-practitioner profile reveals that 80% of the population (South Africans) are indigenous Black African first language speakers and that less than 1% of the qualified speech–language pathologists and audiologists speak a Black language (Ramkissoo & Khan, 2003:1). Multilingualism and cultural background complicate the selection of communication methods and amplification, as some cultures do not necessarily believe in the benefits of amplification and aural rehabilitation (Amedofu et al., 2004:119).

**Late identification:** Hearing loss in South Africa is on average identified at a late stage, i.e. after the child has been exposed to one or more Black African languages (Ramkissoo and Khan, 2003:2). This is due to lack of systematic screening programs and limitations of subjective screening methods (Swanepoel, 2005:2). The effects of late identification contribute to delays in cognition, socio-emotional development, speech and language development and limited employment opportunities later in life (Swanepoel, 2005:8). Late identification makes aural rehabilitation more complicated, as it will not be conducted in the client’s first language which raises the ethical issue, namely audiologists and speech-language pathologists providing treatment to clients in languages other than their first language (Evans, 2001:22). This problem can be ameliorated by using an interpreter. However this in itself brings about numerous problems. These problems are discussed below.

**Lack of Interpreting Services:** There is a severe lack of trained interpreters for speech-language therapy and audiology services in South Africa due to limited tertiary training programs and unclear employment avenues (Evans, 2001:23 & Fisch, 2001:10). Most therapists and other health professionals resort to using clients’ relatives, cleaners, and other clients as interpreters (Swartz, 1998:26). Issues arise with ad hoc interpreting, for

example clinicians feeling inadequate by using such methods and may also become irritated by the untrained person's lack of skill (Swartz, 1998:31). A great number of errors can also be made during interpretation such as omissions, additions, substitutions, misunderstandings, condensation and role exchanges between the interpreter and clinician (Evans, 2001:24).

**Location of Service Centers:** Audiologists who work in government settings are mainly based at provincial hospitals and not at community clinics, due to infrastructure. A large number of clients live in rural and outlying areas (Hugo, 1998:5). With the introduction of community service for graduates since 2003, many audiologists and speech-language pathologists have been placed at district level community clinics and centers, but lack of necessary equipment and infrastructure still ensures that clients must be referred to a provincial hospital. The National Health System of South Africa requires that service delivery occur at a community level and empower clients by allowing them to have access to adequate health care (Louw & Avenant, 2002:147). Currently there are no mobile clinics or outreach audiology services. Transportation costs are high, and clients cannot afford to miss a day's work to visit the hospital (Swartz, 1998:170). When a defective hearing aid is taken to the hospital it will still have to be sent to the company for repairs, and some clients prefer to go directly to the manufacturer to save time. However, hearing aid companies are located in large cities far from rural settlements, and this factor therefore, also presents an accessibility issue for clients. Locations of hospitals and hearing aid companies do not meet the rehabilitative needs of the low-income population. There is a need to bring services to the people, not vice versa (Hugo, 1998:5).

**Literacy levels of patients:** The population served by government institutions in South Africa is poor and the majority have low levels of education, and subsequently low levels of literacy (Swartz, 1998:46). According to Statistics South Africa Population Census (2001:7), the average educational level is between Grades 8-10, and there is a high percentage (40.3%) of the population that have no schooling or only primary level education. Hearing aid orientation programs are usually accompanied by a pamphlet or

manual on how to use the device. This is mainly in English and Afrikaans and not necessarily in the language of the client. Therefore, some clients are at an added disadvantage by not being able to benefit from written information that they can take away with them.

**Cultural Differences:** Nowadays a great deal of importance is being placed on professional transformation related to the demands of the South African community (Hugo, 1998:4). In other words, academic training must be adequate for the requirements of the culturally diverse workplace. Health professionals need to be competent, sensitive, and respectful to the different communities they serve. This is vital, as differences between clinician and client have a serious impact on the success of rehabilitation services (Louw & Avenant, 2002:146).

**Recollection of information disseminated during hearing aid fittings:** Some audiologists often do not realise the complexities of client's lives. Most individuals lead busy lives and there are a copious number of reasons that work against the probability they will remember what is told to them (Margolis, 2004:1). Furthermore, Margolis (2004:12) noted that clients only remember about 50% of information provided during the hearing aid orientation. Depending on the situation and conditions, 40-80% of information presented may be forgotten. It was also realised that half of what is remembered is incorrect and half is forgotten immediately. Even if the client is a first-language English or Afrikaans speaker, only a certain amount of information can be retained by the person, therefore one can imagine the difficulty with a client who does not speak the same language as the therapist when there is no interpreter (Margolis, 2004:10).

The above-mentioned concerns may result in a sizeable percentage of hearing aids being discarded, underused, or poorly maintained (Tye-Murray, 2004:464). This aspect is evident to audiologists and speech-language pathologists working at government institutions, as most clients do not return for batteries, servicing, repairs or replacement of defective aids and rehabilitation after receiving the hearing aid. Some hearing aids are ordered and not even collected from the hospital (Dr. George Mukhari Hospital Statistics,

2004:1-5). This is not in keeping with the Gauteng Provincial Government's long-term goal, which states that clients must "obtain the greatest benefit from public monies" (Provincial Government Charter, 2004:2).

In order to address some of these problems, Gauteng Provincial Health sought to develop an evidence-based clinical protocol for the dispensation of hearing aids in Gauteng. "Evidence-based practice is described as the conscientious, explicit, judicious use of current best evidence in making decisions about the care of individual patients" (Sackett, Rosenberg, Gray, Haynes and Richardson, 1996:71). Unfortunately, this document is not available for publication but it is said to include the fitting and follow-up criteria of all government hospitals in Gauteng, so that the entire province can utilise one standardised format. This will be similar to what has been done in the United States of America – the ASHA (American Speech and Hearing Association) Taskforce on Adult Hearing Aid Fitting (1997) and the Joint Committee Statement on Adult Hearing Screening (AAA, 2000), which are recommended practice guidelines for the provision of hearing aids and follow-ups based on research conducted in the United States of America.

According to the government's principles of *Batho Pele* "People First", the first and most important duty of public health workers is to serve all South African citizens - by providing equal access to services they are entitled to, and by providing value for money. The National Patients' Rights Charter (Department of Health, 1997:2) clearly states that amongst other services, therapy, rehabilitation, and counselling must always be provided to all clients who require the above services.

## **2.5 CONCLUSION**

Research has shown that even in developed countries where adequate resources such as finance, personnel, infra-structure, etc, are available there is still only a small percentage of hearing aid users that still utilise their device and are satisfied with it. This may be a result of various intrinsic and extrinsic factors. In developing countries such as South

Africa, in addition to intrinsic and extrinsic factors there are also service delivery issues which impact on hearing aid provision.

According to the South African Speech-Language-Hearing Association's Code of Ethics (1997:3) and Guidelines on Service Provision in Hospitals (1998:5-8), audiologists must regularly evaluate the effectiveness of therapy and products dispensed. This can be achieved by using methods, protocols and products that are suitable for the clients' needs, culture and language.

Aural rehabilitation is an integral part of health and well-being of individuals with hearing loss. In South Africa however, there are factors that impede the aural rehabilitation process and may lead to the rejection and misuse of hearing aids. While it is important to remember that no health care delivery system is flawless, it is still necessary to examine ways in which the current system can be improved upon and investigate methods that provide the best health care as possible.

## **2.6 SUMMARY**

This chapter examined service delivery during dispensation of hearing aids in developed countries as well as developing countries similar to South Africa and dilemmas experienced. It also explored issues in South Africa that impact on hearing aid provision and utilisation as these will clarify the findings of the study.

## **CHAPTER THREE**

### **METHODOLOGY**

Aim: To present and justify the research design and methodological approach utilised in the research study, as the ultimate purpose is to answer the research question: What is the maintenance and utilisation of government fitted hearing aids?

#### **3.1 INTRODUCTION**

“The relationship between a science, whether a social or other, and its research component has always been a very close one” (De Vos, Strydom, Fouche, Poggenpoel, & Schurink, 1998:5).

From the previous chapters it is evident that the provision of hearing aids and their utilisation by individuals with hearing loss is complicated by a considerable amount of factors. These factors are present in developed countries as well as in developing countries. Furthermore, service delivery in developing countries has additional challenges due to low economic status, high mortality rates and lack of services (Olusanya, 2004: 563).

#### **3.2 AIMS OF THE STUDY**

The main aim of the study was to determine the maintenance and utilisation of government fitted hearing aids.

The following sub-aims were formulated in order to provide information in which the main aim could be realised:

3.1.1 To establish the maintenance of government fitted hearing aids.

3.1.2 To establish the utilisation of government fitted hearing aids.

3.1.3 To establish the condition of government fitted hearing aids after dispensation.



### 3.3 RESEARCH DESIGN

“A research design is the strategy, the plan and the structure of conducting a research project” (Kweit & Kweit, 1981:357). Both a qualitative and quantitative research approach was utilised. Creswell (1994:2) explains quantitative research as “an inquiry into a social or human problem based on testing a theory composed of variables, measured with numbers and analyzed with statistical procedures” whereas qualitative research involves “an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants”.

Both approaches were selected for this study due to the nature of the data that was collected from the participants’ i.e. individual thoughts, and experiences in narrative form as well as numeric data that allow for statistical procedures and analysis. The type of research was cross-sectional and analytical. Cross-sectional studies necessitate the observation of units of analysis at a single point in time (De Vos et al., 2002:40). This is economical to the participant and the researcher in terms of time and cost, as participants will be studied once (Neuman, 1997:28). However, conclusions based on observations made a one point in time remain the main disadvantage of cross-sectional studies (Babbie, 2001:95). Analytic induction seeks to develop universal statements containing the essential features of a social phenomenon (De Vos et al., 1998:286). Furthermore, analytic induction compels the researcher to develop conceptual frameworks that correspond to the subjective everyday experience of the participants (Manning, 1982 cited in De Vos et al., 1998:338).

In terms of this study, the researcher aimed to obtain information regarding hearing aid experience at least one year post fitting. A method of non-probability purposive / judgmental sampling was employed (Babbie, 2001:227). Non-probability sampling methods in general are regarded as less reliable than probability sampling, but they are often easier and cheaper to use (Babbie, 2001:227). This sample was selected according

to principles such as nature of the research aims, researcher's knowledge of the population and its elements and based on the purpose of the research (Babbie, 2001:225). The nature of the investigation was a descriptive survey; whereby the researcher conducted structured face-to-face interviews (De Vos et al., 1998:297). The structured / standard interview was adopted, whereby the interviewer asked the participant the same questions using an interview schedule i.e. for example a formal instrument that specifies the precise wording and ordering of all the questions to be asked of each participant (Leedy, 1997:193). The researcher was thus aware of the negative aspects associated with the research methods chosen to perform the study and avoided them. This was achieved by providing an interpreter who was fluent the first language of the participants and could thus clarify questions and terminology for participants during the interview.

### **3.4 ETHICAL CONSIDERATIONS**

The importance of research ethics is to ensure that the researcher adheres to the responsibility to the participants, the public, and to the profession (Mouton, 2003:238). In the South African context there are unique challenges, and dilemmas faced such as poverty, HIV and AIDS, cultural and linguistic diversity and low literacy (Hugo, 1998:6-7). These aspects were considered carefully by the researcher as they play an integral part of studying human behaviour and responses. The researcher also bore in mind the principles of "*Batho Pele*" (People First) as stated in the Patients Right Charter (Department of Health, 1997:1) by ensuring that all participants were treated with respect and courtesy and that information about services / service delivery was provided.

The main ethical considerations according to De Vos et al., (2002:62-76) are as follows:

Autonomy: The researcher acknowledged the participants' autonomy by providing a consent letter to each participant to ensure that the individuals in the study were completely and correctly informed in order to make decisions regarding their involvement the research project (Refer to Appendix B.1). The letter and consent form stated the aims of the study, procedures, and potential benefits using clear and

unambiguous language. These were also translated into two languages viz. Setswana, Northern SeSotho (Refer to Appendix B.1), as these are the main languages spoken at the hospitals involved in the study. Measures were also taken for semi-literate and illiterate clients whereby the consent letter was read aloud to them and verbal consent was given, as well as a cross was made instead of a signature.

Beneficence / Non-Maleficence: The researcher acknowledged the participants' right to beneficence by ensuring that no harm came to the participants during the course of the study.

- Ethical clearance from the Research Proposal and Ethics Committee of the Faculty of Humanities, University of Pretoria and each of the hospital's Chief Executive Officer (CEO) was obtained. (See Appendix E)
- Permission was obtained from the Heads of Speech Therapy Departments at each hospital to conduct the study. (See Appendix B.3)
- All potential benefits and risks were explained in detail to the participant.
- Data collection procedures were non-invasive.

Confidentiality / Anonymity

- All personal data received from the participant was treated confidentially.
- Participants were informed that names would not be used in the study, rather each participant was assigned a unique number.

Actions and Competence of Researcher

The researcher has an ethical obligation to be competent and adequately skilled. The study must therefore be conducted in a principled manner to ensure accountability to fellow colleagues (Babbie, 2001:475). Therefore ethical clearance was first obtained from all concerned parties. In addition, all data collection procedures and processing of data was conducted by the researcher (a qualified audiologist).

### **3.5 PARTICIPANTS**

#### **3.5.1 Selection criteria**

A discussion follows on the selection criteria for the participants and the interpreter.

##### **3.5.1.1 Selection criteria for participants:**

- Participants had to be hearing aid users for a minimum period of one year, as the aim of the study was to investigate utilisation of hearing aids. It was essential that the participant had the hearing aid for a sufficient amount of time i.e. at least one year and was therefore able to make judgement regarding usage and maintenance (Tye-Murray, 2004:462).
  
- **Monaural Fittings**  
Participants had to be fitted with only one hearing aid. This was considered a criterion as government institutions mostly fit one hearing aid to adults, unless a second device is highly motivated for (Dr. George Mukhari Hearing Aid Statistics, 2004). Additionally, the questions that were asked during the interview were aimed at monaural hearing aid users.
  
- **Age**  
Participants had to be 18 years or older. Participants within this age range could answer questions themselves and were more self-aware, and could articulate feelings, experiences, and needs regarding the issues being investigated more adequately (Alpiner & McCarthy, 2004).
  
- **First language Black African speakers**  
Most of the population served do not speak English or Afrikaans proficiently (Swartz, 1998:33-34). This impacts on the hearing aid fitting process as well as the rehabilitation process the client participates in, thus the study aimed to investigate this specific population group. Furthermore, according to the population census data, Black Africans make up the majority of the population

distribution i.e. approximately 78% (Population Group Distribution, Statistics South Africa Census, 2001).

- Geographical Area/ Region

Two provincial government hospitals in Tshwane were selected. This was done for purposive sampling as these hospitals dispense hearing aids and also because these hospitals serve all areas (rural and urban) for the entire province (Refer to Appendix F – Map of Tshwane, Tshwane Annual Report, 2003-2004:1).

### 3.5.1.2 Selection Criteria for Interpreter

- Qualifications

The individual had to be qualified and trained as an interpreter i.e. at least a bachelor's degree in languages or a Postgraduate Diploma in Interpreting, and Translating that is recognized by the South African Qualifications Authority (SAQA). In addition, the person had to be registered with the Language Practitioners' Council of South Africa (Erasmus, Mathibela, Hertog and Antonissen, 1999:19, 309).

- Prior knowledge

The individual had to have prior exposure and at least one year experience with regard to the profession of speech-language pathology and audiology i.e. he / she had to be familiar with terms such as hearing aid and ear mould. This was imperative, as the researcher would have ensured that the participants fully understood the nature of the questions and terminology used (Swartz, 1998:37-38).

- Languages

The individual had to be fluent in the two languages used for the study i.e. SetSwana and Northern SeSotho as well as English. This was important to ensure correct communication between the researcher and interpreter (Swartz, 1998:38).

### 3.5.2 Selection procedures

Procedures for the selection of participants and interpreter will follow.

#### 3.5.2.1 Selection procedures for participants

A method of non-probability purposive sampling was adopted as a strategy that uses the purpose of research and nature of the aims to obtain participants (Babbie, 2001:225). The population sampled was that of adults with government fitted hearing aids. Participants were contacted using their telephone numbers. Hearing aid statistics from Gauteng Province 2004 (See Appendix A.1) were used in order to decide on an appropriate sample size. During the last financial year (2004-2005) approximately 200 hearing aids were distributed by the main provincial hospitals in Tshwane. For a population of 200, it was suggested by Stoker (cited in De Vos et al., 1998:192) that approximately 32% of the population is needed for an adequate representative sample i.e. 64 participants.

- Participants were contacted telephonically. The telephone numbers were obtained from client records. The purpose and implications of their involvement in the study were explained to them. Those participants who gave their informed consent i.e. their voluntary participation based on a full understanding of the possible benefits and risks; were interviewed according to a structured interview procedure based on the pilot study results.
- The researcher developed the instrument to be used in the standard interview procedure.

#### 3.5.2.2 Selection Procedures for Interpreter

- Interviews

Potential candidates for interpreter were identified using the Human Resource Department at Dr. George Mukhari Hospital. Once possible candidates for interpreting

were identified, these individuals were approached and a brief summary of the proposed research was discussed. Individuals who were interested then submitted curriculum vitae to the researcher. The researcher then selected an interpreter based on the informal interview and qualifications listed in curriculum vitae. The interpreter who was selected was from the same cultural/ethnic background of the participants. This helped to establish rapport, provide accurate interpretation and offer significant insights into the participants' culture (Hegde & Davis, 1995:162). The selected interpreter was willing to accompany the researcher to the hospitals for purposes of data collection. The interpreter was compensated for time and services rendered.

### 3.5.3 Description of Participants

The following diagram (Figure 3.1) represents the description of the participants in terms of gender, age, type and number of hearing aids, and current activity.

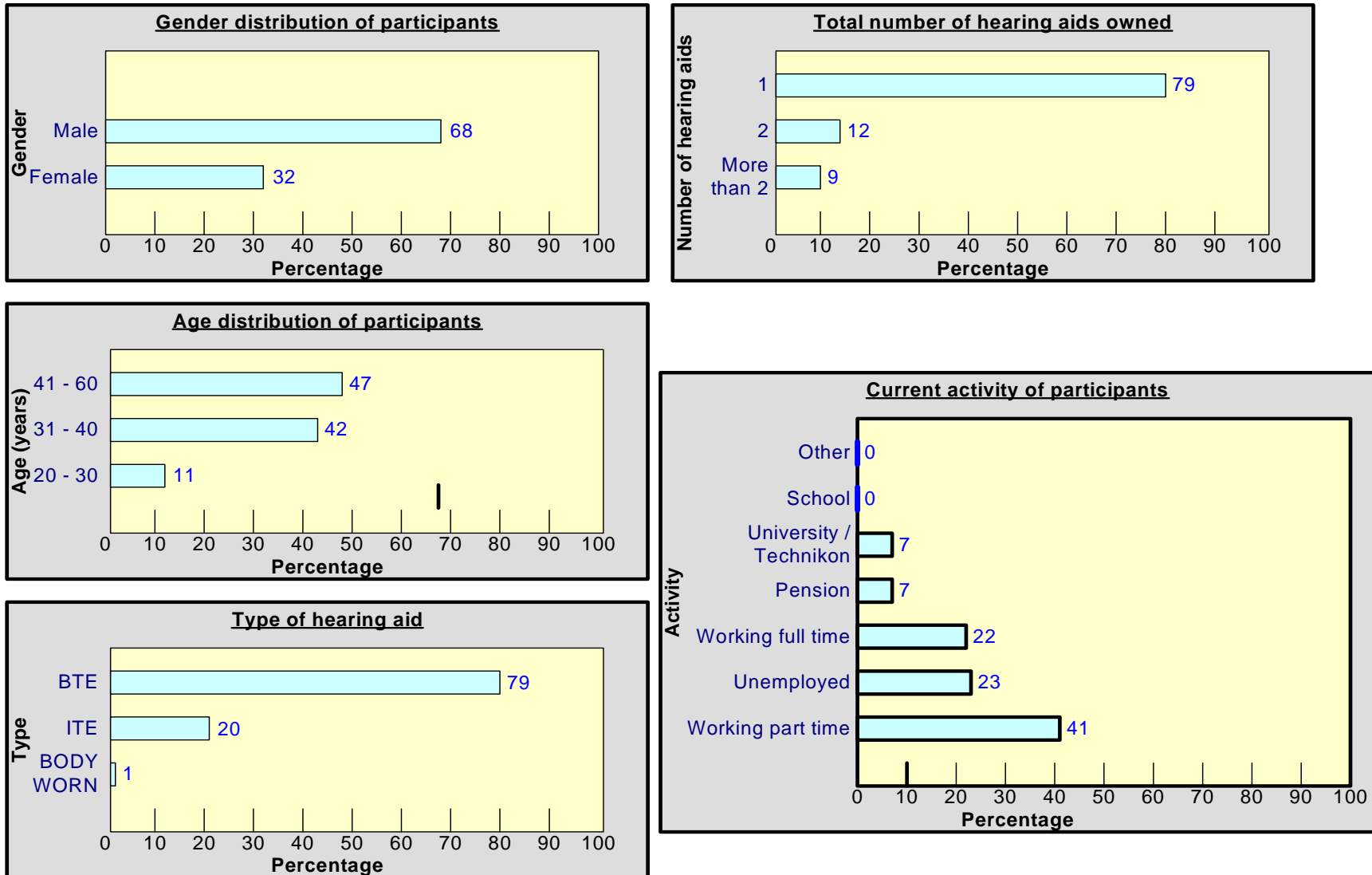


Figure 3.1: Summary of the description of participants (n=57).



Figure 3.1 represents a summary of the description of participants. Fifty seven of the targeted 64 participants responded. This indicates a response rate of 87 % which according to Neuman (2000:267) is more than adequate. Of the 57 participants, 39 were male and 18 were female. The ratio for male to female is 2:1, and this is in accordance with the gender distribution of the population according to the Gauteng Statistics (2001:1), which indicates that males are almost double in number than females. According to the age distribution of the participants, the greatest percentage of participants fall into the 31-40 year category, and this is to be expected according to the international incidence of hearing loss (National Institute for Deafness and other Communication Disorders, 2006:1).

Forty one percent of participants were reported to be working part time, and an almost equal number of participants were unemployed (23%) or working full time (22%). Seven percent were studying at a university and seven percent were receiving a pension from the government. The majority of participants (79%) have had only one hearing aid, 12% have had two and only 9% have had more than two hearing aids. The 21% who have had more than one hearing instrument stated losing and breaking their instruments as the reasons. These results are for monaural hearing aid fittings.

Sixty three percent of the participants reported wearing their hearing aid in the right ear, 33% in the left ear and disturbingly 4% indicated that they alternate wearing their aid between right and left ears. Thirty two percent indicated that they wear their hearing aids continuously and 68% reported not wearing the device continuously because according to participants they did not need to and their hearing loss was not severe enough to warrant wearing the device continuously.

The majority of participants (79%) reported to have Behind-the-Ear (BTE) hearing aids and 20% reported to having an In-the-Ear (ITE) hearing aid. This is to be expected as the majority of hearing aids available on the Gauteng State Tender are BTEs. (Tender Document #GSSC-81-2004MC).

### **3.6 MATERIALS AND APPARATUS**

In this section, materials for the data collection and recording will be presented.

#### 3.6.1 Materials and Apparatus for collection of data

The interview schedule and apparatus will follow.

##### 3.6.1.1 Interview Schedule (See Appendix C.1)

An interview schedule was constructed, as opposed to using questionnaires that had already been developed such as the Expected Consequences of Hearing Aid Ownership - ECHO (developed by Cox & Alexander, 2000) as the researcher felt these questionnaires did not fully investigate and probe factors specific to this research study. However, the interview schedule developed was based on a questionnaire by McAdam (2002) to investigate utilisation of wheelchairs in South Africa. The questions on the interview schedule were asked by the researcher and answers were also documented by the researcher.

Aim of the interview schedule:

The aim was to obtain information regarding usage levels of hearing aids issued, situations where hearing aids were utilised most, maintenance and care of these instruments and needs of the participants with regard to access of maintenance and repair services.

Language of the interview schedule:

The interview schedule was developed in English only, this was done as the researcher ensured there was an interpreter available for the all of the interviews therefore there was no need to translate the interview schedule into other languages.

Format and content of the interview schedule:

The interview schedule design was based on a questionnaire developed by McAdam (2002), who conducted a similar follow-up study in Mpumalanga investigating usage of government issued wheelchairs. Further literature and standardised questionnaires were also considered in the development. The completed interview schedule comprised of nine pages, seven sections and 61 questions. The length of the interview

schedule was justified as over 75% of the questions were closed or scaled, with participants needing to indicate their selection of responses to each question, and this aided the completion of the interview schedule. More closed questions were also used to ensure accuracy, to avoid confusion and to speed completion (Neuman, 2000:261). A number of open-ended questions were also formulated to allow for an opportunity for the participants to make recommendations regarding the service delivery and to comment on the impact of the hearing device on their lives. A number of prompts were included to the interview schedule in the event that the participants did not understand the questions or could not recall the relevant details, so that opinions and suggestions could be probed further (Neuman, 2000:277). The questions were arranged so as to obtain data systematically, and to facilitate data analysis. The first few questions (i.e. Section A: Questions 1-4) were easy and non-threatening, to serve as a warm-up to the interview. The main body of the interview schedule comprised of questions to obtain information about the participant's hearing aid usage, their repair, and maintenance, and operation skills. The interview schedule took approximately 15-20 minutes to complete and according to Neuman (1997:245) this is acceptable as hour long face-to-face interviews are common.

The face-to-face interview was selected over the other type of survey options such as postal questionnaires, for the following reasons:

- Postal addresses are often not known for many of the participants of research studies especially for participants from rural areas (Leedy, 1997:196).
- The accuracy of those postal addresses that are known may be unreliable, as participants may have relocated (Leedy, 1997:196).
- Face-to-face interviews presented the opportunity for the degree of enquiry to be altered if where appropriate, for example the use of prompts to clarify the nature of the questions, or follow-up questions to elicit additional relevant information (Terre-Blanche & Durrheim, 1999:282).
- Face-to-face interviews provided the opportunity for the researcher to observe and photograph the condition of the hearing aids.
- This type of interview works well in the South African context due to low levels of literacy among possible participants (Terre-Blanche & Durrheim, 1999:282).

- Face-to-face interviews also have a higher response rate than other types of interviews such as group interviews or mailed questionnaires (Terre-Blanche & Durrheim, 1999:282).

However, according to Terre-Blanche & Durrheim (1999:281-282) there are also disadvantages with using this type of interview such as:

- Participants often have to pay to reach the interview venue. The researcher tried to address this aspect by conducting the interviews at the hospital where the hearing aid was obtained i.e. the hospital closest to the participant.
- The interviewer/interpreter may influence the responses. Having a trained and experienced interpreter minimised this. In addition, possible case scenarios were discussed prior to the interviews i.e. how to handle a participant who goes off the topic question. Issues that arose were addressed in the pilot study.

Table 3.1 illustrates the development and description of subject matter in the interview schedule.

**Table 3.1: Development and description of interview schedule content.**

Section	Questions	Topic	Explanation
Section A	Questions 1-4	Biographical Information	This section included personal information such as age, gender, level of qualification, etc in order to describe the participants accurately and to correlate this information to the findings during data analysis.
Section B	Questions 1-8	Fitting of hearing aids	Section B looked at the logistical aspects of hearing aid fittings such as cost, venue and transport, as well as the hearing aid history of participants. The above information was felt to relate strongly to factors associated to usage and maintenance levels.
Section C	Questions 1-11	Repairs/replacement of hearing aids	The third section included information on repair and maintenance history of the participants hearing instruments i.e. how many times did they have to repair or replace their devices. This was included in order to correlate this information to similar studies and during data analysis.
Section D	Questions 1-11	Care and maintenance of hearing aids	This section evaluated participants' knowledge of care and maintenance of hearing instruments. This information was included so that it could be later correlated to aural rehabilitation/ training they received.
Section E	Questions 1-12	Hearing aid orientation	Section E investigated the nature and content of the training participants received when they were issued with hearing aids. Additional questions regarding language of the training, were included to ascertain if this aspect played a role in future use and care of the instruments.
Section F	Questions 1-7	Use of hearing aids	This section examined specific situations and purposes that participants used their hearing instruments for, as well as satisfaction levels of the instrument as perceived by the participants.
Section G	Questions 1-6	Participants view on hearing aid orientation programmes	The last section aimed to probe information regarding how and where participants would prefer hearing aid fittings, maintenance, repairs and rehabilitation to occur; as this information would provide useful data on developing effective service delivery guidelines.

3.6.1.2 Evaluation Checklist (See Appendix D) was designed for the evaluation of the condition of the hearing aid, using information from three textbooks (i.e. Vonlanthen, 1995; Sandlin, 2000 and Sweetow, 1999) as well as the WHO 2004 Guidelines. The evaluation checklist consisted of a list of all major components of hearing aids as well as ear moulds and the researcher had to fill in whether these components were intact, missing, broken and / or clogged. This evaluation was conducted after the interview.

### 3.6.2 Materials and Apparatus for recording of data

#### 3.6.2.1 Interview environment

- This was a quiet room, with a table, a number of comfortable chairs, drinking water, and adequate ventilation and lighting. Arrangements were made with the Head of Department (Speech-Language Pathology and Audiology) prior to the interview date.
  
- The researcher made use of the above-mentioned interview schedule, as well as the evaluation checklist.
  
- A Hewlett Packard HP PhotoSmart R507 camera was used to take photographs of the condition of all the hearing aids in the study. These photographs are available as a printed copy (Appendix G.1) and on a compact disc (Appendix G.2).

## **3.7 PILOT STUDY**

Bless and Higson-Smit (2000:155) describes the pilot study as a “small study conducted prior to a longer piece of research to determine whether the method, sampling, instrument and analysis are adequate and appropriate.”

The pilot study allowed the researcher to evaluate the following aspects of this study:

- The interview schedule

Irrespective of how carefully a data collection instrument is designed, for example an interview schedule, there is always the possibility of error (Leedy, 1997:116). Pilot studies identify potential problems with the proposed research using a small number of participants before the main study is conducted. This allows space for revision and or reworking of the instrument for data collection. The results of the pilot study provide valuable information on the administration of the interview and the quality of the responses from the participants (Terre-Blanche & Durrheim, 1999:298).

- The interpreter

Furthermore, the pilot study provided an opportunity for the researcher and interpreter to clarify roles, expectations and procedures (Hegde & Davis, 1995:162-163). This allowed for any confusion and ambiguities to be elucidated. The recommendations from the pilot study were implemented before commencement of the main study. The developed interview schedule was piloted on clients from Dr. George Mukhari Hospital.

### 3.7.1 Participants of pilot study

Participants for the pilot study were selected according to the previous mentioned selection criteria as for the main study. Five participants were included in the pilot study, to ensure that at least one participant from each language group had a chance to be interviewed i.e. English, SetSwana and Northern Sesotho. This was done to ensure that the researcher and interpreter had the opportunity to interview clients in all three languages. The interpreter was selected according to the above-mentioned criteria as for the main study.

### 3.7.2 Procedure for data collection for the pilot study

The interview schedule was administered to five participants (two females and three males). Once this was completed, a further set of questions pertaining to the following were asked:

- Explanation of research: was the language clear and unambiguous in all three languages and was the purpose of the research clear and acceptable?
- Was there any offensive language/terminology in the questionnaire?

- ❑ Clarity of questions
- ❑ Administration time
- ❑ Layout of questions
- ❑ Comments on the venue

(See Appendix C.2)

### 3.7.3 Results of pilot study and implications

Once the pilot study was completed, the researcher evaluated the accuracy of the coding on the interview schedule as well as the effectiveness of the evaluation checklist. This enabled changes to be made prior to commencement of the main study, thus ensuring accurate results and statistical data.

#### 3.7.3.1 Context

In terms of the above aspect, the context of a pilot study is relevant as it is similar to the main study. The government hospital served as a good setting to conduct the interviews, since clients were attending the hospital for other clinics as well. Participants were therefore familiar with the venue and did not have any recommendations regarding this issue.

#### 3.7.3.2 Procedure

In terms of procedure, researcher and interpreter established good rapport and there were no misunderstandings or errors during the interview process. This was determined by the fact that there was clear and unambiguous communication between researcher and interpreter and there were no discontinuities or clarifications during the interview process (Erasmus et al., 1999:169).

#### 3.7.3.3 Materials and Apparatus

The consent form, explanation of the research and a question and answer session took approximately 10 minutes to complete. The interviews lasted approximately 15-20 minutes per participant, including the evaluation of the hearing aid. This was not seen as



too time consuming by the participants. In terms of adaptations to the interview schedule, the following table illustrates the specific changes made.

**Table 3.2: Adaptation of the interview schedule items based on results of the pilot study.**

Question items that were misunderstood / queried / misinterpreted by participants	Comments / Suggestions made by participants	Adaptation to interview schedule
<p>Question E.1 “When you were fitted with your hearing aid was an orientation program provided to you?”</p> <p>The word “orientation” was difficult to understand, even after it was explained by the researcher.</p>	<p>A simpler word / explanation should be used.</p>	<p>The word “training” was substituted in question E.1. The question now reads “When you were fitted with your hearing aid was a training program provided to you?”</p>
<p>Questions E.2, E.5, E.6 and E.7 contained the word “orientation” and therefore presented difficulty to participants.</p>	<p>Same as above.</p>	<p>The word “orientation” was changed to “training” in all of the mentioned questions. Furthermore, a copy of a hearing aid pamphlet was to be kept for the main study interviews to be used as an example to show the participants.</p>
<p>In Question F.4, it was felt by many participants that an option be available for work purposes i.e. the</p>	<p>To add a further option for work purposes and type of employment, and this impacts on</p>	<p>An extra option regarding work purposes and to describe employment, was added to the</p>

type of occupation.	whether or not the user needs a hearing aid for work or not.	answer list for questions F.4 and F.5 (as these two are linked).
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### 3.8 MAIN STUDY

The procedures for collection of data will follow:

#### 3.8.1 Procedure for collection of data

- Data was collected by means of structured face-to-face interviews with pre-formulated closed, open and scaled questions in form of an interview schedule.
- The interview schedule was adapted according to the pilot study outcomes.
- At the end of the interview in order to complete the hearing aid condition section, the researcher conducted a thorough evaluation of the parts / components of the aid, and ear mould to ascertain what condition they were in. If they warranted repairs, recommendations were be made for the recipients to contact the therapist at the hospital from which they received the aid or the area closest to them currently.

### 3.9 DATA ANALYSIS

The quantitative data was coded to organise the responses into an appropriate format for data capturing and analysis. The coded responses were entered into a computer using the Microsoft Excel program to conduct statistical analysis of the data. A combination of

qualitative and quantitative methods was employed to analyse the data from the study i.e. data gathered in narrative form, and numeric form.

In terms of analysing quantitative data, the researcher made use of descriptive statistics. This branch of statistics describes what the data appears like, how broadly the numbers are spread, and how it is related in terms of one aspect to another aspect of the same data (Leedy, 1997:252). Results are presented in graphs, and tables.

Qualitative data i.e. responses to open-ended questions were categorised into main themes and ideas. Qualitative data analysis is primarily an inductive process of organising the data into categories and identifying patterns among the categories, according to McMillan and Schumacher (2001). Although there is no standard procedure for qualitative analysis, this does not mean it is not systematic or rigorous. Once the data was analysed, common themes, and recommendations were then identified.

### **3.10 VALIDITY AND RELIABILITY**

When using an interview schedule, the validity and reliability of the responses must be considered. These are the fundamentals of quantitative and qualitative measurements. Validity refers to the “appropriateness, meaningfulness, and usefulness of the specific inferences made from test scores” i.e. the instrument measures what it intends to measure (McMillan and Schumacher, 2001:318).

According to Hudson (cited in De Vos et al., 2002:85) to evaluate the validity of an instrument, one needs to pose three questions:

1. How well does the instrument measure what you want it to measure (Content)?
2. How well does the instrument compare with other external criteria claiming to measure the same thing (Criterion)?
3. What does the instrument mean – why does it operate the way that it does (Construct)?

To ensure high validity the interview schedule and checklist developed was first evaluated by professionals within the field, in order to gauge feedback and critique

(Neuman, 1997:138). In addition, pertinent theoretical aspects of hearing aid fittings were included in the interview schedule and a pilot study was carried out, so that practical and constructive changes could be made to the interview schedule and interview process, thereby ensuring high content validity (Neuman, 1997:138-140). According to Leedy and Ormrod (2001:105-106), using real life settings will ensure a more representative sample and high construct validity, therefore state hospitals and clients attending these hospitals were utilised. Unfortunately, adequate criterion validity could not be achieved as there were no external criteria that measured what the interview schedule in this study claimed to measure to compare with.

Reliability refers to the accuracy or precision of an instrument i.e. not what is being measured but how well it is being measured (De Vos et al., 1998:85-86). A high degree of trustworthiness must be realised in social research. Issues such as credibility, transferability and dependability were addressed in this study by having a thorough literature review, detailed descriptions of the sample population, data collection instruments and data collection procedures.

Furthermore, the use of audio-visual methods in a research study i.e. photography is a creative way to enrich the project and provide visual records of the daily life of the group under scrutiny (De Vos et al., 1998:328). However, these photographs can be difficult to interpret and therefore issues of reliability and validity need to be addressed (De Vos et al., 1998:328). The researcher addressed these issues by ensuring the quality of the photography was adequate and each photograph was explained in detail and accurately (See Appendix G.1 and G.2 – Compact Disc).

### **3.11 CONCLUSION**

Research conducted within the South African public health care sector is crucial, as the majority of the population utilises public institutions. However, there is still a great need for research and data regarding service delivery in the public sector. Therefore, this research examined information pertaining to hearing aids obtained from government hospitals in order to develop service delivery guidelines that are based upon sound

scientific principles. The need for such information i.e. factors that impact utilisation and maintenance of hearing aids in the public sector is fundamental as this will increase awareness regarding the specific needs of the adult hearing aid user in South Africa.

### **3.12 SUMMARY**

This chapter clarified the aims and sub aims of the research, and was followed by an explanation on the research design employed. This was then accompanied by a description of the selection criteria and procedures. The outcomes of the pilot study was also examined, followed by detailed descriptions on the development of the questionnaire, data collection procedures and data analysis procedures.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

Aim: To present the results of the research and to clarify the meaning and impact thereof. An evaluation of the results will also be described against the outline of the information in the literature review.

#### **4.1 INTRODUCTION**

Since the move from the medical model of disability to the social model, emphasis has been placed on providing health care services and rehabilitation at primary and community levels. With the advent of the 2004 WHO Guidelines on hearing aids and services in developing countries, there is an urgent need for the acquisition of information regarding the current status of hearing aid service delivery and the needs of the hearing aid users in developing countries. This will help in addressing the problem areas and the subsequent development of sustainable and equitable hearing aid service delivery guidelines for South Africa. In order to acquire this information, research is fundamental. Throughout South Africa there is now a widespread awareness that enhanced public service is the hallmark of responsive governance. Equally important is the recognition that the level and quality of service delivery is as important as the values of ethics and accountability of the public institutions that deliver the services (Ferrer et al., 2005: 698).

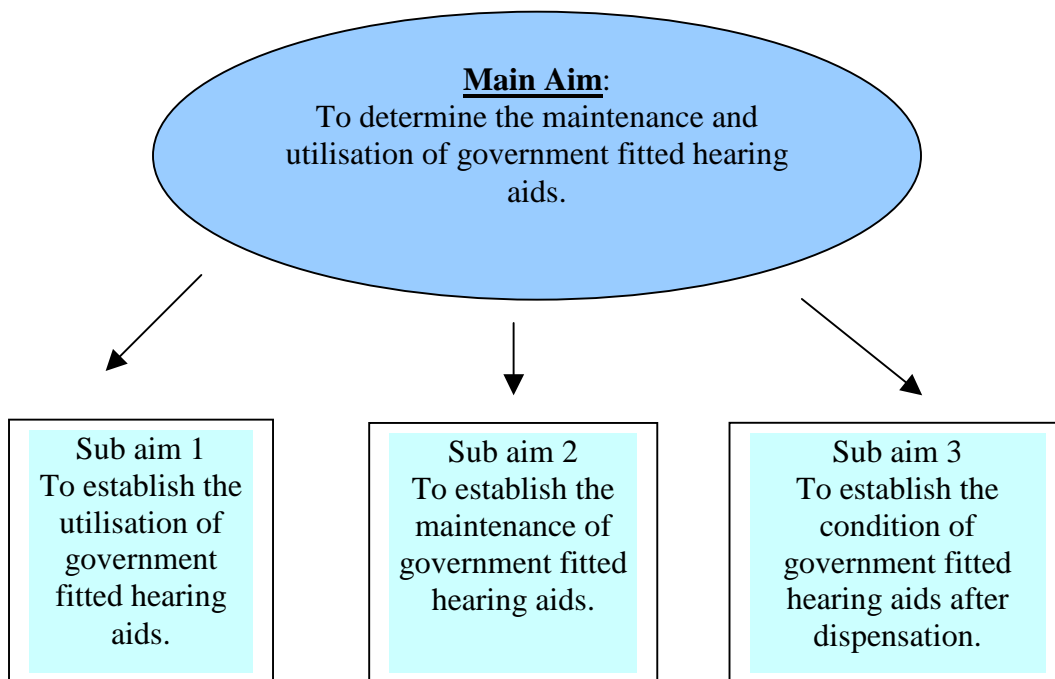
In this study, a descriptive survey was employed to investigate the maintenance and utilisation of government fitted hearing aids, these findings will assist in developing hearing aid service delivery guidelines for use in the province of Gauteng. It is envisaged that the guidelines will attempt to address the needs of hearing aid users.

Chapters 1 and 2 discussed the theoretical foundations of hearing aid fittings and aural rehabilitation as well as hearing aids in the African and South African context. Chapter 3 presented the methodological and research structure of the study. The aim of this chapter

is to describe the results of an investigation into hearing aid utilisation and maintenance by a South African population and discuss these results in terms of pertinent literature and similar research findings. Although the main aim of the research was to establish the maintenance and utilisation of government fitted hearing aids, additional information was probed on the needs of hearing aid users as well as areas of recommendations and improvements.

## 4.2 DISCUSSION OF RESULTS

The results of the study will be presented according to the sub-aims posed and elucidated through the use of visual representations.



**Figure 4.1: Presentation of sub aims in relation to achieving the main aim.**

### 4.2.1 The maintenance of government fitted hearing aids

The first sub aim of the study was establish the maintenance of government fitted hearing aids. These results include responses to items from Section B to Section D. The first area that was investigated dealt with problems experienced with hearing aids and how this may impact on the maintenance of the hearing aid (Table 4.1), followed by repair and replacement information as well as cleaning of instruments. An interpretation and discussion of the general tendency of this sub aim will conclude the section.

**Table 4.1: Problems experienced with hearing aid (n=57).**

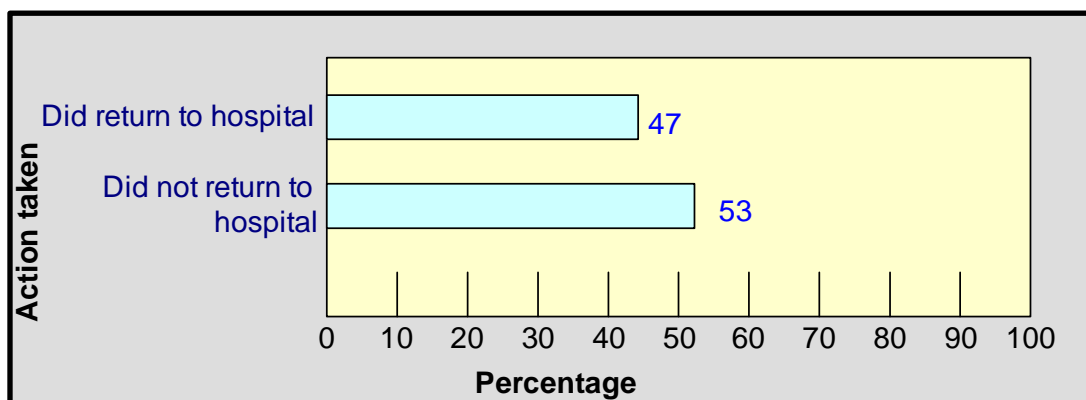
<b>Problem</b>	<b>Percentage</b>		
Whistling from the hearing aid	26%		
Hearing aid is uncomfortable to wear	32%		
Hearing aid is painful to wear	16%		
Embarrassed to wear the hearing aid	74%		
Hearing aid makes the ear itchy	21%		
Hearing aid is too loud	47%		
Hearing aid is not helping	46%		
Cannot put in hearing aid properly	39%		
Hearing aid is not helping in noisy situations	47%		
Other (Specify)	25%	Lost	17%
		Broken	8%

It is obvious from Table 4.1 that the greatest problem perceived by participants is embarrassment from wearing the hearing aid (74%). This is similar to international research findings which also indicate that embarrassment and stigma attached to wearing a hearing aid was perceived as a problem by adult hearing aid users (Irwin, 2004:110). Embarrassment issues could also stem from intrinsic factors of users such as personality types and attitudes towards appearances (Wong et al., 2003:129). However, in comparison with other assistive devices such as wheelchairs, embarrassment was not perceived an issue by adult users (McAdam, 2002: 23). This could be due the fact that there is more public awareness regarding wheelchairs and spectacles than hearing aids. Additional problems reported indicated that the hearing aid was perceived as too loud



(47%) and that it does not help in noisy situations (47%). The problems experienced with loudness imply poor hearing aid fittings and possibly hearing aids that are too powerful for their specific hearing loss, which may result in further cochlear damage (Dillon, 2000:276). The 25% of participants who chose option “Other” specified that hearing aids are lost easily (17%) and break easily (8%). This response could be largely due to lack of information or understanding of information on handling and caring for hearing aids during the hearing aid orientation. Furthermore, the fact that clients do not make a large personal financial contribution towards the hearing aid i.e. instruments are subsidised by the government could imply that they did not take ownership and responsibility of the instrument and therefore lost and broke them easily (Dillon, 2000:326-327). These responses indicate that participants’ require adequate counselling on hearing loss and wearing a hearing aid, as well as a need for more public awareness of hearing aids. This can be achieved by more advertisements on hearing loss and hearing aids in the media.

Figure 4.2 represents the action taken by participants regarding problems experienced with their hearing aids.

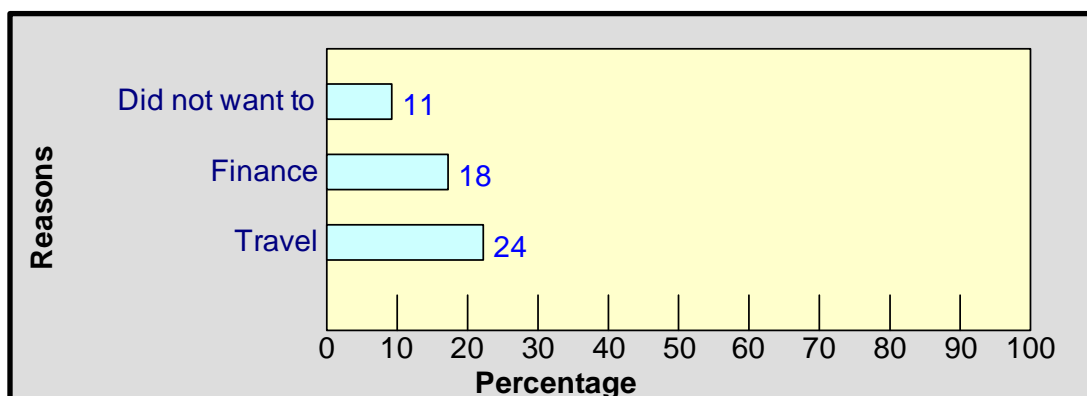


**Figure 4.2: Action taken by participants regarding problems with the hearing aid (n=57).**

Participants who experienced problems with their hearing instruments were questioned on whether or not they took their hearing aids back to the hospital for repairs, replacement or additional help. Results show that only 47% of participants took their device back if they experienced problems with the hearing aid. This amount is similar to

findings in developed countries where only half of adult hearing aid users sought further help if problems were experienced (Jerram et al., 199:450). Just over half of the participants (53%) in this study who reported they did not take the hearing aid back.

Figure 4.3 indicates the participants’ reasons for not returning to hospitals for help regarding hearing aid problems.



**Figure 4.3: Reasons for not returning to hospitals (n=30).**

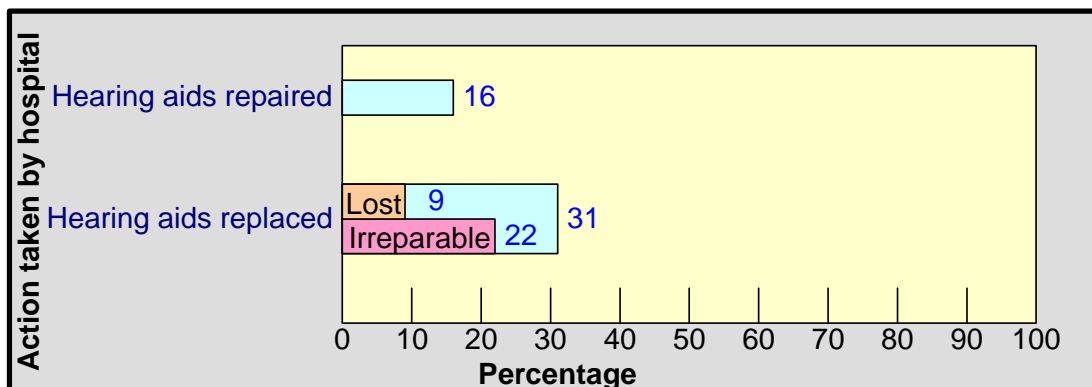
The participants that did not return to the hospital cited as travel / distance (24%) and lack of funds (18%) as the main reasons. Surprisingly, these issues i.e. transport and mobility constraints are also mentioned in research findings of developed countries, where one would expect the public transportation to be of a higher standard (Jerram et al., 1996:451). The responses of participants indicate an urgent need for a more accessible means of repair and support for hearing aids i.e. community clinics or free designated transport to and from hospitals. Table 4.2 represents the type of transport utilised by participants in this study to access public hospitals for hearing aids.

**Table 4.2: Types of transport utilised to access hospitals and cost involved (n=57).**

Type of Transport	Percentage of participants (%)	Cost (Rands)
Bus	4	R20.00
Taxi	88	R50.00
Hitchhiking	0	-
Own transport	8	-

Other	0	-
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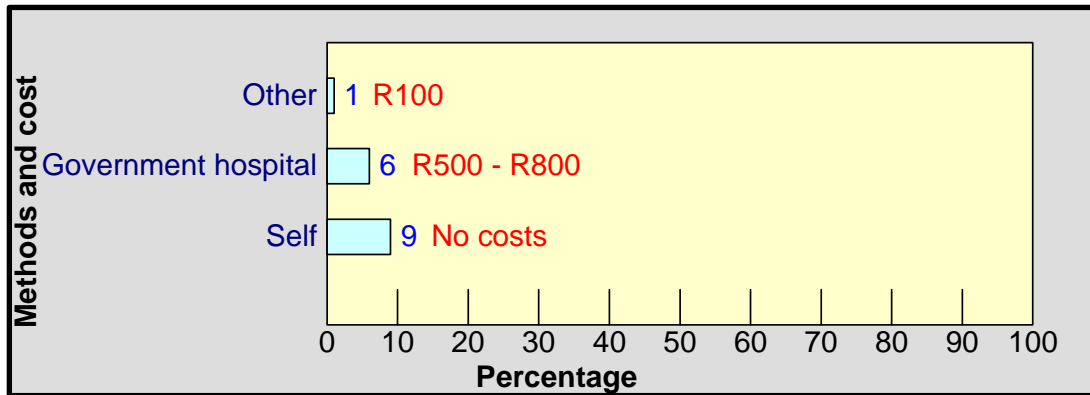
The majority of participants (88%) reported to use the taxi to get to and from the hospitals, and this cost was estimated to be approximately R50 for a return trip. Other public transportation used was the bus service and this was estimated to be somewhat less expensive than the taxi i.e. approximately R20 for a return trip. According to the population statistics, a large number of people in Tshwane are employed, however just about half of this percentage (47%) of those who are employed earn less than R1000 per month (Census 2001, Statistics South Africa Economically Active Population, Tshwane). This indicates that most participants cannot afford to come often to hospital for repairs. Figure 4.4 represents the action taken by hospitals in addressing the hearing aid problems experienced by participants.



**Figure 4.4: Action taken by hospitals (n=57).**

Of the 47% of participants who went back to hospital with their hearing aids, 31% reported their instruments were replaced and 16% were not. Reasons as to why such a high number of hearing aids were replaced were due to 22% of instruments being damaged beyond repair and 9% that were lost. All participants who had their hearing aids replaced received the replacement aid from government hospitals. The 16% of hearing aids that were not replaced were repaired. This aspect is in keeping with international research which indicates that if hearing aids are lost and or cannot be repaired, they will be replaced (Gianopoulos et al., 2002:469).

Figure 4.5 indicates the method and cost of repairs of hearing aids.

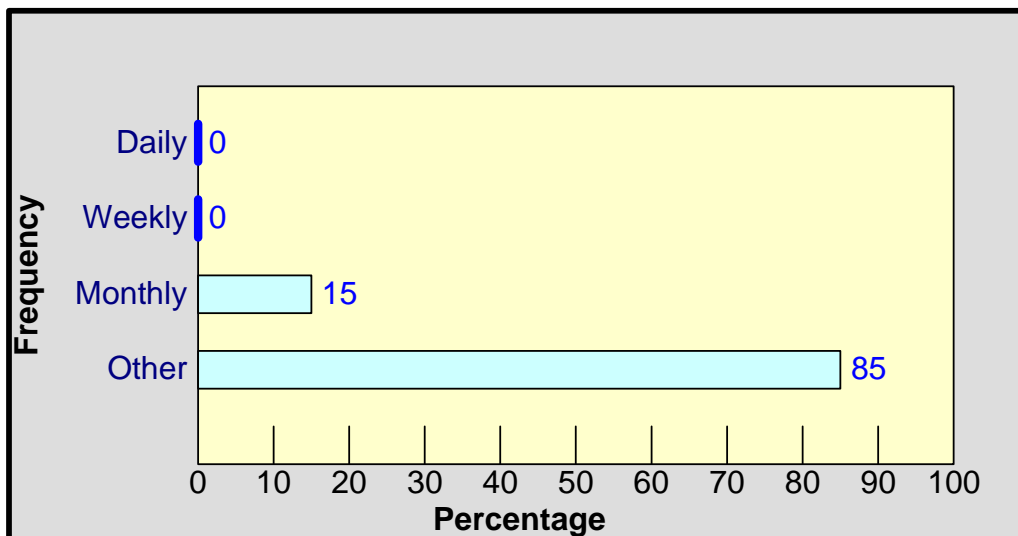


**Figure 4.5: Method and cost of repairs to hearing aid (n=57).**

Repairs done through government hospitals amounted to 6% of the participants, 9% reported that they repaired the aid themselves and the remaining 1% reported taking the hearing aid to other sources to be repaired such as the local hardware shop. None of the participants took the aid directly to the manufacturer / hearing aid company as they did not know where the companies were located. This is quite different from international findings which indicate that repairs are done at the manufacturer or the local dispenser (Humes et al., 2002:430).

Of the 6% of repairs conducted at state hospitals, 5% of participants had to pay for repairs and 1% did not have to as their hearing aids were still under guarantee. However, all participants who had their hearing aids repaired reported that repairs took approximately 3 – 5 months and those who had to pay stated the costs ranged from R500 - R800. The long waiting period for repairs impacts on participants' work, family and social contexts as they do not have their hearing aid during this period and will most likely struggle in all situations. All self-repairs were reported as immediate and no costs were involved as they utilised materials from home. This is similar to South African research findings on wheelchair repairs conducted, most were self repairs utilising materials from the home (McAdam, 2002: 24). The participants who took the aids to other places reported repairs to be completed within two weeks and costs were approximately R100.

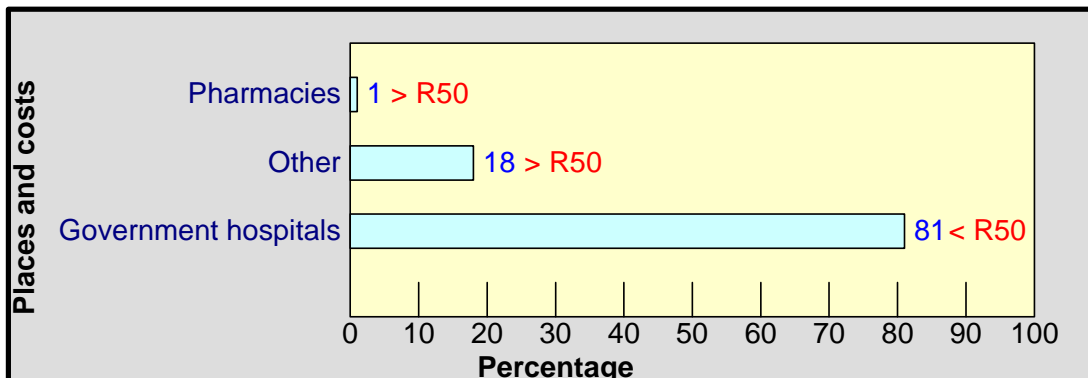
Figure 4.6 represents the frequency of replacement of hearing aid batteries by participants.



**Figure 4.6: Frequency of replacement of hearing aid batteries (n=57).**

Only 15% of participants reported that they change their batteries monthly, the majority of participants (85%) however chose option “Other” and specified that this meant whenever they had money to purchase the batteries and whenever they had time to go to hospitals to obtain the batteries. This indicates that participants utilise their hearing aids infrequently and are therefore not optimally utilising their residual hearing (Dillon, 2000:384). It is unfortunately impossible to predict how often batteries should be changed as this depends on a number of factors such as the type of instrument, hours of usage, and size of batteries (Dillon, 2000:46, 157). However, from international research there seems to be an indication that batteries are replaced by users as soon as they are depleted (Humes et al., 2002:431).

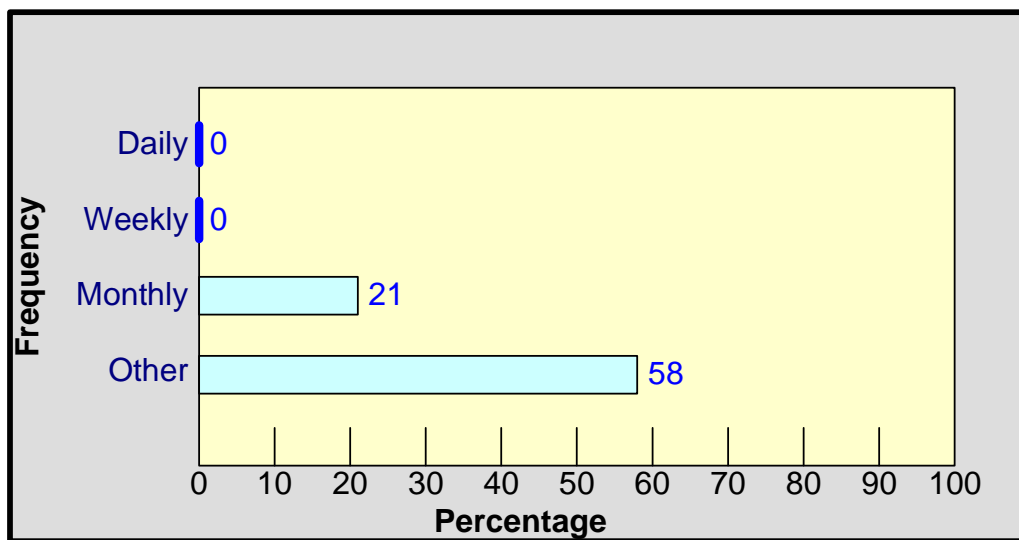
Figure 4.7 indicates the place and cost of acquisition of hearing aid batteries.



**Figure 4.7: Place and cost of acquisition of hearing aid batteries (n=57).**

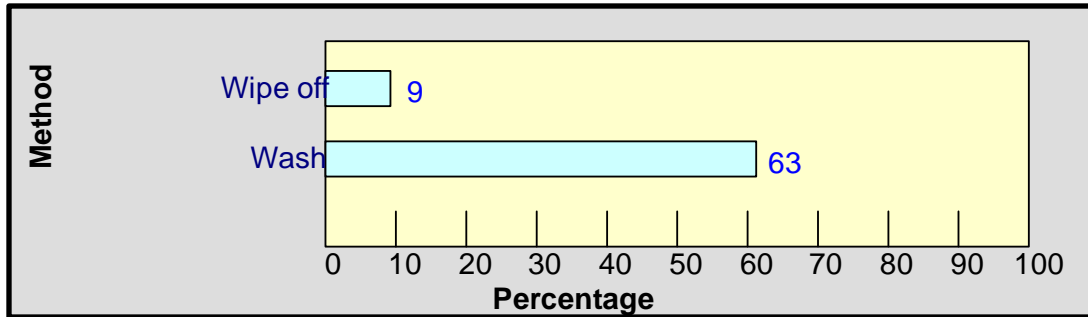
A high number of participants (81%) indicated that they purchase the batteries from state hospitals, 1% reported to buy from pharmacies, and 18% stated other sources such as local supermarkets and shops. Cost of batteries at state hospitals was reported to be less than R50 for a pack of six batteries whereas at pharmacies and supermarkets cost was estimated at more than R50. This is very expensive as according to McPherson et al., (2004:219), the average cost of a six pack of zinc air batteries is approximately \$4.50 which is approximately R30. The additional R20 that is charged could be due to importation costs. A possible solution would be for government to subsidise the cost of batteries or the development and sale of a solar powered hearing aid similar to the one currently in production in Botswana (McPherson et al., 2004:219).

Figure 4.8 indicates the frequency of ear mould cleaning by participants.

**Figure 4.8: Frequency of ear mould cleaning (n=45).**

Of the 79% of participants who had BTEs, 21% cleaned their ear mould monthly, the other 58% reported to cleaning their ear moulds only when it was dirty.

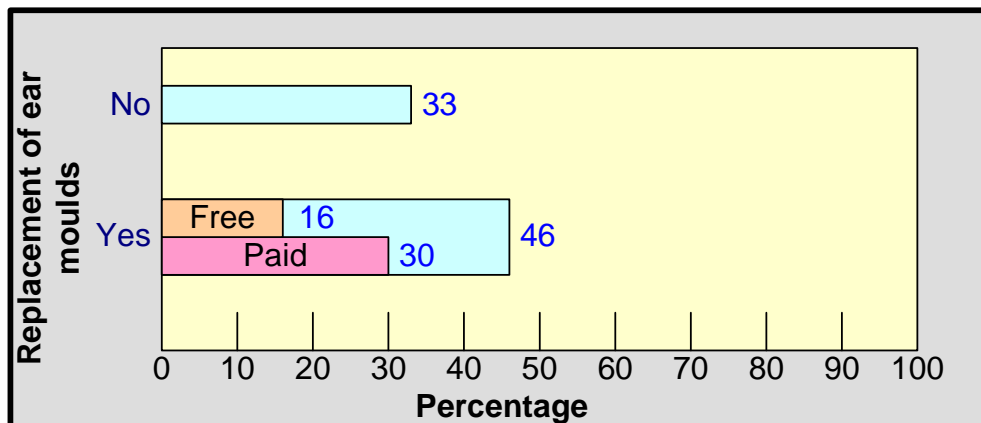
Figure 4.9 is representative of the method utilised by participants to clean their ear moulds.



**Figure 4.9: Method of ear mould cleaning (n=45).**

Sixty-three percent reported that they cleaned their ear mould by washing it in warm water and soap while the remaining 9% reported that they would only wipe it with a cloth or tissues. This indicates that most participants do indeed know the correct method of cleaning an ear mould. The 9% of participants who only wipe their ear moulds could be at risk for possible ear infections which may even result in further hearing loss (Sandlin, 2000:161).

Figure 4.10 indicates the replacement and cost thereof of participants' ear moulds.



**Figure 4.10 Replacement and cost of ear moulds (n=45).**

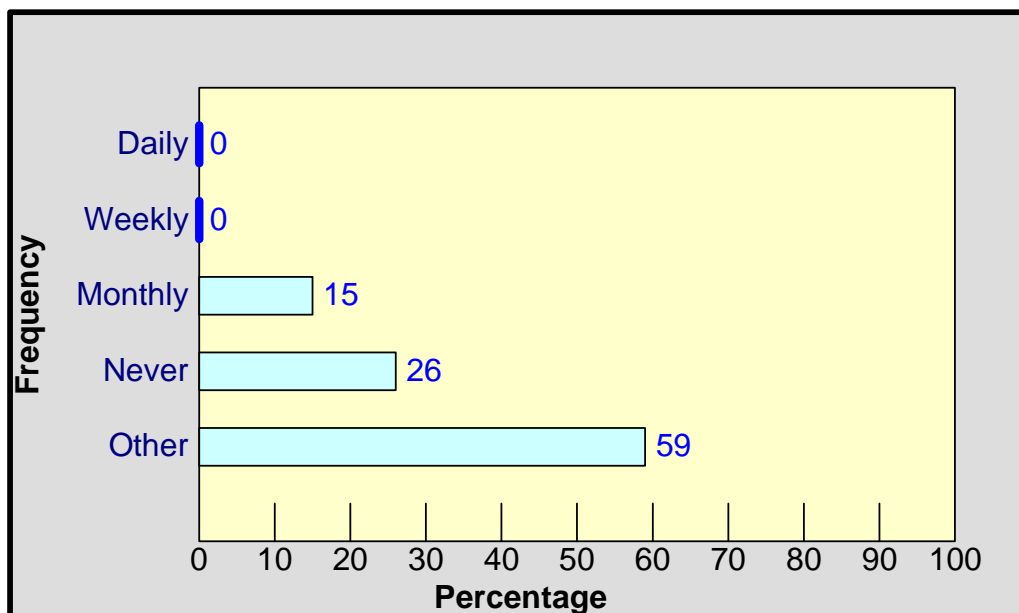
Almost half of the participants (46%) have had their ear moulds replaced at government hospitals. Sixteen percent said this was done for free while 30% reported that they paid between R50 - R70 for a new ear mould. Table 4.3 represents the percentage of participants who have had their ear mould tubing replaced.

**Table 4.3: Replacement of ear mould tubing (n=45).**

Replacement of ear moulds tubing	Percentage
Yes	3%
No	76%

Only 3% of the sample have had their ear mould tubing replaced and this was done for free at hospitals by the audiologist. This indicates that the majority of participants have not replaced their ear mould tubes which can impact on sound quality transmitted to the ear via the ear mould should the tubing be cracked or hardened. Visual representations of ear mould cleaning i.e. videos or photographs of correct cleaning methods may help to increase overall understanding of hygiene of ear moulds for clients.

Figure 4.11 reveals the frequency at which participants clean their hearing aids.

**Figure 4.11: Frequency of hearing aid cleaning (n=57).**



Twenty-six percent of participants reported to never having cleaned their hearing aids, while 15% of participants clean their aids monthly. This is not in keeping with what is usually recommended to clients internationally and nationally, which is to wipe the hearing aid daily and to keep it in a Dry Aid kit every night, especially in hot and humid climates such as Gauteng (Dillon, 2000:327). If the hearing aid is not wiped daily and kept in a special drying kit, the microphone or the tone hook of the hearing aid may become clogged with debris which in turn affects sound quality and overall benefit derived from the hearing aid (Dillon, 2000:102). Over half of the participants (59%) reported that they do not use a specific time frame for cleaning but rather clean the instrument only when its very dirty (38%) and if they have the time (21%). Seventy-two percent of participants reported wiping the hearing aid with a soft cloth to clean it, while a shocking 2% reported to washing the instrument. Washing the instrument will lead to permanent damage of the inner circuitry of the device (Sandlin, 2000:448) and this will in turn lead to replacement of the instrument, which will be at the expense of the government. Furthermore, during this time the client will be left without a device and this will affect their work, family and social lives. Once more, the use of visual representations i.e. videos or photographs of correct hearing aid cleaning methods may help to increase lifespan of hearing aids of clients.

The main findings for the first sub aim of the study indicate that there are several factors which negatively influence the maintenance of hearing aids. One of these factors is finance. The cost of travelling to and from hospitals, the cost of batteries as well as the cost of repairs to hearing aids plays a key role in the whether or not government fitted hearing aids are maintained and kept in good condition. Furthermore, distance from hospitals was also related to whether or not hearing aids and ear moulds were taken in for repairs or replacement as a high number of participants preferred to conduct repairs by themselves or at local shops. These findings illustrate the need for servicing, repairs and maintenance of hearing aids to be conducted at primary health care level i.e. in the community.

#### **4.3.2 The utilisation of government fitted hearing aids**

Results for this sub aim are responses from items in Section E, F and G of the interview schedule. Information is firstly presented on the hearing aid training conducted, specific uses of hearing aids and participants' views on hearing aid services.

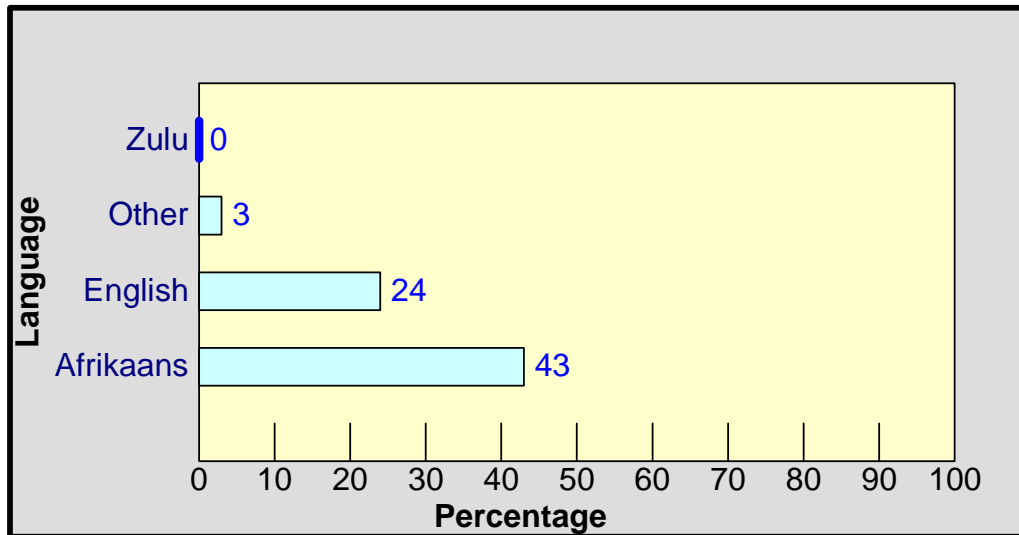
Utilisation of hearing aids is closely related to the hearing aid orientation program that was conducted when the hearing aid was first received. Table 4.4 represents the percentage of participants that recall having a hearing aid orientation programme.

**Table 4.4: Orientation programme (n=57).**

Orientation programme done	Percentage
Yes	72%
No	28%

Seventy-two percent of participants in the study recall having a training program conducted, however 28% reported that no such activity occurred when they first received their instruments. Of the participants who experienced a training program, only 3% reported that it was done in their first language i.e. a Black Africa indigenous language. This indicates that the majority of participants had a training program conducted in their second language, which could possibly impact on understanding of information thereby resulting in a lack of awareness on utilisation and maintenance of the device.

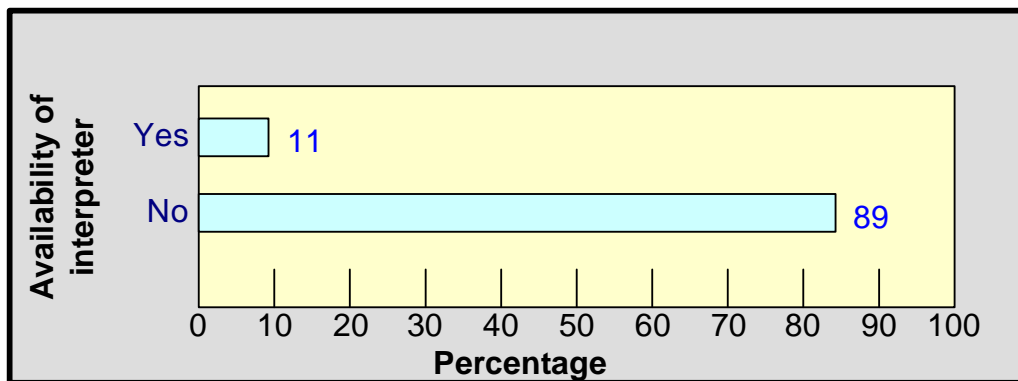
Figure 4.12 represents the language that training programs were conducted in.



**Figure 4.12: Language of hearing aid orientation (n=57).**

Figure 4.7 indicates that a high percentage of the participants (43%) received their hearing aid orientation program in Afrikaans. This is followed by English (24%) and only 3% reported that it was conducted in other languages. This is to be expected as the majority of audiologists and speech-language pathologists are English or Afrikaans speaking (Louw and Avenant, 2002:146) This presents a problem such as miscommunication (clients do not fully understand the audiologist), as a significant percentage (39%) of the Tshwane population speaks Setswana and Sesotho according to the Statistics South Africa Census 2001 (Dominant Home Language Tshwane). The above results clearly indicate a need for the hearing aid orientation to be conducted in the predominant Black African languages of the province. There is also a need for more Black African audiologists and speech-language pathologists in South Africa in order to ensure that information is correctly transmitted to clients in their first language.

Since the majority of hearing aid orientations were conducted in English and Afrikaans, participants were further questioned on availability of interpreters for the training and orientation. Figure 4.13 indicates the availability of interpreters.



**Figure 4.13: Availability of interpreters (n=57).**

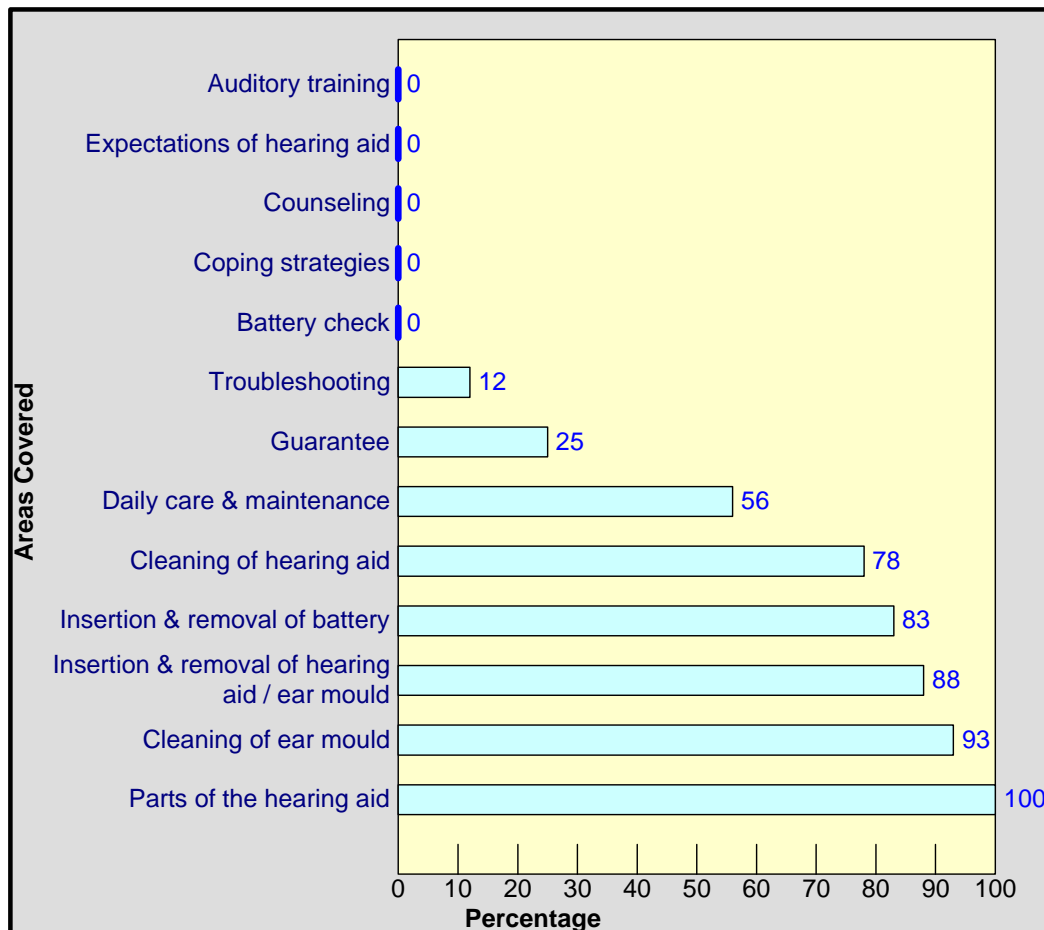
Eighty-nine percent reported that there were no interpreters available and 11% indicated that there were people available to interpret, however participants were unsure if these individuals were qualified employees of the hospital. This indicates a great need for the employment of qualified and trained interpreters in the public health sector.

**Table 4.5 Understanding of orientation programme (n=57).**

Complete understanding of orientation program	Percentage
Yes	16%
No	84%

Sixteen percent of participants reported that they understood everything that was done in the hearing aid training session regardless of language while the majority (84%) indicated that they did not fully understand everything that was done during the training due to the language differences. This shows that most participants went home with their hearing aids without fully understanding how they work, how to clean them and how to troubleshoot problems. This impacts on the utilisation, maintenance and condition of these instruments.

Figure 4.14 indicates the various areas that were covered with participants during the hearing aid training program.



**Figure 4.14: Areas covered during the hearing aid training program (n=57).**

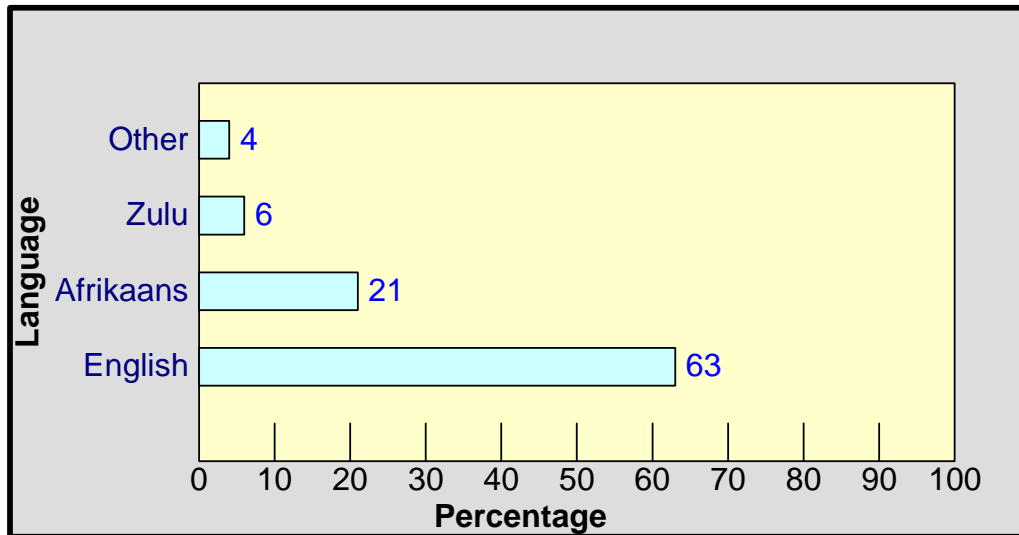
The above figure represents all areas that should be covered during a hearing aid program (Dillon, 2000:323-339):

- **Parts of the hearing aid:** The client must be familiar with all parts of the instrument is he / she is too properly utilise it.
- **Cleaning of ear mould and hearing aid:** The client must be aware of how to clean and maintain the ear mould and hearing aid for hygiene and increased lifespan purposes.
- **Insertion and removal of hearing aid and battery:** The client has to be independent in hearing aid use and this means correct insertion and removal of the hearing and battery.

- **Battery check:** This aspect is extremely important as clients must be able to check the power output of the battery that is in their hearing aid, as this will be a good indicator for when new batteries are required.
- **Troubleshooting:** Many repairs to hearing aids are minor and can be done by clients who can diagnose the problem. It is expensive and unnecessary for aids to be returned to the clinician or manufacturer for common problems such as a clogged microphone or a dead battery.
- **Guarantee:** The client must be aware of the guarantee period for his / her hearing aid, as well as the guarantee on specific parts of the hearing aid.
- **Counselling and expectations of hearing aid:** This is vital to the adult hearing aid user, as clients must have a good understanding and acknowledgement of their hearing loss and realistic expectations of their hearing aid.
- **Coping strategies and auditory training:** Clients must be introduced to basic training strategies that are available such as speech reading as well as ideas on how to adjust to new sounds and experiences with the hearing aids.

The above areas represent skills that must be mastered by the hearing aid user if independent hearing aid use is to be possible. Of all the areas that are supposed to be covered during a training program, all participants in this study indicated that the basic components of a hearing aid were explained to them. Furthermore, areas covered which received a high recognition from participants were cleaning of hearing aids and ear moulds, insertion and removal of hearing aids and battery. However, participants reported that certain areas such as battery check, expectations of hearing instruments, and counselling on hearing loss were not covered by the audiologist at all. This is important because if counselling and expectations of the hearing aid are not conducted some clients may expect too much from the hearing aid, which can then lead to frustration, low satisfaction and possibly under utilisation or non use of the device. Only 12% indicated that some troubleshooting of common problems was explained to them.

Figure 4.15 represents the language of the pamphlet or training manual given to participants.



**Figure 4.15: Language of hearing aid pamphlet / training manual (n=57).**

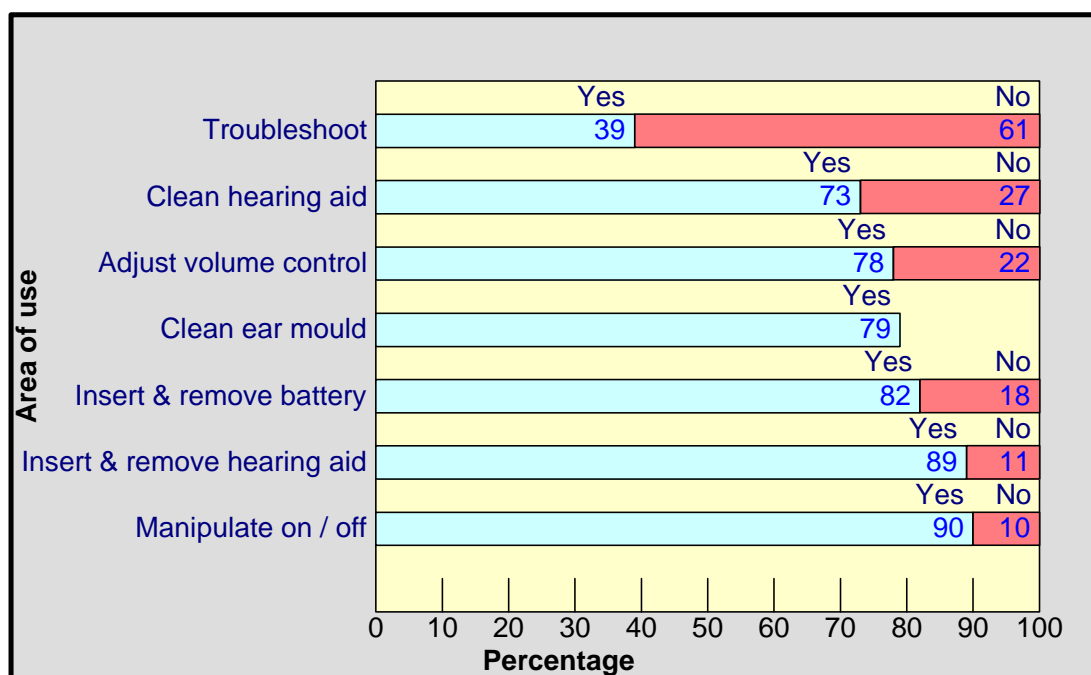
It was observed in the Gauteng Provincial Profile (Statistics South Africa, 1999:39) that approximately 94% of individuals in Gauteng over the age of 20 years can read and write in at least one language i.e. their first language. However as mentioned in Chapter Two, over 40 % of the adult population have had only primary school education and therefore their reading levels would be not be at a high school level. In Figure 4.7 a large percentage (63%) of the participants indicated that they received a hearing aid pamphlet that was in English. Six percent of participants indicated they received a pamphlet in Zulu, while only 4% reported that it was in another language i.e. a Black African language such as Setswana. Six percent did not receive a pamphlet at all. Table 4.6 represents the helpfulness of the hearing aid pamphlet / training manual as perceived by participants.

**Table 4.6: Helpfulness of pamphlet (n=57).**

Helpfulness of pamphlet	Percentage		
Yes	20%		
No	74%	Could not read	Lost
		52%	22%

Twenty percent of participants reported that the pamphlet was of some help to them. The remaining participants indicated that they either could not read or understand it (52%) or they lost it (22%). These responses clearly indicate a vital need for the availability of hearing aid pamphlets and training manuals in all of the official languages of South Africa, as well as a pictorial manual with visual representations for semi-literate and illiterate adults.

Figure 4.16 indicates the participants’ ability to demonstrate to the researcher if they knew the correct way in which to use and maintain a hearing aid.



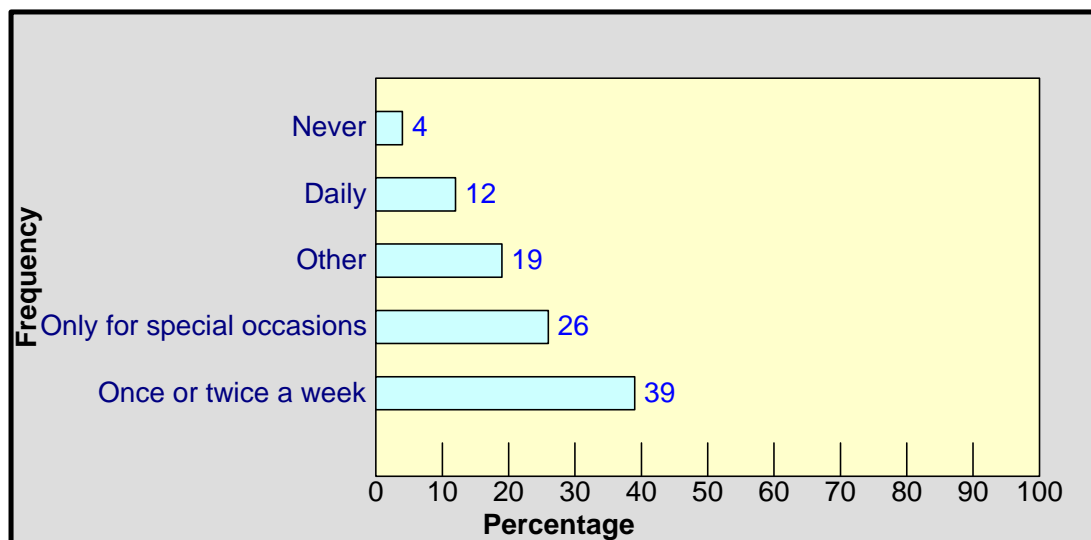
**Figure 4.16: Participants ability to demonstrate hearing aid use (n=57).**

Responses show that a high number of participants could demonstrate correct cleaning techniques for the ear mould and hearing aid as well as insertion and removal of the instrument and battery. This is promising, as it indicates that most participants are comfortable with basic care and use of a hearing aid. This corresponds to the responses in Figure 4.8, which indicated that these areas were covered during the training program. Sixty one percent of participants did not know how to troubleshoot simple and common problems experienced with hearing aids. For clients who reside in rural communities, the



ability to troubleshoot simple problems is very important as these clients will not be able frequent provincial hospitals on a regular basis for minor repairs.

Figure 4.17 represents that frequency of use of hearing aids by participants.



**Figure 4.17: Frequency of use of hearing aids (n=57).**

A large percentage of participants (39%) indicated that they wear their hearing instruments once or twice a week however only 12 % reported to using it daily. This indicates that most participants are at risk for auditory deprivation as they do not wear the device on a daily basis and may take even longer to adapt to amplification (Sandlin, 2000:471). Four percent of the participants no longer utilise their hearing aids at all. Of the 19% of participants who chose the option “Other” specified that they only wear the hearing aid at home (10%) and only if they need it i.e. if they feel they cannot cope (9%). This also indicates the risk for auditory deprivation and longer adaptation periods. These results are not in keeping with findings from research conducted in similar contexts i.e. in a developing country. Results from a study conducted in Ghana showed that 45% of adults used their hearing aids all the time every day and almost 26% of adults who were fitted used their hearing aids daily but not all the time (Amedofu et al., 2004:119). The lower utilisation percentages for South African can be largely attributed to a combination of several factors including language issues, finance, transport and cosmetic concerns.

Figure 4.18 reveals the situations and frequency of hearing aid use by participants.

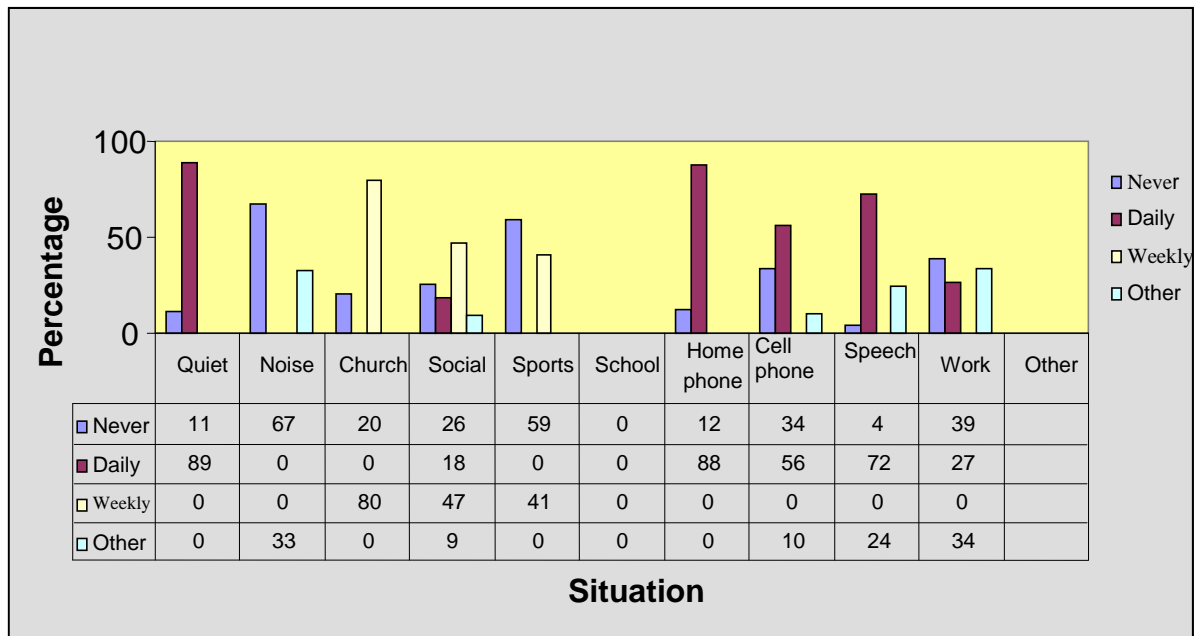


Figure 4.18: Situations of hearing aid use (n=57).

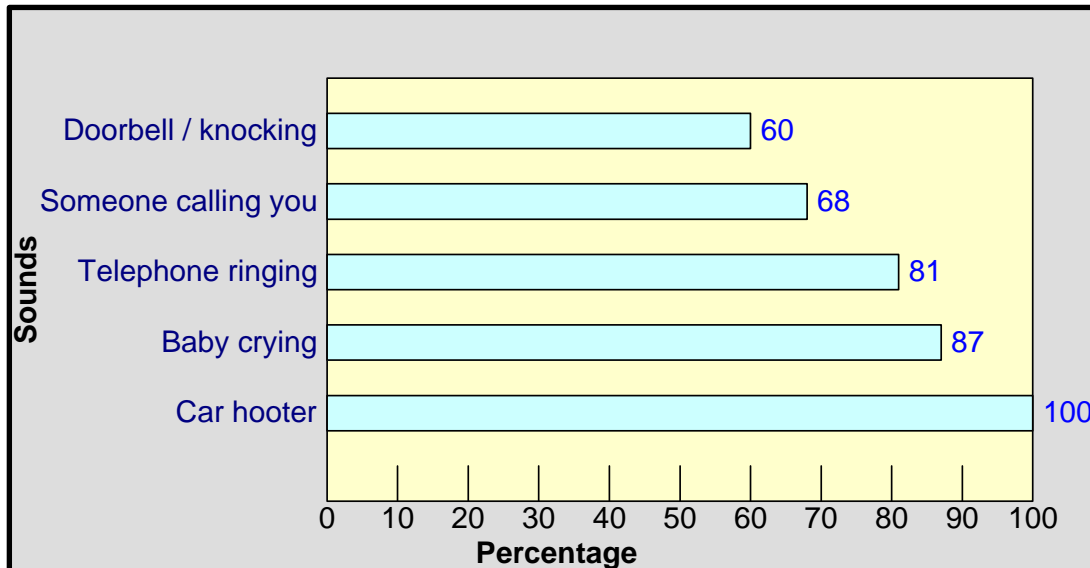
From the above figure it is apparent that participants feel more comfortable using their hearing aids in quiet situations and at home, as it was in these two situations that most participants used their hearing aids on a daily basis. This may be attributed to a number of reasons such as a lack of cosmetic concerns at home i.e. participants feel more comfortable wearing the hearing aid with family members and do not feel judged as being incompetent. Telephone usage indicated that a high percentage of participants (88%) made daily use of their hearing aids when talking on the home telephone, while only 56% made daily use of hearing aids when talking on cellular telephones. This could be attributed to the environment in which both types of telephones are utilised i.e. the home telephone in a quiet location and most individuals feel at ease speaking at home,

whereas a cellular phone may have to be answered at any location where there maybe noise present at the time and other persons around.

A great number of participants (80%) reported to wearing their hearing aids on a weekly basis for church and for other social activities on daily basis. It was observed however that 67% of participants never make use of their hearing aids in a noisy environment due to possibly poor speech discrimination or over amplification of noise. Furthermore, only 27% of participants utilised their hearing aids on a daily basis for work purposes. This indicates that the majority of individuals interviewed would prefer not to disclose their hearing status to colleagues and superiors. This response also corresponds to results in Table 4.1, which indicated that the greatest problem perceived by participants was embarrassment when wearing their hearing aids. This demonstrates a lack of awareness in society regarding issues of hearing loss and hearing aids, which indicates that tolerance and acceptance of adult hearing aid users cannot be fostered until the public becomes more informed. The acceptance of hearing loss and hearing devices by society will increase utilisation of hearing aids in public situations and enhance communication between individuals with hearing loss and those with normal hearing.

The above findings indicate that more counselling regarding acceptance of hearing loss and hearing aids is required. Furthermore, the use of hearing aids in certain situations is lacking and this indicates a need for coping strategies and auditory training for clients in different listening situations. This may be achieved by having support groups for clients in the community.

Figure 4.19 represents the participants hearing ability for every day sounds with their hearing aids on.



**Figure 4.19: Hearing ability for everyday sounds (n=57).**

All participants indicated that they could hear a car hooter while wearing their hearing aid. A high number of participants reported that they could hear the telephone ringing and a baby crying. However, just over half reported that they could hear knocking on a door and people calling them. These results indicate that most participants are aware of warning and alerting sounds in their daily environment. This is very important for safety and communication in the participants' life.

The following table indicates the three most important uses of the participants hearing aids.

**Table 4.7: Three most important uses of hearing aid (n=57).**

Most important use of hearing aid	Percentage
1. Watching Television	97%
2. Conversation	88%
3. Work	68%

A large number of participants (97%) reported that they utilise their hearing aid for watching television at home and for conversation purposes, this correlates to the

responses in Figure 4.11, where participants reported to utilising their hearing aid at home. Sixty eight percent of the participants indicated that they use the device for work. This also correlates to responses in Figure 4.11, where almost 61% reported utilising their hearing aids for work. These responses indicate that participants feel most comfortable utilising their hearing aids in quiet situations e.g. the home environment and therefore most utilise their hearing aids for listening situations in that environment. This also indicates that there needs to be more public awareness in the workplace regarding hearing aids, as this would increase participants’ confidence in disclosing their hearing status and hearing aids at work.

The following table is representative of the positive and negative effects the hearing aid has had on the participants’ lives. This important as is reveals the impact of an assistive listening device on an individual’s daily life and well being.

**Table 4.8: Positive and negative effects of the hearing aid on participants’ lives (Excerpts from responses to Question E.5) (n=57).**

	<b>Positive Effect (79%)</b>	<b>Negative Effect (21%)</b>
Effect of hearing aid on participants’ lives	“...it has made me hear my family again...”	“...this thing is too much, I don’t like to wear it...”
	“...when I can hear sounds then I feel good and I communicate with all people...”	“... people at work don’t want me to go down the mines, they think I can’t hear...”
	“...I hear all the things the pastor is saying in church and I can watch TV...”	“...everybody is always asking me what that thing is and I feel bad...”

“...many times I couldn’t hear but I now I can hear and I am happy...”	“...I can’t find work, even with this machine, they think I’m stupid, so I don’t wear it...”
“...the machine is good. It helps me at work and home...”	“...it’s very loud and noisy. It makes too much noise and the ears pain...”

Table 4.8 indicates that a 79% of participants have positive feelings towards their hearing aids while 21% have negative feelings towards the device. This indicates that most participants are pleased with their device and how it functions. From the negative comments however, it is apparent that embarrassment and work plays a major role on the perceived impact of the device. This also suggests the need for adequate counselling and increased public awareness.

Participants were also asked to comment on ways on which to improve the hearing aid service in the public health sector. Table 4.9 highlights the recommendations made by participants.

Recommendations	Yes	No
Need for interpreters	93%	7%
Need for extra training sessions	5%	95%

**Table 4.9: Recommendations from participants (n=57).**

A high number of participants (93%) agreed that an interpreter should be available during the training session as it would make the information easier to understand, however 7% reported that there was no need for an interpreter as they were unsure if an interpreter would be of any help. As expected, 95% of participants indicated that that only one training session is adequate for them, as they do not want to return to the hospital due to

logistical reasons. Only 5% of participants recommended the need for extra sessions and more information regarding their hearing aids. All participants reported that they would prefer to go to a clinic for hearing aid fittings and follow-ups, as it will be easier in terms of accessibility, expenses and time. This correlates to research conducted in another developing country where transport and finance were also key issues (Amedofu et al., 2004:119).

From the findings of sub aim 2, it is evident that multilingualism presents an obstacle in terms of utilising hearing aids correctly and to their full benefit. This suggests the necessity for more qualified and trained interpreters to be employed in the public sector, as well as the need for the employment of more Black African speech-language therapists and audiologists. It was also apparent that the attitude of the participants towards their hearing aid influenced usage of the device. Those who had a negative attitude towards their hearing aids, made little or no use of the instruments. It has been shown in previous research that counselling will help with expectations and attitude towards amplification. Therefore there is an urgent need for pre-fit and post-fit counselling for clients in the public sector.

#### **4.2.3 The condition of government fitted hearing aids after dispensation**

Results for this sub aim reflect the evaluation of the condition of participants' current hearing aid. It is important to note that not all participants had brought their hearing instruments with them when they arrived for the interview. Only 25 participants brought along their hearing aids / ear moulds / parts of hearing aids. This confirms the findings for the frequency of use of hearing aids, which showed that 39% of participants do not use their hearing aids all of the time. Table 4.10 represents the different types of hearing aids of the participants.

**Table 4.10: Different types of hearing aids in the study (n=25).**

Type of hearing aid	Number of hearing aids	Number and percentage of broken hearing aids
BTE	16	7 (44%)

ITE	8	3 (38%)
Body worn	1	1 (100%)

The above results indicate that the majority of participants (44%) were fitted with BTE hearing aids. This was to be expected because as mentioned in Chapter Two, most hearing aids on the government state tender are BTEs. Results also revealed that more BTE hearing aids were broken than ITE hearing aids, this can attributed to the fact that more BTEs were fitted than ITEs.

Table 4.11 represents the condition of the above hearing aids, as well as the ear moulds.

**Table 4.11: Condition of hearing aids and ear moulds after dispensation (n=25).**

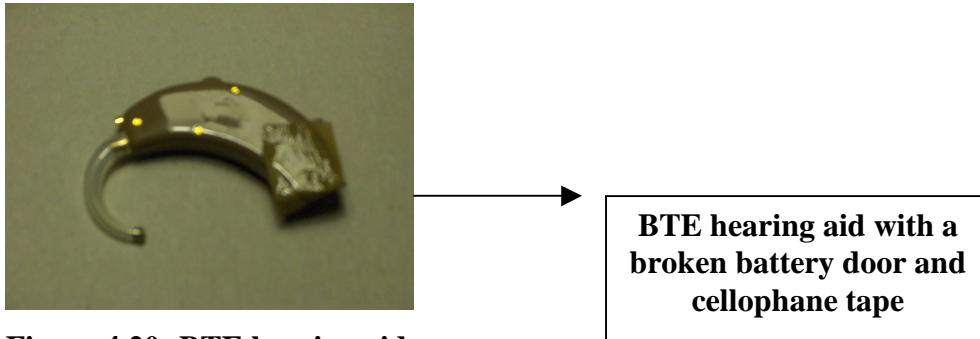
Condition	Percentage
Intact, functioning hearing aid	54%
Missing / lost ear mould	54%
Broken, cracked or missing battery door	21%
Intact but no longer functioning hearing aid	17%
Intact ear mould	8%
Missing hearing aid components	8%
Missing ear mould tube	4%
Broken hearing aid outer casing	4%
Missing / lost hearing aid	4%

From the above table is it apparent that just over half of the participants (54%) have intact, functioning hearing aids, however there is an equal amount of missing or lost ear moulds. This indicates that although the hearing aid is still in good working order, participants cannot utilise them without an ear mould. Furthermore, 21% of hearing aids had a broken, cracked or missing battery door. This indicates that battery life is comprised. Seventeen percent of hearing aids were intact but were no longer functioning, which suggested possible problems with the inner circuitry.



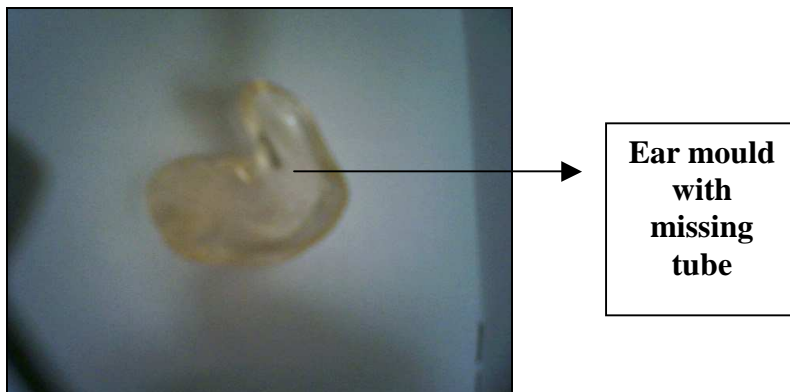
Photographs were taken with a digital camera of all hearing aids that were evaluated. All photographs taken are available as a printed document (See Appendix G.1) and on a Compact Disc (See Appendix G.2).

Figure 4.20 and 4.21 are examples of two hearing aid instrument photographs taken.



**Figure 4.20: BTE hearing aid.**

Figure 4.13 represents a BTE hearing aid of which the battery door has been broken and is stuck back together with cellophane tape. This indicates the need for hearing aid repairs. It also indicates that the battery life could possibly be affected if the battery is not making proper contact with the interior mechanisms and this will in turn influence the sound quality resulting in inadequate or intermittent amplification (Dillon, 2000:113).



**Figure 4.21: Ear mould.**

The figure is a photograph of an ear mould with a missing tube. The above ear mould belongs to a client who cannot utilise his BTE hearing aid until the tube on the ear mould is replaced.

It is apparent from the findings of this sub aim that most government fitted hearing aids and accessories are poorly cared for and maintained. The reasons for this are varied and were discussed in sections B, C and D. Poor maintenance and lack of servicing of hearing aids does not only pose a hygiene problem to clients' but also impacts on the quality of sound received by the listener which in turn influences daily activities and social communication.

#### **4.4 CONCLUSION**

The main aim of this research was to determine the maintenance and utilisation of government fitted hearing aids in order to develop hearing aid service delivery guidelines. There appears to be a general consensus about self-image and wearing of hearing aids, as most participants are embarrassed to wear their devices. This could be due to inadequate and lack of counselling and public awareness. Furthermore, the maintenance for ear moulds seems to be worse than that of the hearing aid. This could be attributed to lack of training on daily care and maintenance. It was therefore imperative to carefully examine the implications of findings for each sub aim and this will aid the development of service delivery guidelines to ensure optimal maintenance and utilisation of government fitted hearing aids.

#### **4.5 SUMMARY**

This chapter provided a presentation and summary of the results from the research study, which included the interview schedule and evaluation checklist. Results were organised in terms of the three sub aims and how they related to the main aim. Each sub aim was concluded with a discussion of the responses. These results will establish the foundation whereupon service delivery guidelines can be developed for the distribution of government hearing aids in Gauteng.

## **CHAPTER FIVE**

### **CONCLUSIONS**

Aim: To derive specific conclusions and implications from the findings and formulate recommendations for future research. The value of the research study will be discussed in terms of application of the hearing aid service delivery guidelines.

#### **5.1 INTRODUCTION**

In the last decade more emphasis has been placed on the importance of accountability. Health care professionals began to appreciate the complexity of quality assurance necessary for effective service provision, as this adds the value of beneficence, autonomy and justice for all clients. The South African population is one of diversity and constant change therefore research must fulfil the requirements of the population. This research aims to fulfil those goals by highlighting the needs of clients with government fitted hearing aids. The research has practical implications for audiologists in government hospitals as well as for hearing aid users in the South African context.

The development of service delivery guidelines even in a working format has benefits and provides useful information in addressing the needs of the South African population. This chapter contains the conclusions and limitations of the study. A critical evaluation of the findings is also provided as well as recommendations for future research possibilities.

## **5.2 CONCLUSIONS AND CLINICAL IMPLICATIONS**

### **5.2.1 General conclusions**

It is evident from the results of this study that in general government fitted hearing aids are inadequately cared for and under utilised. This was found to be attributed to a number of factors. One of the main factors to influence the utilisation and maintenance of government fitted hearing aids is finance. The cost of travelling to and from tertiary hospitals, as well as paying for repairs and batteries significantly contributed to under utilisation and poor maintenance. Furthermore, the issue of language also presented a complication in terms of participants not being able to fully understand all aspects covered during the hearing aid fitting and orientation. There is also an unmet need in terms of adequate counselling and aural rehabilitation. The above findings indicate a need for improvement in the service delivery of hearing aids in the public sector and the development of service delivery guidelines to address the above issues.

### **5.2.2 Development of service delivery guidelines**

“Clinical practice guidelines are tools for making decisions in health care more rational, for improving the quality of health care delivery, and for strengthening the position of the patient” (Council of Europe Committee, 2000:1).

Service delivery guidelines must be systematically developed statements which will assist in the decision making about appropriate health care for specific clinical conditions. One must firstly consider the role of service delivery guidelines i.e. to promote effective health care by reinforcing good clinical practice and to promote change in professional practice where this does not comply with current evidence of best practice. Secondly, one has to consider the role of all stakeholders involved the delivery of the specific area (Ferrer, Hambidge and Maly, 2005:691-699).

The concept of primary health care is to match client needs to health care resources available. Primary level care is the most financially and geographically accessible arm of

the health care system. In order to achieve a good health status for all, society must be able to distribute health care across its entire population with equity and efficiency. The problem occurs when idealised versions of primary health care becomes difficult to reliably execute into reality. Therefore, before conceptualising service delivery guidelines, one has to consider three questions (Ferrer et al., 2005:695):

1. How should people be linked primary care practices to promote the systems functions to primary care?
2. How should primary care be linked to other services within the health care system (i.e. tertiary levels) to optimise the functioning of the overall system?
3. How should primary care be linked to communities to best integrate community members?

The proposed guidelines for the service delivery of hearing aids in the public sector is based on literature for developing service delivery guidelines and models as well as the findings and responses from participants'. Figures 5.1, 5.2 and 5.3 provides a description of three options / guidelines to consider for the service delivery of hearing aids in the South African context. An evaluation of each option is also provided. All options were developed according to the principles of community care (Thorncroft and Szmukler, 2001:159-161), which are the following:

**Continuity/ Sustainability:**

This refers to the ability of relevant services to continue regardless of change of personnel.

**Accessibility:**

Service characteristic experienced by clients and their caregivers, enables them to receive services where and when they require it.

**Comprehensiveness:**

Services extend across the entire range of assessment, diagnosis, treatment and rehabilitation.

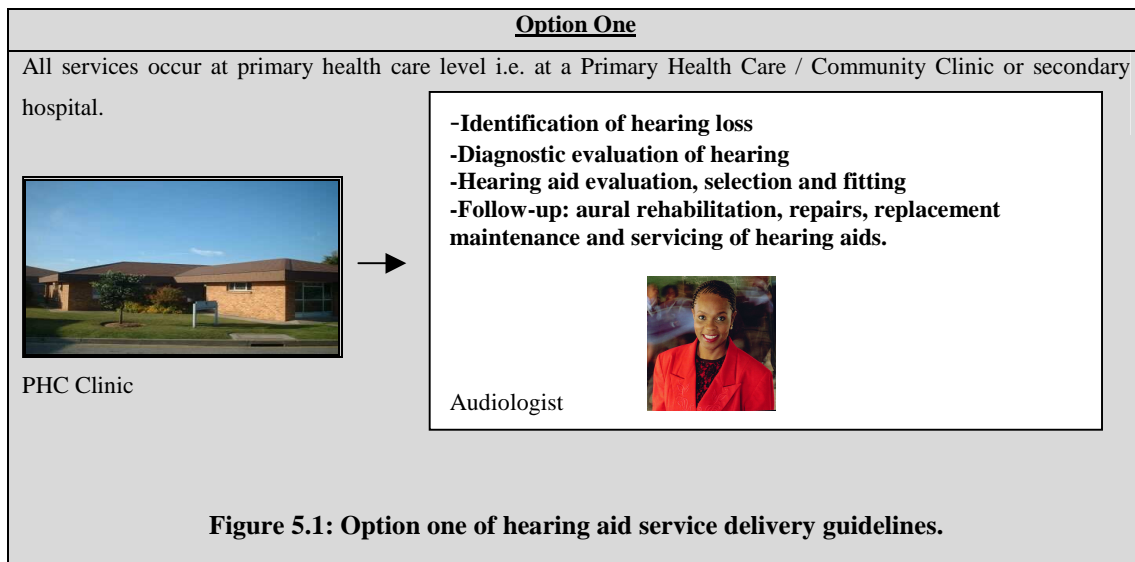
**Equity:**

This ensure a fair distribution of resources i.e. services available are similar on par with that of tertiary level care.

**Efficiency:**

Services rendered are carried out with efficiency and adequacy.

The following figures represent three possible options for hearing aid service delivery in South Africa. The visual representations of options will be followed with a discussion of each.



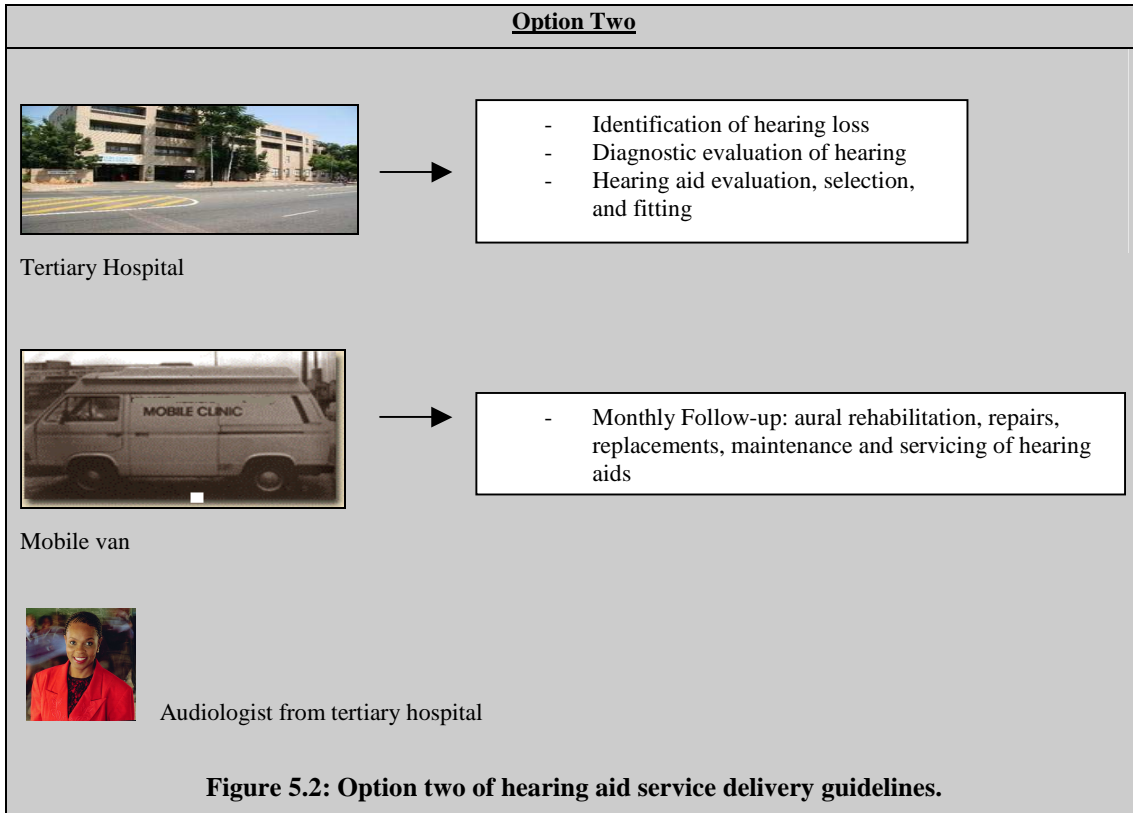
In Figure 5.1 all hearing services including hearing aids and follow-up is conducted at a primary health care level i.e. primary clinic or a district level (secondary) hospital. The advantages of this option is that services will be easily accessible to all clients since primary clinics and district hospitals are situated in rural areas close to where the majority of clients reside. This would also be a more financially viable option to clients as they would not have to pay for transport to tertiary hospitals and clients' would not have to miss a day's work due to the service being available close to where they live and most likely work. Furthermore, waiting times for repairs and servicing would be improved as well as the purchase of batteries.

However, in order for option to work effectively the following aspects must be available:

- Placement of speech-language pathologists and audiologists at primary clinics and district level hospitals. This will require the creation of positions and the willingness of professionals to work in such areas.
- Placement of trained interpreters at primary clinics and district hospitals. This will also require the creation of positions and the willingness of professionals to work in such areas.
- Infrastructure i.e. budget for hearing aids, salaries and equipment. This will require government health official's approval of a budget.

If Option One is to be implemented it will meet the principles of community care and will be a form of assertive outreach (Thornicroft et al., 2001:557). Assertive outreach is an active form of services taken to clients rather than expecting clients to attend services at tertiary level and services are offered in community settings at times suited to clients (Thornicroft et al., 2001:557).

There are also several challenges with regard to option one. For example it requires interpreters. However, there is a lack of trained interpreters as well as a lack of Black audiologists and speech-language pathologists. Therefore even though services will be more accessible and affordable, a language barrier may still exist and this could still impact negatively on the utilisation and maintenance of government hearing aids.



Option Two is represented in Figure 5.2. In this option some hearing services occur at tertiary level and some at primary level.

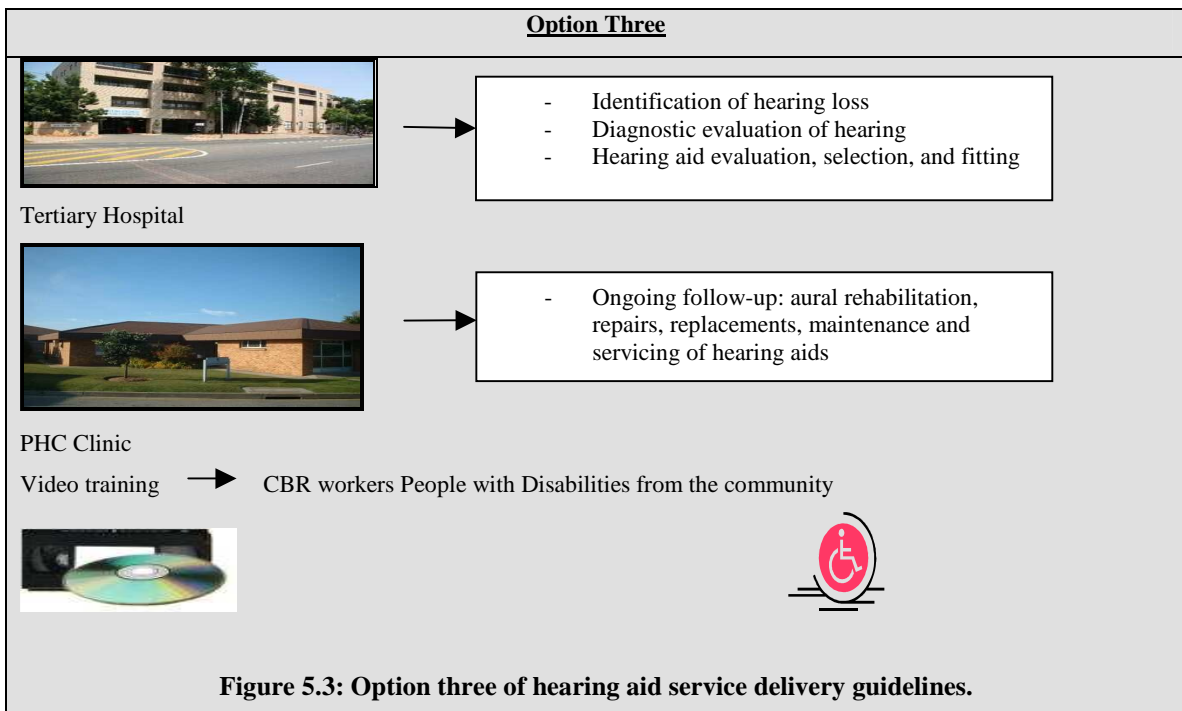
Currently, identification of hearing loss, diagnostic evaluation as well as selection and fitting of hearing aids can occur at tertiary level. This can remain as is. However follow-ups i.e. rehabilitation, repairs, servicing, replacements and distribution of batteries can be done monthly at a primary health care clinic. The audiologist or speech-language pathologist can visit various clinics monthly via a mobile van. Other professionals such as optometrists, occupational therapists, etc can also be included to facilitate coordinated service delivery by a team of health care professionals.



The advantages of this option are similar to option one in that services will be more accessible and economical for clients. However, since the audiologist would only go in monthly, waiting times for repairs, replacements and batteries would not be as immediate as Option one.

Rehabilitation can occur via group therapy or support groups during the monthly visits and checklists can be kept by the audiologist to monitor areas that require assistance and additional support.

As with option one, this option has numerous challenges as well. Clients will still have to visit tertiary institutions for diagnostic testing and the hearing aid fitting which brings about financial and travelling issues. Furthermore, a monthly clinic may not be sufficient for repairs and rehabilitation. In addition, there will still be the issue of multilingualism as the audiologist will require an interpreter during the monthly visits. Clients may also not prefer aural rehabilitation to be conducted via group therapy. All of the above challenges will have to be addressed if the utilisation and maintenance of hearing aids is to improve.



**Figure 5.3: Option three of hearing aid service delivery guidelines.**

Figure 5.3 represents Option Three which encompasses much of Option Two, in that some hearing services will be conducted at tertiary level. However the major difference is that instead of the audiologist or speech-language pathologist conducting the repairs and follow ups, this will now be done at community level by community based rehabilitation (CBR) workers and people from the community with disabilities. Furthermore, hearing aid training programs can be translated into all official languages and video tapes can be utilised as tools for rehabilitation at primary health care clinics.

However, in order for this option to be successful it will require the following:

- Collaboration with the community and its members
- Collaboration with hearing aid companies and audiologists, as training of the community members and rehabilitation workers will be required
- Collaboration with local government structures with regard to infra structure

The advantages of this option is that costs and waiting times for rehabilitation, repairs, and servicing of hearing aids would be reduced for clients, as services would be provided at community level. In addition, this option would promote job creation and skill development for members from the community and initiate an overall sustainable mechanism for hearing aid service delivery. Moreover, this option would alleviate the need for trained interpreters, as people from the community who can speak the predominant languages will now be providing services.

The challenges associated with option three include persuading members of the community to be involved, as well as collaboration with the hearing aid companies in order to provide the training needed. Hearing aid companies may view this as threat to their income if they are no longer solely responsible for the repairs and servicing of hearing aids. Furthermore, as with option two, clients will still have visit tertiary hospitals for diagnostic hearing evaluations and hearing aid fittings.

### **5.3 CRITICAL EVALUATION OF THE STUDY**

It is necessary to critically evaluate the research conducted in terms of strengths and weaknesses, as this will provide guidelines for future research projects of a similar nature.

Strengths of the research study:

- Findings are considered to be reliable, as the study was executed according to sound research principles and methodological guidelines as discussed in Chapter Three.
- A pilot study was conducted before commencement of the main study to determine validity and reliability of the data collection instruments.
- Results from this study can be utilised as a basis for similar research in the future, since literature and data in this area is limited especially with regard to the South African context.
- The service delivery guidelines developed can be utilised by government officials and can be added to and improved upon.
- This is a unique study done using a specific population that has been known to be under-serviced.

Limitations of the research study:

- The geographic area of the sample for this research was limited to Tshwane thus caution should be taken when generalising findings to other provinces in the country.
- The interview schedule comprised of mainly closed set questions, which although is quick and easy to complete, may not always include all the alternatives for participants to answer.

- Participants were asked to comment on recommendations and suggestions for improvement of hearing aid service delivery. Although participants had no experience and knowledge regarding those areas, they nevertheless provided constructive insight and information that was incorporated into the development of service delivery guidelines.

Significance of the research study:

- This study is the first to be conducted in the area of hearing aid service delivery in South Africa, thereby providing a foundation for future research and improvement of hearing aid service delivery in the public health care sector.

#### **5.4 RECOMMENDATIONS FOR FUTURE RESEARCH**

The current research focused on maintenance and utilisation of hearing aids fitted at government hospitals in Tshwane, in order to develop service delivery guidelines. However, there is still a need for additional research to supplement findings from this study. This information will provide necessary data needed for improving and establishing effective hearing aid services for the South African population.

The scope for research in this area is vast and it is recommended that future investigations should concentrate on the following areas:

- The development, use and effectiveness of Black African indigenous language video training with regard to hearing aid training programs.
- The development, use and effectiveness of pictorial hearing aid pamphlets and training manuals to aid illiterate and semi-literate adults who are fitted with hearing aids.
- The effectiveness of primary health care and community clinic hearing aid distribution and follow-up.

- Research regarding utilisation and maintenance of government hearing aids in other provinces of South Africa to establish similarities and variations in the findings.

## 5.5 CONCLUSION

The requirements of the South African adult population with hearing loss is immense and there is an urgent need to address issues that impact negatively on utilisation and maintenance of government fitted hearing aids. There is also a critical need for increased public awareness regarding acceptance and open-mindedness of individuals with hearing loss and hearing aids. Furthermore, the multilingual needs of the South African population must be catered for especially in the public health sector and this necessitates the training of more interpreters and the introduction of more Black audiologists and speech-language pathologists into the profession.

Speech-language pathologists, audiologists, interpreters, community based rehabilitation workers, community members, and government officials must collaborate in order to provide optimal hearing aid services for the South African population.

“Long-term care leaders have a tremendous opportunity to make a difference in their facilities by loosening boundaries and creating flexible environments. In doing so, they encourage and support teamwork. We know that any real change in health care depends on improving the ways in which we work together within and among organizations. Collective work and collaboration is the engine of transformation” (Dixon, 2002:32).

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# Hearing Aid Follow-Up Assessment Form

University of Pretoria etd - Sooful, P (2007) Appendix C.1

Respondent Number	Official Use Only			
	V1			1-3
District / Area	V2			4
Province	V3			5-7
Hospital	V4			8-10

## Section A: Biographical Information

A.1	What is your age?	V5			11-12
A.2	Gender	V6			13-14
A.3	What is your highest level of qualification?	V7			15-16
A.4	Are you currently:	V8			17-23
	a. Working (Full time)		1		
	b. Working (Part time)		2		
	c. At school		3		
	d. At university/technikon		4		
	e. Receiving a pension/grant		5		
	f. Unemployed		6		
	g. Other (specify)		7		

## Section B: Fitting of Hearing Aids

B.1	At what age did you receive your first hearing aid?	V9			24-25
B.2	How many hearing aids have you had in total?	V10			26
B.3	If more than 1, why?	V11			27-28
B.4	In which ear do you wear your hearing aid?	V12			29-31
	a. Right Ear		1		
	b. Left Ear		2		
	c. I alternate between ears		3		
B.5	Have you worn this hearing aid continuously?	V13			32-33
	Yes 1		No 2		
B.6	If no why not?	V14			34



## Section C: Repairs / Replacement of Hearing Aids (continued)

<b>C.4</b>	If No, why did you not take it back?			V36						62
<b>C.5</b>	Was your hearing aid replaced?			V37						63-64
	Yes 1		No 2							
<b>C.6</b>	If your hearing aid was replaced, what was the reason? (Tick more than 1)									
	a.	It was damaged beyond repair	1	V38						65-69
	b.	You lost the original hearing aid	2	V39						
	c.	Unable to access repair services	3	V40						
	d.	Other (specify)	4	V41						
	e.	Unsure	5	V42						
<b>C.7</b>	Where did you get the replacement hearing aid from?									
	a.	Government Hospital	1	V43						70-74
	b.	School	2							
	c.	Donation	3							
	d.	Private Practice	4							
	e.	Other (specify)	5							
<b>C.8</b>	If your hearing aid was repaired, where did the repairs take place?			V44						75-79
	a.	Hospital Audiology department	1							
	b.	Hearing aid manufacturer	2							
	c.	Self	3							
	d.	Other (specify)	4							
	e.	Unsure	5							
<b>C.9</b>	How long did these repairs take?			V45						80-81
<b>C.10</b>	Was any costs inferred to you?			V46						82-83
	Yes 1		No 2							
<b>C.11</b>	If yes, how much?			V47						84-85

## Section D: Care and Maintenance of Hearing Aids

<b>D.1</b>	How often do you replace the batteries in your hearing aid?									
	a.	Daily	1	V48						86-89
	b.	Weekly	2							
	c.	Monthly	3							
	d.	Other (Specify)	4							
<b>D.2</b>	Where do you obtain batteries from?			V49						90-92
	a.	Hospital	1							
	b.	Pharmacy	2							
	c.	Other	3							

**Section D: Care and Maintenance of Hearing Aids (continued)**

<b>D.3</b>	<b>How much do they cost?</b>			<b>V50</b>						93-94
	a.	Less than R50.00	1							
	b.	More than R50.00	2							
<b>D.4</b>	<b>How often do you clean your earmould?</b>			<b>V51</b>						95-98
	a.	Daily	1							
	b.	Weekly	2							
	c.	Monthly	3							
	d.	Other (specify)	4							
<b>D.5</b>	<b>How do you clean your ear mould?</b>			<b>V52</b>						99-100
<b>D.6</b>	<b>Was your earmould ever replaced?</b>			<b>V53</b>						101-102
	Yes 1		No 2							
<b>D.7</b>	<b>If Yes, where was this done and how much did it cost?</b>			<b>V54</b>						103
<b>D.8</b>	<b>Was your earmould tube ever replaced?</b>			<b>V55</b>						104-105
	Yes 1		No 2							
<b>D.9</b>	<b>If Yes, where was this done and how much did it cost?</b>			<b>V56</b>						106
<b>D.10</b>	<b>How often do you clean your hearing aid?</b>			<b>V57</b>						107-111
	a.	Daily	1							
	b.	Weekly	2							
	c.	Monthly	3							
	d.	Never	4							
	e.	Other (specify)	5							
<b>D.11</b>	<b>How do you clean your hearing aid?</b>			<b>V58</b>						112-113

**Section E: Hearing Aid Orientation**

<b>E.1</b>	<b>When you were fitted with your hearing aid, was an orientation programme given to you?</b>			<b>N.B Researcher/interviewer will explain to the participant, what is meant by an orientation programme.</b>						
	Yes 1		No 2	<b>V59</b>						114-115
<b>E.2</b>	<b>Was the orientation programme done in your first language?</b>			<b>V60</b>						116-117
	Yes 1		No 2							



## Section F: Use of Hearing Aids

University of Pretoria etd – Sooful, P (2007)

F.1	Please explain briefly how you would do the following: Correct = "yes" Incorrect = "no"			yes/no						
	a.	Clean an earmould	1	<b>V83</b>						165-166
	b.	Clean a hearing aid	2	<b>V84</b>						167-168
	c.	Insert a mould/ hearing aid	3	<b>V85</b>						169-170
	d.	Remove a mould/aid	4	<b>V86</b>						171-172
	e.	Insert and remove battery	5	<b>V87</b>						173-174
	f.	Troubleshoot problems	6	<b>V88</b>						175-176
	g.	Adjust volume control	7	<b>V89</b>						177-178
	h.	Manipulate the On/Off switch	8	<b>V90</b>						179-180
<b>F.2</b>	<b>Where do you keep your hearing aid when you are not using it? (Tick more than one)</b>									
	a.	In it's box/case	1	<b>V91</b>						181-184
	b.	On the table/ cupboard	2							
	c.	In your bag	3							
	d.	Other (specify)	4							
<b>F.3</b>	<b>How often do you use your hearing aid?</b>									
	a.	Daily	1	<b>V92</b>						185-189
	b.	Once or twice a week	2							
	c.	Only for special occasions	3							
	d.	Never	4							
	e.	Other (specify)	5							
<b>F.4</b>	<b>In what situations do you use your hearing aids? Tick N -Never, D -Daily, W -Weekly, O -Other</b>									
	a.	quiet situations	1	<b>V93</b>						190-192
	b.	television/music	2	<b>V94</b>						193-195
	c.	church	3	<b>V95</b>						196-198
	d.	social events	4	<b>V96</b>						199-201
	e.	sports events	5	<b>V97</b>						202-204
	f.	school	6	<b>V98</b>						205-207
	g.	home telephone	7	<b>V99</b>						208-210
	h.	cell phone	8	<b>V100</b>						211-213
	i.	talking to 1 person	9	<b>V101</b>						214-216
	j.	talking to many people	10	<b>V102</b>						217-219
	k.	Other	11	<b>V103</b>						220-222

## Section F: Use of Hearing Aids (continued)

University of Pretoria and Soofu, P (2007)

F.5	Please tick Yes/ No if you are satisfied with your hearing aid in these situations.						
		Yes/ No					
	a.	quiet situations	1	V104			223-224
	b.	television/music	2	V105			225-226
	c.	church	3	V106			227-228
	d.	social events	4	V107			229-230
	e.	sports events	5	V108			231-232
	f.	school	6	V109			233-234
	g.	home telephone	7	V110			235-236
	h.	cell phone	8	V111			237-238
	i.	talking to 1 person	9	V112			239-240
	j.	talking to many people	10	V113			241-242
	k.	Other	11	V114			243-244
F.6	With your hearing aid on, can you hear the following: (tick more than 1)						
	a.	Doorbell/ knocking on the door	1	V115			245-246
	b.	A baby crying	2	V116			247-248
	c.	The telephone ringing	3	V117			249-250
	d.	A car hooter	4	V118			251-252
	e.	Someone calling your name from another room	5	V119			253-254
F.7	What are the 3 most important things you use your hearing aid for?						
	a.		1	V120			255-256
	b.		2	V121			257-258
	c.		3	V122			259-260

## Section G: Participant's View on Hearing Aid Orientations

G.1	Comment on the effect that your hearing aid has had on your life since you got it.						
				V123			261-262
G.2	What are the most common problems you have with your hearing aid?						
				V124			263-264

## Section G: Participant's View on Hearing Aid Orientations (continued)

University of Pretoria etd - Scofield, P (2007)

<b>G.3</b>	<b>Do you think an interpreter should be available if the therapist does not speak your first language?</b>							
	Yes 1		No 2		<b>V125</b>			265-266
	<b>If No, explain why</b>			<b>V126</b>				267
	<b>If Yes, explain why</b>			<b>V127</b>				268
<b>G.4</b>	<b>Do you feel that one orientation session is enough?</b>							
	Yes 1		No 2		<b>V128</b>			269-271
	<b>If Yes, explain why</b>			<b>V129</b>				272
	<b>If No, explain why</b>			<b>V130</b>				273
<b>G.5</b>	<b>Would it be easier and more economical for you to go to the community clinics rather than hospitals, if your hearing aid needed repairs/servicing?</b>							
	Yes 1		No 2		<b>V131</b>			274-275
	<b>If Yes, explain further</b>			<b>V132</b>				276
<b>G.6</b>	<b>Where would you prefer to go to have your hearing aid repaired or serviced?</b>			<b>V133</b>				277-279
	a.	Clinics		1				
	b.	Hospitals		2				
	c.	Other		3				



# Appendix D: Evaluation Checklist

University of Exeter Ltd – Sooful, P (2007)

## Evaluation of the status of current hearing aid

Respondent Number:

**Evaluation of status of current hearing aid & earmould. State whether part is Intact, Missing, Broken or Clogged.**

**To be evaluated by the researcher**

a.	earmould	1	V1			1-2
b.	earmould tube	2	V2			3-4
c.	hearing aid cover	3	V3			5-6
d.	battery door	4	V4			7-8
e.	on/off switch	5	V5			9-10
f.	volume control	6	V6			11-12
g.	microphone	7	V7			13-14
h.	casing	8	V8			15-16
i.	tone hook	9	V9			17-18
j.	battery	10	V10			19-20