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UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

The Barriers Towards the Uptake & Retention of Hearing Aids in the 70+ Years Population.

Amy O'Regan

CARL Research Project
in collaboration with
the Cork Deaf Association

CARL
COMMUNITY - ACADEMIC
RESEARCH LINKS
University College Cork, Ireland

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Name and year of course:	MSc in Audiology 2019
Date completed:	31st May 2019

What is Community-Academic Research Links?
Community Academic Research Links (CARL) is a community engagement initiative provided by University College Cork to support the research needs of community and voluntary groups/ Civil Society Organisations (CSOs). These groups can be grass roots groups, single issue temporary groups, but also structured community organisations. Research for the CSO is carried out free of financial cost by student researchers.

CARL seeks to:

- provide civil society with knowledge and skills through research and education;
- provide their services on an affordable basis;
- promote and support public access to and influence on science and technology;
- create equitable and supportive partnerships with civil society organisations;
- enhance understanding among policymakers and education and research institutions of the research and education needs of civil society, and
- enhance the transferrable skills and knowledge of students, community representatives and researchers (www.livingknowledge.org).

What is a CSO?
We define CSOs as groups who are non-governmental, non-profit, not representing commercial interests, and/or pursuing a common purpose in the public interest. These groups include: trade unions, NGOs, professional associations, charities, grass-roots organisations, organisations that involve citizens in local and municipal life, churches and religious committees, and so on.

Why is this report on the UCC website?
The research agreement between the CSO, student and CARL/University states that the results of the study must be made public through the publication of the final research report on the CARL (UCC) website. CARL is committed to open access, and the free and public dissemination of research results.

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How can I find out more about the Community-Academic Research Links and the Living Knowledge Network?

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Abstract

Background: Age-related hearing loss known as 'presbycusis' is the third most prevalent chronic health condition affecting older adults. The most suitable treatment option available is amplification using hearing aids, however the uptake and retention of the device is considerably low. Research has been conducted previously on the factors preventing the uptake and retention of hearing aids but not within an Irish based context or for a particular age group.

Research Aim: The aim of this study was to identify the patient-centred barriers preventing the uptake and retention of hearing aids for members of the Cork Deaf Association (CDA) who were 70+ years of age. It was conducted in co-operation with Community Based Academic Research Link (CARL) initiative in University College Cork (UCC). CARL facilities scientific research collaboration with local community organisations. The community group chosen for this project was the Cork Deaf Association.

Methods: The study was a survey-based pilot study. A mixed-methods research design was used to collect the data. The data was gathered using a questionnaire that was disturbed to 26 members of the CDA. The quantitative research findings were represented using statistical analysis. The qualitative data was analysed using a latent thematic approach.

Results: 16 members of the CDA responded to the questionnaire. The results indicated that all of the participants who wore hearing aids reported that they improved their quality of life. However, a number of common issues emerged such as discomfort from hearing aid earmolds, difficulty using the telephone with hearing aids and general displeasure when positioning and removing the hearing aid.

Conclusion: The findings indicate the need for further counselling to ensure effective use of hearing aids, a stronger patient-centred relationship with the Audiologist and a wider availability of information to avoid common problems arising.

Acknowledgements

Firstly, I would like to thank my research supervisor, Dr Siobhan Laoide-Kemp. Siobhan was always available to answer any queries throughout the research process. The research supervisor offered constant support and guidance while continuously reassuring me of my capability and strengths throughout the dissertation process.

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I would like to express my sincere thanks to the Cork Deaf Association for facilitating this research project. Working with the Cork Deaf Association was a very rewarding experience and one I will always remember. I would like to thank each of the valuable members who took the time and effort to participate in this study.

Finally, a very special thank you to my family and close friends. I greatly appreciate all their patience and constant support during the journey of completing my two-year Masters in Audiology.

Declaration

The Dissertation submitted is the candidate's own work and it has not been submitted for another degree, either at University College Cork or elsewhere.

Signed: Amy O Regan

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Abbreviations

CARL - Community Academic Research Link

CDA - Cork Deaf Association

HSE - Health Service Executive

LOC - Locus of Control

CREC - Clinical Research Ethics Committee

QoL - Quality of Life

Chapter 1 – Introduction

Outline

The research study investigated the barriers to the uptake and retention of hearing aids within the 70+ age group within an organisation (CDA) in the Cork area. This chapter will outline the background to the research topic and the Community Academic Research Links (CARL) initiative (See Appendix I). It will also explore the research rationale and what the study aimed to achieve.

Background to the Topic

Presbycusis is a form of age-related hearing loss occurring within the inner ear and the hearing nerve pathway to the brain. Damage to hair cells results in an irreversible hearing loss. There is no cure for the condition, however hearing aids are the most effective treatment option available. In spite of the fact that hearing aids can be adjusted to specific hearing losses and individual needs, the rate of uptake and retention of hearing aids remains low
(McCormack & Fortnum, 2013).

Rationale for the research

This research project was conducted as part of a community-based research project established in University College Cork known as CARL, where research is conducted on behalf of and in partnership with community groups and charity organisations. The chosen group to partner this research project was the Cork Deaf Association (CDA) (See Appendix II). The CDA is a charity service that is part funded by the Health Service Executive (HSE). Its aim is to encourage and empower deaf and hard of hearing individuals in the County Cork region. This project was specifically chosen as the area of hearing aid uptake and retention requires investigation in Ireland and the findings could be of benefit to CDA members and the greater society.

Aim of the Research

The aims of the study carried out were two-fold:

1. To investigate the factors preventing the uptake of hearing aids.
2. To investigate the factors preventing the retention of hearing aids.

In order to investigate these areas in conjunction with the project scope, two research questions evolved:

1. What are the barriers towards the uptake of hearing aids in the 70+ age group who are members of the CDA?
2. What are the factors that prevent hearing aid retention in the 70+ age group who are members of the CDA?

Chapter 2 - Literature Review

Outline

This chapter will provide a review of the most relevant literature relating to the research topic. Specifically, it will define age related hearing loss, its impact on quality of life and the global prevalence of age-related hearing loss. This chapter reports on the findings of previous literature in the area regarding the factors that can prevent uptake and hearing aid use. It concludes by synthesising the research to date while outlining the research gap.

Age Related Hearing Loss

Age-related hearing loss is an irreversible form of hearing loss that is caused due to the degeneration of sensory hair cells in the inner ear (WHO, 2013). In older adults, it is the most common form of hearing loss and the most widespread sensory impairment (Gratton & Vázquez, 2003). The National Council on Ageing (1999) conducted a large-scale study that outlined the principal function of a prescribed hearing aid. It found that its primary purpose was to assist individuals with hearing loss and to provide them with auditory cues for monitoring their environment. Hearing loss is often left untreated and unrecognised with adults delaying, on average, 10-15 years before acting on a hearing related difficulty (Davis et al, 2007). This is largely due to said adults not accepting that a hearing loss is present or not booking a consultation with a health professional as difficulty arises.

Impact of Hearing Loss

Many studies have established the adverse psychosocial effects and decreased quality of life associated with a hearing impairment, especially amongst the older adult population (Chia et al, 2007; Heine & Browning, 2004). Communication is consequently limited for both the hearing-impaired individual and their communication partner, often resulting in frustration and isolation (Arlinger, 2003). Difficulties are experienced in a wide variety of situations such as in work, home, and social environments, which in turn can cause social isolation, psychological strain, and functional decline (Chia et al, 2007, Saito et al, 2010 & Gopinath et al,

2012). Despite these consequences, the number of individuals using hearing aids as a means of a treatment remains considerably low (McCormack & Fortnum, 2013).

The Rise in Demand for Audiological Assistance

Approximately 65-72% of adults in the Western population aged 70 years or older has a hearing impairment. The cause of the majority (90%) of age-related sensorineural hearing loss is presbycusis (Chia et al, 2007). Previous national estimates on hearing aid use propose that 59% of individuals aged 70 years and older who have a moderate to severe hearing loss do not regularly use their hearing aid (Lin et al, 2011). The increase of hearing loss in conjunction with the increase in life expectancy is also of particular concern in an ageing population. The number of elderly individuals suffering from a hearing loss is estimated to rise further due to the increasing average life span (Roth et al, 2011). McCormack & Fortnum (2013) report that this trend is indicating that there will be increased demand for hearing healthcare professionals with more audiological rehabilitation needed in the near future.

The Evolution of Hearing Aid Technology

The 1980's was the pre-digital (analogue) hearing aid era. Since the late 20th Century, major advancements have been made due to the introduction of digital hearing aids. As discussed by Davis (2001), a number of additional features have been modified. Firstly, the appearance of the device has been made more cosmetically pleasing by reducing its overall size and discreteness. Secondly, sound quality for the users has been improved with the introduction of directional microphones, which reduces digital feedback and increases speech enhancement. As a whole, digital hearing aids have become a more attractive means of treatment for the hearing impaired due to the advancements in features available such as multiple listening programs and volume options, which gives the user greater control (Davis, 2001). Digital hearing aids were introduced to enhance hearing-loss treatment and have both practical and clinical advantages. Despite these advancements, the uptake and retention of hearing aids remains low.

Factors Preventing Hearing Aid Treatment

A hearing aid is the primary treatment option available for individuals presenting with a hearing impairment. Research on the older adult population in Australia has found just 61% of people seek a hearing aid consultation from a hearing professional as a means of treatment (Schneider et al, 2010). Moreover, only 33% of this population successfully decide to wear a hearing-aid and a mere 25% successfully retain them (Hartley et al, 2010).

Research has been reported in the field of audiology to better understand the potential factors that prevent hearing aid uptake and use. A variety of potential causes have been identified in the literature. Firstly, the degree of hearing loss is one predictor that has been examined. In general, as the severity of one's hearing loss increased, the more likely the person was to adhere to hearing aid treatment (Chang et al, 2009). However, patients' age was found to be an inconsistent variable in recent studies as certain research suggested there to be an increase in hearing aid uptake with increasing patient age (Helvik et al, 2008; Hidalgo et al 2009). Yet, Uchida et al (2008) found that the rate of hearing aid uptake decreased with age. This study consisted of 1192 men and 1163 women aged between 40-84 years old with findings suggesting increasing age to have a negative effect on hearing aid possession for both genders, while Humes et al (2003) found adults representing with self-reported auditory difficulty to be more likely candidates for successful uptake and retention. Despite these findings, a lack of hearing loss acknowledgment and acceptance of severity is a common preventing factor for an adult in not acquiring a hearing aid (Jenstad & Moon, 2011).

McCormack & Fortnum (2013) reported that audiological reasons relating to the comfort and fit of the hearing aid were the most commonly reported factors preventing their regular use. Hearing aid users found the device ineffective in noisy environments and of poor benefit in sound quality. Specific reference was made to the difficulty users experienced with inserting and removing the ear-mould. As Erber (2003) noted, most individuals with a hearing aid are older adults and consequently may have issues manipulating the device due to restrictions in manual dexterity. If a

hearing aid owner is incapable of inserting, removing, and handling their hearing aid, they are less likely to routinely wear one.

Similar research by Ferguson et al (2012) recommended that clinicians assess the patient's ability to use a hearing aid during the fitting process and that it is important for the healthcare professional to give adequate counselling, information, and support. It has been identified as key to a new hearing aid user's experience to be fully knowledgeable on how to manipulate the device before exiting the clinic setting (Desjardins & Doherty, 2009). Likewise, counselling regarding unrealistic high expectations of hearing aids needs to be discussed in detail with the new user (Kochkin, 2000). Research suggests that patients often have dissatisfaction with hearing aids due to overly high expectations, which were not addressed prior to fitting and consequently results in the discontinuation of the device (Cox & Alexander, 2000).

Personality and psychological factors are other reported influences on hearing aid uptake outcomes. Meyer et al (2014) found older adults, which have perceived self-efficacy, will present with a different initial attitude towards adapting to hearing aids. Perceived self-efficacy is the personal belief of one's own proficiency to complete a task (Bandura, 1993). When an individual presents with confidence in their capability to manage the basic functioning of a hearing aid, they are more likely to consult a hearing professional and achieve successful long-term outcomes. Similar research in the area by Cox et al (2005) suggested that subjects who are motivated to acquire and use a hearing aid have a certain characterisation of high internal locus of control (LOC). An individual who has an internal LOC believes that they can influence events and their results. Thus, it allows them to acknowledge their hearing impairment and continuously use their hearing aid to allow for effective communication. In contrast, Helvik et al (2008) proposes that individuals who adapt fewer maladaptive coping behaviours will result in avoidance of conversation or social interaction due to their hearing impairment. It consequently leads to a rejection of hearing aids due to both a denial of one's hearing loss and the use of poor communication.

As mentioned previously, audiological technology has advanced and so, too, has the appearance and physical size of hearing aids. These factors were once thought to be militate against their uptake and use as they were more noticeable and consequently persons felt stigmatised. Jenstad & Moon (2011) reported that the influence of stigmatisation is inconsistent across studies, while Franks & Beckhmann (1985) suggest stigma as the highest concern or deterrent. Other studies suggested it was less of an influence (Meister et al, 2008). McCormack and Fortnum (2013) explain that the age of these studies will have had some impact on the findings as the design of hearing aids has changed in the intervening years, suggesting that as audiological technology advances, the influence of stigma is reduced.

Cost is another potential barrier to hearing aid uptake. In Ireland, a medical card holder is entitled to a hearing aid free of charge from the HSE. There is also a slight reduction in the cost for individuals who have obtained a certain number of PRSI contributions. (HSE, 2018) Alternatively, a hearing aid must be purchased privately for often a large sum of money and the cost has previously been reported to be a barrier to uptake (Jenstad & Moon, 2011). The predictor of cost needs to be considered cautiously as Knockins (2007) survey found that 64% of the participants reported that they couldn't afford hearing aids, yet, 45% indicated that they were not worth the expense.

Conclusion

Previous studies in the area have concentrated on barriers towards hearing aid uptake, patients' satisfaction with hearing aids, and general hearing aid use studies, however these have not been investigated within an Irish context or for a specific age group. Therefore, there is a gap in the research for a study to be conducted to investigate the barriers to uptake and retention within the Irish context and for a specific age group.

Chapter 3 – Methodology

Outline

This chapter will discuss the methodological process undertaken to investigate the research question. It will discuss why the mixed methods research design was chosen and how the data was collected, analysed and stored.

Ethical Considerations

Prior to commencing the study, an ethical application was submitted to the Social Research Ethics Committee (SREC) in University College Cork. The study was approved (See Appendix III).

Research Design

A mixed methods research design was used based on the Creswell et al (2011) mixed methods approach (See Appendix IV). A mixed methods research approach involves collecting, integrating and analysing both quantitative and qualitative research. Similar to the Clark & Ivankova (2015) study, the rationale for choosing a mixed method approach was to use quantitative research methods to gather statistical data while also taking advantage of qualitative research methods to gain richer data. The coupling of these two approaches was used to gain a deeper and more insightful understanding of the patients' experiences.

The Sample

The participants of the study were recruited from the CDA. The questionnaire was distributed to a total of 26 of the CDA members. The participants of this study were found through purposeful sampling. The CDA members could provide in-depth detailed information about the phenomenon under investigation as all the participants were considered to be of ownership of hearing aids (Palinkas et al, 2015). The CDA distributed the questionnaire to the participants that met the inclusion criteria of this study (See Table 1). The participants were recruited by an information sheet (See

Appendix V) and consent form (See Appendix VI) which was received to the individuals by post.

Table 1 reports the inclusion and exclusion criteria of the study.

Table 1: Inclusion and Exclusion Criteria of the Sample	
Inclusion Criteria	**Exclusion Criteria**
Adults over the age of 70 years old from the Cork Deaf Association which have been diagnosed as having a hearing loss and own a hearing aid.	Adults under the age of 70 years old, not from the Cork Deaf Association, without a hearing loss and who do not own a hearing aid.
Adults over the age of 70 years old from the Cork Deaf Association with normal intellectual capacity.	Adults with an intellectual impairment or who are considered vulnerable.
	Adults with diminished social skills.
	Adults who are dependent on others for personal and intimate care.
	Adults who do not have the capacity to report.
	Adults with a communication disorder.

Data Collection

As a survey-based pilot study, the data was collected by means of a questionnaire. The questionnaire was based on work conducted in a previous study by Uriate et al (2005) (See Appendix VII). The questionnaire used in this study was adapted to suit the Irish context with the addition of questions 1-3, 5-9, 14-17 (See Appendix VIII). The questionnaire was chosen as it was suitable to collect the type of data that was relevant to answer the research question, while also being suitable for simple completion by the participants.

Data Collection Procedure

The CDA sent the questionnaire by post to its members who were selected based on the inclusion criteria. They received an information sheet outlining the purpose of the study (See Appendix V) and a consent form (See Appendix VI). The questionnaires were then returned in a stamped addressed envelope to the Chief Investigator (Dr. Siobhán Laoide-Kemp). All of the information was collected and stored anonymously as per University College Cork's data protection policy (University College Cork, 2018).

The participants were given three weeks to complete the questionnaire and a reminder telephone call was made by the CDA following a two-week period to encourage participation in the questionnaire. A further extension was made to the return date which allowed the participants to complete the questionnaires within a four-week period.

Data Analysis: Quantitative

The questionnaire was made up of 17 questions. Questions 1-16 represented the quantitative data collected. The raw quantitative data was inserted into an Excel spreadsheet and displayed using histograms and charts. Statistical analysis was used to report the quantitative findings (See Appendix IX).

Data Analysis: Qualitative

Although questions 13-16 asked quantitative questions, they also collected qualitative data as they allowed participants to give further insight into the topics. Question 17 was a solely qualitative question, which allowed participants to include any further thoughts about their hearing aid use or non-use. The qualitative data was analysed using thematic analysis (Braun & Clark, 2006).

Thematic Analysis

Thematic analysis involves examining, analysing and recording patterns (themes) within the data collected (Braun & Clark, 2006). The six-step thematic analysis method by Braun & Clark (2006) was adopted for questions 13-17 for interpreting the data and developing themes. Firstly, familiarisation with the data was made through multiple reads of the responses in order to note down initial ideas. Next separate folders were created to gather instances of similar topics or ideas that formed initial themes. A review of the themes was conducted with the research supervisor (Dr. Siobhán Laoide-Kemp) by checking if the themes worked in relation to the coded extracts as well as the entire data set. This generated a thematic map of analysis and gave a clearer definition of the themes, allowing appropriate names of the themes to be formed. (See Appendix X). This research process was based on a deductive approach, which involves coding the data for a specific research question.

Chapter 4 – Results

Outline

The quantitative research findings of questions 1-16 are displayed within this chapter by the use of histograms or charts. In order to interpret the qualitative data gathered from questions 13-17, four key themes were formed and interpreted.

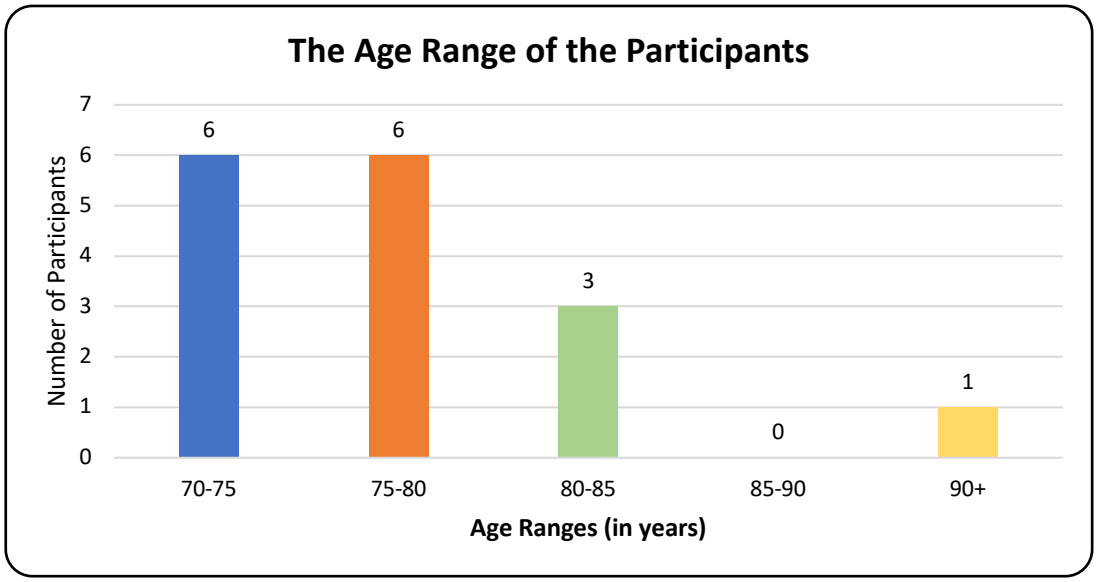
Quantitative Analysis (Questions 1-16)

The Sample

The CDA distributed 26 questionnaires to their members who met the study's inclusion criteria. The response rate was 60% (n=16). The sex of the respondents was unknown. Throughout the analysis, 'N/A' represents the participant who responded that they do not own a hearing aid.

The majority of the sample was within a 70-80 years age bracket (n=12). Figure 1 below reports the age ranges of the participants.

Figure 1: The Age Range of the Participants in the Sample



Question 2 investigated the number of participants that wear hearing aids (See Table 2).

Table 2: The Number of Participants Who Wear Hearing Aids		
Answer	Yes	No
Number of Participants	14	2

Question 3 investigated how often the participants wear their hearing aids (See Table 3).

Table 3: How Often Participants Wear Hearing Aids					
Answer	Every Day	Most Days	Occasionally	Never	N/A
Number of Participants	10	3	1	1	1

Question 4 investigated how many hearing aids the participants use (See Table 4).

Table 4: How Many Hearing Aids Participants Use			
Answer	One	Two	N/A
Number of Participants	4	11	1

Question 5 investigated how the participants received/bought their hearing aids (See Table 5).

Table 5: How Participants Received/Bought Their Hearing Aid					
Answer	Private	Public	Private and Public	Unsure	N/A
Number of Participants	5	8	1	1	1

Question 6 investigated the participants' degree of hearing loss (See Table 6).

Table 6: The Participants' Degree Of Hearing Loss					
Answer	Mild	Moderate	Severe	Profound	Unknown
Number of Participants	1	5	9	1	0

Question 7 investigated the cause of the participant's hearing loss (See Table 7).

Table 7: The Cause of the Participants' Hearing Loss							
Answer	Age-Related	Noise Exposure	From Birth (congenital)	Injury	Unknown	Other	Age Related and Noise Exposure
Number of Participants	6	1	2	1	3	2	1

Question 10 investigated the participant's level of hearing without a hearing aid (See Table 8).

Table 8: The Participant's Level of Hearing Without A Hearing Aid					
Answer	Good	Adequate	Inadequate	Bad	N/A
Number of Participants	0	2	5	8	1

Question 9 investigated how long the participants have experienced hearing loss (See Table 9).

Table 9: How Long The Participants Have Experienced Hearing Loss							
Answer	< 1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5-10Years	10+ Years
Number of Participants	0	0	0	0	0	2	14

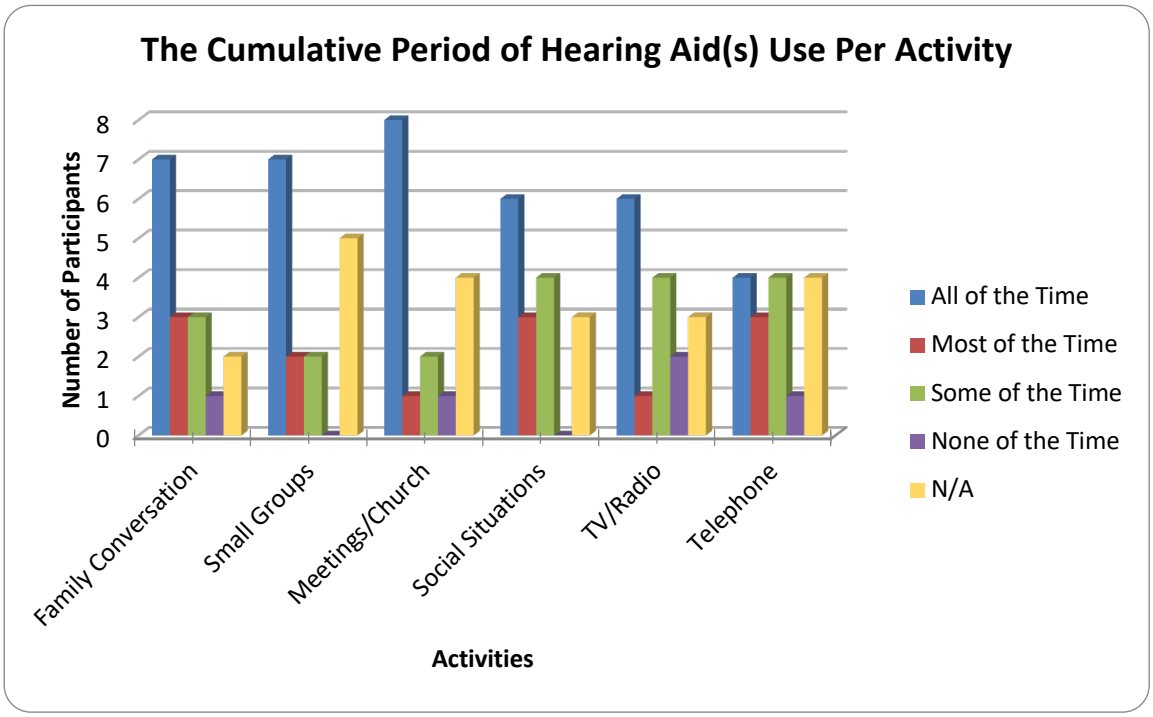
Question 10 investigated how often the participants wear their hearing aids per day (See Table 10).

Table 10: How Often The Participants Wear Their Hearing Aids Per Day							
Answer	More than 8 hours a day	Between 5 and 8 hours a day	Between 1 and 4 hours a day	Less than 1 hour a day	Less than 1 hour a week	Never	N/A
Number of Participants	9	2	2	0	1	1	1

Question 11 investigated the cumulative period of hearing aid benefit during a range of activities. Possible responses ranged from: 'All of the Time' to 'None of the Time', to describe the frequency of hearing aid benefit during common activities (See Figure 2).

- Only 25% of participants found hearing aids to be of benefit 'All of the Time' during telephone use.
- The 'N/A' column refers to the participants who did not answer the respective section of the question (See Figure 2).

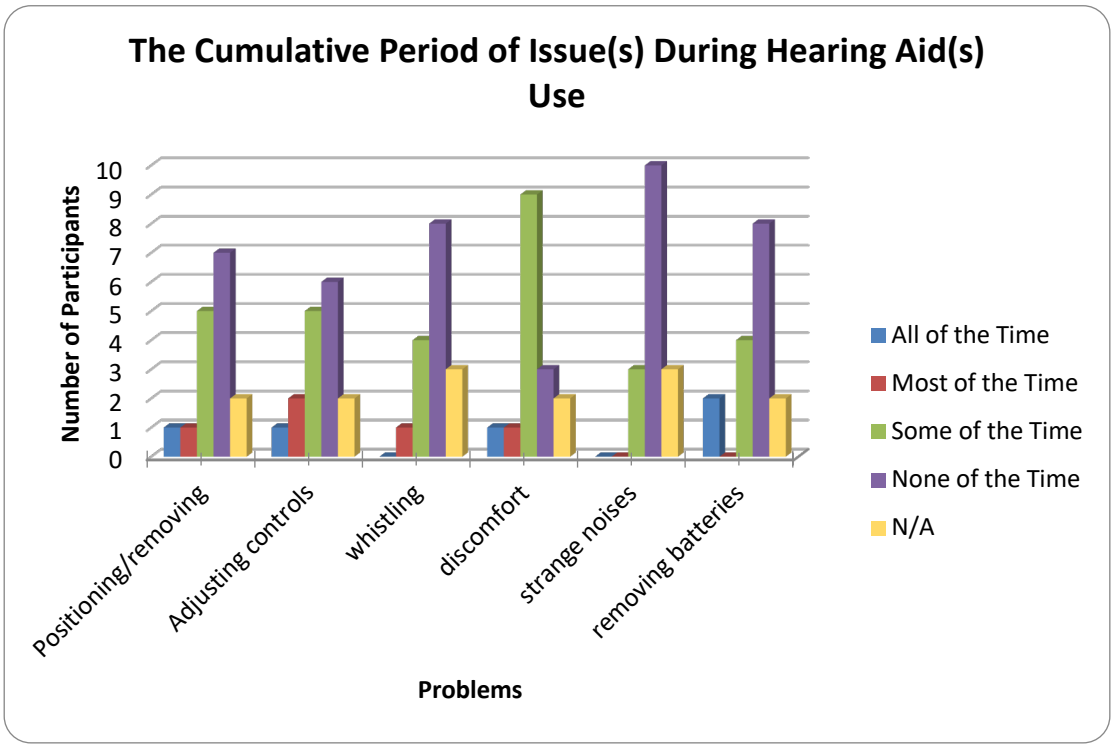
Figure 2: The Cumulative Period of Hearing Aid(s) Use Per Activities



Question 12 investigated the cumulative period of common issues during hearing aid use. Possible responses ranged from 'All of the Time' to 'None of the Time' to describe the cumulative period of common issues experienced during hearing aid use (See Figure 3).

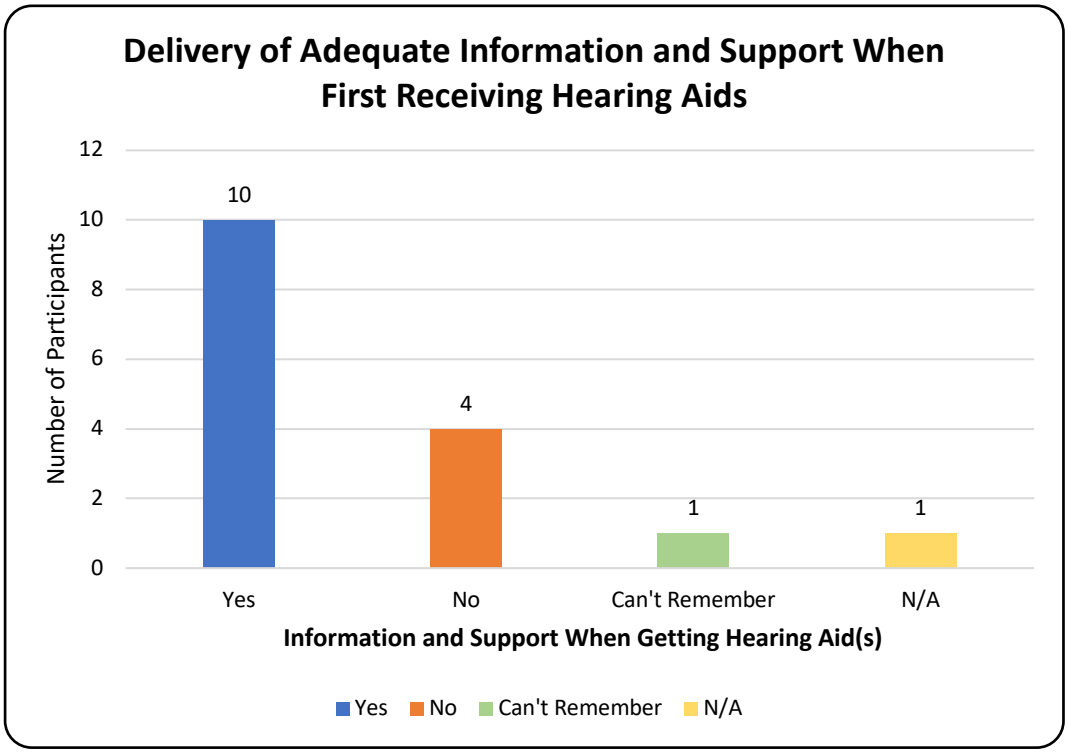
- *'Removing batteries'* had the highest 'All of the Time' response with 12.5% (n=2) of the participants experiencing it.
- '*Discomfort'* was found to be experienced by 68.5% (n=11) of participants responding to have incurred this issue either 'Some of the Time', 'Most of the Time', or 'All of the Time'.
- *'Positioning/Removing'* was less of a problem as only 43% (n=7) of participants reported to have incurred this issue either 'Some of the Time', 'Most of the Time', or 'All of the Time'.
- The 'N/A' column refers to the individuals that did not answer the question (See Figure 3).

Figure 3: The Cumulative Period of Issue(s) During Hearing Aid(s) Use



Question 13 investigated the adequacy of information and support provided when participants first received their hearing aid(s). The participants were given the option to answer in a YES / NO format only, however, one participant responded that they 'can't remember' alongside this option. The 'N/A' column refers to the individual that has a hearing loss but is not in possession of a hearing aid (See Figure 4).

Figure 4: Responses to the question "When you were fitted with your hearing aid(s), did you feel you were given enough information and support?"



Question 14 investigated if the participants are worried about other peoples' opinions whilst wearing a hearing aid (See Table 11).

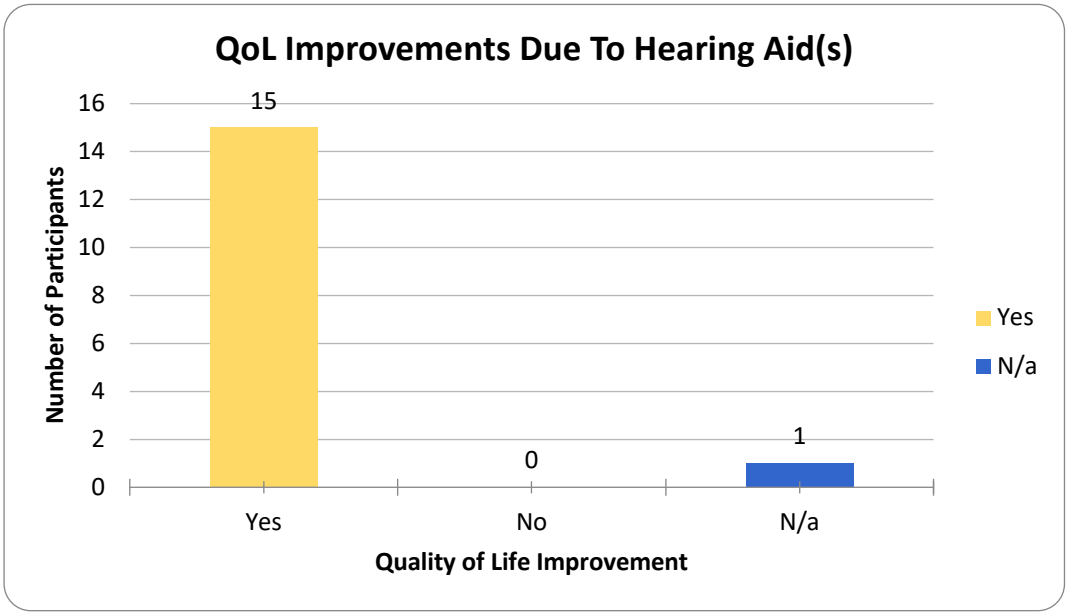
Table 11: The Number Of Participants Who Worry About Other Peoples' Opinions Whilst Wearing Hearing Aids

Answer	Yes	No
Number of Participants	14	2

Question 15 investigated whether participant's felt their QoL had improved since using their hearing aid(s). The participants were asked to answer in a YES / NO format (See Figure 5).

- Of the people who have a hearing aid, 100% stated that their hearing aid had improved their QoL.
- One participant had a hearing loss but is not in possession of a hearing aid. This person is represented as 'N/A' in this graph.

Figure 5 : QoL Improvement Due To Hearing Aid(s)



Question 16 investigated the likelihood of participants continuing to use hearing aids (See Table 12).

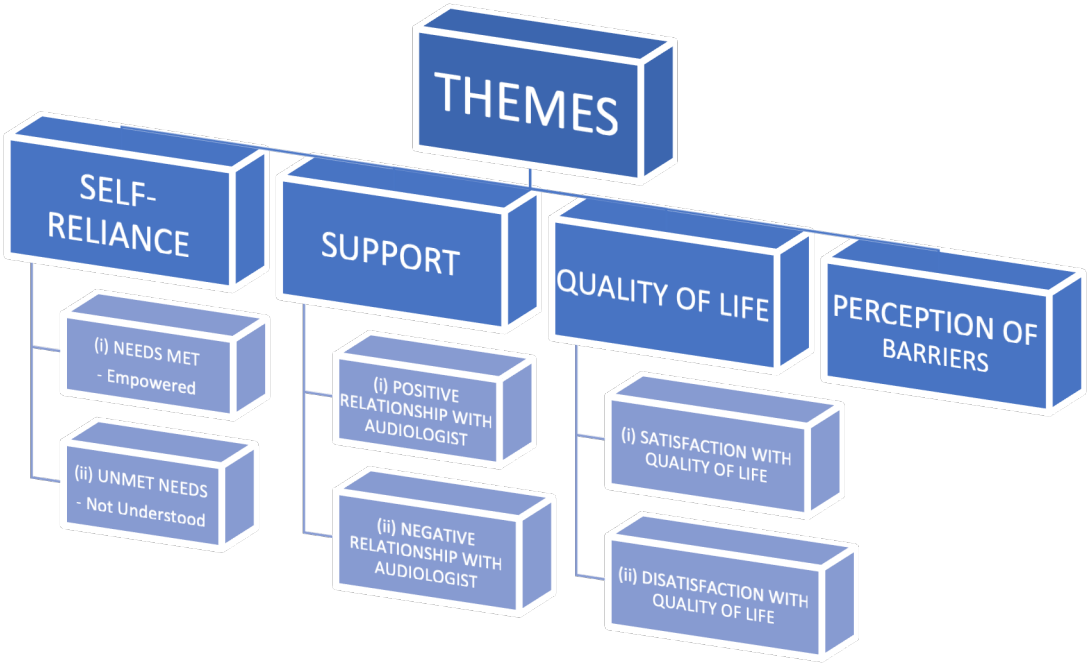
Table 12: The Likelihood Of Participants Continuing To Use Hearing Aids

Answer	Very Likely	Likely	Not Sure	Unlikely	Very Unlikely	N /A
Number of Participants	13	2	0	0	0	1

Themes

Four primary themes were identified from the qualitative data in the questionnaires: *self-reliance, support, quality of life, and perceptions of barriers*. The themes and sub-themes of each individual code are available below (See Figure 6).

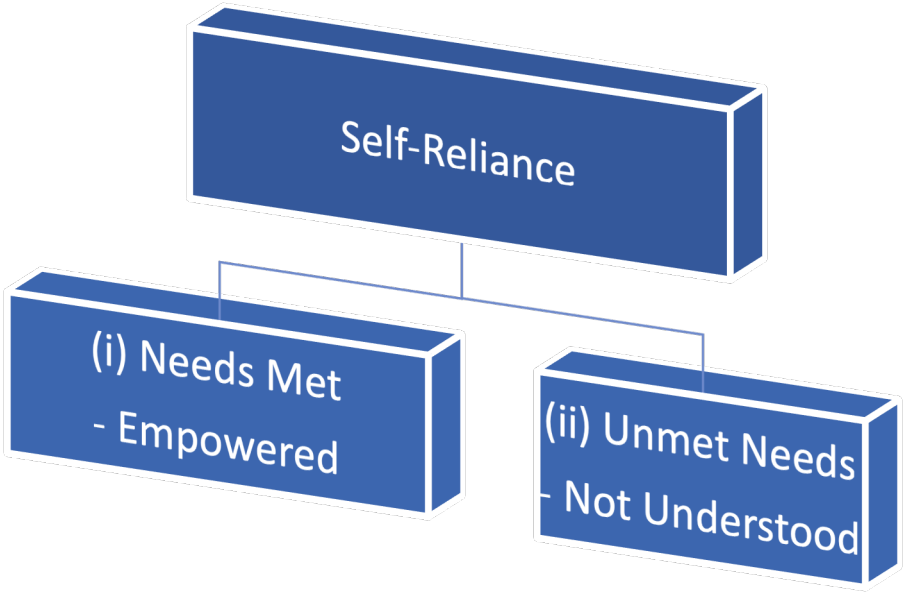
Figure 6: The Qualitative Data Themes and Subthemes



Theme 1: Self-Reliance

The first theme identified was *self-reliance*. Self- reliance was further categorised into two subthemes, which were *'needs met'* and '*unmet needs*' (See Figure 7).

Figure 7: The Theme of Self- Reliance



Subtheme (i) Needs Met

The subtheme *'needs met'* encapsulates the empowerment felt by participants and the effect it had on their capability to manage a hearing aid and use it proficiently. There was an emerging pattern that the empowered participants displayed high motivation towards hearing aid(s) management and that they were quick learners.

"I adjusted really quickly to wearing the hearing aid."

"Learnt a lot myself."

The participants who displayed self-reliance and empowerment characteristics were more driven to succeed with hearing aids so that all their hearing needs and requirements would be met. For instance, one respondent notes:

"*The last time I changed my hearing aids for new ones I also got (a) … range of products – items that connect to my television and my landline and mobile phones by a streamer which I wear around my neck that is charged at night. It has been my lifesaver.*"

Individuals that had their needs and desires met presented as self-reliant with a high motivation to succeed.

Subtheme (ii) Unmet Needs

The subtheme *'unmet needs'* emerged from the participants that felt misunderstood when fitted with hearing aids. Many participants had reported dissatisfaction with the service due to a lack of partnership and collaboration with their Audiologist during the hearing aid fitting. Strong feelings were noted from participants who were left to rely on trial and error on how best to manage the use of their hearing aid(s). One respondent had particular frustration with the lack of information provided:

"*Very little information or support…won't explain deaf and hard of hearing or background noise in crowded areas (hotels-pubs etc)* ."

There was a sense that the dissatisfied respondents with unmet needs often had to be self-reliant due to the lack of support provided.

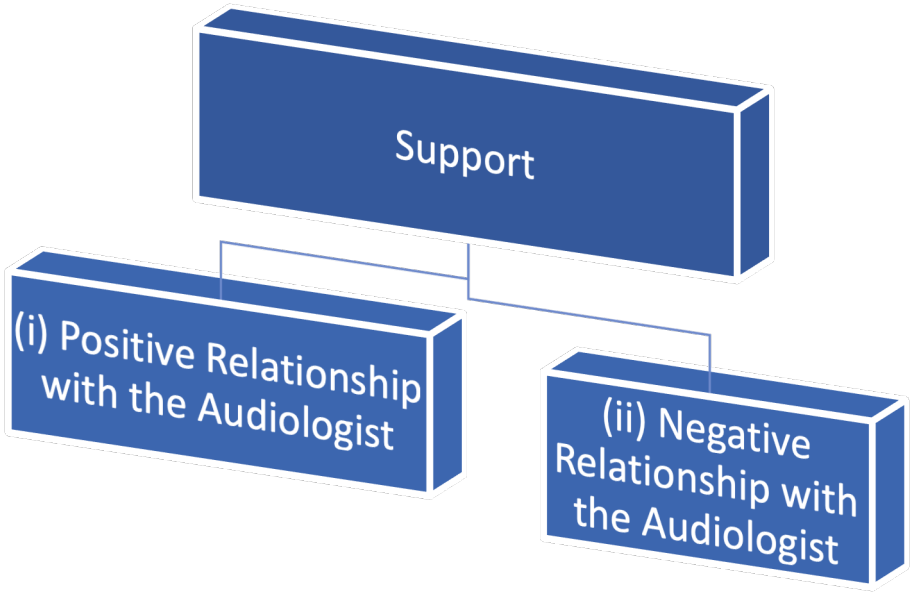
"I would have preferred a written demonstration and some practice time."

"Took time to get used to them in my ears."

Theme 2: Support

The second theme established from the research findings was *support.* The primary theme of support was examined in the two codes of a *positive relationship with the Audiologist* and a *negative relationship formed with the Audiologist* (See Figure 8).

Figure 8: The Theme of Support



Subtheme (i) Positive Relationship with the Audiologist

10 out of the 14 participants reported receiving satisfactory support and guidance from an Audiologist when receiving their hearing aids. A pattern emerged that there was a strong rapport having been developed between the participants and their Audiologist when satisfactory support and guidance had been received. For instance, one participant remembered and declared that he was *"Always well treated in X over the years."* A positive relationship with the Audiologist appeared to provide the context for a clear communication process that included explanations and support:

"It was explained to me that clarity and speech was my main problem."

The majority of the participants (n=10) that received support from their audiologist formed a positive relationship, which resulted in satisfaction with the service.

Subtheme (ii) Negative Relationship with the Audiologist

Four of the participants voiced that they did not receive enough information and support when fitted with hearing aids. A pattern emerged in the data of a negative relationship between the Audiologist and these participants. It was interpreted from the data that these participants had a poor view of the Audiologist's clinical skills and assessment procedures. One participant voiced:

"*Most hearing dispensers fail to carry out a proper hearing test and give very little information or support. They will fit hearing aids that amplify all sound"*

A similar lack of faith in an Audiologist's clinical procedures was echoed by another participant:

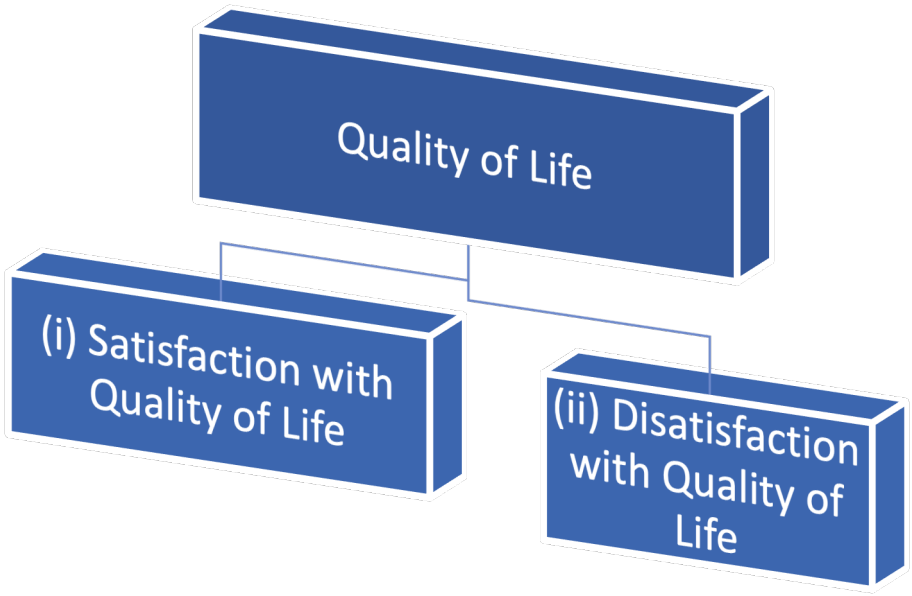
"*There should be no hearing aids dispensed without… total independent Audiologist hearing test certificate/report."*

A small number of the participants (n=4) had evidentially developed a negative relationship with their Audiologist.

Theme 3: Quality of Life (QoL)

The third theme identified from the research data was *quality of life*. The primary theme quality of life was sub-coded into the two categories of *satisfaction* and *dissatisfaction with ones quality of life* (See Figure 9).

Figure 9: The Theme of Quality of Life (QoL)



Subtheme (i) Satisfaction with Quality of Life

There was a considerable degree of positivity towards hearing aids as 15 out of 16 participants responded that hearing aids had improved their quality of life. The one participant in the sample who was dissatisfied with their quality of life did not own a hearing aid. Participants reported feeling much less isolated since they acquired hearing aids:

"*I don't feel as isolated as I did before I got them.*"

"*They do make a difference in my life.*"

"I would feel much more isolated and cut off without them."

"The hearing aids give me more confidence when I was without them I lacked confidence because I missed what other people were saying."

"Could not survive without them."

Subtheme (ii) Dissatisfaction with Quality of Life

Dissatisfaction with hearing aids and inconvenience with regard to quality of life emerged as a subtheme. One participant in the sample who owns a hearing aid but is not commonly wearing it noted:

"They are a nuisance, if in rain they could be damaged… I manage without them."

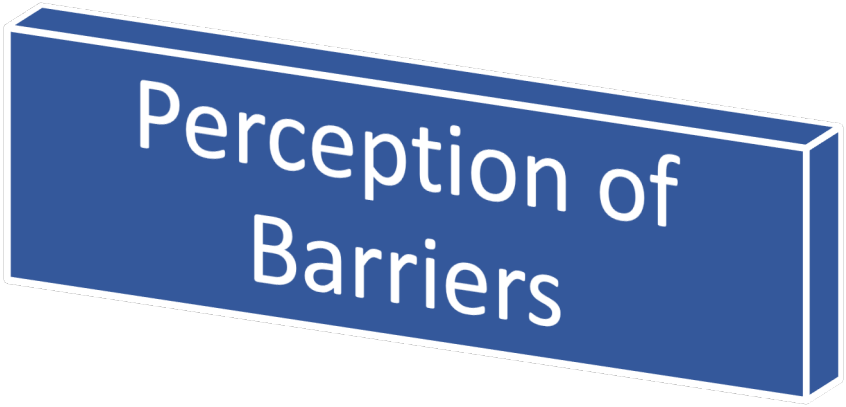
"Makes only a very little difference."

Another participant reported dissatisfaction with hearing aids due to the external stressor of wax:

"*Buildup of wax (needing microsuction regularly) is the main reason that I do not wear 8 hours daily."*

Theme 4: Perceptions of Barriers

Figure 10: The Theme of Perception of Barriers



The final emerging theme was *perceptions of barriers* (See Figure 10). In response to question 17, a number of participants (n=9), wrote about the kind of barriers that can interfere with the hearing aid uptake process. One such barrier that was perceived was the use of the telephone with a hearing aid:

"I have to remove my hearing aid to take a telephone call. I would prefer not to have to, but the sound is too distant."

Other participants (n=2) wrote that their hearing aid was uncomfortable. When asked about possible changes that could be made to encourage people to wear hearing aids participants recommended changing the earmold:

"Probably a different material for ear piece. Present earpiece makes ears feel very itchy and sweaty."

"Possibly a different material for ear piece. It can be itchy and uncomfortable in my ear."

Another participant had expressed a degree of frustration towards the barrier of cost. There was a sense of injustice about the cost of hearing aids:

"*I object to how expensive they are!! But I am glad that I can afford them! I wish that they were more accessible to more people!"*

Chapter 5 – Discussion

This chapter will discuss the findings gathered during the research with reference to the aims of the study, as well as recommendations for future research.

From the results, it was found that all participants believe their hearing aids improved their QoL and lessoned their feeling of isolation in a variety of settings. Despite this, clear barriers or potential issues were flagged that could negatively influence the uptake and retention of hearing aids.

The four themes collected from the qualitative research data were *self-reliance, support, quality of life,* and *the perceptions of barriers*. All of the themes identified highlighted different, yet related, areas that are of influence to hearing aid success rates.

Theme 1: Self-Reliance

Within the theme of *self-reliance*, and the subtheme *needs met*, it was found that participants felt more empowered when they had a high intrinsic motivation and a personal drive to succeed with hearing aids. As Ryan & Deci (2000) propose, individuals that are intrinsically motivated towards a task without any external influence will generally display more enthusiasm towards initiating action and won't be influenced by an extrinsic pressure such as a family member reinforcing hearing aid uptake. Cox et al (2005) conducted an in-depth research project (published in Ear and Hearing) of 230 older adults, where, through the use of a personality questionnaire, they determined that particular character traits were held by people seeking hearing aids. This study reinforces the hypothesis that individuals who seek hearing aids differ in character from the general population.

The second subtheme *unmet needs* encapsulates the voice of participants who were dissatisfied with the Audiological services provided to them. The dissatisfied respondents with *unmet needs* had to be self-reliant due to the lack of support provided. This finding is echoed in the International Journal of audiology literature by Grenness et al (2014). This study conducted research interviews with 10 adults

over the age of 60 years, who had owned a hearing aid for at least one year, and the qualitative analysis similarly found patient-centred emphasis in audiological rehabilitation to be lacking. Audiologists have been found to display task-orientated behaviour when fitting hearing aids i.e. conversation can be solely focused on the technical aspects of using a hearing aid with little reference to the lifestyle and communication needs of each individual patient (Grenness et al 2014).

Theme 2: Support

The theme of *support* incorporated two subthemes: a positive and negative relationship with the Audiologist. A positive relationship was linked to the participants receiving appropriate support, which subsequently resulted in satisfaction with their Audiologist. In contrast, the negative relationship linked to a lack of support, which consequently resulted in a lack of faith in the Audiologist's skills and a poor relationship was then established. As discussed in the literature by Sims et al (2000), which is a review of public health and health promotion approaches, older adults generally consider health professionals to be credible sources of information and the advice and support given is used to better their own personal wellbeing. Conversely, some CDA participants in this study reported how a lack of support and advice established a poor viewpoint of their Audiologist's clinical skills and competencies, therefore failing to fully better their personal wellbeing.

Theme 3: Quality of Life (QoL)

As outlined in the International Classification of Functioning: Disability and Health by the World Health Organization (2001), participation is defined as 'the involvement in a life situation'. Since using the hearing aids, numerous participants reported to have found their inclusion in group settings and other activities to have improved, resulting in less feeling of isolation and improved QoL.

Theme 4: Perception of Barriers

The final theme that emerged from the qualitative data was a *perception of the barriers* encountered by the participants when using hearing aids. It should be noted

that the participants were not deterred by the barriers themselves as they are long-term hearing aid users. However, from their own experience, they reported factors that they perceived to be potential uptake and retention barriers for others when using hearing aids or considering them as a treatment option.

One perceived barrier was the difficulty whilst using a telephone. This particular barrier is noteworthy as the sample consisted of an older adult population that are often dependent on the telephone as a source of communication that acts as a means of preventing social isolation. Surprisingly, it has not been referred to in recent literature as a barrier when using hearing aids, but the findings from this study suggest it to be a difficulty.

Another barrier was uncomfortable earmolds, which has been reported frequently in previous studies (McCormack & Fortnum, 2013). Of the barriers mentioned by the sample, each could be resolved by further audiological counseling and support in a follow up appointment. Gionopulous et al.'s (2002) study interviewed 116 hearing-aid owners who had been fitted 8-16 years prior. They reported that a large proportion of those hearing aid owners had dismissed previous hearing aids for reasons that could be easily prevented by better training on how to use the device. Although the participants in this sample have not yet rejected their hearing aids, further continuation with such barriers could potentially/hypothetically result in discontinuation of use in the future.

An additional finding in the quantitative research was the participants' difficulty in removing hearing aid batteries, which could also be resolved with further counselling. Erber (2003) has reported this finding in previous literature with the older adult population commonly suffering from restriction in their manual dexterity. For these patients, there are modern assistive tools available, such as magnetic battery removers, that reduce the necessity for high levels of manual dexterity.

Key Findings of the Research

The research findings suggest that three particular areas impact on the successful retention of hearing aids (1) the individual characteristics of a hearing aid user, (2) the relationship formed with the Audiologist, and (3) regular personal experience in using the hearing aid.

1. Successful hearing aid retention was found to be dependent on the participants' ability to cope and to use a hearing aid independently. This was dependent on their individual and unique characteristics. For the participants with less intrinsic motivation and drive to succeed, minor difficulties appeared to develop into larger problems that prevented effective hearing aid use.

2. The relationship with the Audiologist is a factor that influences successful retention i.e. a positive and supportive relationship was linked to higher levels of retention and visa-versa. It could be hypothesised that negative relationships may be due to the clinicians being too process focused rather than patient focused, which could lead to a lack of synchronicity between Audiologist and the patient.

3. Successful retention is achievable when the participants have the capacity to use the hearing aid technology proficiently, either as a result of effective counselling or acquired technological expertise. Similar to the nurturing of the Audiologist-patient relationship, it would also be recommended that, at the hearing aid fitting, the patient is fully aware of how to operate the hearing aid and its functions correctly. Despite this being done when the patient first receives the hearing aid, they may still need further counseling and information, which is why the follow-up appointment should be strongly recommended and encouraged.

Limitations of the Research

The study sample consisted of frequent long-term hearing aid users. Consequently, it was difficult to identify the initial barriers to uptake they experienced with hearing aids. The study was made up of a small sample size of 16 participants and was limited to members of the CDA, however, it was a pilot study with the aim to test the feasibility of it becoming a larger research project. Lastly, the participants were selected using purposeful sampling, with the implication that most participants had successfully retained their hearing aids for a substantial period of time. This may have limited the study's ability to address the potential barriers to retention.

Conclusion

This study has achieved its aim of identifying the barriers/factors that prevent the uptake and retention of hearing aids for members of the 70+ age group that are members of the CDA. There are numerous barriers described that prevent the uptake and retention of hearings aids, however, most of these can be overcome without severe difficulty. This should be a concern for the audiological profession as the success of hearing aid use is being impeded by avoidable factors that can be reduced or eliminated with simple solutions such as further counseling and support from patients' Audiologists. As the older population grows in numbers, so, too, does hearing aid demand and the need for greater emphasis on audiological practices and solutions. With this in mind, patients shouldn't need to learn how to deal with barriers but work in a collaborative manner with their Audiologist to overcome/avoid them, in order to ensure satisfaction and successful retention.

Recommendations for Future Research

Although this research study outlines the barriers to the uptake of hearing aid(s) and the areas that impact their successful retention, further research needs to be conducted on a larger scale and in more depth, in order to better understand these factors and propose effective and actionable solutions. To do this, investigation needs undertaking to identify the barriers and their weight of influence at different stages of the uptake process, both before and after receiving the hearing aid(s).

Similarly, the factors that result in successful long-term retention and their weight of influence needs to be researched further so correct measures and emphasis can be placed accordingly. By doing this, more effective and patient-centric procedures can be implemented to improve hearing aid success rates.

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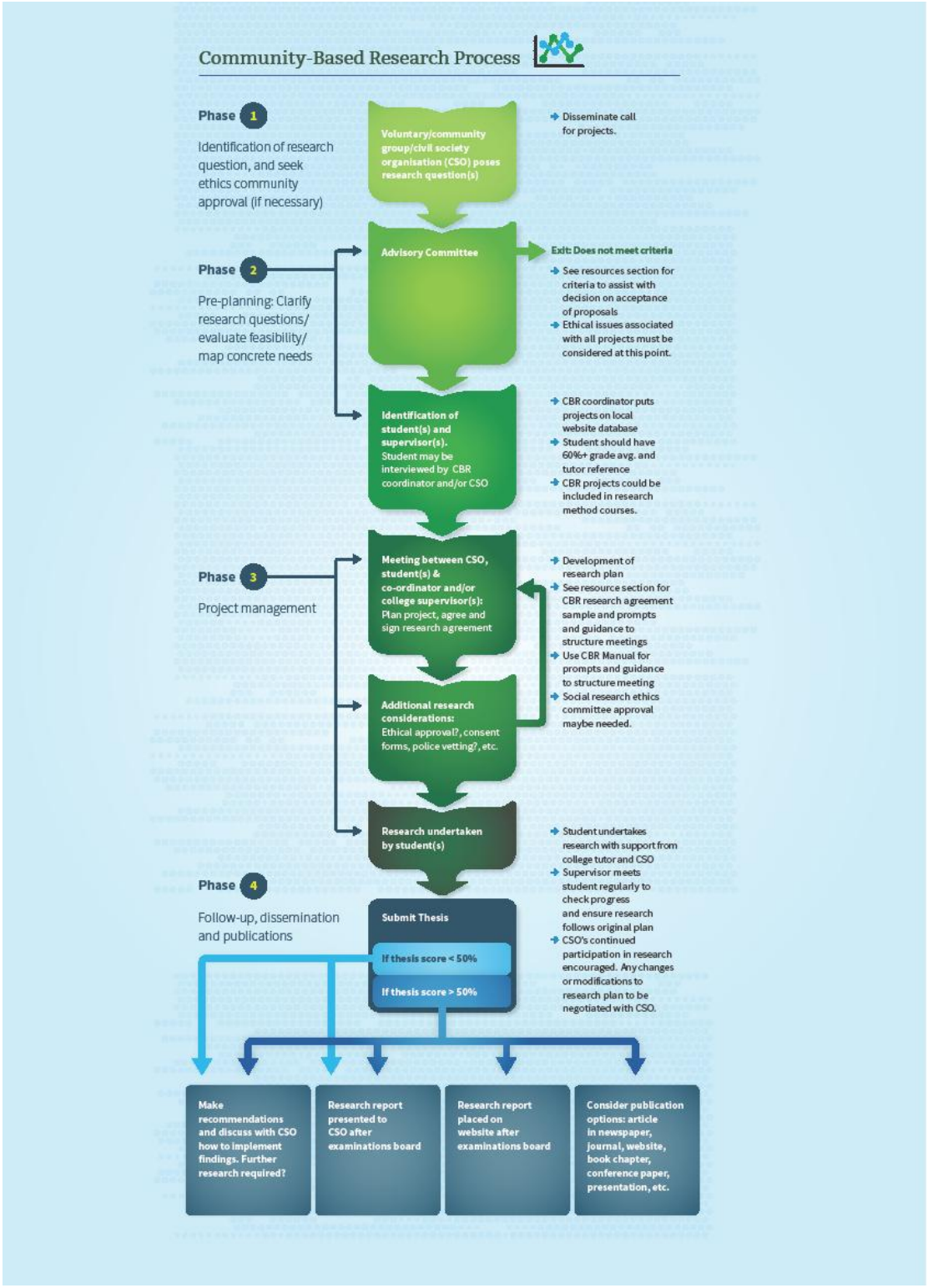
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Appendix – I:
The Community Based Research Process



Appendix – II:
The CARL Research Agreement

CARL
COMMUNITY - ACADEMIC
RESEARCH LINKS
University College Cork, Ireland

Research Agreement

Community-Academic Research Links

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UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Name of community and voluntary group:	Cork Deaf Association
Community and voluntary group liaison:	Gerrie O'Grady
Name of student(s):	Amy O'Regan
Name of academic supervisor(s):	Dr Siobhán Laoide-Kemp
University course and module:	MSc Audiology
Date:	18th of October 2018

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An agreement between **Cork Deaf Association** and **Amy O'Regan MSc Audiology** at University College Cork, Cork, Ireland.

This agreement relates to arrangements agreed between the student and the group for the execution of a research project entitled: ***The barriers towards the uptake and retention of hearing aids in the 70+ years population***

1. It has been agreed that Amy O'Regan will carry out research on behalf of and in participation with the Cork Deaf Association as follows:

1. This is a survey based research project whereby members of the Cork Deaf Assocation who are over 70 years of age will be asked to complete a postal questionnaire on the barriers towards the uptake and retention of hearing aids. 2. Amy will attend a coffee morning and will network with CDA members who will liaise with her in this research and encourage others to participate. 3. Gerrie O'Grady will identify a staff member who will act as a link person for this project. 4. Ethical application will be submitted as soon as possible.

2. The time of the academic supervisor of the student undertaking the research will normally be provided without charge as part of the student's degree course at the University.

3. The University will provide accommodation, the use of equipment, the services of technical and other supplies to the extent that is normally provided for internally based student projects. Where the provision required for the timely and efficient execution of the project exceeds the normal allowance for student projects or exceeds the host department's budget, the community and voluntary group may be asked to pay for such provision or to join with the University / Community-Academic Research Links (CARL) in securing provision from a third party source. No costs will be incurred *without prior* agreement. (These additional provisions will be listed in an appendix at the end of the Agreement or in point 1 above, if deemed necessary).

4. The name of the student(s) will be listed below. The names of the students, the academic supervisor, or the University / Community-Academic Research Links (CARL) may only be used after obtaining prior approval. Permission to refer to the University will not be unreasonably withheld.

5. The copyright, or any other intellectual property rights, created by the project will rest with the University. Free and full use by the Community Partner for the purpose declared when the project was initiated is agreed in advance. Use for any further purpose(s) will be for negotiation and approval on a case-to-case basis. Permission will not be unreasonably withheld.

6. Use of the project report in other than its complete form will be checked with the University / Community-Academic Research Links (CARL) in reasonable and sufficient time before the intended date of such use to allow discussion as to the accuracy or suitability of the modified form.

7. Students will normally carry out the project. Notwithstanding the contributions by the University and its staff, the University / Community-Academic Research Links (CARL) gives no warranty as to the accuracy of the project report or the suitability of any material contained in it for either general or specific purposes. It will be for the Community Partner, or users, to ensure that any outcome from the project meets safety and other requirements. The Community Partner agrees not to hold the University responsible in respect of any use of the project results. Notwithstanding this disclaimer, it is a matter of record that many student projects have been completed to a very high standard and to the satisfaction of the Community Partner.

8. Upon completion of the project the student (as well as completing the requirements of his or her University course) and CARL will be responsible for providing the Community Partner with a completed copy of their project report. The student and CARL shall provide the Community Partner with the completed project report within a reasonable amount of time, but not more than two months after the final Examination board.

9. Upon completion of the project, students should meet with the Community Partner within one month of the submission of the dissertation to the University to discuss the study findings, to explore actions / implementation plan arising from the study and to discuss future public presentations and publications related to the study by the student and/or the Community Partner.

10. All parties agree that upon completion of the project, that the research report will be placed - with the approval of the course tutor providing it reaches the requisite academic and presentation standards - on the University College Cork, Community-Academic Research Links website: http://carl.ucc.ie. No party has the right to veto the publication of the research report.

Student dissertation submission date:	May 31st 2019
Completion date of research report to community group: *(normally after the Examinations Board has formalised the dissertation grade, which is usually 2 months after submission of dissertation)*	September 2019
Date report to be published on the CARL website: *(normally after the Examinations Board has formalised the grade, which is usually 2-3 months after submission of dissertation)*	September 2019

Signed by the liaison person from the community and voluntary group partner

Signature *(By signing this Agreement you are confirming that you have sought and secured the*	

requisite permissions to proceed with this project within your organisation):	
Print Name:	Gerrie O'Grady
Title/Role in Group:	Manager
Date:	18th of October 2018

Signed by student(s)

Signature(s): *(By signing this Agreement you are confirming that you have sought and secured the requisite permissions from your tutor and/or course team to participate in a CARL project):*	Amy O'Regan
Print Name(s):	Amy O'Regan
University Course(s) and Year:	MSc Audiology
Date:	18th of October 2018

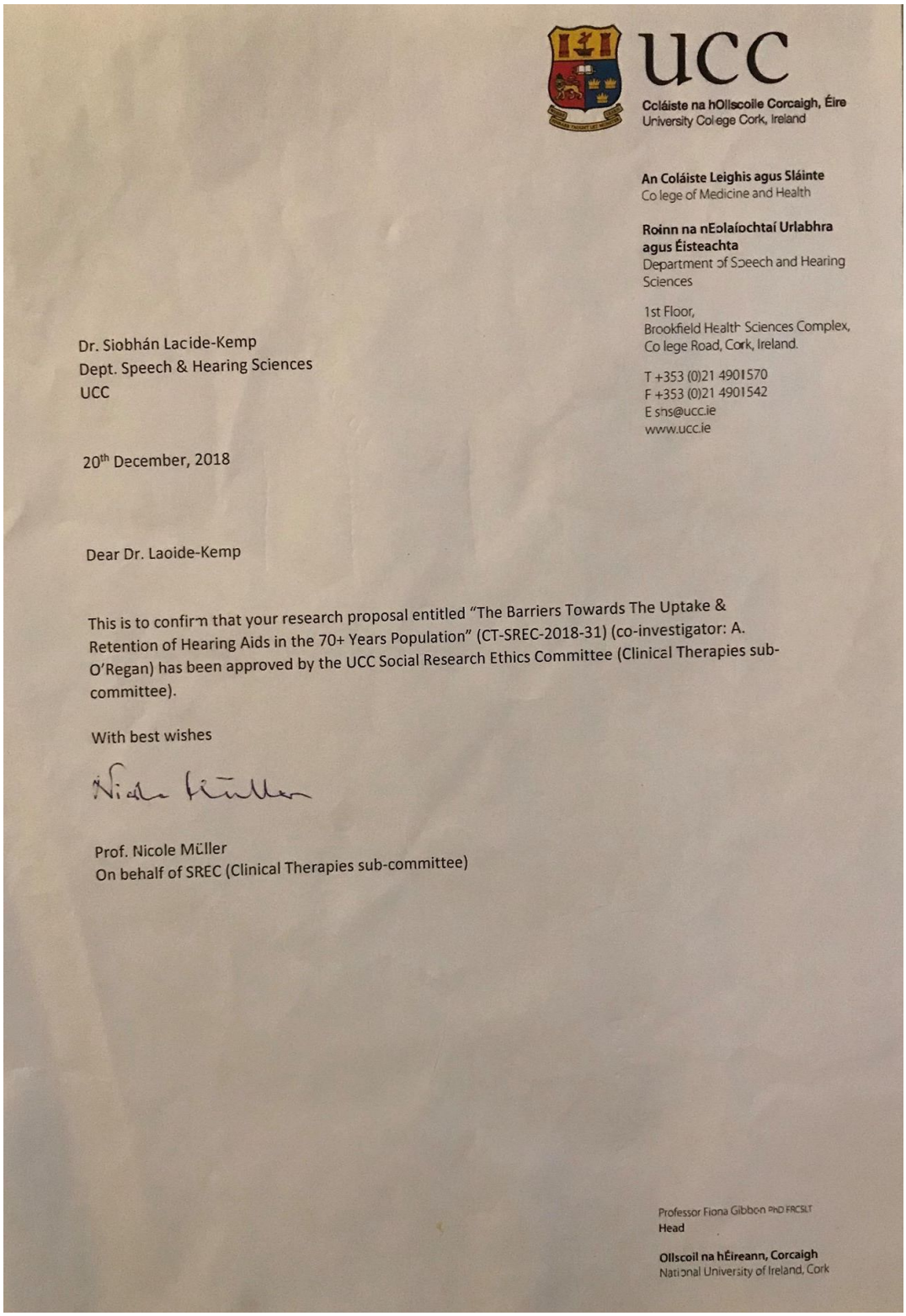
Signed by CARL Coordinator / Academic Supervisor(s)

Signature:	Anna Kingston and Siobhán Laoide-Kemp
Print Name:	Anna Kingston/Siobhán Laoide-Kemp
University Course(s) and Year:	
Date:	18th of October 2018

Version 5. Updated June 2016. http://carl.ucc.ie . This form is based upon a version of the QUB Science Shop CBR contract – used with permission.

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Appendix – III:
Social Research Ethics Committee (SREC) Approval



UCC

Coláiste na hOllscoile Corcaigh, Éire
University College Cork, Ireland

An Coláiste Leighis agus Sláinte
College of Medicine and Health

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Dr. Siobhán Lacide-Kemp
Dept. Speech & Hearing Sciences
UCC

20th December, 2018

Dear Dr. Laoide-Kemp

This is to confirm that your research proposal entitled "The Barriers Towards The Uptake & Retention of Hearing Aids in the 70+ Years Population" (CT-SREC-2018-31) (co-investigator: A. O'Regan) has been approved by the UCC Social Research Ethics Committee (Clinical Therapies sub-committee).

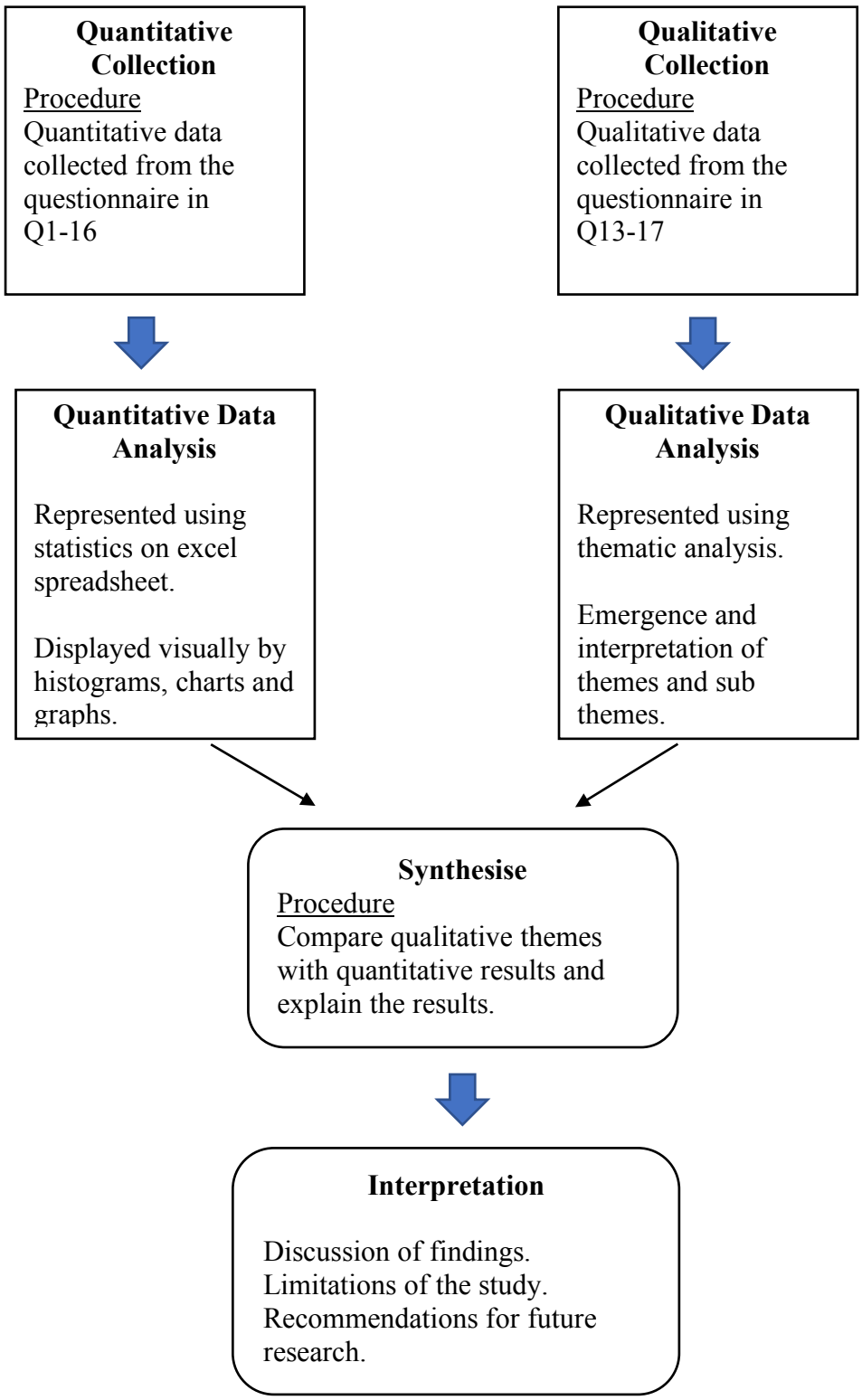
With best wishes

Prof. Nicole Müller
On behalf of SREC (Clinical Therapies sub-committee)

Professor Fiona Gibbon PhD FRCSLT
Head

Ollscoil na hÉireann, Corcaigh
National University of Ireland, Cork

Appendix – IV:
The Mixed Methods Research Design



***Note*. Adapted from Creswell et al, 2011**

Appendix - V:
The Information Sheet

Title: Barriers Towards the Uptake & Retention of Hearing Aids In the 70+ Years Population.

Thank you for considering participating in this research project. The purpose of this document is to explain to you what the work is about and what your participation would involve, so as to enable you to make an informed choice.

Purpose of the Study

The purpose of the study is to explore the barriers towards the uptake and retention of hearing aids in the 70+ Years population. Should you choose to participate, you will be asked to complete a short questionnaire, which consists of fifteen questions. The questions relate to your wearing, use and management of hearing aids.

Participation

Participation in this study is voluntary. You will be asked to sign a consent form before
you complete the questionnaire. There is no obligation to participate, and should you choose to do so you can refuse to answer specific questions, or decide to withdraw from the study. All information you provide will be confidential and your anonymity will be protected throughout the study.

Anonymity and Data Protection

The data gathered will remain anonymous. It will be stored electronically on the researcher's (Amy O'Regan) laptop and the research supervisor's (Dr. Siobhan Laoide-kemp) computer. Both computers will be encrypted for protection to prevent unauthoirsed access. The data will be kept confidential for the duration of the study, available only to my research supervisor Dr. Siobhan Laoide-Kemp and myself. On completion of the study, the information will be retained for a minimum of 10 years in a locked filling cabinet in UCC and it will then be destroyed**.** The results of the study will be presented in the Cork Deaf Association, which will take place in September 2019 and will also be included in the researcher's MSc dissertation.

This study has obtained ethical approval by the UCC Social Research Ethics Committee.

If you have any questions about this study, you can contact the below:

Amy O'Regan (researcher) BHSC Room 1.37, Dept. of Speech & Hearing Sciences, Brookfield Health Sciences Complex, UCC, Cork Email: 114301991@umail.ucc.ie Phone: 0857542396	Dr. Siobhán Laoide-Kemp (research supervisor) BHSC LG105 School of Clinical Therapies, Brookfield Health Sciences Complex, UCC, Cork Email: siobhan.laoidekemp@ucc.ie Phone:021-420-5624

If you agree to take part in this study, please complete the consent form overleaf.

Appendix – VI:
The Consent Form

I,_____ agree to participate in the study 'Barriers Towards the Uptake & Retention of Hearing Aids in the 70+ Years Population'.

I have understood that (please tick):

☐ I agree to participate in the research.

☐ The purpose and nature of the study has been explained to me.

☐ I am participating voluntarily and can withdraw without providing reason at any time.

☐ I grant permission for the data collected to be used for the research only.

☐ I understand that my anonymised data will be securely stored in UCC for 10 years.

☐ This research is part of a dissertation and it may be published.

☐ I have been given the opportunity to contact the Chief Investigator and researcher with any queries before signing this form.

Signed…….. Date: ……

PRINT NAME: ……..

Appendix – VII:
Uriate et al. (2005) Original Questionnaire

Instructions: Some questions require a tick in the answer box. Please tick only one box per question. For some other questions you will be asked to indicate your answer by circling a number. For these questions you will need to circle a number on each row unless otherwise directed. Other questions require a short written answer.

1. How many hearing aids do you usually wear?
(Tick one box only)

One Hearing Aid	☐	1
Two Hearing Aids	☐	2

2. How often do you use your hearing aid/s?
(Tick one box only)

More than 8 hours a day	☐	1
Between 5 and 8 hours a day	☐	2
Between 1 and 4 hours a day	☐	3
Less than 1 hour a day	☐	4
Less than 1 hour a week	☐	5
Never	☐	6

2a. If you never wear your hearing aid/s please tell us why.

_____

_____

3. How much has your hearing aid helped you with any of the following?
(Circle the appropriate number for each statement—if you do not participate in any of the activities please leave the row blank)

	A lot	A moderate amount	A little	Not at al
Family conversation	1	2	3	4
Small groups	1	2	3	4
Meetings/Church	1	2	3	4
Social situations	1	2	3	4
TV/Radio	1	2	3	4
Telephone	1	2	3	4

4. How often do you experience problems with any of the following when using your hearing aid?
(Circle the appropriate number for each statement)

	All of the time	Most of the time	Some of the time	None of the time
Positioning the hearing aid or removing the hearing aid	1	2	3	4
Adjusting the controls of the hearing aid	1	2	3	4
The aid whistling when it is in the ear and set at a comfortable listening level	1	2	3	4
The hearing aid or ear mould causing you discomfort	1	2	3	4
The hearing aid making any sudden loud noises (unbearably loud not just annoying)	1	2	3	4
Your own voice sounding hollow or echoing	1	2	3	4

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5. Have you reported these problems to your hearing practitioner?
(Tick one box only)

Yes	☐	1
No	☐	2

If No, go to Question 7.

6. What action did your practitioner take after you reported the problem?

_____

_____

_____

The next few questions are about your satisfaction with the service you received and with the hearing aid/s.

7. How satisfied were you with the quality of service provided by your chosen practitioner?
(Tick one box only)

Very satisfied	☐	1
Satisfied	☐	2
Dissatisfied	☐	3
Very dissatisfied	☐	4

8. How satisfied are you with your hearing aid/s?
(Tick one box only)

Very satisfied	☐	1
Satisfied	☐	2
Dissatisfied	☐	3
Very dissatisfied	☐	4

9. If you are dissatisfied with your hearing aid/s or with the service provided by your chosen practitioner, please explain why.
(Please feel free to attach any additional written material that you feel may help to answer the question)

_____

_____

_____

10. Do you want the Office of Hearing Services to follow up on this matter with your practitioner?

Yes	☐	1
No	☐	2
Not applicable	☐	3

Appendix – VIII:
The Research Questionnaire

Barriers Towards The Uptake & Retention of Hearing Aids in the 70+ Year Population Questionnaire.

Please sign the consent from <u>before</u> you fill out the questionnaire and return both in the stamped self-addressed envelope provided.

1. Tick the box representing your age range

70-75 years	75-80 years	80-85 years	90-95 years	95+ years
☐	☐	☐	☐	☐

2. Do you currently wear a hearing aid(s)?

Yes ☐ No ☐

3. If yes, how often do you wear it?

Every Day	Most days	Occasionally	Never
☐	☐	☐	☐

4. How many hearing aids do you have? Tick the appropriate box.

One hearing aid ☐ Two hearing aids ☐

5. Did you get your hearing aid(s) privately (i.e. bought from a hearing aid supplier) OR did you receive your hearing aid(s) publically (i.e. from a HSE community service)? Tick the appropriate box.

Private ☐ Public ☐ Unsure ☐

6. What is your degree of hearing loss? Tick the appropriate box.

Mild	Moderate	Severe	Profound	Unknown
☐	☐	☐	☐	☐

☐

7. What is the cause of your hearing loss? Tick the appropriate box.

Age Related	Noise Exposure	From Birth (congenital)
☐	☐	☐

Injury	Unknown
☐	☐

Other (please specify): _____

8. How would you describe your level of hearing **without** a hearing aid? Tick the appropriate box.

Good	Adequate	Inadequate	Bad
☐	☐	☐	☐

9. How long have you been experiencing hearing loss? Tick the appropriate box.

< 1 Year	1-2 Years	2-3 Years	3-4 Years
☐	☐	☐	☐

4-5 Years	5-10 Years	10+ Years
☐	☐	☐

10. How often do you use your hearing aid(s)?
Tick one box only.

More than 8 hours a day ☐
Between 5 and 8 hours a day ☐
Between 1 and 4 hours a day ☐
Less than 1 hour a day ☐
Less than 1 hour a week ☐
Never ☐

11. To what extent does your hearing aid help you with any of the following activities? (Tick the appropriate box for each one. If you do not participate in any of the activities please leave the row blank)

	All of the time	Most of the time	Some of the time	None of the time
Family Conversation	☐	☐	☐	☐
Small groups	☐	☐	☐	☐
Meetings/ Church	☐	☐	☐	☐
Social Situations	☐	☐	☐	☐
TV/radio	☐	☐	☐	☐
Telephone	☐	☐	☐	☐

12. How often do you experience problems with any of the following when using your hearing aid?

	All of the time	Most of the time	Some of the time	None of the time
Positioning the hearing aid or removing the hearing aid.	☐	☐	☐	☐
Adjusting the controls of the hearing aid.	☐	☐	☐	☐
A whistling sound from the hearing aid.	☐	☐	☐	☐
Discomfort (from the ear-piece)	☐	☐	☐	☐
The hearing aid making any strange noises.	☐	☐	☐	☐
Removing and inserting batteries	☐	☐	☐	☐

13. When you were fitted with your hearing aid(s), did you feel you were given enough information and support? Tick the appropriate box.

Yes ☐ No ☐

If no, why?

_____

_____

14. Do you worry about what other people may think about you wearing hearing aids?

Yes ☐ No ☐

If yes, why?

_____

15. Do you think that hearing aids help you to have a better quality of life?

Yes ☐ No ☐

If no, why?

_____

16. How likely are you to continue using hearing aids? Tick the appropriate box.

Very Likely ☐ Likely ☐ Not Sure ☐ Unlikely ☐ Very Unlikely ☐

If you never wear your hearing aid(s), please tell us why?

_____

17. What changes, if any, would you make about hearing aids that would encourage you to use them more? Please be detailed.

_____

_____

_____

_____

_____

_____

Appendix – IX:
The Statistical Analysis Method Used for the Quantitative Data

The Statistical Analysis Method Used for Quantitative Data				
Question #	Nominal Scale	Ordinal Scale	Binary Scale	Ratio Scale
1				✓
2			✓	
3		✓		
4	✓			
5	✓			
6		✓		
7	✓			
8		✓		
9		✓		
10		✓		
11		✓		
12		✓		
13			✓	
14			✓	
15			✓	
16		✓		

Appendix – X:
Primary Themes & Subthemes

Primary Themes	Sub Themes Related to Primary Theme		Direct Quotations
Self-Reliance	**1.**	**Needs Met**	*"I adjusted really quickly to wearing the hearing aids."* *"Learnt a lot myself."* *"The last time I changed my hearing aids for new ones I also got … range of products – items that connect to my television and my landline and mobile phones by a streamer which I wear around my neck that is charged at night. It has been my lifesaver."*
	2.	**Unmet Needs**	*"Very little information or support…won't explain deaf and hard of hearing or background noise in crowded areas (hotels-pubs etc.)"* *"I would have preferred a written demonstration and some practice time."* *"Took time to get used to them in my ears."*

Support	**1.**	**Positive Relationship with Audiologist**	*"Always well treated in X over the years."* *"It was explained to me that clarity and speech was my main problem.".*
	2.	**Negative Relationship with Audiologist**	"*Most hearing dispensers fail to carry out a proper hearing test and…..fit hearing aids and amplify all sound. "* "*There should be no hearing aids dispensed without… total independent Audiologist hearing test certificate/report."*
Quality of Life	**1.**	**Satisfaction**	*"The hearing aids give me more confidence when I was without them I lacked confidence because I missed what other people were saying."* *"Could not survive without them."*
	2.	**Dissatisfaction**	*"They are a nuisance, if in rain they could be damaged… I manage without them."* *"Makes only a very little difference."* *"buildup of wax (needing microsuction regularly) is the main reason that I do not wear 8 hours daily."*
Perception of Barriers			"*I have to remove my hearing aid to take a telephone call. I would prefer not to have to, but the sound is too distant."* *"Probably a different material for ear piece. Present earpiece makes ears feel very itchy and sweaty."*

		"Possibly a different material for ear piece. It can be itchy and uncomfortable in my ear". "*I object to how expensive they are!! But I am glad that I can afford them! I wish that they were more accessible to more people!"*