University of Southampton

Faculty of Engineering and Physical Sciences

Institute of Sound and Vibration Research

The Impact of Hearing Loss on Work Life and the Supporting Role of Audiology Services: A Qualitative Exploration of the Perspectives of Audiologists and Workers with Hearing Loss

by

Margaret Zuriekat

Thesis for the degree of Doctor of Philosophy

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Abstract

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Hearing loss (HL) among working-age adults in the UK is becoming more prevalent. Workers with HL face communication challenges that impact their career prospects, work performance, psychosocial wellbeing and financial security, leading to economic costs to wider society. Most of the available literature on workers with HL is focused on some aspects of the adversities they encounter. It is very deficient in examining the multidimensionality of the impact and the vital role of supportive audiology care in mitigating the impact of HL on work life. The available research concerning workers' experiences with HL and their healthcare is severely lacking in the United Kingdom (UK), and most of the international studies were conducted in previous decades, when work practices, disability legislation, and audiology services were rather different from today. This thesis gathers the experiences and views of audiologists and workers with HL to better understand the impact of HL on workers in the workplace. It explores the state of UK audiology care for workers with HL and identifies the factors that help or hinder effective support.

Three qualitative studies were conducted. Study 1 gathered interview data from 25 audiologists working either in the National Health Service (NHS) or independent health services, and Study 2 interviewed 24 workers with HL. The perspectives of both groups were then triangulated, and the issues around coping that came out strongly from Study 2 were further analysed in Study 3. The interviews were all thematically analysed for Studies 1-3. From the triangulated perspectives of audiologists and workers, supported by previous literature, a conceptual framework is developed, offering an unprecedented demonstration of the multidimensionality of the challenges affecting workers with HL and the issues that were perceived to be influencing workers’ experiences and wellbeing. HL can affect every aspect of a worker's working life, from career choices to day-to-day struggles and career progress. They experience stress, fatigue and difficulties adapting to different work situations, and a sense of being not sufficiently well supported by employers and colleagues and audiology services.

Key findings include the acknowledgement by audiologists in Study 1 that workers with HL have specific needs that often go unmet due to lack of resources, lack of funding, and lack of knowledge and training on how to support this demographic. The workers in Study 2 expressed uncertainty about who to approach for support and perceived a gap in audiological care for working adults, especially by the NHS. The triangulation of their perspectives showed that the audiologists and the workers mostly agreed that there were important issues in audiology care for the working population, such as better access to services, more effective patient-audiologist interaction, and more advanced technological support aside from hearing aid provision. However, the triangulation showed some misalignment of perspectives between the two groups. For example, the audiologists believed that workers were most in need of appointments outside of working hours, whereas the workers were much more concerned about inordinately long waits for appointments and overly-convoluted referral pathways and how these affected their jobs.

Study 3 identified the coping strategies used by workers' with HL in the workplace, such as disclosure of HL, use of basic and advanced hearing technologies and withdrawal. Unlike previous research, this research found that factors related to coping In work life with HL include self-management skills and better support from audiology services. Overall, this thesis shows that audiology services should make more effort to identify workers' needs and provide better support aside from standard hearing aid provision. Audiologists need to be supported by services and the health system to make effective improvements. Workers with HL need to take an active role in their care, while being supported by audiology services, healthcare provision and employers. This research can be used to develop higher standards of care for workers with HL and improve audiology services. Further research is needed to understand the factors influencing the quality of audiologic rehabilitation of workers with HL and how to implement timely, practical and effective positive changes to service delivery.

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Research Thesis: Declaration of Authorship

Print name: MARGARET ZURIEKAT

Title of thesis: The impact of hearing loss on work life and the supporting role of audiology services: A qualitative exploration of the perspectives of audiologists and workers with hearing loss.

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. Parts of this work have been presented through poster or oral presentations, and have been published in a scientific journal:

Publication:

- Study 1 (the part concerning audiologists' perspectives on the hearing healthcare for workers with hearing loss): Zuriekat, M., Semeraro, H., Watson, V., Rowan, D., and Kirby, S., 2021. Hearing healthcare for workers with hearing loss: Audiologists' experiences and views. *Disability and Rehabilitation journal,* 1-11.

Poster presentations:

- British Society of Audiology (BSA) annual e-Conference (2019)
- Human Sciences Group (University of Southampton) research away day (2019)

Oral presentations:

- Hearing and Balance Centre seminars (University of Southampton) (2019)
- Human Sciences Group research away day (University of Southampton) (2019)
- Signal Processing, Audio and Hearing Group (University of Southampton) (2020)

Signature: MARGARET ZURIEKAT Date: 10/12/2021

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Isabel & Ayla, the flowers in my garden, I hope you will grow to be kind to yourselves and others and be brave to take risks. Good stuff are not always easy. I hope you fill your lives with beautiful experiences, not things. Have stories to tell, not stuff to show. One day you may read this, be sure, then, that I have and will always love you and support you. My love for you is given from deep within, and it is yours till the end of time.

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Magi

Abbreviations

ALD	Assistive listening devices
AQP	Any Qualified Provider
AR	Adult rehabilitation
ATW	Access to Work
BSA	British Society of Audiology
CCM	Chronic Care Model
CI	Cochlear implant
COSI	Client-Oriented Scale of Improvement
COVID-19	Coronavirus disease identified in 2019
ENT	Ear, nose and throat specialist
GHABP	Glasgow Hearing Aid Benefit Profile
GP	General practitioner
HHC	Hearing healthcare
HL	Hearing loss
IC	Independent company
ICF	International Classification of Functioning, Disability and Health
NHS	National Health Service
PCC	Patient-centred care
QoL	Quality of life
REM	Real ear measurements
RNID	Royal National Institute for Deaf People
UK	United Kingdom
USA	United States of America
WHL	Workers with hearing loss
WHO	World Health Organisation

Chapter 1 Introduction

1.1 Background, rationale and thesis aims

Hearing loss (HL) is a significant known chronic health disability of adulthood and influences a large population of adults. There are many reasons to believe that the number of working-age adults affected by HL is increasing. Mainly because people are working longer and HL prevalence constantly increases with age, especially after the individual becomes 50 years old age (Davis, 1989, Davis, 1995, Stevens et al., 2011). Also, the exposure of recent generations to noisy digital media applications and personal listening devices could be increasing the vulnerability of young people to hearing challenges in the future. The literature includes plenty of evidence that HL can negatively affect individuals' wellbeing (Nordvik et al., 2018), and this will be reviewed thoroughly in Chapter 2. Overall, HL impacts the human capacity to communicate, which is very important. It can also affect the quality of personal interactions in social life and may lead to frustration, social isolation, and low self-esteem (Gellerstedt and Danermark, 2004, Morata et al., 2005, Jennings and Shaw, 2008, Kramer, 2008, Mathews, 2011, Granberg and Gustafsson, 2021). Individuals with HL are also vulnerable in labour markets and are prone to experiencing higher unemployment, increased sick leave, lower job satisfaction and performance, and early medically-related retirement (Kramer et al., 2006, Mathews, 2011, Nachtegaal et al., 2012, Svinndal et al., 2018, Granberg and Gustafsson, 2021). These are critical issues in the individual's life and are worth attention and understanding by their families, friends, colleagues and employers, communities and healthcare providers. Workers with HL can benefit greatly from support to ease their struggles and facilitate adjustments to day-to-day difficulties.

People with HL facing workplace problems frequently consult healthcare professionals (Hua et al., 2015), but healthcare professionals, including audiologists, policy makers and researchers, are not giving enough attention to the struggles, needs and care of working adults with HL. The literature review in Chapter 2 elaborates on this issue. There is a scarcity of research on workers with HL and a lack of focus on this population in UK healthcare, where the National Health Services (NHS) audiology services are the main point of contact for HL support. The main HL management offered by audiology services is the fitting of hearing aids. Although hearing aids are advantageous in some circumstances, it is a physical instrument and does not facilitate the restoration of normal hearing (Souza and Hoyer, 1996). Workers with HL, even those using hearing aids, will always have residual hearing difficulties and will have to deal with complex listening situations such as noisy offices and group discussions (Hua et al., 2015). There is a need to hear the stories of workers with HL and to understand their experiences and views on working life and hearing healthcare (HHC). In the same way, it is necessary to understand how audiologists experience their work with this demographic, as they are key care providers. The perspectives and experiences of both groups are required to gain insights into the issues that concern workers with HL, especially with regard to HHC.

This thesis presents an empirical investigation of the perspectives of audiologists and workers with HL and aims to:

1. Explore the work life, health, and wellbeing of workers with HL.
2. Explore the experiences and views of workers with HL regarding their coping in the workplace and the extent to which the support available to them helps or hinders their ability to cope.
3. Explore the experiences and views of workers with HL, as well as those of audiologists, with regard to the current state of audiology services in the UK.
4. Identify the facilitators and barriers to effective audiology support for workers with HL in the UK.

1.2 Overview of the thesis structure

This chapter (Chapter 1) offers a brief background to the research topic, the rationale behind conducting this research and outlines the overall aims of the thesis. Chapter 2 comprises the literature review. It describes the search strategies used to find the relevant literature and synthesises the review. Hearing care delivered to individuals affected by HL is discussed broadly under the umbrella of the patient-centred care (PCC) approach and the chronic care model (CCM) for long term health conditions. Then, the evidence relating to the population of workers with HL is reviewed, focusing first on the challenges they encounter in their work life and setting this knowledge within a framework. Next, the literature on coping with HL is discussed and the role of audiologists support, and finally, gaps in research are identified.

Chapter 3 outlines and discusses the general research paradigm, design, methodology and methods that are common to the three studies in the thesis. The specific methodological details of each study, such as recruitment methods and sample selection, are included in each study chapter.

Chapter 4 presents Study 1, which explores the perspectives of UK audiologists on the impact of HL on adult workers. It also explores the HHC provided by audiology services, and asks audiologists to identify the barriers to effective support for workers with HL. Chapter 5 presents

Study 2, which explores the workers’ perspectives of the same themes and issues as Study 1. Chapter 6 presents Study 3, which looks at the experiences of workers with HL in coping with HL and aims to identify aspects that help or hinder this process.

Chapter 7 presents an integrative summary and provides a brief discussion of the triangulated perspectives of audiologists and workers with HL in order to give a fuller picture and a deeper understanding of the results obtained from Studies 1 and 2. Chapter 8 discusses the research results and presents the overall conclusions of the thesis. It also offers reflections on the research as a whole, including methodology, quality, and limitations, and lists the contributions of the research to current academic knowledge. With reference to the study findings, this final chapter deals with the implications for audiology services for the target population and makes recommendations for future research and clinical practice.

Chapter 2 Literature review

2.1 Literature search strategies and how they evolved

Interesting challenges presented themselves during the search for relevant, evidence-based literature. Over the past two years, there has been an increase in publications focusing on the effects of HL in working life, such as the recent research by Granberg and Gustafsson (2021) and Svinndal et al. (2018), Svinndal et al. (2020a), Svinndal et al. (2020b). The search terms used to locate the most relevant literature included: ‘hearing impaired workers’, ‘employees with hearing loss’, ‘hearing loss and work’, and ‘coping with hearing loss at work’. Search engines including Google Scholar, Web of Science, PubMed, Science direct, ResearchGate, DelphiS and journal websites such as *The International Journal of Audiology*, *Journal of the Deaf and Hard of Hearing*, and *Journal of Disability and Rehabilitation* were searched for relevant literature as well as citations and references to other publications. Unfortunately, a number of papers with titles that would appear to deal with the heart of the topic could not be accessed, and these have therefore been cited lightly, according to the information available in their abstracts or in other papers citing them, such as Laroche and Garcia (2001). Google was also searched to identify grey literature, such as unpublished dissertations and theses, as well as charity and organisational research reports. Moreover, any authors who were found to have contributed significantly to this area were followed up, and some were contacted personally.

A network of contacts was also developed, which included a number of authors, audiologists, employment consultants, occupational therapists, hearing therapists, and individuals working with HL. Gathering information from these contacts involved in-person and online meetings, phone calls, and attendance at workshops, adult audiology rehabilitation consultations and hearing therapy clinics. This helped to learn more about workers with HL and to identify work related to this research field published by a variety of different authors and organisations. These focused networking strategies also revealed work not published by peer-reviewed journals as well as other texts with titles that did not directly state that they concerned workers with HL, such as the research report *Unlimited Potentials* by the UK charity organisation Royal National Institute for Deaf People (RNID)[1]. Networking also helped in identifying and meeting contacts who are experts in this field of research and provided insights into the dynamics of this research field.

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[1] RNID is a national-level UK charity that supports people affected by HL. The organisation was established in 1911 and changed its name briefly to Action on Hearing Loss from 2011 to 2020, when research reports relevant to the working population were published.

The research discussed or included in this thesis was not restricted by country, level of evidence, type of research (qualitative, quantitative or mixed methods), characteristics of the participants, whether they were employers or audiologists working with persons with HL, or were workers with HL themselves. This decision was made due to the scarcity of research focusing on workers with HL. Deficiencies and quality issues were, however, highlighted. In research with workers with HL as participants, there was no exclusion based on differences such as HL degree, hearing technology use, work type or age, as long as the participants were working, had worked, or were of working age.

Overall, the relevant literature that was identified at the international level was significant but not vast, and research conducted in the UK in this area was found to be scarce. Interestingly, many of the studies found commented on or contained elements relating to workers with HL and their hearing care, even if the topic or the title of the paper did not directly allude to this. It was therefore challenging to produce an exhaustive list of all of the studies, reports, and articles that have contributed to this research. Also, although papers commenting on this topic continued to be found throughout the research process, no new information was generated. Therefore, the focus in the literature review remains on key papers that were the most relevant.

2.2 Overview

The literature includes plenty of evidence on the difficulties faced by adults with HL. HL is unique in that it is usually an invisible disability, unless the person wears a visible hearing device. It is also typically linked to old age and is usually not expected to occur in younger, working-age adults. In this demographic, therefore, individuals with HL must decide whether to hide or disclose their condition and to deal with the consequences. This is particularly challenging when a worker with HL is applying for a job or starting a new one and fears discrimination and stigma in the workplace as well as negotiating the fundamental lack of job opportunities (Southall et al., 2011). Many studies show that HL in workers[2] adversely affects their communication abilities, employment status, occupational functioning and psychosocial health. This then leads to an inferior quality of life (QoL). A number of established interventions, such as hearing aids, have been found to significantly alleviate many of the adverse effects and improve a worker's QoL; however, the extent to which workers with HL have access to practical, psychosocial and work-related support in the UK has never been sufficiently researched and is, therefore, poorly understood. There are a few reports which suggest that support by audiology services is suboptimal, although this has

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[2] A worker with HL is a worker who experiences hearing difficulty or has been found to have HL on audiological tests. For a discussion on who is considered a worker, please see Section 2.4.1.

been investigated only minimally and solely from the point of view of workers with HL. To the best of the author’s knowledge, no studies have yet been conducted to explore how workers with HL collaborate with their audiologists to produce individualized management plans that take into account the considerable challenges of work life. Moreover, there is very little understanding of how to enable and improve hearing care services so that they support workers efficiently and effectively.

Optimal hearing care is vital in order to improve the working lives and wellbeing of adults with HL, and research is increasingly important for several reasons. First, the working population with HL is increasing in the UK, as well as in many other countries. This has important implications for the current state of the hearing care services, whether in the nature of the service or the scale. There is a need for sufficient hearing care staff who are trained to support working adults efficiently. Second, keeping workers with HL productively working would decrease or prevent financial losses at the level of the individual as well as that of society. Lost productivity and unemployment due to HL are thought to be responsible for £25 billion output loss yearly in the UK economy (International Longevity Centre, 2014, Shield, 2018).

This literature review will start by looking into current hearing care services for those with chronic HL, with particular emphasis on patient-centeredness. PCC is important for workers with HL as it takes into account their individual experiences and values, including those in the workplace. Also, PCC is required in order to ensure that audiologists focus on the particular areas of care and support that matter most to working adults. This literature review will later synthesise all of the available literature on the impact of HL on workers and sets it within a conceptual framework to provide an overview of what we currently know about workers with HL, and what shapes their experiences and influence their wellbeing, as well as how they cope. So far, there has been very little attention and discussion on their QoL and coping in the literature. Finally, there is a discussion about hearing care services that are provided to the working population, showing the gaps in knowledge which led to the first study.

2.3 The current hearing care services

2.3.1 Hearing care services for hearing loss as a long-term condition

Acquired HL[3] in adults is considered a prevalent and long-term condition (Barker et al., 2014), particularly because it is commonly chronic and requires healthcare support for a long period of time. The chronic care model (CCM) is a framework to aid in planning healthcare for patients with long-term conditions in order to produce better outcomes (Bonomi et al., 2002) and has been used to shape PCC for many long-term conditions. Figure 1 below shows the CCM for HL. It shows that the model recognises that audiologist-patient interaction is influenced by the local community's policies and resources, as well as the local health system with its various elements of self-management support, delivery system design, clinical information system and decision support. Table 1 below provides a brief explanation of each of the CCM components.

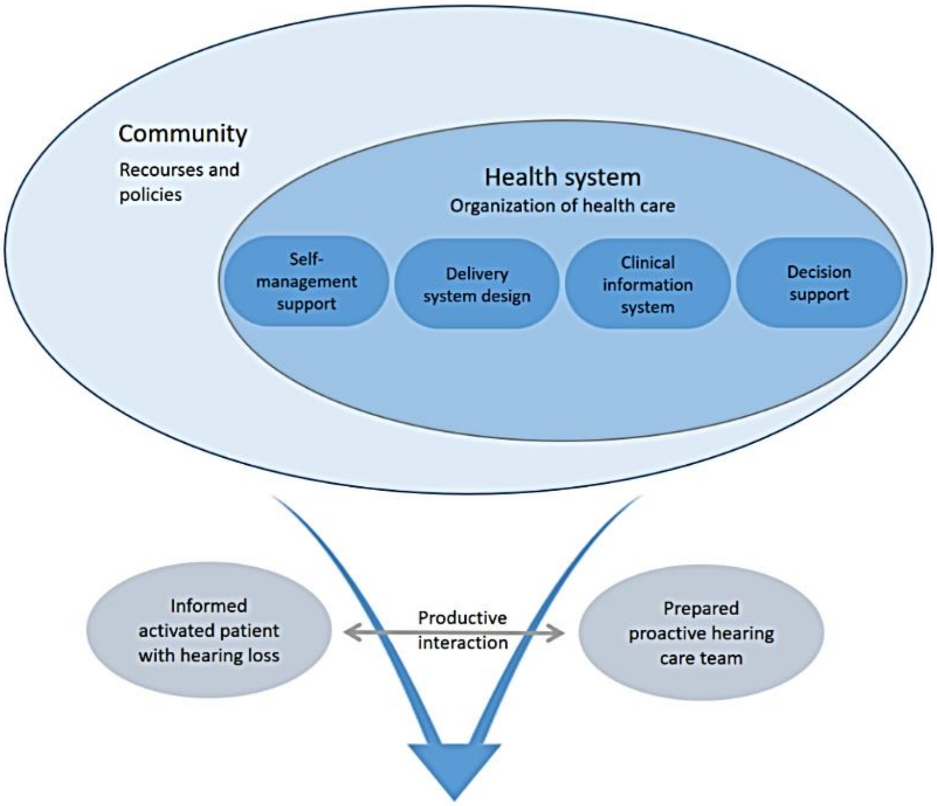

Figure 1: The chronic care model for hearing loss (Barker et al., 2014). This diagram was used and edited with permission.

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[3] Acquired HL is HL that occurs any time after birth. It is commonly caused by age-related HL and noise-induced HL.

Table 1: Elaboration of the Chronic Care Model components. The elaborations on the elements of the health system and the community were obtained from Bodenheimer et al. (2002).

Chronic care model component		**Elaboration**
Informed activated patient		• Patient who has the information and motivation to be able to manage their condition.
Prepared proactive care team		• A care team which interacts efficiently with the patient and provides high quality care by offering the necessary information, resources and decision support at the time of interaction.
The community with its resources and policies		• The community support or recommends policies that help provide better healthcare. • Work with organisations in the community, such as charities, to make effective programmes or to support already established ones. • Motivating patients to engage in effective programmes.
Health system	Self-management support	• Supporting patients and their carers to manage illness by teaching them substantial parts of its management and providing the tools for this. For example, teaching the patient or their carers how to deal with hearing aids and provide tools to clean them and batteries to keep them working.
	Delivery system design	• Designing service delivery in terms of defining the roles of the service providers. For example, the hearing care practitioner manages HL, non-hearing care practitioners help in self-management support or ensure follow up.
	Clinical information system	• Having computerised information to help the hearing care team act in accordance with the practice guidelines, to monitor performance and to help plan for individualised patient care.
	Decision support	• Using evidence-based practice guidelines in day to day clinical practice and sharing them with patients. • Using specialist expertise and educating the team.

The use of the CCM has produced better health outcomes for various chronic health conditions, such as diabetes (Stellefson et al., 2013, Baptista et al., 2016) and asthma (Mangione-Smith et al., 2005). Although it has attracted the attention of professionals and authors in the field of audiology, it has not been implemented in chronic HL care (Convery et al., 2019). This is unfortunate because using the CCM can contribute to a better understanding of how health services are offered to adults with HL, and without its use, many aspects influencing the service could be missed. For example, audiologists and researchers in the field of HHC give little attention to the influence of healthcare organisation and community resources and policies on patient-audiologist interaction and the resulting health outcomes, as discussed later in this section.

The focus in healthcare for HL is still limited to specific aspects. For example, during their interaction with patients, audiologists commonly focus on certain aspects such as audiology tests and fitting hearing aids (Jennings and Shaw, 2008). Similarly, research in the field has always focused on these issues. This narrow 'medical' focus overlooks many important aspects that could vastly improve hearing care services. At present, there is little focus on how audiologists can collaborate with patients in formulating a management plan. In addition to formal assessments and tests, audiologists need to value the patient's own account of their particular problems and challenges, as well as their opinions on what would help them overcome these. Similarly, Convery et al. (2019) argue that using the CCM to improve clinical practice for chronic HL is linked to better patient health outcomes, especially through improving self-management support.

The whole biopsychosocial picture of illness cannot be captured if audiologists focus only on assessing patients' HL and describing it by the outcomes of audiological tests, such as the pure tone and speech audiometry thresholds and the outcomes of audiological questionnaires, or if they focus on fitting hearing devices. These tools have a limited ability to define HL as a long-term condition that might have consequences in areas such as psychosocial health or the ability to participate in the workplace. Counselling, self-management support and other parts of the appointment seem to be given a lower priority. This could be caused by many and complex factors such as inefficient support from the health system or community to enable the audiologist and patient to have an efficient, productive interaction. For example, the audiologist might not have the resources or decision support tools like knowledge and training. For the audiologist to offer a high quality service they need information, resources and decision support at the time of interaction, and would benefit from more efficient tools in hearing care that capture the whole biopsychosocial picture of an individual's HL.

The lack of any element from the CCM might produce suboptimal care. For example, the service provided could be influenced negatively if the audiologists did not have adequate knowledge of their patients’ experiences and perspectives, or if they did not have effective tools to identify them. Granberg et al., (2014a, 2014b) studied patients’ and audiologists’ perspectives of disability and functioning with HL. The two groups showed some agreement in their perspectives; however, patients had additional and influential perspectives that audiologists did not consider. For example, both patients and audiologists had similar perspectives regarding the activities and participation aspects of the International Classification of Functioning, Disability and Health (ICF) model, which were mostly related to communication ability. However, the audiologists focused on noise and hearing aids as influential environmental factors, which the patients identified as well, but the patients revealed additional environmental factors that are of importance from their perspective, such as the role of social support, whether from the family, relationships or friendships, and social attitudes in the patient’s environment in general. This finding could mean that there are gaps between audiologists’ and patients’ understanding of the effects of HL on functioning and disability. Therefore, there appears to be a need for supporting the audiologists by educating them or providing training sessions to enable them understand their patients’ perspectives better. In addition, audiologists can be supported by providing a tool or a framework that values the multidimensional aspects of health in hearing care clinical practice such as the ICF model.

The ICF model provides a framework that aims to capture the different dimensions of health related issues, and can be a useful tool in clinical practice. The ICF core sets for HL were developed by Danermark et al., (2013) to cover the broad perspectives associated with HL and health, whether they are positive or negative. Two core sets were developed for HL; a comprehensive list and a brief list. The latter is a downsized version of the former (from 117 to 27 categories) for ease of use in assessing the health of people with HL. Figure 2 below summarises the brief core sets within the frame of the ICF model proposed by the World Health Organization (WHO), (2001). To what extent it is being used in audiological clinical practice is still unclear, but with the shift toward PCC standards and the increased awareness of the concept of biopsychosocial health, it is becoming important to integrate the ICF model of care or its elements into audiological clinical practice and research it in depth. With the development of HL specific core sets, this might have become easier to apply. Recent research investigated online operationalisation of the brief ICF core sets in audiology and otology clinical practice and the results indicate that it helped in screening for patients’ functioning difficulties which is the first step towards personalising hearing care and following the biopsychosocial model of healthcare (Van Leeuwen et al., 2020).

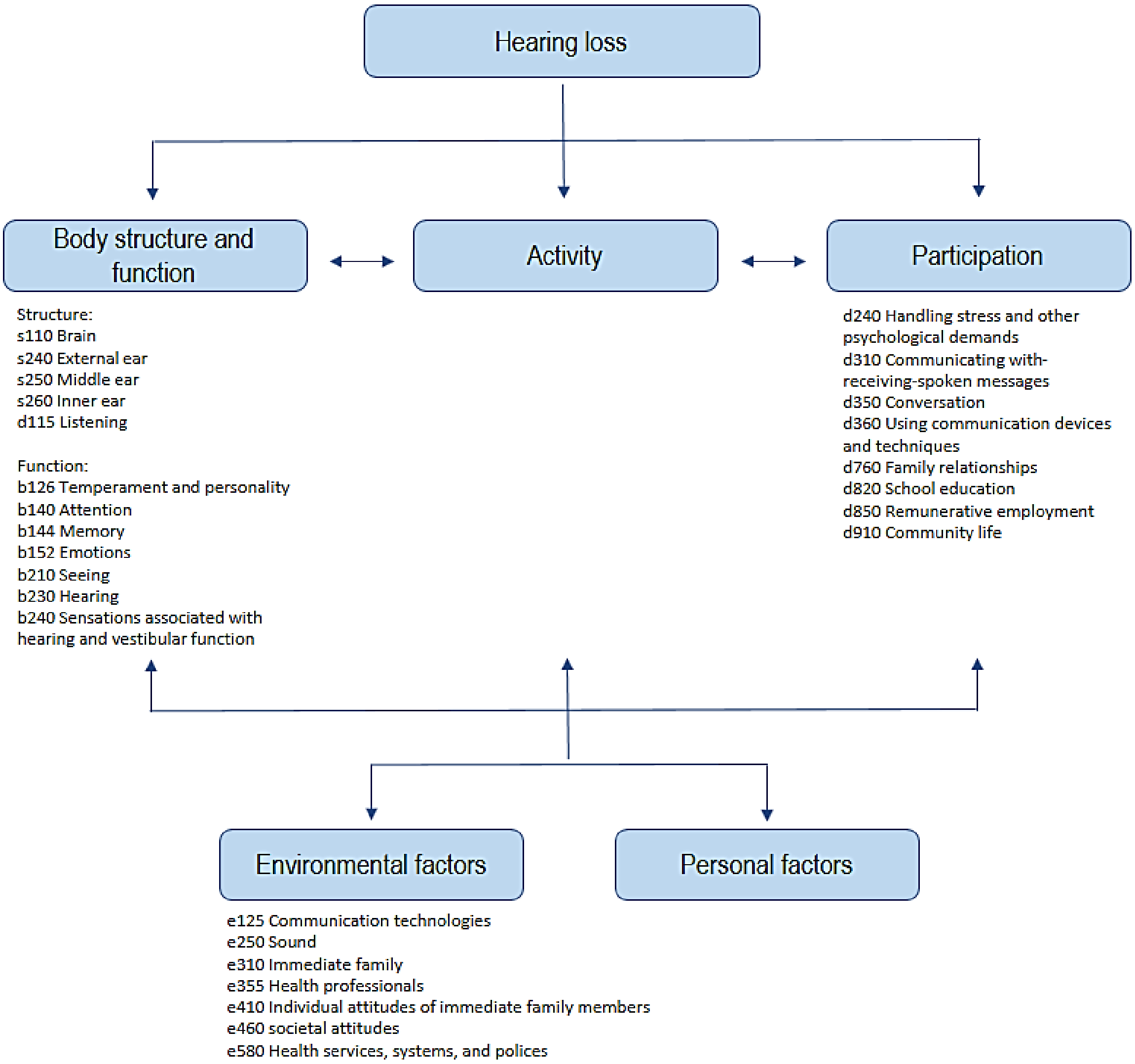

Figure 2: The brief International Classification of Functioning, Disability and Health core sets for hearing loss (Danermark et al., 2013), integrated into the World Health Organisation model of functioning and disability (WHO, 2001).

While implementing a tool like the ICF core sets to help patient-audiologist interaction could help improve the services provided for chronic HL, it is only one of the many available that can affect the interaction as proposed by the CCM. Lexis and Dixon (2004), in their article *Rethinking management of chronic diseases*, argued that the NHS in the UK had not integrated a model such as the CCM, which helps in managing chronic conditions, despite the financial and health burden caused by those conditions, and despite the availability of efficient models that have proved to produce better outcomes when implemented in other countries like the United States of America (USA) and Canada. Unfortunately, difficulties in implementing CCM into clinical practices were reported, such as financial issues, lack of sufficient clinical information system, healthcare audiologists rushing and being busy most of the time and their frequent resistance to change (Rundall et al., 2002). However, there are facilitators that can help overcome these difficulties, such as the existing electronic records or information system, supportive leaderships and external organisations and the organisation's willingness to provide high-quality services (Rundall et al., 2002).

Lewis and Dixon (2004) also recommended and suggested that the NHS in the UK could benefit from implementing the CCM to help shape the broader strategies affecting care for chronic conditions. In the UK, the hearing care service for chronic hearing is shaped by a Clinical Commissioning Group, which chooses hearing care service providers based on the Any Qualified Provider (AQP)[4] scheme that started in 2012 (Barker et al., 2014). The AQP scheme determines which service providers match the required standards. Barker et al. (2014) evaluated these standards and compared them with the CCM concepts. They examined health system documents, such as those used in the AQP scheme to determine adult hearing aid services, and community policy documents, such as the Department of Health documents for long-term conditions care. They conducted content analysis of the documents. A list of keywords was formed from the elements of the CCM, and from words from the elements' definitions that the authors agreed on to be representative of that element. Then, they looked for those keywords in the study documents and checked that they were being used in the appropriate context to include in the analysis. For example, they included the word 'monitor' and looked for it in the study documents, and when found, they checked that it was used in the context of monitoring care-team performance, which is in the definition of the clinical information system element of the CCM. They then calculated the mean word count for each document to take into account that different documents have different lengths, and trimmed 25% of keyword use as a robust way to remove outliers. Finally, they calculated the percentage of consistency for each document with CCM for each element.

They found that the keyword content of the audiology health system documents (AQP documents) did not match well with the CCM elements, compared with the Department of Health documents for long-term conditions. Lower consistency with CCM percentages was found for the audiology documents. The differences were mainly in the self-management and decision support domains, and the delivery system design. This suggests that hearing service providers are being chosen based on targets that lack these elements; therefore, these elements could be deficient in their hearing care services. Further investigation is required to explore how hearing care services and health outcomes are being influenced by deficiencies in the provision of self-management support and decision support, as well as delivery system design. Such research is needed to

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[4] The AQP scheme is a government policy that concerns the hearing care services for adults in the UK, by which an opportunity is given to private hearing care services to provide NHS services.

validate the findings of Barker et al. (2014), although probably by using different research methods, since their content analysis results cannot produce a deep understanding as it is based on word counts and may be lacking in a robust theoretical basis (Mayring, 2014). In addition, their results reflect the content of selected documents, and therefore, the results are likely to be different if other documents are used. Overall, the use of a framework like CCM for managing chronic conditions seems reasonable and promising, and its implementation should be investigated for chronic HL.

2.3.2 Are the current hearing care services patient-centred?

PCC in the hearing care field is attracting considerable interest. PCC has proved to be beneficial in various health conditions, especially in increasing and improving patient satisfaction (Swenson et al., 2004), health practitioner satisfaction (Roter et al., 1997), patient adherence to self-management plans, and overall outcomes (Michie et al., 2003). In the hearing care field, PCC can also be beneficial, especially for improving the quality of service and health outcomes, including patients' QoL. Studies looking into patient-centred traits in audiologists' behaviour, such as in the area of communication and interaction, found that the way the audiologist interacts and communicates with the patient affects the management of the condition as well as QoL and health outcomes (Laplante-Levesque et al., 2010, Poost-Foroosh et al., 2011, Grenness et al., 2015c). Despite the benefits of PCC, it is suggested that it is still poorly employed in audiology services and more research is needed to evaluate it (Ekberg et al., 2014, Grenness et al., 2014a, Grenness et al., 2015a, Action on Hearing Loss, 2016, Shah, 2020).

Findings from a survey carried out in Scotland by RNID revealed that the majority of NHS audiology service users did not think that their management plan was individualised enough for their specific needs (Action on Hearing Loss, 2016). The survey also showed that more than half of the participants reported that their audiologists did not ask them about the effect of their hearing difficulties on their daily work or social life. Surprisingly, 71% of the patients felt 'very' or 'quite' satisfied with the service they received from their local audiology health service. This percentage raises another issue, namely the extent of patients' awareness. Presumably, if they were aware of the ultimate standards of care, like PCC, and were aware of their rights as a patient, these percentages might have been different. Critical appraisal of this survey and its findings was hindered by many issues. This survey was conducted by the organisation RNID, and the report was published on the organisation's website without being subjected to academic peer review. The report also lacked methodological detail and therefore quality judgements were hard to make. Advanced insights into PCC among NHS audiology services could be gained if high quality research was conducted to validate the survey results and conduct the research throughout the UK rather than in Scotland alone.

In spite of the increased awareness around PCC among audiologists and their preference for it (Laplante-Levesque et al., 2014), it is unclear why it has not been fully put into action. There are some potential explanations. First, the standards that shape the hearing care clinical services might be lacking in patient-centeredness. This can be inferred from the findings of the study by Barker et al., (2014) discussed in the previous section (2.3.1). Self-management support and decision-making could be essential for PCC, and the current audiology healthcare system that shapes and pre-defines the audiology interview agenda appears to lack these elements (Barker et al., 2014).

Second, the deficiency in delivering PCC could be due to problems in how audiologists are educated and trained in PCC. Tai, Barr and Woodward-Korn (2018) explored the barriers and facilitators to teaching PCC in audiology programs in Australia. They conducted interviews with audiology teachers to explore their perspectives on the topic. They found that PCC teaching is influenced by four agendas: first, knowledge and understanding of PCC. Second, individual factors like individual communication skills and the ability to interact with people. Third, professional culture and values like professional attitude toward PCC and to what extent the professional is bio-medically driven. Fourth, contextual factors such as organisation in hearing clinics where placement take place, or university obligations and resources. The study of Tai, Barr and Woodward-Korn (2018) offers valuable knowledge into why PCC is not explicitly implemented into hearing clinical care; however, their study has only examined this in one country, whereas audiology teaching programs are likely to be different in other countries.

Moreover, their findings represent only the perspectives of the interviewed audiology teachers, who were all academics and not necessarily involved in clinical practice. It would be interesting to explore the perspectives of audiology students and audiologists active in clinical practice as well. The literature holds plenty of data gathered from service users but not so much from audiologists. Further research that involves audiologists in the PCC research field would be of great value because understanding audiologists' perspectives, and in particular, their experiences would help identify the issues they perceive are important and which may affect care quality and patient outcomes. Identifying and addressing those issues could ultimately produce better patient outcomes.

Efforts have been made to boost the quality of audiology services in the UK, and they are continually improving (Barker et al., 2014). For example, the hearing technologies available to NHS service providers has improved through advances in the quality of hearing aids. Moreover, there is increased awareness among policy makers, service providers and audiologists of the crucial implementation of the PCC approach, especially for chronic HL. However, the previous discussion shows that audiologists' interactions with their patients, as well as the current hearing care system, remains a benchmark of patient-centeredness. Further evaluation is therefore required to estimate patient-centeredness in auditory rehabilitation clinics, and to identify the barriers associated with that. In addition, it is necessary to further evaluate audiology service providers to assess how they support self-management and decision-making and how that influences their patient-centeredness.

2.4 Hearing loss among workers: a review from a quality of life perspective

2.4.1 Introduction

A worker with HL is someone who experiences hearing difficulty or has been found to have HL after audiological tests. According to the UK government, a worker is defined as a person who has an arrangement, such as a contract, to carry out work or services personally for remuneration or other kinds of benefits, such as a promise of future work (UK Government, 2021). This means that a worker could have a paid or unpaid job. It is worth noting that the term worker includes all employees, but employees have a contract and have more rights and responsibilities that may not apply to workers who are not employees (UK Government, 2021). This research follows the above definition of a worker (UK Government 2021) and also includes voluntary workers since this type of work is a life activity that could also be affected by hearing disability. In addition, some adults with hearing loss may be doing voluntary work because non-voluntary work could be difficult to access due to HL.

In countries with ageing populations, such as the USA, Australia, and the UK, workers' retirement age is increasing. The current retirement age in the UK is 65 years, and that number is expected to rise to 68 years by 2037, mainly due to increasing life expectancies and the increasing age for state pensions (Department of Work and Pensions and Gauke MP, 2017). The UK government had intended to raise the state pension age to 68 years in 2044 rather than in 2037, but plans were brought forward to overcome the potential financial burden of an ageing population (Department of Work and Pensions and Gauke MP, 2017). As it is now possible to work legally beyond state pension age in the UK, the workforce comprises an increasingly larger number of older workers.

Figure 3 below shows trends of change in the employment rate[5] for people aged 50 years and over in the UK from 1992 to 2018. It is clear from the graph that the employment rate of older workers is increasing, especially those in the 50 to 64 years age range. Such demographic changes in the workforce are leading to larger numbers of workers with HL, since it is closely linked to age (Davis, 1989, Davis, 1995, Stevens et al., 2011).

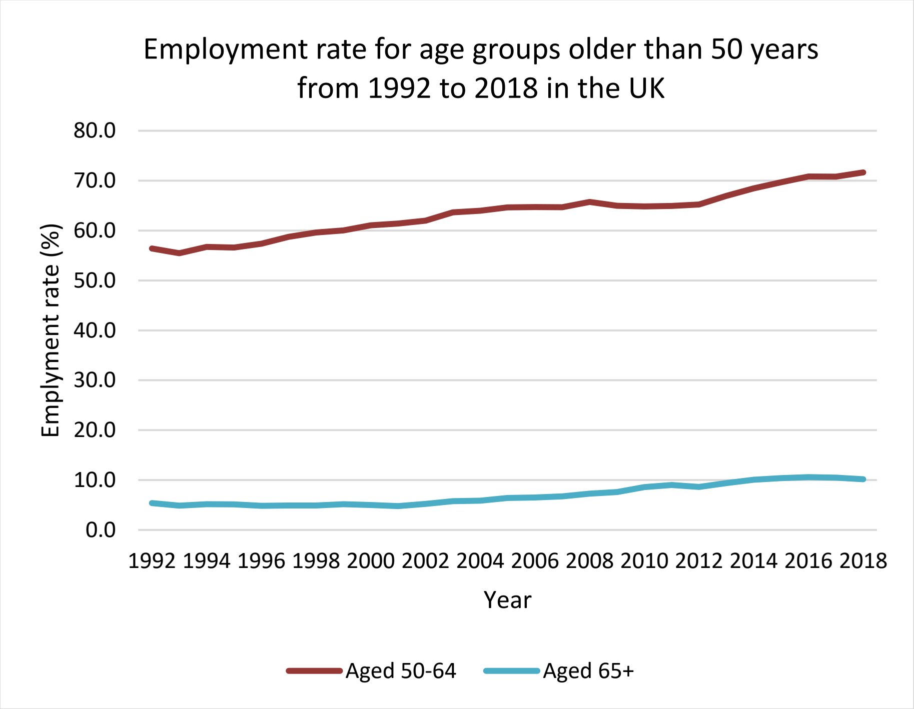

Figure 3: Employment rate for age groups older than 50 years from 1992 to 2018 in the UK. The data used in this graph was obtained from Office for National Statistics (2018a), Office for National Statistics (2018b).

Researchers have noticed a rapid increase in the risk of acquired HL after 50 years, although studies have shown that acquired HL due to ageing can start as early as 30 years of age (Davis, 1989, Wilson et al., 1999, Agrawal et al., 2008, Feder et al., 2015). As working adults grow older, hearing difficulties are likely to arise, creating challenges both in and out of the workplace. Even for milder cases of acquired HL, the loss of hearing affects the QoL and health of affected workers adversely (Monzani et al., 2008) (the QoL of workers will be discussed in depth in Section 2.4.2). In addition to HL related to ageing, there are individuals who are born with HL as well as those who develop it later in life due to other reasons, such as exposure to noise. All of these groups are prone to experiencing hearing-related struggles in their working lives.

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[5] The employment rate is the proportion of people in a population who are employed, e.g. the employment rate for people older than 50 years is the proportion of those who are in employment out of the total population older than 50 years.

Before discussing the effects of HL on workers' QoL, it is worth elaborating here on the concept of QoL and how this has been approached in this thesis. HL is known to adversely affect many dimensions of life and therefore affects QoL. HL extends beyond the facts of hearing impairment because communication difficulties can then be detrimental to many aspects of life, such as social life, leisure activities and work. The central questions are, what is QoL and what contributes to it? The WHO (1995) defined it as:

> *'Individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns'*

Generally, the term QoL is commonly used to refer to the general wellbeing of an individual (Post, 2014). But, to date, there is no clear criteria outlining the dimensions that it delineates. It is also not known which dimensions exert the greatest influence on QoL. Authors frequently argue that it is challenging to describe QoL because its meaning varies between individuals (Post, 2014). How people evaluate and judge their QoL can vary due to their approach to life, life goals or different religious and cultural values. In other words, QoL is highly subjective. However, some authors suggest a number of shared dimensions that could be used to measure QoL, such as health status, psychological and emotional wellbeing, social functioning and work functioning (for reviews see Buhagiar, (2012); Post, (2014); and Charlemagne-Badal et al., (2015).

Post (2014) suggests an approach that can benefit researchers when studying QoL in order to overcome its vagueness. The suggestion was that researchers should be very clear about three things: the 'concept', the 'what', and the 'how'. To clarify the 'concept', the researcher should define QoL in the context of their area of research, and what measures they use to evaluate it, i.e. they should be very specific about what they mean by the term QoL. An example of a study with a clear concept could be: An exploration of occupational, psychosocial and healthcare factors that influence the subjective QoL of workers with HL. The 'what,' refers to the dimensions chosen to measure QoL in a particular research topic. Post (2014) proposes that researchers should select or design QoL measures based on their research aims and objectives. For example, Buhagiar (2012) developed QoL measures to study the effects of receiving a second cochlear implant on patients' QoL. Studying a sample of patients who had one cochlear implant and then received a second, Buhagiar (2012) identified domains of QoL and then asked for patients' subjective evaluation of these domains via interviews and open ended-questionnaires. Examples of Buhagiar (2012)' QoL domains were happiness and wellbeing, lifestyle and social relationships, and communication. The QoL measure (a questionnaire) was developed based on these domains, with clear dimensions that were specific to the goals of the research.

There also exists the Schedule for the Evaluation of Individual Quality of Life-Direct Weighting (SEIQoL-DW QoL). This is a common face-to-face interview method that measures QoL by generating the dimensions directly from participant responses and can be used to produce individualised QoL measurements (Hickey et al., 1996). Thus, the SEIQoL-DW allows the respondents to select and evaluate the dimensions that are important to their QoL. Other examples of established QoL measures are the WHOQOL-BREF and Social Functioning-36. Post (2014) identifies two issues with the 'what'. First, most researchers use established QoL measures such as the WHOQOL-BREF and Social Functioning-36, especially in the medical field, and developing a QoL measure for every research topic seems impractical. Second, this would lead to an infinite number of QoL measures and domains, which would highly complicate the comparison of research findings and would hinder any systematic reviews. Regarding the 'how', Post (2014) argues that measuring QoL should also be clear. For example, QoL could be evaluated through measures of performance or measures of experience. Measures of performance are more objective and are usually accomplished via questionnaires asking respondents to rate independence or frequency of behaviour. On the other hand, measures of experience are subjective, such as perceived difficulty or perceived satisfaction.

The following two sections present the available evidence on the difficulties faced by workers with HL, how these difficulties affect QoL, and how the workers cope. The aim is to provide an overview of what is known about the difficulties faced by this population and how these affect QoL, and to set this within a synthesised conceptual framework as well as exploring what is known about their coping in the workplace. The conceptual framework was built in this literature review to outline the measures used to define workers' QoL as used in this thesis. The measures are: auditory aspects, occupational aspects, employment status, behavioural aspects, psychosocial aspects and physical health. QoL includes both subjective and objective assessments, although the 'what,' and the 'how' are not made definitive here because this review compares studies that use different 'whats' and 'hows'. That is, the individual studies were done with different aims and objectives, and therefore had different measures of QoL (the 'what'), with some measuring performance and others measuring experience (the 'how').

2.4.2 Working-age adults living with hearing loss

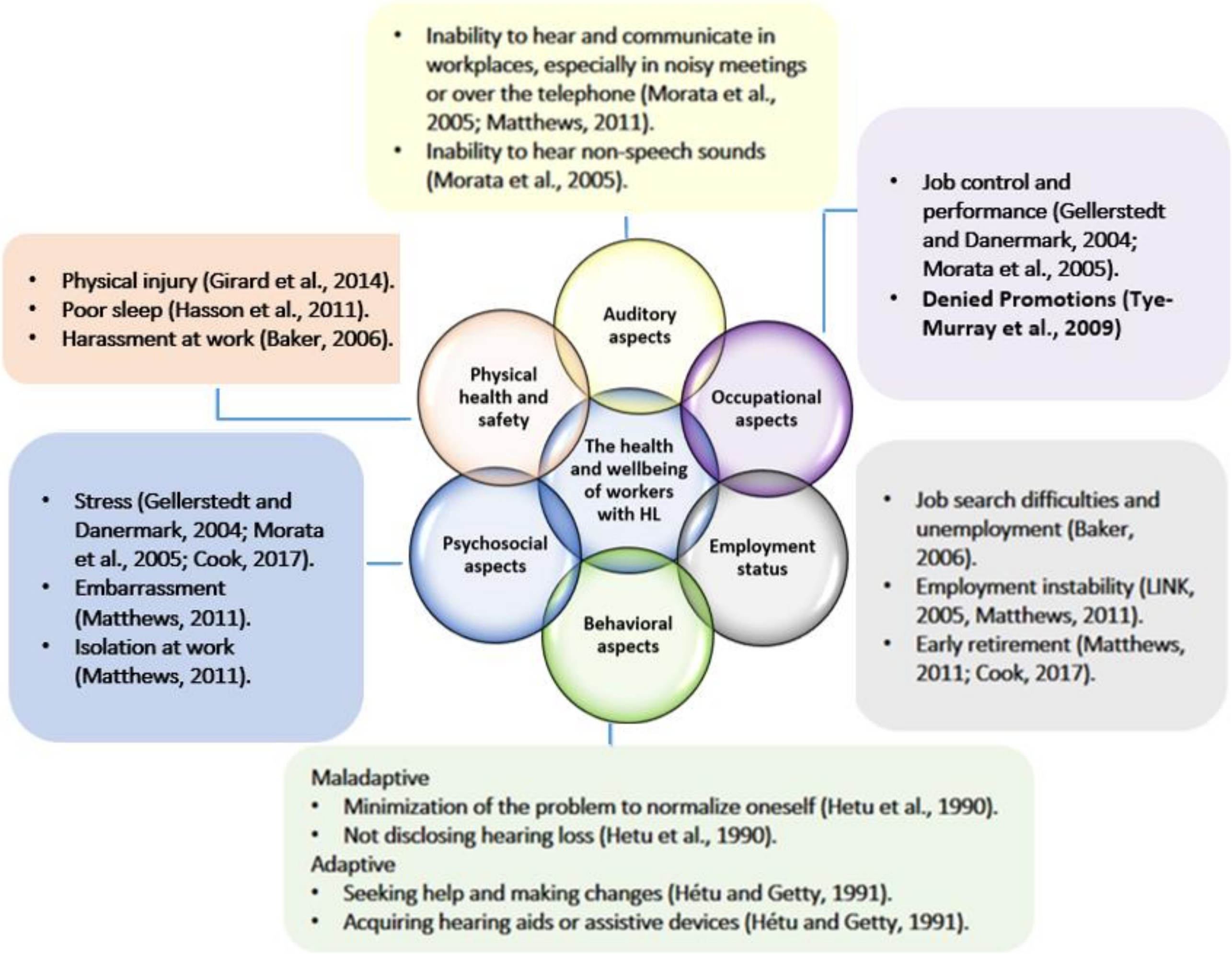
The literature holds plenty of evidence that HL adversely affects many aspects of day-to-day life and is known to reduce the QoL of those affected by it (Nordvik et al., 2018). Adults with HL tend to experience restrictions in their ability to participate that go beyond social life and involve other important aspects, such as work. Evidence at the international level, including grey literature, irrespective of its quality, touches on the following issues; the impact of HL on employment opportunities, day-to-day work life, and psychosocial issues including fatigue and ability to adapt to different environments (Gellerstedt and Danermark, 2004, Baker, 2006, Kramer et al., 2006, Punch et al., 2007, Jennings and Shaw, 2008, Nachtegaal et al., 2009, Tye-Murray et al., 2009, Mathews, 2011, Nachtegaal et al., 2011, Jahncke and Halin, 2012, Nachtegaal et al., 2012, Arrowsmith, 2014, Fischer et al., 2014, Hua et al., 2014, Trotter et al., 2014, Hua et al., 2015, Arrowsmith, 2016, Punch, 2016, Cook, 2017, Svinndal et al., 2018, Shan et al., 2020), gender differences (Hallberg, 1999, Gellerstedt and Danermark, 2004), employers perspectives and experiences working with individuals who have HL (Stokar, 2016, Svinndal et al., 2020a), impact of HL in specific jobs like the military (Alamgir et al., 2016) or farming (Canton and Williams, 2012), barriers and facilitators in the workplace, accessibility issues and workplace accommodation and support (Shaw et al., 2013a, Svinndal et al., 2018, Koerber and Jennings, 2020, Svinndal et al., 2020b), economic aspects of HL in relation to employment and productivity loss (Kim et al., 2018, Shield, 2018).

While some research focusing on workers with HL exists, reviewing these revealed the following issues: first, most of these studies focused on one or a few specific aspects of their problems. For example, there are papers looking into workers’ job performance, such as those by Morata et al. (2005), Kramer et al. (2006), while others investigate their need for recovery, e.g. Nachtegaal et al. (2009). Most of these studies are experimental, relying on laboratory tests to measure performance, for example, which makes translating the findings into a real-world context somewhat limited, and attempting to ascertain implications and make decisions based on them can be difficult. Second, In the UK, some of the challenges were investigated qualitatively and quantitatively by the organisation RNID (Mathews, 2011, Cook, 2017, Action on Hearing Loss, 2018). Although the RNID research contains much methodological ambiguity and quality issues when compared with academic publications, it provides insights into the experiences of UK workers that have not been considered elsewhere. Only one peer-reviewed study focusing on UK workers was found, and this reports an investigation of UK workers’ employability and work satisfaction after receiving a cochlear implant (Fazel and Gray, 2007). Other than these, no research targeting UK workers was found.

The available data in the literature comes mostly from studies conducted in a limited number of countries such as the Netherlands, Canada, Australia, USA, Sweden and Norway (Backenroth and Ahlner, 2000, Yoder and Pratt, 2005, Jennings and Shaw, 2008, Kramer, 2008, Hallberg and Carlsson, 2009, Jennings et al., 2010, Shaw et al., 2013a, Trotter et al., 2014, Punch, 2016). Third, there is a scarcity of quality research looking into the QoL of workers with HL or their general wellbeing. For example, the title of one study purported to be an investigation of the QoL of workers before and after rehabilitation and counselling (Backenroth and Ahlner, 2000), but reading the paper revealed many issues that prevent drawing solid conclusions from the study. For example, there is a lack of clear approach to assessing workers’ QoL and no description of how the analysis was conducted.

In a recent scoping review of key issues related to HL in working life (Granberg and Gustafsson, 2021), the authors conducted a narrative analysis of the literature on this subject. This analysis produced three themes, first, individual experiences, second, work environment in both the social and physical contexts, and third, work issues such as employability. As found in researching this present review, Granberg and Gustafsson (2021) discovered many studies which mention working life and experiences with HL, but the findings are rarely discussed. The authors also spotted many critical deficiencies in the literature, including a general lack of published research focusing on workers with HL during the last three decades, the absence of a multidimensional perspective that considers the individual in working life as well as in societal and organisational contexts, and they identified deficiencies in the reporting of workers’ vocational rehabilitation. The Granberg and Gustafsson (2021) review is timely and is closely linked to this thesis. Granberg and Gustafsson (2021) detect many gaps in knowledge in reviewing the literature between 2017 and 2021. These gaps, especially the lack of multidimensional understanding of HL in work life from a wellbeing perspective, have motivated the development of a conceptual framework at the start of this PhD project.

The following discussion presents this conceptual framework (Figure 4) with its elaboration in Tables 2-7 (developed from the literature review). Not only does it illustrate the issues that could arise due to having HL and working, but it also proposes that these different aspects are interrelated, which is an issue that has not received attention in earlier research on workers.



- Inability to hear and communicate in workplaces, especially in noisy meetings or over the telephone (Morata et al., 2005; Matthews, 2011).
- Inability to hear non-speech sounds (Morata et al., 2005).

- Physical injury (Girard et al., 2014).
- Poor sleep (Hasson et al., 2011).
- Harassment at work (Baker, 2006).

- Job control and performance (Gellerstedt and Danermark, 2004; Morata et al., 2005).
- **Denied Promotions (Tye-Murray et al., 2009)**

- Stress (Gellerstedt and Danermark, 2004; Morata et al., 2005; Cook, 2017).
- Embarrassment (Matthews, 2011).
- Isolation at work (Matthews, 2011).

- Job search difficulties and unemployment (Baker, 2006).
- Employment instability (LINK, 2005, Matthews, 2011).
- Early retirement (Matthews, 2011; Cook, 2017).

Maladaptive
- Minimization of the problem to normalize oneself (Hetu et al., 1990).
- Not disclosing hearing loss (Hetu et al., 1990).

Adaptive
- Seeking help and making changes (Hétu and Getty, 1991).
- Acquiring hearing aids or assistive devices (Hétu and Getty, 1991).

Figure 4: Diagram showing the different inter-related aspects of having hearing loss and being a worker, which influence the quality of life of workers. In addition, it shows some examples for each aspect. (Hétu et al., 1990, Hétu and Getty, 1991, Gellerstedt and Danermark, 2004, LINK, 2005, Morata et al., 2005, Baker, 2006, Hasson et al., 2011, Mathews, 2011, Girard et al., 2014, Cook, 2017).

First are the auditory aspects. Table 2 below lists the auditory difficulties faced by workers. In general, auditory demands at workplaces could be divided into communication and safety demands, and both vary from one workplace to another. Communication difficulties in the workplace were reported and emphasized by many studies; on the other hand, there is limited research reporting safety problems due to HL at the workplace. This could be a result of changes in responsibilities and jobs due to HL; however, there is no evidence to support that. As Table 2 lists, workers with HL reported that they find it hard to hear in group situations such as meetings, and some find it difficult to use the telephone at the workplace. The struggle is more when they are in noisy places, but still exists in quiet areas. This might influence the occupational aspects of their life, including work performance. Their inability to hear sounds can also prevent them from localising the sound source and hearing non-speech sounds like fire alarms, which can affects their safety and physical health. HL might also influence a worker's social life, behaviour, psychological health, and employment status, because these aspects are interconnected as demonstrated in the proposed conceptual framework. For example, in one study, difficulties with telephone use led some workers with HL to quit their job, or retire early, and more dismissals occurred due to this difficulty than for any of the other HL related barriers (Scherich, 1996).

Table 2: Auditory aspects that influence the quality of life of workers with hearing loss.

Auditory aspects
• Inability to hear speech in noise, like in noisy workplaces, meetings or over the telephone (Scherich, 1996, Scherich and Mowry, 1997, Backenroth and Ahlner, 2000, Laroche and Garcia, 2001, Morata et al., 2005, Punch et al., 2007, Mathews, 2011, Hua et al., 2015). • Inability to hear speech in quiet (Morata et al., 2005, Mathews, 2011). • Inability to hear non-speech sounds (Morata et al., 2005). • Difficulties in sound localisation (Kramer et al., 2006)

Second are the occupational aspects. Table 3 below lists the occupational issues in relation to workers with HL. Hearing is a crucial ability in many occupations (Kramer et al., 2006). Several occupation-related outcomes can result from having a hearing difficulty. One example is the individual's occupational performance. Kramer et al. (2006) studied the occupational performance of 210 workers, 150 of whom had HL. They used the Amsterdam checklist for hearing and work, which was formulated to be used in their study. This checklist is composed of three main sections. The first asks about participants' job characteristics. The second incorporates questions about the need for hearing in the workplace (e.g. meetings, telephone calls), and the third asks about general work conditions (e.g. job control, job demands and satisfaction). The results showed that workers with HL felt less in control while tasking in the workplace than normal hearers, despite reporting the same level of job demands. Moreover, participants with HL were more affected by noise in the workplace when compared with normal hearing participants. Their perception of background noise was higher than that of normal hearers when having conversations at work.

A different study with an experimental nature found that workers' performance in a cognitive task was not affected in the HL participants when compared with normal hearers, whether there was noise or not (Hua et al., 2014). On the surface, this contrasts the results of Kramer et al. (2006), but the HL group reported higher perceived disturbance from noise during the task compared with normal hearers, similar to the findings of Kramer et al. (2006). The results of these two studies means that evaluations of noise levels in the workplace may need to consider the signal-to-noise ratio rather than the noise level per se. Additionally, occupational performance, whether affected by HL or not, is mostly dependant on many other factors such as the nature of the task (e.g. cognitive or manual) and the way performance is measured (e.g. self-reported or experimentally measured) and the measured outcome (e.g. time needed to accomplish the task or accuracy of tasking). This may explain differences in the results of Kramer et al. (2006) and Hua et al. (2014).

Table 3: Occupational aspects that influence the quality of life of workers with hearing loss.

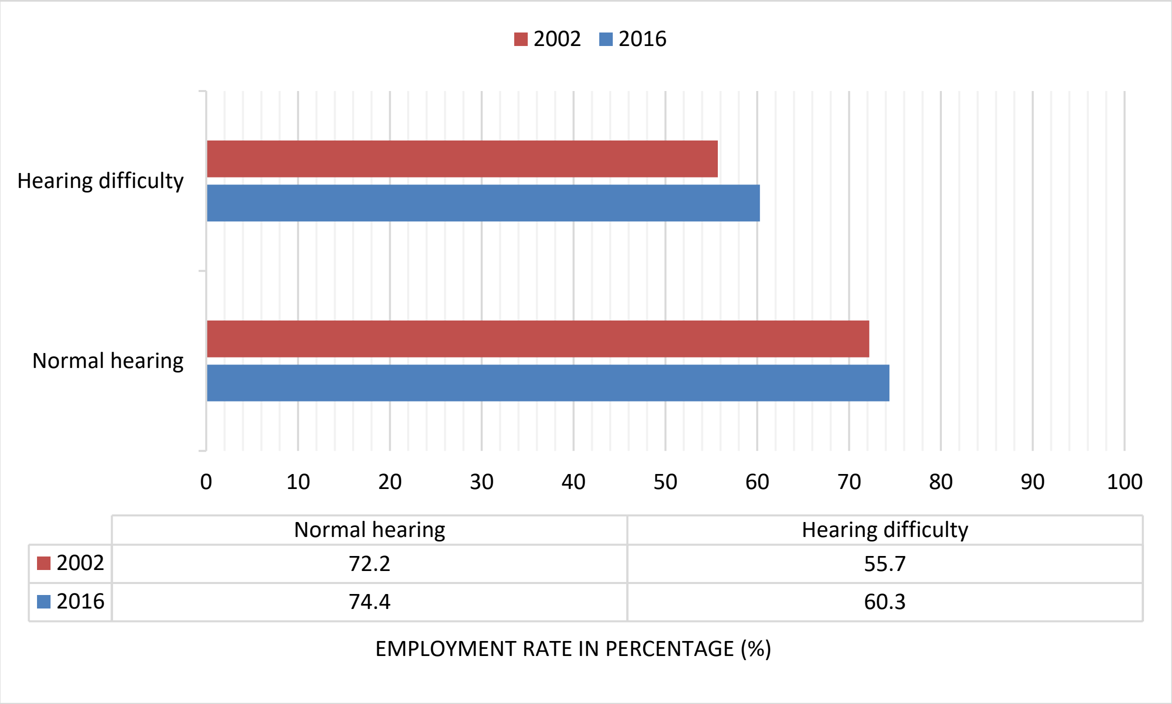
Occupational aspects
• Difficulties carrying on demanding communication tasks at work and detriment to occupational performance (Scherich, 1996, Scherich and Mowry, 1997, Backenroth and Ahlner, 2000, Laroche and Garcia, 2001, Morata et al., 2005, Kramer et al., 2006, Tye-Murray et al., 2009, Mathews, 2011, Jahncke and Halin, 2012, Hua et al., 2015). • Challenging environment/ Job control (Gellerstedt and Danermark, 2004, Morata et al., 2005, Kramer et al., 2006). • Loss of competitive edge at work (Tye-Murray et al., 2009). • Higher level of disturbance from loud work-related noise (Kramer et al., 2006, Hua et al., 2014). • Take more sick leaves (Kramer et al., 2006, Nachtegaal et al., 2012, Svinndal et al., 2018). • Discrimination (Hétu et al., 1990). • Being denied promotion (Tye-Murray et al., 2009).

Third are the employment aspects, which are listed in Table 4 below. Employment is another aspect that was found to be affected by HL. Overall, most of the previous research indicates that people with HL are less likely to be in employment. However, one study found no difference in working-age adults employment compared with controls (Thomas and Herbst, 1980). This contrasting finding could be explained by several issues. First, 82% of the participants in Thomas and Herbst (1980) had mild-moderate HL. Those with severe-profound HL were more likely to experience employment detriments, and this group constituted a small percentage of the sample (18%). Their study also included only hearing aid users who sought professional help and accepted using hearing aids during the 1970s. It is worth noting that this was a time during which HL-related social stigma was stronger. Therefore, the participants in this study may have been more accepting of their HL and may have coped better and been more active in their working life compared with those who did not wear aids.

Table 4: Employment aspects that influence the quality of life of workers with hearing loss.

Employment status
• Job search difficulties and unemployment (Blanchfield et al., 2001, Baker, 2006, Fazel and Gray, 2007, Punch et al., 2007, Jung and Bhattacharyya, 2012, Stam et al., 2013, Emmett and Francis, 2015, Department for Work & Pensions and Department of Health & Social care, 2020, Shan et al., 2020, Office for National Statistics, 2021) . • Employment instability and job loss (Scherich, 1996, LINK, 2005, Jennings and Shaw, 2008, Mathews, 2011). • Early retirement (Scherich, 1996, Andersson and Hägnebo, 2003, Mathews, 2011, Helvik et al., 2013, Fischer et al., 2014, Christensen and Gupta, 2017, Cook, 2017, Action on Hearing Loss, 2018). • Lower income compared to normal hearers (Shield, 2018)

To explore further this inconsistency in previous research, we shall now look at some UK-based statistics. Figure 5 below shows the employment rates, for people who self-reported hearing difficulty and those who did not, in the UK in the years 2002 and 2016.



	Normal hearing	Hearing difficulty
🟥 2002	72.2	55.7
🟦 2016	74.4	60.3

Figure 5: The employment rates for working-age adults (16-64 years) per self-reported hearing status in the years 2002 and 2016 in the UK. The employment rates for normal hearing people for the years 2002 and 2016 were obtained from the Office for National Statistics (2018b) and for people with hearing difficulty in 2002 from the Office of Disability (2008) cited by Riddell (2010) and for the year 2016 from Department of Work and Pensions and Department of Health and Social Care (2017).

The figure illustrates that adults reporting hearing difficulties are less likely to be employed than those who do not have hearing difficulties; those with hearing difficulties had lower employment rates than normal hearers in both years. However, the employment gap[6] reduced over time. The most recent statistics, published in 2020/2021, show the same trend. In 2019, the proportion of working-age people in the UK who were in employment out of the total number of those with HL was 61.1%, lower than that for the general working-age population, which was 76.1% (Office for National Statistics, 2021), which was also the case in previous years, despite improving over time.

The lower employment rate for workers with HL, although it is improving, it is still lower than that for hearing people. Why people with hearing difficulties are less likely to be employed compared to normal hearers is not clear. One could argue that the reasons are multifactorial. One reason is that employers may hesitate to hire those with disabilities (Cook, 2017) or that adults with HL tend to have a lower level of education (Emmett and Francis, 2015), which leads people to face job search difficulties (Baker, 2006). Another reason could be that workers with HL tend to retire early. In their report of 2018, the RNID found that 56% of those who retired early related that to their hearing problem (Action on Hearing Loss, 2018).

Fischer et al. (2014) also compared the retirement incidence of people with and without HL and found that there was a significantly higher rate of retirement for the HL group; however, after corrections for age, gender, general health and hearing technology use, there was no significant difference. This further indicates that the HL and auditory difficulties should not be viewed alone and could be interacting with the other aspects such as psychosocial health, physical health and adaptation strategies. Further to support this suggestion of interaction between the framework domains, a survey by RNID showed that 72% of those who retired early did so because of stress at work related to their HL (Action on Hearing Loss, 2018). On the other hand, another study suggests that staying in employment helped workers' social lives and mental health (Ringdahl and Grimby, 2000). Finally, another employment aspect can be financial. Shield (2018) conducted a review and found that workers with HL have lower incomes than hearing workers due to reasons that include workers with HL working more in lower-paid jobs and being under-employed. All of the evidence clearly shows that adults' employability can be adversely affected if they have HL.

Fourth, adaptive and maladaptive behaviours. Table 5 below includes some adaptive or maladaptive behaviours in relation to workers with HL. Human behaviour can be complicated, especially when there are complexities such as work difficulties because of hearing problems.

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[6] The employment gap is the difference between the employment rates. Here it represents the difference between the employment rates of those who have HL and those who do not.

Workers with HL may behave in adaptive or maladaptive ways depending on many factors. These behaviours of workers with HL are lightly investigated in the literature, and some of the available evidence can be considered to be outdated. Maladaptive behaviour can be in the form of not seeking help, not disclosing HL, attempts to normalise oneself and minimising the problem, while seeking help and HL disclosure can be considered as adaptive actions.

Table 5: Behavioural aspects that influence the quality of life of workers with hearing loss.

Behavioural aspects
Maladaptive • Minimisation of the problem to normalise oneself (Hétu et al., 1990). • Extremely trying situation (Gellerstedt and Danermark, 2004). • Not disclosing HL (Hétu et al., 1990, Southall et al., 2011, Action on Hearing Loss, 2018). • Hostility (Monzani et al., 2008). Adaptive • Seeking help and making changes (Hétu and Getty, 1991, Trotter et al., 2014). • Disclosure of HL to others at work (Hétu and Getty, 1991, Tye-Murray et al., 2009, Hua et al., 2015). • Requesting from communication partners or colleagues to facilitate communication through various techniques (Hétu and Getty, 1991, Tye-Murray et al., 2009, Trotter et al., 2014, Hua et al., 2015). • Learning to become more confident about dealing with difficulties at workplace in relation to HL (Hétu and Getty, 1991). • Regulate the environment through adjustments to facilitate communication (Tye-Murray et al., 2009, Hua et al., 2015). • Acquiring hearing aids or assistive devices (Hétu and Getty, 1991, Tye-Murray et al., 2009, Trotter et al., 2014, Hua et al., 2015). • Higher commitment to work (Cinamon et al., 2008).

One of the investigated adaptive behaviours is HL disclosure, whether to employers or colleagues. A recent survey in the UK by RNID found that more than half of the participants did not disclose their hearing problems (Action on Hearing Loss, 2018). The factors that affect a worker's decision not to disclose HL in the workplace are various; for example, they might fear being stigmatised at work or fear losing their job (Southall et al., 2011). Currently, the UK government is changing its policies to improve the workplace situation for workers with HL and support them. Reasonable adjustments are required from the work stakeholders, and there is a big emphasis on equality after the Equality Act 2010; therefore, these factors may change, and workers can become more confident in order to tell their employers and co-workers about their HL, and request some adjustments. Section 2.4.3 will discuss further the literature about HL and coping with it in working life.

Fifthly, psychosocial aspects. Table 6 below lists the psychosocial issues in relation to the population of workers with HL. There is evidence to suggest that workers with HL are more affected by work-related stress (Gellerstedt and Danermark, 2004, Morata et al., 2005, Kramer et al., 2006, Mathews, 2011, Cook, 2017), and take stress-related sick leave (Kramer et al., 2006). Moreover, many feel embarrassed and have a negative self-image (Mathews, 2011). Isolation at work, anxiety, depression and even suicidal thoughts were also reported (Monzani et al., 2008, Mathews, 2011). On the other hand, there is some evidence to suggest that full-time workers with HL are less affected by social isolation than non-working ones (Ringdahl and Grimby, 2000). Social aspects of the issue might include the family's role in influencing work-related aspects, whether positively or negatively. To the best of the author's knowledge, there is no research as yet which addresses the role of the family and its influence, and social aspects in general.

Table 6: Psychosocial aspects that influence the quality of life of workers with hearing loss.

Psychosocial aspects
• Stress (Gellerstedt and Danermark, 2004, Morata et al., 2005, Kramer et al., 2006, Mathews, 2011, Cook, 2017). • Anxiety and fear (Monzani et al., 2008, Mathews, 2011). • Denial or unease in talking about it (Mathews, 2011). • Negative self-image and embarrassment (Mathews, 2011). • Concerns about and feelings of being stigmatised (Hétu et al., 1990, Tye-Murray et al., 2009, Wallhagen, 2010, Southall et al., 2011). • Concerns about future quality of life and employability (Morata et al., 2005). • Feeling less valued and isolation at work (Punch et al., 2007, Mathews, 2011, Canton and Williams, 2012). • Depression and suicidal thoughts (Monzani et al., 2008, Mathews, 2011). • Effortful listening (inconsistent findings in the literature, see Appendix A) • Fatigue and tirdness (Backenroth and Ahlner, 2000, Morata et al., 2005, Hua et al., 2015, Svinndal et al., 2018, Holman et al., 2019) and increased need for recovery after work (Nachtegaal et al., 2009).

Stigma in the workplace is another problem reported by workers with HL (Tye-Murray et al., 2009, Southall et al., 2011). It was reported as a significant issue affecting workers' sense of identity in the area of occupational HL in the previous decades (Tye-Murray et al., 2009). It has been suggested that the problem of stigma in the workplace has decreased with time and does not now constitute a major issue for workers (Tye-Murray et al., 2009). However, it would be interesting to explore whether stigma still constitutes a barrier to people with HL in the workplace given that legislations for disabilities had been set, and that awareness of disabilities and HL might have improved since then.

Another psychological aspect of HL that should be considered is the amount of mental effort that workers with HL need to exert in order to listen in the workplace. It is possible that HL gives rise to the need for much greater concentration and mental effort to listen compared to that exerted by hearing colleagues. In previous research, workers have reported mental exhaustion, tiredness and fatigue (Morata et al., 2005, Svinndal et al., 2018, Holman et al., 2019) which might drain their mental capacity and consequently affect their performance in other tasks. Holman et al. (2019)

suggest that a persons' wellbeing can be adversely affected by listening-related fatigue; however, this was also found to be influenced by many factors such as hearing technology use and the literature is inconsistent regarding the link between HL and effortful listening overall and does not focus on the population of workers with HL.

There has been a lot of recent interest on this topic (effortful listening) due to the emergent focus on HL and its association with the risk of dementia. It is known that ageing, as well as HL, are associated with cognitive decline and dementia (Bernabei et al., 2014, Nadhimi and Llano, 2020), but it is not very clear how the work life of the individual might influence their cognitive function and risk of dementia. The increasing prevalence of dementia and its link to HL has received much attention in the past decade (Bernabei et al., 2014, Nadhimi and Llano, 2020) and recent research has proved that HL is a risk factor for dementia and proposes theories that explain that the mechanism for risk, namely the common cause, social isolation, and cognitive load theories. In theory, working can feed back into both the social isolation and cognitive load theories, and consequently decrease or increase the worker's risk of dementia. This would indicate that effective management of HL for working patients could be critical to their risk of developing dementia.

An overview of the emerging literature linking HL and dementia is provided in Appendix A. The aim of this overview is to provide an understanding of how work can contribute to the risk of dementia and how improving the work life of people can protect them from dementia. The risk of dementia among workers is discussed in the Appendix to deliver two main arguments. First, whatever the reason for the links between HL and dementia (social isolation or effortful listening and cognitive load), work comes into the interplay with those. Social exclusion at work and loss of job or early retirement feed into the social isolation hypothesis. In addition, if people with HL go to work and it is effortful, that feeds into the cognitive load theory. Second, making sure that people are not excluded from work and when they are at work, they are not exhausted, would be a good thing to do to decrease the risk of dementia, as well as improve QoL. However, much uncertainty still exists about the listening effort at work and further research is required. Future studies should also be designed to investigate the risk of dementia among this population. Another occupational aspect is the worker's need for recovery after work. Nachtegaal et al. (2009) studied the relationship between hearing status and the need for recovery after finishing work. They found that workers with HL needed more time to rest after work than normal hearers. The aetiology is unknown but it could well be related to the demands of concentrated and effortful listening.

The final aspect is physical health. Table 7 below lists some of the physical aspects of coping with HL in working life. To the best of the author's knowledge, there is little research which specifically addresses the physical health of workers with HL. In one study, workers reported having worse physical health due to work-related stress, especially women (Gellerstedt and Danermark, 2004), and sleep problems were reported among Swedish workers (Hasson et al., 2011). Moreover, in another survey, 26% of participants believed that HL was the reason they were harassed at work (Baker, 2006). Working with HL may also cause safety risks. Workers with HL have particular concerns about health and safety at work because of being unable to hear warning sounds such as shouted warnings, alarm bells, or sirens (Morata et al., 2005). Also, workers might not be able to hear certain important noises such as running machinery or be able to manage critical hearing tasks[7] such as those found in the military. Hearing ability is very important in certain jobs such as the military or coast guards, and this has motivated the development of tests to screen workers for hearing-critical tasks that takes into account the levels of background noise in an environment (Semeraro et al., 2017).

Table 7: Physical health aspects that influence the quality of life of workers with hearing loss.

Physical health
• Bad general physical health (Gellerstedt and Danermark, 2004). • Poorer sleep quality (Hasson et al., 2011). • Harassment at work (Baker, 2006). • Risk of safety and physical injury due to accidents (Morata et al., 2005, Girard et al., 2014).

2.4.3 Coping with hearing loss in the workplace

The previous discussion in the literature review showed that workers with HL have to cope with many challenges in their working lives. This section outlines some theories and strategies explaining how humans cope with difficult situations such as disabilities and relate them to workers' coping with HL in the workplace. Then, there is a discussion of potential factors that possibly influence the coping process of workers with HL, followed by looking into what is known about the coping needs of workers with HL, and audiology role in assisting workers in coping.

2.4.3.1 What is coping, and what are the theories behind it?

Workplaces have employees with various health or social issues that demand a coping mechanism to help them sustain their productivity. The coping concept includes the effort made by an

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[7] Hearing-critical tasks are tasks for which hearing ability is very important, and disability in hearing could result in significant problems or endanger safety.

individual to overcome hardships and reach out within themselves for resources to help them deal with difficulties (Heffer and Willoughby, 2017). Coping involves accepting, tolerating or adjusting to negative realities and events while striving to retain a positive emotional equilibrium or personal image (Hallberg and Carlsson, 1991a). Some theories tried to explain humans' coping processes, including coping ability, coping strategies and the factors influencing coping. 1) Self-efficacy is one of the coping mechanisms individuals with HL can cope with. It is a primary element proposed in Bandura's social cognitive theory (Freire et al., 2020). This notion constructs how an individual perceives his abilities to work out the course of action required to accomplish their desired goals. Bandura's theory introduces a framework of change and adaptation that can help the individual pursue a proactive role in adjusting the processes rather than allowing oppressing factors such as HL to influence their vulnerability (D'Amico et al., 2013). This model resonates well with 2) the approach-avoidance conflict theory (Aupperle et al., 2015). An 'approach' technique, in the case of adaptation to HL in the workplace, would mean attempting to take positive action such as disclosing HL to employers or colleagues, while 'avoidance' would mean avoiding disclosure due to the fear of negative consequences such as stigma or job loss (Aupperle et al., 2015). The approach-avoidance conflict theory involves stress in decision-making when the goal has both negative and positive results (Aupperle et al., 2015).

3) Psychodynamic coping theories illustrate similar mechanisms to those described in the previous paragraph of coping via a wide range of human adjustments. Psychodynamic theories include a) the classic Freudian ego functioning model and b) Haan's ego processes model (Radnitz and Tiersky, 2007). Freud's model focuses on the ego. The ego is viewed as responsible for dealing with difficult situations or reality. The ego in Freud's model resembles the mind's capability to balance decisions or reactions between the person's internal drives (e.g. personal desires or drives such as violence) and the external drives (e.g. the person's drives to be disciplined and follow the rules in society) (Vaillant, 1995).

Haan's Ego Processes theory involves coping, defence, and fragmentation (Haan, 1977). According to Haan, the person will attempt to cope (positively) if possible, defend if necessary, and fragment in such cases where they are unable to either cope or defend. An example can be a worker with HL facing difficulties in telephone related work tasks. If possible, the worker could try to cope with an amplified telephone, or they could go into denial and refuse to admit the difficulties and fail to cope positively or refuse to receive help. This is an example of the coping-defence components of Haan's ego process theory. Further detailed explanation is to be found in (Haan, 1977, Radnitz and Tiersky, 2007). Haan's ego processes model is different from the classical Freudian model. The classical Freudian model suggests that the defences work unconsciously, while Haan suggests that it operates at a preconscious level, i.e. neither conscious nor unconscious (Radnitz and Tiersky, 2007). These models can help explain how individuals with HL in a given workplace can overcome conflicting disabilities and limitations.

While many working adults have to adapt to HL problems in their daily work life, each person's circumstances are unique and need personal planning, effort, and attention from employers, healthcare professionals, and disability supporting bodies. Professional health workers play an essential role in giving various forms of support in workplaces to help staff with hearing disabilities deal and perform effectively despite their challenges, and they often give specialised and comprehensive counselling (Sitzman, 2004). Workplace support is also of particular importance in dealing with HL in the workplace. HL is an invisible disability with disclosure problems (Hétu et al., 1990, Southall et al., 2011). Employers could be unaware of their employees' hearing-related struggles. Consequently, they cannot assist them in coping in the workplace. During the hiring process, the person may have concealed or failed to mention pre-existing conditions with hearing impairments that may eventually deteriorate over time. Similarly, audiologists might not be aware of patients' needs to adapt in the workplace and often restrict their management strategy to hearing aid support. Clearly, it is vital to understand and support workers' coping processes in their work lives.

2.4.3.2 Coping strategies

Adults with HL need to adapt to their condition within the work environment to remain productive and operate effectively. Although one study suggests that most workers with HL can cope with full-time employment (Backenroth, 1997c), this requires effort and can lead to burn-out. In another study, workers' attempts to cope at work were associated with increased stress, tiredness, social isolation, and inferior QoL (Backenroth, 1996). Therefore, there is a need to find appropriate support and suitable coping strategies that are efficient and convenient for each person and their job demands. There is also a need for more recent research focusing on the ability of workers with HL in coping in the workplace because most of the available evidence comes from research conducted in the era of occupational HL. Since then, there have been shifts in the type of jobs people do, stigma prevalence, disability legislations, audiology provision and technologies.

The coping strategies involve cognitive and behavioural tactics to manage challenges and difficulties. The literature contains discussions of different coping strategies, such as engagement coping (also called adaptive, problem-focused, and positive coping) and disengagement coping (also called maladaptive, emotion-focused, and negative coping) (Hallberg and Carlsson, 1991b, Hallberg and Barrenäs, 1995, Gomez and Madey, 2001, Heffernan et al., 2016). The engagement strategies of coping highlight the strategies that the individual uses to take charge of the difficulties, to solve problems through taking action and regulate the relating emotions to work effectively with fewer hindrances. In engagement coping, the person affected by HL identifies the problems, accepts the situation, tries to adjust to the conditions, has the urge to proceed in work regardless of the disadvantages, rejects the stigma, and applies efficient strategies. Engagement coping resonates with the social cognitive theory of Bandura, the approach-avoidance theory and the coping component of Haan's ego processing theory that were discussed earlier. The disengagement strategies of coping mean taking personal or emotional action in order to divert oneself from the difficulties and their related emotions. Individuals who opt for the disengagement category of coping tend to have negative experiences from the consequences of the stressors more than those who choose the engagement category (Garnefski and Kraaij, 2012). Disengagement coping with HL includes pretending to hear, withdrawal from and within social situations and activities, and denying the HL (Heffernan et al., 2016, Barker et al., 2017). These resonate with the defence component of Haan's ego processing theory that was discussed earlier.

Work demand and workplace experiences pose various problems for workers with HL. Engagement or problem-concentrated strategies are essential to workers as they react directly to challenges arising from HL during the working day. The individual with HL can apply problem-concentrated methods of adjusting, including maintaining communication, regulating the environment, using different nonverbal and verbal communication forms, and wearing hearing aids and assistive devices (Tye-Murray et al., 2009, Hua et al., 2015). However, some workers apply emotion-focused methods of adjusting at work, such as refusing to disclose the HL or ask for help in order to avoid embarrassment, and they may choose to withdraw or avoid communicating with people in the workplace. Table 5 (Chapter 2) includes a list of the coping strategies reported in previous research focusing on workers with HL. This list also makes it clear that the evidence in this area is mostly old, necessitating more recent evidence. The coping style of workers with HL is a critical aspect of their journey and is just as important as their way of coping with HL in social life. Whether workers manage through engagement or disengagement strategies influences their psychosocial experiences and has been linked to their risk of developing anxiety and depression (Garnefski and Kraaij, 2012). Engagement coping is believed to be effective in improving the psychosocial health of people affected by chronic illnesses (Carrico et al., 2005). Therefore, it is critical to help workers establish and maintain positive coping in the workplace.

2.4.3.3 What factors influence the coping process?

It is important to emphasize that different workers with HL are likely to vary widely in their preferences as to what coping strategies suites them and they find helpful in the workplace. Factors that can influence the coping process of workers with HL in the workplace can include the persons’ age, gender, personality, education, job, socioeconomic status, hearing technology use, social and physical environment, the fear of stigma and striving to preserve a positive self-image. People are, by nature, all different in their personalities and ways of thinking. They also work in different environments and have to perform varying job tasks. All of these factors influence the extent and nature of their struggles, and the persons’ values, priorities, motivation and psychosocial experiences will also shape their coping process (Holman et al., 2019). There could be a socioeconomic gradient, too, in both the onset of the disability and its acceptance. Studies indicate that the level of education among people with disabilities has a causal relationship with their success in coping with the disability (Bengtsson and Datta Gupta, 2017). Different age groups could also cope differently. Ageing can influence people's cognitive and physical ability to cope with disabilities (Borson, 2010) and place them at higher risk of HL problems and reduced work productivity. This is in addition to the cognitive decline independently associated with HL (Fortunato et al., 2016). It appears that gender may also influence the ways in which workers cope, although the research findings are mixed, with some studies to show that gender has a bearing on the type of coping strategies used (Hallberg, 1999, Christensen and Gupta, 2017), while other research finds no significant differences (Andersson and Hägnebo, 2003).

Most probably, there is a wide range of factors that influence an individual’s ability to cope with HL in the workplace and the strategies used, but there are no existing studies specifically designed to focus on them and explore them in depth. A few studies identify factors that facilitate workers’ ability to cope in the workplace and the coping strategies used, although this was not the direct aim of these studies. For example, Hua et al. (2015) explored the perceptions of working life among fifteen workers who had mild to moderate HL. In their research, they report information about workers’ coping. Similarly, a previous study by Tye-Murray et al. (2009) was designed to assess workers’ job performance and psychological and emotional wellness but report information about coping, as shown in Table 5.

Both, Tye-Murray et al. (2009) and Hua et al. (2015) report their participants' communication strategies to adapt at work and maintain their job performance. These included utilising hearing technologies and making hearing aid adjustments when needed, disclosure of HL to colleagues, having a buddy/helper to write notes or clarify the unheard language, lip-reading, changing location to get nearer to the speaker, asking people to repeat and trying to predict the unheard words or letters. In some instances, some people choose avoidance of difficult situations. Workers with HL may avoid interactions and gatherings with colleagues because of the uncomfortable outcomes of miscommunication and missed information. Also, the people interacting with them may try to switch to talking more slowly, with best intentions, only to end up hindering the art of lip-reading, which leads to miscommunication.

A study by Hallberg and Barrenäs (1995) proposed that the main factor influencing the choice of coping strategy (avoidance vs. control of the situation) among workers with noise-induced HL is their need to maintain a usual self-image because of a fear of stigma and discrimination in the workplace. This notion may have changed from the time this study was conducted, as there is now probably a better general awareness of HL and less stigma than in previous decades, but it is still an essential factor to take account of. The coping strategies of workers may have changed, as well, due to changes in the jobs market, such as the increasing shift towards white-collar jobs compared with blue-collar jobs in recent decades. Overall, the information obtained from these studies relating to workers' coping is valuable; nevertheless, they are provisional, and some are outdated.

2.4.3.4 Workers' coping needs and the influence of audiologists in their coping

There are limited studies looking into what a worker needs to adapt in their professional life. Only one study on worker's coping needs was found, by Detaille et al. (2003), whose aim was to identify the needs of chronically ill patients in coping with work life. Their study included workers with diabetes, rheumatoid arthritis, and HL. A sample of 25 workers with HL were asked what they needed in order to continue working, and the participants' accounts were grouped into clusters. The workers prioritized the following needs: 1. informational needs about hearing technologies and the funding available for them; 2. the need to accept the situation and be assertive in order to cope; 3. the need to find suitable communication strategies and disclose difficulties and needs to colleagues. This interim evidence has to be expanded and explored further in future studies.

There is also a need to find out how audiologist support influences workers and how they cope. Sustaining positive coping throughout working life can be challenging, especially in progressive hearing loss. This aspect emphasizes the importance of quality coping support. Hua et al. (2015) suggest that there is frequent consultation of healthcare experts by workers facing problems at their workplaces. Nevertheless, no research has been identified to estimate and report the frequency of audiology consultations for workers. It is also unknown to what extent coping support is offered in audiology consultations for the HL population, including working adults, and how practical and efficient coping support for workers is. In the Netherlands, a randomized controlled study was conducted to assess a vocational rehabilitation programme for workers with HL (Gussenhoven et al., 2017). This programme was designed to assess and address the work difficulties and needs of workers with HL through an integrated approach and a multidisciplinary team (including an audiologist, occupational therapist, and social worker). It included counselling to help make adjustments at work and psychological counselling for workers who were identified as needing it. The results showed that the intervention group exhibited significantly improved acceptance of their condition compared to the control group with long-term follow up (1 year). Acceptance is an important aspect of coping. The results suggest that professional support can aid workers' coping.

To the best of the author's knowledge, no previous research has investigated the role of audiologists in helping workers to cope with HL in the workplace. The work of Detaille et al. (2003) is highly important in investigating the needs of workers with HL to remain productive, effective, and fit in the workplace. However, there is still a noticeable lack of data on the coping processes of workers with HL and what they need in order to be able to cope positively. Putting workers' coping at the heart of research can be helpful to get a better understanding of the resources available to help workers adapt to their workplace environment and what employers and audiology services can do to provide further resources and support and facilitate positive coping strategies. To date, there does not appear to be any research that explores the coping strategies of workers with HL in the UK. Expanding the knowledge in this area would help in evaluating the effectiveness of the present coping support offered by audiology services and help drive improvements. Therefore, there is still a great need for further research dedicated to exploring workers' experiences and views of coping in-depth.

2.4.4 Summary

Overall, the evidence suggests that workers with HL face a challenging work life. HL affects their auditory functioning, psychosocial health, physical health, behaviour, occupational performance, and employment status. These were mapped into a conceptual framework, which demonstrates and proposes that all of these aspects can impact each other and affect workers' overall health and wellbeing, resulting in lower QoL compared with their normal-hearing peers; however, far too little attention has been paid to this in the literature. Positive coping with all of the ways HL affects daily life requires efforts not only from the worker, but from audiologists and employers to identify issues and use problem-solving strategies so that the worker can be integrated into the workplace and enjoy job satisfaction and productivity. Workers need to identify the problems as they experience them. It helps if they can come to accept their condition as it is, self-regulate their emotions, and make the necessary adjustments in collaboration with employers, colleagues and the audiology services. The numerous gaps in current academic knowledge about workers with HL quickly become apparent on examining the available literature. Overall, there is a lack of research investigating the QoL of workers with HL and their coping process. Apart from the work carried out by the charity RNID, there is a general lack of evidence-based research in the UK targeting individuals with HL and their work life issues. This requires further attention from researchers, as well as audiologists.

2.5 Do hearing care services support workers with hearing loss efficiently?

2.5.1 Introduction

The growing estimates of workers with HL in the UK impose a major challenge on the audiological health services. This means that the coming years may bring higher demand for HL evaluation and management for working-age adults. Over the last thirty years, there have been a small but growing number of researchers who have paid attention to workers with HL and their life challenges. Consequently, there is now ample evidence that workers with HL face a range of challenges and difficulties that reach beyond problems with workplace communication and which lead to a lower QoL. At the same time, focus and research into PCC and the biopsychosocial model of healthcare in audiology has been flourishing. Therefore, now more than ever, audiologists and researchers in the field of audiology need to focus on this population and explore the efficiency and quality of service provided to workers with HL. There is a need to learn how to support patients with HL and who are already at work or are seeking work.

It is worth emphasizing that, as with any other health condition, HL should be thought of at a societal and maybe a global level, rather than at the level of the individual or national health system, primarily because the impact of HL affects the whole of society and not just the affected individual. It is projected that HL will be among the top ten most burdensome health conditions in the high and middle-income countries by 2030 (Mathers and Loncar, 2006), not to mention its impact on the economy (International Longevity Centre, 2014, Shield, 2018). Moreover, everyone in society is at risk of HL and its detrimental consequences, especially working people. Therefore, audiology services should not be alone in holding responsibility for supporting workers with HL. One central question can be, who should take care of workers with HL? Currently, there are a number of organisations who are to offer help to workers with HL, as shown in Figure 6. The UK audiology services represent only one of these bodies, but they are the most involved in caring for those with HL. Others include employers, occupational and hearing therapists, charity organisations like RNID, hearing aid technology companies, and the government itself, with anti-discriminatory policies, and schemes such as Access to Work (ATW). The main issues with all of these authorities and organisations are their efficiency and the ease with which people with HL can access their help.

If we take work organisations and employers, for example, the UK government in its Equality Act of 2010 states that employers and stakeholders must make reasonable adjustments for disabled workers and job applicants (Government Equalities Office, 2010). The worker and employer should discuss these adjustments to decide what is needed. An example of adjustments could be simple, such as holding meetings and interviews in a quiet and bright room so that hearing and lip-reading can be easier, making sure that the worker can clearly see colleagues' faces, or purchasing special equipment at a reasonable price. The problem with this legalisation is that it is very subjective, and some employers can get around it if they are not willing to make an effort. Another gap in this legislation is the ambivalence around monitoring employers for adherence and compliance with this law.

Figure 6: The various bodies that can support workers with hearing loss in the UK. The differently outlined audiologists' circle aims to reflect that audiologists are the most commonly and actively involved in supporting workers compared with the rest of the support groups. RNID: Royal National Institute for Deaf People, GP: General practitioner, ENT: Ear, nose and throat specialist.

There are also many other bodies that have the potential to offer support and help but are apparently not actively involved. This includes the education system, general practitioners, ear, nose and throat specialists, social workers and other informed workers with HL. For example, an experienced worker with HL can raise awareness among other workers with HL as well as hearing colleagues and employers. They can also form groups to support and advise other less-informed workers to help them improve their hearing and general conditions at work. The education system should also contribute to raising awareness of HL. Through schools, young adolescents can benefit from awareness classes or campaigns that focus on recreational noise-induced HL, and encourage its prevention. This can help protect future workers from the adverse occupational difficulties caused by HL. It is also important to raise awareness throughout the whole of the education system so that future workers, co-workers and employers are better prepared to deal with HL in the workplace. The same can be applied to employers and hearing workers, for example, awareness sessions can help employers and hearing workers understand the difficulties their colleagues with HL are having. It would also help them to understand how to support their colleagues. Overall, it is important to broaden the scope of who should take care of workers with HL, and not limit it to the hearing care services. The following sections discuss the evidence on the current support available to workers, especially audiology services, and their access to it.

2.5.2 How do audiologists interact with and support workers with hearing loss?

2.5.2.1 The assessment of work life difficulties and needs in audiology appointments

The British Society of Audiology (2016) has presented four principles that are crucial to use in routine auditory rehabilitation appointments: recognition of patients’ specific needs, shared goal-setting, developing an agreed-on plan and enabling self-management. During a routine audiological appointment, the audiologist first interviews the patient and then conducts some hearing tests, following up with setting goals and working out the management plan. Patient interviewing may be the most critical step as it forms the basis of the assessment and guides the path for the rest of the session. During the interview, audiologists commonly explore hearing and communication difficulties experienced by their patients, mostly from a social perspective. For example, it is common to ask about speech hearing, and how hearing difficulty influences everyday activities and participation in social life with family and friends. It is also common for patients to talk about the social aspect more than occupational difficulties when asked to talk about their hearing problem. There is less emphasis on other life aspects, such as recreational and workplace issues. There seems to be little attention given to the occupational aspect of patients’ lives during the interview. The evidence on this is elaborated next, in Section 2.5.3 and is suggested based on the relatively few studies that are available and mainly looking at findings from RNID research. The RNID research has its limitations, however, as it is not published in peer-reviewed journals, lacks details of the methodologies used, and the participants' characteristics are not clear, which makes it difficult to evaluate the quality of the data and presents the possibility of biased findings (this research is discussed later in Section 2.5.3). Therefore, there is a need for high-quality research.

Furthermore, possibly there is a lack of understanding of the reasons why patients' work-related difficulties are not explored in more depth in audiology consultations. This area in audiology is apparently under-researched and is worthy of exploration. People spend a significant amount of their time at work, and as previously discussed, HL does affect workers' lives adversely in many ways, and can have detrimental consequences on health and life, such as stress, depression or job loss. Therefore, it is essential for the audiologist to ask about HL-related work experiences, and from that identify the patient's specific needs in relation to work, as well as the other non-occupational needs. This is in line with the ICF model of care, because it views the patients within the context in which they live, and work, mostly, constitutes a major part of people's lives. From the perspective of the audiology services, it could be that the time available during a regular audiological appointment is barely sufficient to carry out the tasks that should be done routinely, and it might be very difficult to add further points to the meeting agenda to discuss.

Moreover, there is a possibility that some audiologists are not aware of the difficulties that workers with HL might be experiencing, and the importance of addressing them, as well as how to support this population. It is also unclear whether those audiologists who are aware are addressing these issues. As part of a research study by RNID, Matthews (2015) interviewed six audiologists from the NHS in the UK. The aim was to find out how aware audiologists are of the effects of HL on health and QoL in general, and to evaluate how much awareness levels affect the management strategies delivered to patients, and, where this was not happening, to identify the barriers. The author concluded that the audiologists appeared to have good levels of awareness in general, especially of the psychological issues associated with hearing aid acquisition; however, their awareness of the impact of HL on work life and physical health was limited. If audiologists are unaware of these issues, do not explore them with patients, and do not have the right tools to identify them, they will not be able to help with constructing efficient management strategies for the workplace, and it is unlikely that they will signpost these patients to services that can support them.

Audiologists should be constantly brought up-to-date about ways in which they can deliver the best possible care to their patients. This is a requirement for Equality and Diversity in the NHS. In addition, the healthcare system should support audiologists as the CCM suggests (Figure 1). This can be done by providing them with decision support, either in the form of education, training or tools. Educating and training audiologists in this way can make a difference to patients' lives; however, the literature contains some evidence that audiologists may not be trained in PCC and counselling, and may need more training in those areas (Herzfeld and English, 2001, Tai et al., 2018). In addition to education and training, providing audiologists with an efficient tool may help them to interact more effectively with workers with HL.

The ICF core sets for HL could be a useful tool to help the audiologists during their interaction with workers with HL. It includes work-related categories in the lists (Figure 2), whether directly or indirectly. The list includes work both directly, in the participation section (remunerative employment), and indirectly, in other categories like communication and handling stress (under participation) or attention, memory or emotional functions (under body functions). Nevertheless, there are other important aspects that are not included in the list, for example, the attitudes of co-workers and employers as an environmental factor. The comprehensive list seems to be more inclusive when thinking about work life and HL.

However, before considering using the ICF sets in audiology appointments for workers with HL, there is a need for better understanding of workers' difficulties and the different aspects that affect their QoL through quality research. In-depth exploration of the experiences and views of workers, and then identifying the most important and influential aspects might help in providing a basis to better understand how to assess the health of this population, and possibly develop a specified work-related core set or tool to use in audiology practice to aid audiologists. In addition, it is essential to understand how audiology appointments are being conducted for this population of patients. Workers' as well as audiologists' experiences can help achieve that and could therefore help identify what issues could be inhibiting discussing work life in audiology appointments, and what needs to change before jumping into designing tools, or making education and training recommendations to enhance the audiologist-worker interaction.

From the patient's perspective, it is possible that patients do not think that talking about work difficulties will make any difference to what is going to happen later in the appointment. The public might perceive audiological services as a place where hearing aids are fitted, and are not aware of other aspects of the provision. Another explanation may be that people, in the limited time they have, usually talk about the things that they value the most, such as family. Although work is important, and although it may be the trigger for seeking help, it may not be the most important thing to them. In addition to these assumptions, there can be some issues related to the nature of human thinking and behaviour during the appointment. The complexity of their problems in relation to HL may be so overwhelming that they don't know where to start talking about it. Research in the medical field suggests that what the patient decides to tell the doctor, as well as the patient-doctor communication in general, is influenced by the patient's ability and confidence to discuss their difficulties in a way they think the doctor will understand and not judge them for (Peters et al., 2009). Some patients may feel that it is embarrassing to talk about workplace difficulties; for example, they might fear being interpreted as having less intellectual ability. This potential silence about occupational difficulties during the interview will prevent the audiologist from being aware of the patient's work-related needs, which obstructs the establishment of valid shared goals, an appropriate management plan, and inhibits empowering self-management. Overall, the literature lacks information about audiologists' interaction with their working patients. To what extent work life is being explored during audiology appointments is not clear, and the factors influencing work discussion are not known.

Some researchers have given attention to the need for work life assessment by professionals (audiologists, work rehabilitation professionals and the work organization) from a different viewpoint (Jennings et al., 2010). Their focus has generally been on enabling professionals to understand and evaluate the hearing demands at work, especially in everyday communication as well as safety demands. To do so, Jennings et al. (2010) developed the Audiologic Ergonomic Framework, which offers a theoretical understanding, and the Canadian Hearing Demand Tool, based on this theoretical framework to aid assessment (Jennings et al., 2010). The Audiologic Ergonomic Framework provides a theoretical understanding of the need to evaluate hearing demand in workplaces, taking into account the context at different levels, including the worker context such as age, health and attitude, the immediate work environment and task demand, and the whole communication system. This framework was used to design the Canadian Hearing Demand Tool for the purpose of helping professionals assess the important auditory demands in the workplace.

This work by Jennings et al. (2010) came at a time when all previous endeavours had focused on noise-induced HL prevention, assessment and management and so they instead brought to light the need to appreciate the changing demographics of the working populations and the changes in work environments and demands. But still, no previous research, including the work of Jennings et al. (2010) put workers' QoL at the heart of their research and focused on assessing their needs and assisting them to improve their wellbeing; instead, the focus of previous research was more on work and functionality-related aspects such as job demand, performance, and safety issues. In the era of PCC, there is a need for more research and clinical focus on improving the experiences and wellbeing of the person, within his/her context, in work life.

Finally, thinking about the QoL as an outcome measure, it is commonly used to evaluate QoL in general, or a specific part of life, like health, or disease specific problems. For example, hearing ability-related QoL, which is assessed by COSI (Client-Oriented Scale of Improvement) and GHABP (Glasgow Hearing Aid Benefit Profile) is disease-specific rather than general. When QoL is assessed in general, the focus is mainly on psychosocial and physical aspects of life and to some extent on work-related issues. In the UK, disease-specific tools like COSI and GHABP are commonly used by audiologists but general QoL assessment tools are not used in clinical practice, and are not mentioned in NHS recommendations (Department of Health, 2012). An example of a general QoL measure tool is the EuroQoL questionnaire. This questionnaire is composed of five sections: mobility, self-care, daily or routine activities, pain/discomfort, and anxiety/depression. Work is included under the daily or routine activities section.

Another example is the Social Functioning-36 questionnaire, which is very commonly used nowadays to evaluate health-related QoL for many conditions (Nordvik et al., 2018). The Social Functionning-36 questionnaire includes 36 items, some of which evaluate work life in terms of physical health and mental health. The lack of recommendations to use general QoL tools and using only disease-specific tools in audiology appointments limits obtaining important information about patients’ general wellbeing and this is not in line with the biopsychosocial model of healthcare. Work life participation is an important part of adult wellbeing, and the current tools used in audiology appointments seem to overlook this part of patients’ lives. Re-thinking is needed to decide which tools should be available to audiologists to help them identify problems that affect patient QoL at both the general and the HL levels. This knowledge would lead audiologists and workers with HL to have better-shared goals that are patient-centred, and ultimately produce better outcomes. Further discussion of the questionnaires used in audiology appointments is available in the section below (2.5.2.2).

2.5.2.2 How do audiologists support workers with hearing loss in audiology appointments?

Adult auditory rehabilitation aims to help adults who have HL to improve their hearing ability and QoL, and to reduce restrictions on their activity and participation (Boothroyd, 2007). Ideally, it should include various approaches and methods. Ideal auditory rehabilitation is not exclusively restricted to hearing aid provision, or providing other hearing devices (cochlear implants or assistive devices). The support scope should be wider. One study suggests that workers’ support by audiologists is limited to hearing aids fitting and care (Jennings and Shaw, 2008). Equipping the patient with hearing technologies is only one method of auditory rehabilitation. Other methods include providing information and counselling. A survey was conducted on Dutch workers with HL which showed that one of their most frequent needs was counselling on how to manage workplace difficulties (Graaf and Bijl, 1998). Therefore, audiology appointments for workers ideally should incorporate some counselling on how to deal with HL related difficulties, maintain job control and increase satisfaction in the workplace. Auditory rehabilitation services should also signpost workers to other related services: vocational rehabilitation, occupational and hearing therapy, lip-reading classes, and schemes and charities that support them in various ways, such as the government scheme ATW, which helped those with HL to find jobs and improve their working conditions.

Hearing aids are the most common management method for adults who have HL and the dispensing of hearing aids is routine practice within audiology healthcare. The little evidence of their benefit among the working population indicate that they are helpful to this demographic (Hua et al., 2015). In the field of audiology in general, there are long-established concerns that audiologists tend to limit treatment to the provision of hearing aids, despite the potential for a much wider range of interventions and support. The literature contains robust evidence that support hearing aids provision. There is a considerable body of research on the use and benefit of hearing aids; however, research focusing specifically on the needs of workers with HL is scarce. For example, it is not clear how and to whom audiologists recommend hearing aid fitting among working-age patients. Usually, the decision to fit patients with hearing aids depends on factors related to the audiologist and other factors related to the patient. In making their decisions, audiologists across the UK mostly rely on audiological tests and patient preferences (Boisvert et al., 2017).

Commonly, audiologists recommend hearing aids to patients with higher degrees of HL, and less commonly to patients with mild HL. Patients’ preferences seem to be the main factor influencing the decision to fit hearing aids for mild HL, according to audiologists (Sereda et al., 2015). Those findings suggest that workers with milder degrees of HL are themselves responsible for the decision to wear hearing aids. The key question is whether those workers have the information necessary to make such a decision. It is unlikely that a non-professional would be knowledgeable enough to decide whether hearing aids for mild to moderate HL are advisable, for example. Moreover, support in self-management by the audiology services seem to be underprovided (Barker et al., 2014), as was discussed in Section 2.3.1. Therefore, it appears essential to investigate workers’ decision and self-management support in future studies, and until then, audiologists should help workers with HL to make decisions regarding hearing devices. For example, workers could have mild HL, but need hearing to be at its best to perform certain tasks at work, such as telephone calls and group meetings, or to be safe at work in sectors such as policing and the military. If a worker’s job requirements for accuracy in hearing are high, the audiologist should be able to recommend suitable hearing devices and explain the advantages and disadvantages of each type according to the context in which they will be used. Decision and self-management support are important, especially since patients can be hesitant because of fears of discrimination, stigma and other concerns about the work environment.

Demographic changes are leading the UK workforce to incorporate more people with milder degrees of HL; mainly those who are 50 years old or older (see Figure 3). The number of workers aged 50 years or more increased by approximately 2 million between 1998 and 2013 (Department of Work & Pensions, 2014). HL that affects working adults in their 50s or 60s is most likely to be mild to moderate in most cases; this is when age-related HL starts to manifest slightly. At the onset of HL at this age, workers may struggle with how to cope with it at the workplace, so even milder degrees of HL might significantly influence their participation (Kramer et al., 2006, Monzani et al., 2008). Being in employment imposes hearing and communication demands that are likely to be fewer for retired people. If a simple intervention like hearing aid fitting can benefit working adults, it might improve their work life and consequently their QoL.

Recently, a systematic review has found that the use of hearing aids improved the QoL of adults with HL, particularly within the first year of follow up (Nordvik et al., 2018). Similarly, a Cochrane review has shown that communication ability-related QoL and QoL in general improved for patients with mild to moderate HL when they used hearing aids (Ferguson et al., 2017). While work is generally considered a part of the general QoL assessment (Grimby and Ringdahl, 2000), and workers finding hearing aids helpful (Hua et al., 2015), an assumption can be made that hearing aids might benefit and improve the work life and QoL of adults with HL. There is also evidence that cochlear implants can improve the employability, job satisfaction and confidence of working-age adults, based on the findings of the single peer-reviewed UK study concerning workers with HL (Fazel and Gray, 2007). Nevertheless, the benefits of hearing devices in complex acoustic environments remain a problem and previous researchers have argued that hearing aids could be of limited benefit in this context (Jennings and Shaw, 2008, Kramer, 2008, Hua et al., 2015). In general, hearing aid users commonly find it challenging in noisy environments, especially in challenging acoustic environments and when hearing aids are used alone without assistive technologies (Hua et al., 2015). This is an important issue for future research, which needs to investigate the benefit of hearing aids and other hearing devices among the working population of HL patient, and explore if, and to what extent, they can improve QoL in general and in relation to work life.

Central to the entire discipline of audiology is this thought: What outcome measures and what tools truly evaluate the benefit of hearing aids, especially for workers with HL? Researchers have used numerous outcome measures to assess the benefits of hearing aids. Possible approaches are objective, such as speech tests, and subjective, such as rating scales to judge quality, and questionnaires and self-assessment inventories to assess the effects of disability and participation restriction (Dillon, 2012). The most commonly used benefit tools in UK clinical practice are two questionnaires that evaluate the benefit in difficult listening situations: the COSI and GHABP (Dillon, 2012). The GHAB includes four listening situations and work is not one of them, but the patient can add optional situations if they would like to. COSI allows the patient to list their difficult listening situations freely, and then they are categorised into sixteen general categories listed in the COSI questionnaire. Only one category (number 15) mentions a work-specific listening situation (meetings). Overall, these questionnaires are considered efficient and are widely used. The issues to consider are: 1. how often do audiologists in the UK use them in their appointments with workers or adults in general? This is an issue particularly because the use of such questionnaires is recommended but not compulsory in the NHS (Department of Health, 2012). 2. To what extent do these questionnaires reveal the effect of HL on the life of working adults and their benefit from hearing aids? This is significant especially because they are disease specific and do not look at the patient’s QoL in a broader way. It would be interesting to assess this in future research.

One of the few studies in the audiological field that used general QoL assessment tools was conducted by Joore et al. (2003). They investigated the benefit of hearing aids on general QoL of 80 new hearing aid users. The researchers also studied other outcomes such as disability and handicap and productivity loss. Their participants were 18-95 years old (mean age 68 years) and 31% were younger than 65 years old (working-age). Ten participants were working in paid jobs (mean age 55 years). The remaining ones did voluntary work, were homemakers or were retired or occupationally disabled due to non-auditory causes. Joore et al. (2003) used the EuroQoL and SF-36 questionnaires to evaluate the generic QoL before and after hearing aid use and found a significant improvement in the anxiety/depression domain of the EuroQoL, but not in the routine activities domain. They also found an improvement in social functioning. When they examined productivity among the 10 working participants, there was an improvement in the domains of decision-making, concentration at work, meetings and consultations with their colleagues.

Given the small number of paid workers in their sample, the authors presented their results in frequencies. Therefore, caution must be applied, as the findings might not be transferable to the general working population. Moreover, the lack of significant improvement in the routine activity domain implies that hearing aids did not benefit the participants in relation to work. However, the fact that there were 10 paid workers out of a sample of 80 participants, it is possible that other routine activities of the non-working participants could have influenced the results. Obviously, there is abundant room for further progress in determining the benefit of hearing aids among workers with HL; however, the issue of outcome measures should be resolved to help build consistent future literature that allows a systematic review to be undertaken effectively and to help inform policy-making and ultimately the services provided by audiologists.

Now let us consider Assistive Listening Devices (ALD). ALD are hearing aids accessories designed to amplify or improve the signal to noise ratio to help people with HL (Kim and Kim, 2014). There are many types of ALD, such as FM systems, loop systems, and telephone assistive devices. Their main purpose is to improve speech communication and help hearing aid wearers to have more access to sounds, especially in background noise. These technologies are continuously improving, and can have significant benefits to workers. One of the recent ALD is the Roger pen, which is gaining popularity because of its many useful functionalities. It can connect with other Bluetooth devices (e.g. iPads, iPhones and Android mobile telephones) to make them wirelessly accessible to the hearing aid. It can also pair with the television and adjust the loudness according to the hearing aid settings.

The Roger pen can also work as a remote microphone in three different ways. First, the speaker, rather than the listener, can wear it on the neck so that their speech can be streamed wirelessly into the hearing aid. Second, the person with HL can place the device on a table (e.g. in a meeting) and it will pick up sound in the immediate vicinity without too much of the background noise. Third, and this feature sets it well apart from other ALD, in a noisy environment the user can hold the pen and point it toward the sound they want to focus on. This helps the user to hear the desired sound better than with the hearing aid alone especially when a number of people are talking at once, such as in meetings. The user can hold it and move it easily between speakers. This is easier and less embarrassing than asking people in the workplace to wear a remote microphone on their neck or clip it to their shirts. Although the potential of the Roger pen in the workplace is very strong, there are three main issues concerning this device. First, it is costly; second, research into the potential benefits of ALD is lacking, with only a few studies showing that they could have a significant positive impact on listening and communication abilities (Harkins and Tucker, 2007, Zanin and Rance, 2016). Third, and most importantly, most of the people with HL who could benefit from the Roger pen do not know about it. Here the role of audiologists comes in, giving information and signposting workers to get more information from specialists.

In addition to hearing aids and ALD, the audiologist can recommend other services, such as lip-reading classes, sign language learning groups, hearing therapy, social services, hearing technology companies, occupational therapy or vocational auditory rehabilitation programmes. There are a number of vocational rehabilitation programmes specific to HL; however, to the best of the author’s knowledge, these are not available in the UK. Available programmes can be found in Canada, the USA, Norway, Sweden and the Netherlands. In UK literature, the evidence on vocational rehabilitation for HL is largely lacking, and in the other countries that have vocational rehabilitation programmes for HL, consistent and high-quality evidence on its effectiveness is also lacking. There is a similar problem with lip-reading, social services, occupational therapy and hearing therapy; i.e. there is a noticeable dearth of research on their effectiveness, whether these can help workers, and whether it is worth the effort and cost. These issues require further attention in the future.

Audiologists, or other work rehabilitation professionals can also offer counselling and psychosocial support to help people in the workplace. Still, there is a need for future research to study the usefulness of counselling and psychosocial support for workers aimed at improving their professional life at the level of daily functioning and overall work life and wellbeing. To date, the evidence indicates that adults with HL and audiologists have a positive view of the importance of psychosocial support, especially emotional support (Bennett et al., 2020a). However, this is not commonly provided. In a global survey conducted during the Covid-19 pandemic, only 31.5% of audiology services were found to offer this kind of support (Manchaiah et al., 2021). Moreover, audiologists have been found to engage in non-standardized and informal methods of psychosocial support that are not evidence-based (Bennett et al., 2020b).

2.5.3 The experiences of working adults with audiologists and audiology services

What is known about workers' experiences with hearing care services is very limited internationally, and in the UK is exclusively based on grey literature, i.e. a few non-peer-reviewed research reports published by RNID. In the UK, in particular, audiologists are the main point of contact for workers with HL, and it is not well understood how workers experience their appointments or how audiologists support them. For instance, how audiologists conduct audiology appointments for workers and how they manage their difficulties is largely unknown. The only information comes from two research reports, *Unlimited Potentials* (Mathews, 2011) and *Managing hearing loss* (Arrowsmith, 2016), both available on the RNID website. These reports explore workers' experiences with their employers and audiology services, and assess services such as lip-reading courses and ALD that are specifically targeted at workers with HL. The RNID interviewed people with HL in both studies and conducted a survey in the second study.

The results showed that even though many participants held positive views about their audiology services, many complained about the long waiting times to see an audiologist, and the impact of this on their employment. Participants complained of insufficient time to talk about their difficulties and said they hadn't received help with their work difficulties, whether in the form of information, advice, or ALD. One patient felt that the audiologist focused only on fitting hearing aids and suggested they should learn about work-related hearing difficulties and their impact on life. The survey showed that 85% of respondents reported receiving no information about lip-reading from their audiologists. 83% said that they were not provided with information about hearing therapy, 72% reported not receiving advice on communication tactics. 86% were not told about support groups, and 80% were not given information about charities or organisations supporting them. Only 45% were provided with information about hearing aids or had their problems fixed, and only 36% had been provided with information about devices or equipment that can help them at work. These findings suggest that their audiologists offered them little help and information concerning their work-related problems, and their access to support was limited. From the workers' perspective, the audiology appointments were focused on hearing aids fitting and not much attention was given to issues associated with HL in the workplace. The findings are valuable, given the scarcity of UK research in this area; however, the reports lacked methodological details such as information about the participants and analysis methods, a scholarly publishing procedure, and professionals' perspectives, and unfortunately, there is no other high-quality evidence available to confirm these findings.

A few papers at the international level have commented on or have elements related to workers' HHC, although, in some of the studies this is not the main topic. For example, a pilot survey was conducted in the USA to explore the experiences of 32 healthcare professionals affected by HL and the communication strategies they employed at work (Trotter et al., 2014). The survey included a question about finding an audiologist to support them. More than half of these professionals reported difficulty in finding an audiologist knowledgeable in managing work-related needs. Another study published in 2013 looked into Canadian workers' experiences in addressing work challenges (Shaw et al., 2013b). The participants were asked about professional support relating to work life and many reported not having been asked by audiologists about work difficulties and not receiving work-related support. The results of these two studies do support those of the RNID research mentioned above. There is a consensus within the available literature than an occupational perspective is lacking in audiology appointments for working-age adults. Still, this is an under explored topic in research and no previous study has explored the underlying factors causing this shortcoming. There is also a scarcity of research investigating audiologists' perspectives and the underlying barriers and facilitators to efficient workers' audiological rehabilitation. Only one study was found that explored the perspectives of five audiologists, as well as five occupational therapists, on workplace accommodations to aid workers with HL in Canada (Shaw et al., 2013a). This study pinpointed deficiencies in professionals' practice-related knowledge and in interprofessional networking. They concluded that innovations are required to help professionals provide efficient workplace support such as learning, knowledge transfer and networking.

Overall, high-quality research is needed to explore the impact of HL on peoples' working lives, especially from a wellbeing perspective and explore their support. There are gaps in the current knowledge and a great need for research into the support available from the audiology services, particularly in the UK, where very there is a significant lack of quality knowledge on workers with HL and the care they receive. This can be rectified by finding out how UK audiologists and patients perceive the care and support that is available to workers with HL and explore the facilitators of/ barriers to efficient healthcare as well as adequate psychosocial and practical support. This thesis attempts, therefore, to address this topic and answer the research aims outlined in Section 1.1. It is hoped that the findings significantly add to the understanding of these issues and help to promote practice and policy for workers' audiological rehabilitation.

2.5.4 Summary

Overall, there seems to be little attention given by audiologists to the patient's difficulties in relation to their work life, and there is little known about how audiologists and workers communicate during audiology appointments and how audiologists support their patients who work. There are interventions and ways of support that audiologists can offer to working patients, and some of these interventions proved beneficial; however, the evidence suggests that patients' access to work hearing-related support through their audiologists is limited. Knowing that the population of workers is becoming larger, it is necessary to study further audiologists-workers appointments, possibly through exploring the experiences and challenges from audiologists' as well as patients' perspectives. No research has yet explored the breadth and depth of UK workers' experiences as they view it or as the UK audiologists learned in their professional journey. There could be many other unexplored and under-addressed aspects of workers' problems in the UK, such as issues related to their self-management and adjustment at work. These would help to identify the barriers that could be preventing audiologists from addressing the needs of workers, and develop strategies to empower their role in this particular issue.

2.6 Conclusion

Higher demand for HL evaluation and management for working people in the UK is expected in the near future, primarily due to changing demographics to the ageing population, continuous increases in official retirement age, and the subsequent growing number of workers with HL. Workers face difficulties in finding jobs and in maintaining them. Communication difficulty is only one of the many issues they struggle with on a daily basis at work. HL can impact their psychosocial, behavioural and physical health and these impacts can feedback into each other. A conceptual framework was developed in the literature to demonstrate the impacts. The available literature on the impact of HL on workers leads to concerns about the QoL of those individuals, and efficient management and support by audiologists should be able to improve at least some aspects of patient's work life and consequently their QoL.

Audiologists, supported by the community and the health system, need to identify, manage and support their working patients, and tailor that to their individualised needs. There are many available ways for audiologists to support workers, and some have proven very beneficial; however, the limited available evidence suggests that workers with HL are not accessing the available support through their hearing care services. Little is known about the healthcare they receive from audiology services. For example, very little is known about the interactions that occur between audiologists and workers during audiology appointments, and how audiologists support working patients. Concerns have been raised which question the presence of an occupational perspective in audiological assessment and management. Additionally, the barriers and facilitators for audiologists to efficiently interact with and support their working patients are largely unknown. To the author's best knowledge, no prior studies have addressed these issues. The increased demand for hearing care for working adults poses a major challenge to present and future hearing-care services. The lack of understanding of the current state of audiological service provision for workers, and the barriers associated with it, will detrimentally affect meeting this challenge with good quality service; therefore, this PhD project aims to expand the understanding of these issues. In particular, we would like to understand how audiologists approach and support workers with HL and how to improve this.

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Chapter 3 The research paradigm, methodology and methods

3.1 Research paradigm

The term ‘research paradigm’ is given to a philosophical framework whose concepts are generally agreed upon by researchers in their attempts to investigate and understand scientific problems Kuhn, (1963). Research paradigms encompass the philosophical underpinnings or beliefs that guide researchers in constructing methodologies and interpreting results, and can be qualitative or quantitative in nature. Research on HHC for workers with HL is very sparse and there are many gaps in the current body of academic knowledge. In closing these gaps, there was a need for a methodological approach that draws on up-to-date knowledge of the individuals involved: workers whose hearing is affected and the audiologists who support them. A qualitative rather than a quantitative approach was deemed the most appropriate for this particular project, because the three studies that were devised require subjective data that would not be obtainable using a quantitative approach. Qualitative research generally revolves around people’s experiences and views and considers these to be the best sources of information from which knowledge is derived (Braun and Clarke, 2013). This then raises the problems: ‘What should the researcher consider as real knowledge?’ or ‘What information is out there to discover?’ (termed the ‘ontological assumption’) and ‘How can the researcher find this information?’ (termed the ‘epistemological assumption’).

One philosophical viewpoint regarding ontology is that reality exists and is waiting to be discovered (realist), while another holds that reality is relative and is created by our interpretations (relativist). It is difficult, however, to fully agree with either one extreme or the other, and therefore most authors hold their ontological positions somewhere on the continuum between the two poles of realism and relativism. This allows for a philosophical positioning that acknowledges the existence of an objective reality, but also takes into account the belief that our presence as researchers affects what we are investigating (critical realism) and that individuals experience reality differently to each other (Scott, 2007). Regarding the epistemology, there are a number of epistemological approaches to the derivation of knowledge. Two of these, constructivism and interpretivism, draw conclusions about reality or knowledge via processes of interpreting information to discover its underlying meaning. Another approach is positivism, which derives knowledge of reality via quantitative measurements. The interpretivist, constructivist, and positivist approaches are examples of different ways of knowing or discovering reality.

Yet another approach is that of pragmatism. Unlike the previously mentioned ontological or epistemological assumptions, pragmatism does not make assumptions about reality and how to find it; nor does it frame its way to derive knowledge (Parvaiz et al., 2016). It is not bound to a single epistemological or ontological stance; instead, it uses one or more epistemological approaches to include subjectively, as well as objectively, derived knowledge, and this attribute has made pragmatism popular in mixed-methods (combining qualitative and quantitative) research (Parvaiz et al., 2016). Pragmatism differs from the other approaches by its focus on serving particular and practical purposes (Glasgow, 2013). For example, a realist researcher will be concerned about finding truth or reality, while a pragmatic researcher will question whether the information obtained serves the research purposes and will consider reality as constantly changing, depending on the context and the individual. From a pragmatic point of view, there are many versions of reality that depend on how it is experienced by different people. Thus, reality is multi-layered and how we know about it (epistemology) is constructed from how people construct it as well as what is real in the world.

All three studies in this project were designed and analysed using a pragmatic approach. Pragmatism was chosen because of the explicit intention to focus on audiologists’ perspectives as well as those of the workers with HL, in order to serve the purpose of the research, which is to improve the understanding of their experiences and hearing care provision and practices (Glasgow, 2013). The Patient-Centred Outcomes Research Institute encourages research that gives attention to practical issues and outcomes in order to maintain a patient-centred approach (Selby et al., 2012). This resonates with the underlying concepts of pragmatism, which, as a practical and purposeful philosophy, aligns with the notion of PCC. The pragmatic approach in health research is promising because it aims to obtain data and information that helps contemporary decision-makers and policy-makers to keep up-to-date with best practice (Glasgow, 2013). A positivist approach was not used because it views and studies phenomena in an objective way, (such as measuring and uncovering human behaviour by statistics), and adopting this approach would not have allowed the in-depth exploration of audiologists’ and workers perceptions. In addition, positivism would keep the ideas tied to previous theories (which are lacking in this research area) or to theories assumed by the researcher who designed the questions. In contrast, pragmatism can go further towards achieving the research objectives by allowing the participants to openly discuss their understanding and feelings without introducing preconceived ideas such as those contained in multiple-choice questionnaires.

3.2 Methodology and methods

Interview techniques are commonly used in research to study the perceptions and experiences of individuals. They are classically thought of as a method of collecting data rather than as a study design; however, interview methods are now considered to be a distinct approach in qualitative research (Kumar, 2014). Questionnaires or surveys could have been chosen to obtain qualitative data, but these will use researchers ideas and preconceptions or level three theories from previous research. This could lead to concealing key issues that matter to the people involved and are not captured by previous research or known to the researcher who designed the questions. This was seen as limiting what could be learned from the participants' experiences and views. Moreover, interviews were chosen because they produce much stronger descriptive data and can yield much greater quantities of in-depth knowledge in terms of participants' experiences, perceptions and opinions (Kvale, 2003). Interviews allow participants the freedom to tell their own stories rather than answering questions that are constrained in advance (Knudsen et al., 2012). In addition, it is less likely that incomplete or faulty answers are obtained because the interviewer can clarify questions and ask for further information during the interview.

Focus groups could have been used to answer research questions. The use of focus groups is time and cost-efficient compared to conducting 1:1 interviews. It also allows discussions if there are differences between the participants' perspectives. Nevertheless, interviews are superior in giving each participant more time and opportunity to discuss their experiences and views openly. It also allows the researcher to ask the participant to extend their answers. Further, it enables the researcher to ask further questions, rephrase questions, and request clarification from the participants to ensure their views are clear, consistent and true to them. Moreover, some of the participants stories could be personal to them and might not share them in focus groups. For example, some audiologists might feel uncomfortable discussing the difficulties they face with ALD or their feeling of professional incompetency when supporting workers with HL in front of colleagues and might decide not to share such experiences. It was also seen as challenging to get all participants together to conduct the study at the same time, especially the audiologists. For these reasons, 1:1 interviews were used in this research project.

As for any other approach, interviewing in research has its limitations and challenges. Meticulously transcribing and analysing interviews requires an input of time, energy and concentration. In addition, interviewees may share information that could be out of touch with the way things really are, for various reasons. For example, they could provide only information that they think is acceptable or that the interviewer expects from them and approves of. Therefore, learning about the topic of interest using more than one method such as supplementing the interviews with observational research, or triangulating the perspectives obtained from different sources is very helpful to gain valid and rich data (Alshenqeeti, 2014, Kern, 2018). In this project, the audiologists' perspectives obtained from the first study were triangulated with the workers' perspectives from the second study and these are subsequently discussed in Chapter 7.

Another aspect of the research design was the data analysis strategy. Over the years, various strategies have been developed to analyse qualitative data, such as thematic analysis, grounded theory, interpretative phenomenological analysis and discourse analysis (Braun and Clarke, 2013). Thematic analysis is a commonly used method to analyse qualitative data. It is considered a foundational and flexible method (Braun and Clarke, 2013) which appears suitable to the type of data in this study, and if conducted properly, can provide a rigorous method of answering the research questions. In particular, thematic analysis was chosen because of the assumption that the studies' data would contain certain data types: experiences, understandings and perceptions, practices, and influences. These can be analysed together using thematic analysis, while other methods do not have this capability. For example, an interpretative analysis is not a suitable method to analyse data talking about practices (Braun and Clarke, 2013).

3.2.1 Recruitment

One of the challenges in this project was determining the sampling strategy. There were two main issues to consider: how to select the sample and how many participants to involve. Regarding sample selection, purposive sampling is the most commonly used in qualitative research, whereby participants are selected based on their ability to provide data that are rich in information and allow in-depth understanding, rather than with the intent to generalise findings (Braun and Clarke, 2013). This is different to the random sampling commonly used in quantitative research, which aims to generalise findings (Braun and Clarke, 2013). Thus, purposive sampling was chosen to select workers with HL and audiologists who could provide the required data for analysis in order to fulfil the research aims.

Regarding sample size, there is no consensus on how many participants should be recruited for qualitative studies. Commonly, qualitative studies use 15 to 30 participants when aiming to identify patterns in the data (Braun and Clarke, 2013). In addition, the breadth and richness of data obtained can be a factor influencing how much data to collect. When no new patterns or information are being discovered, the data are seen as saturated, i.e. it have enough breadth and richness (Braun and Clarke, 2013). Because this research aims to explore the perspectives of audiologists, as well as workers with HL, in depth and breadth in an under-researched area, a relatively large sample was considered the better choice (20 to 30 participants). At the same time, a decision was made to remain open and rely on the data obtained while conducting the studies to determine when to stop collecting.

Recruitment ceased in Studies 1 and 2 when the last few interviews stopped showing any new information (saturation), and when the interview participants exhibited a reasonable variation of background and characteristics. It was important to make sure that data saturation was determined by no new information emerging, rather than because the participants expressed similar experiences and views because of their similar background or characteristics. Details about the recruitment of audiologists and workers with HL can be found in Sections 4.2.1 and 5.2.1, respectively.

3.2.2 The interview process

All of the interviews were conducted by the researcher. At the beginning of each interview, the researcher introduced herself as a student at the University of Southampton. The research topic and its purpose were briefly described, and it was explained that there were no right or wrong answers and that it was their perspectives that were of interest. The participants were encouraged to ask if they had any queries before starting the interview. The interviews were audio-recorded, for which the participants signed the consent form. The participants were informed that the interviews would be transcribed but that anonymity would be maintained. The participants were informed when the audio recording was about to start.

Interview guides were used to ask open-ended, semi-structured questions, using follow-up prompts when needed. These questions and guiding prompts can be found in the interview guides in Table 9 (Chapter 4) and Table 13 (Chapter 5), respectively. Sometimes additional questions were asked to allow the participant to expand on an interesting point or to clarify something they said. The used questioning phrases were like ‘Can you tell me more about this?’ or ‘Can you explain this more please?’ Less often, specific questions were asked to obtain specific information. Additional questions were asked either when the participant stopped talking or later in the interview after making a reminder note to ask them.

The interviews allowed the open discussion of each participant’s perspectives. The participants were encouraged to talk about any issues that arose in relation to the topic, even if they were out of the frame of the interview questions. Active listening and expressions of acknowledgement such as ‘Mmm…’ or ‘Right…’ were used to encourage further conversation. Sometimes the participants were asked to expand further with questions such as ‘Can you tell me more about this?’ This was deemed of particular importance to allow an inductive approach and not to restrict the interview to the pre-determined semi-structured questions. At the end of the interviews, the participants were asked if they would like to add anything and if they had any questions. Within 48 hours, an email was sent to thank each participant.

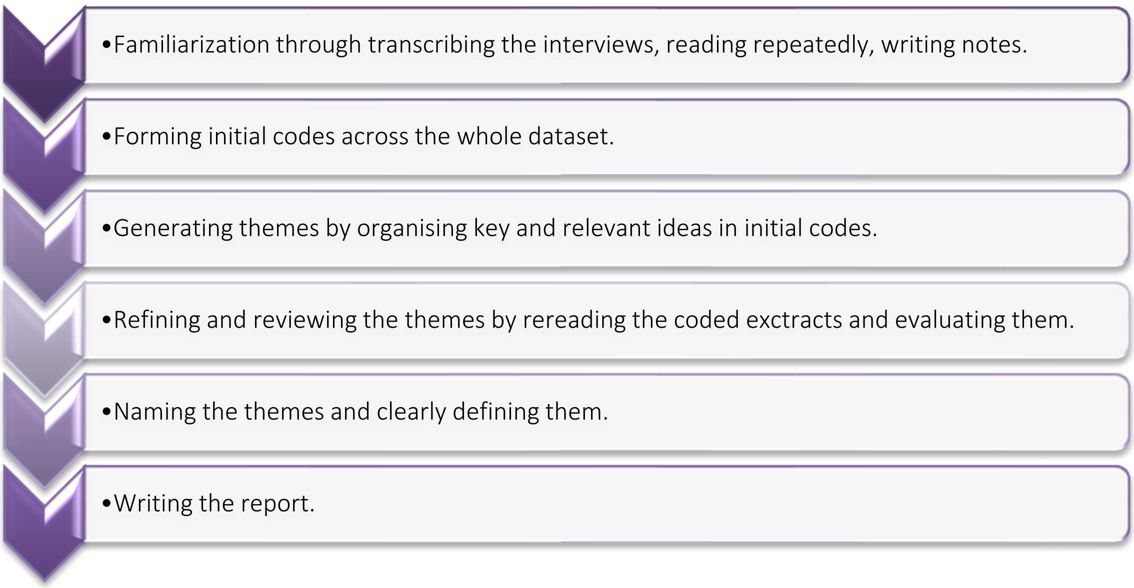
Piloting interviews were conducted and analysed at the start of both study 1 and 2 and before proceeding with interviews and analysis (Sections 4.2.4 and 5.2.4 contain the details for the individual studies’ piloting). The piloting interviews were included in the final analysis for several reasons. First, their data was deemed valuable and beneficial in achieving the research aims. Second, the piloting only improved the language clarity of the interview questions (rephrasing) and the researcher’s skills and efficiency in subsequent interviews. Finally, the participants in the piloting stage did not respond differently compared with the following interviews.

3.2.3 Analysis of the interviews

The thematic analysis of the interviews was informed by the steps described by Braun and Clarke (2006, 2013). In addition, a few grounded theory techniques were borrowed, where helpful. Both thematic analysis and grounded theory aim to identify patterns within the data; however, grounded theory aims to develop theories (Charmaz, 2006), which is not the aim of this project. Grounded theory techniques described later in this section are word coding, line-by-line coding, sentence coding, and making comparisons.

All of the transcripts were coded inductively by the researcher. A deductive approach could have been used, but it was seen as not suitable and would have limited the knowledge generated. First, because a deductive approach includes mapping the analysis results into previous theories or frameworks, and these are lacking, especially concerning the hearing healthcare for workers with hearing loss. This thesis focus on an under researched area and it was seen useful to stay open to the perspectives of the people involved (audiologists and workers with HL). Second, using the deductive approach can result in overlooking perspectives that could be important. The deductive approach could have been useful and less time consuming, but it was seen as not suitable for this research topic for these two main reasons.

Figure 7 below shows the steps adopted to analyse the data. First, the interviews were transcribed verbatim. Each participant was assigned a number to maintain anonymity. After fully transcribing each interview, the researcher listened to the recording again while simultaneously reading the transcript to check for errors. Notes were made of any interesting analytical or important ideas that arose during the transcription phase. This process of transcribing, reading and listening to each interview several times over, as well as writing notes, helped to familiarise with the data. The transcribed interviews were then transferred to nVivo Software (v12) for qualitative data management. This tool assisted in managing and organising the data, keeping notes, and analysing the interviews.



- Familiarization through transcribing the interviews, reading repeatedly, writing notes.
- Forming initial codes across the whole dataset.
- Generating themes by organising key and relevant ideas in initial codes.
- Refining and reviewing the themes by rereading the coded exctracts and evaluating them.
- Naming the themes and clearly defining them.
- Writing the report.

Figure 7: Steps used in data analysis, after Braun and Clarke (2006).

The initial coding followed. At the start, open coding was used to code the interviews fully using very low-level codes. This was done by tagging each word, sentence or line with a code. These techniques are known as word coding, line-by-line coding and sentence coding, and are commonly used in grounded theory coding. They are useful in terms of staying close to the data and paying attention to detail (Charmaz, 2006) and were considered worthwhile in order to refine the codes. At the same time, higher-level codes were developed for tagging more than one sentence or a big piece of text. These codes could then be spliced if required. (See Appendix B for an example of an extract with low- and high-level codes.)

The initial coding resulted in a large number of codes which were then integrated to form fewer and more powerful groupings via a process of reordering, refinement and categorization, which was consistent with Dey's splicing and linking techniques (1993). This process of refining and grouping the codes generated themes and subthemes, which were named and defined, then the codes within each were further checked and refined through rereading the extracts. It is worth noting the following points regarding the analysis. First, comparisons were frequently made throughout the process and included comparisons between data within the same interview, between the data and the notes from the same interview, and between data from different interviews. This method was based in grounded theory analysis and helped identify differences and similarities to develop analytic ideas (Charmaz, 2006).

Second, the interview recordings were frequently revisited in order to confirm that the participants' narratives had been accurately understood. Third, the transcripts were frequently revisited throughout the analysis in order to practise recoding the data under different conditions (e.g. different days), without looking at the originals, in order to ensure consistency (Anney, 2014). Moreover, an independent coder was available and coded some of study 1 interviews to check the commonalities and discrepancies between the coders' results (for further details see Section 4.2.5). These were an important checking steps as it was the first time the researcher had undertaken a formal thematic analysis. Fourth, all of the workers' interviews were analysed twice and separately for studies 2 and 3.; They were analysed first for Study 2 and then a second time for Study 3. Mainly because there were interesting perspectives relating to the participants coping with HL in the workplace. Therefore, a decision was made to re-analyse the workers' interviews again to allow an in-depth investigation into workers' coping issues in the workplace for Study 3.

Finally, the process and details of the analysis, as well as the results, were discussed frequently with the project supervisors, who were either experienced in qualitative research or were audiologists themselves. Amendments were made accordingly, and this helped to develop more meaningful and distinct themes. In addition, as audiologists in clinical practice as well as academia, some of the supervisors were able to validate the results of the analysis due to resonating with their experiences.

3.3 Documentation of study process

Notes and diaries were kept from the time of conducting the interviews onwards. Notes were written during the interviews, immediately after the interviews, during transcription, during coding and during writing up the results. This not only helped to develop and link the themes, but also to identify ideas for discussion and produce the thesis. Documentation of the study process also helped in staying close to the data and being reflexive (more about this in Section 8.4 in Chapter 8). Further, it influenced the planning and design of the questions to ask while interviewing workers in Study 2.

3.4 Reporting the results

The results were reported according to the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist (Appendix C). The results of the three studies in this research project are presented in the form of themes and subthemes. Sub-subthemes have also been distinguished where necessary. Some of the themes and subthemes appear in quotation marks because they are taken verbatim from the interviews. Supporting extracts are presented in italics as well as in quotation marks. The extracts include identifiers such as participant number. The extracts were chosen to provide insightful examples of interview data. Conventional punctuation was added to make the extracts clearer, e.g. commas were added around ‘Um’ and ‘Yeah’ and repeated words. Commas were also added to mark intonation of the responses where this was helpful. Text in brackets { } represents an explanation of context or abbreviations. Three dots (ellipsis) were added to indicate omitted filler words such as ‘Umm’ or ‘So’, or text removed due to irrelevancy or repetition.

The themes and subthemes highlight key meanings and issues in relation to the research questions rather than quantifying them. Vague terms such as ‘most’ and ‘many’ were used in results reporting, termed ‘semi-quantification’. These were used to give a general idea of the number of participants who held the same view or had the same experience. The purpose was to give the reader an idea of how common the theme was within the sample and not quantify the results or generalise them when interpreting the results. This is the essence of qualitative research. The way these terms were used resulted from discussions and an agreement between the researcher and the supervisors who are experts in qualitative research reporting. ‘Most’ or ‘majority’ were used when 15 participants or more expressed the same perspective. ‘Many’ was used when they were 8-14. ‘Some’ or ‘several’ were used when the number was 5-7, and ‘a few’ or ‘a small number’ were used for 3 or 4 participants. When only 1 or 2 participants expressed the same view, it was reported clearly.

Quotations from interviews have been given even if only one participant mentioned the theme illustrated, as these represent key evidence of the breadth of participant experience, rather than generalisability (which is not an aim of qualitative research). It is essential to appreciate these narratives because the fact of a theme being cited by only one or two of the participants does not mean that other participants did not think it is important, and it may well be that other participants would have felt similarly had they been asked.

Chapter 4 Study 1: the perspectives of audiologists

4.1 Introduction

No previous study has been found that investigated how audiologists conduct audiology appointments for workers and how they support them. As previously discussed in the literature review, there are a number of reports indicating that workers receive little help from their audiologists in terms of work and employment-related issues; however, there is no high-quality evidence to confirm that. Further, these studies looked at the problem only from the patients' perspectives, and no previous study has thoroughly investigated audiologists' perspectives of how they can help workers with HL and their knowledge about the impact of HL on UK workers. The main aim of this study was to explore the HHC provided to workers with HL by their audiologists in the UK, and to explore the facilitators and barriers to effective support from audiologists' perspectives. It also aimed to explore the impact of HL on workers' lives by exploring audiologists' experiences and views.

The findings should make an important contribution to the field of audiology research and enrich the sparse literature about adults with HL who work, by providing new information about the hearing care they receive from their audiologists and the factors influencing it from the audiologists' point of view. Further, the findings could add to the current knowledge about the impact of HL on workers lives.

Study 1 was motivated by three related research questions:

1. What are audiologists' experiences and views of working with patients who work?
2. What do audiologists think are the facilitators and barriers to effectively supporting these patients?
3. What do audiologists think are the effects of HL on the lives and health of workers with HL?

This study was conducted by interviewing audiologists to explore their experiences in their appointments with workers and their views regarding the facilitators and barriers to providing better support for workers with hearing difficulties, and to explore their perspectives concerning the impact of HL in the workplace. A better understanding of their experiences and knowledge will help us understand the current hearing care services available to workers with HL, and potentially identify current challenges or important issues where there could be scope for service improvement. This could also be helpful for hearing care services to be able to manage efficiently the continuously increasing demand for hearing care for the working-age population, especially in the light of changing demographics.

4.2 Research methodology and methods

The general research paradigm, design and methodology for this study and for the following two studies are discussed in Chapter 3. The following sections present some methodological specifics for this study (Study 1). Please refer to Chapter 3 for further information.

4.2.1 Recruitment

The Research Ethics Committee of the Institute of Sound and Vibration Research approved Study 1. In addition, ethics approval was obtained from the Health Research Authority and Health and Care Research Wales, so that NHS organisations can participate.

The participating audiologists were recruited from all over the UK and from all types of audiology services (independent companies, independent companies providing NHS services under the AQP scheme[8] and NHS services). The audiologists were recruited via several different methods. First, an email was sent to various departments and services in the UK inviting them to take part in the study. 84 NHS audiology departments and 8 main independent companies were emailed. Most of the independent companies contacted have many departments across the UK, and the email was forwarded to many of those departments through their heads of department. Second, the research was advertised in the British Academy of Audiology Horizons monthly magazine, and a recruitment advert was posted on the Ida Institute Learning Hall webpage. Third, audiologists in the University of Southampton, as well as the audiologists who participated, were asked to recommend potential participants who could help in this study and these individuals were emailed. Finally, a few audiologists were verbally approached, either through their departments or by the researcher, asking them to participate directly. It was made clear to all that participation was voluntary, and if the approached participants were interested, they received the participant information sheet by email. Audiologists who agreed to participate received a demographic questionnaire (Appendix D) and a consent form by email before the interview was conducted, and

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[8] The AQP scheme is discussed in Section 2.3.1

were asked to fill in the questionnaire and sign the consent form and return these by email to the researcher. A few of the audiologists filled in the questionnaire and signed the consent form just before the interview, when it was conducted face to face.

At first, the sampling of audiologists was specific to finding qualified audiologists who work in adult rehabilitation clinics or cochlear implant services in the UK (regardless of their age, gender, type of qualification, experience in audiology, the area of work, service type and geographic location). This helped to gather common perspectives. However, the researcher noticed some variations between the perspectives of different groups of audiologists, and noticed that some groups of audiologists dominated the sample. Therefore purposive sampling was used, e.g. to recruit audiologists working in the NHS. For example, at a certain point, the researcher noticed that the interviewed NHS audiologists were mostly the heads of their departments. It is possible that they were able to take part in the study because they were less busy than audiologists lower down the hierarchy, who spend more time in clinics seeing patients. After this point, lower level NHS audiologists were recruited in order to explore their perspectives. If there were hints or information from participants with particular characteristics, the researcher purposively sampled participants from that group to see if that was a common theme for that group or not.

Saturation of data was reached with 13 interviews. However, sampling continued until 25 participants had been interviewed. The reason was to sample sub-groups. For example, the sample was initially constituted mostly of audiologists working in independent companies and in the south of the UK. Therefore, purposive sampling was carried out to interview audiologists working in the midlands and the north and to recruit more audiologists working in the NHS. Recruitment of more NHS participants was of particular importance, because the interviews pointed to potentially different findings for different services. In addition, maximum geographic variation was considered, because audiologists’ perspectives regarding their practices could be different in the north compared to the midlands and southern UK; the types of jobs of workers do in different geographical locations may vary (Office for National Statistics, 2018a); therefore, audiologists working in different geographical locations could have different experiences with their patients.

4.2.2 Participants

Table 8 below summarises the participants' characteristics. 25 participants were interviewed. The sample consisted of 19 female and 6 male audiologists. This dominance of females in the sample reflects their dominance in the field of audiology in the UK as well as other countries (Litosseliti and Leadbeater, 2013). The ages of participants ranged from 23 to 58 years (mean age = 36.5, standard deviation = 12.2). The sample included audiologists with variable characteristics in terms of years of experience, areas of work, type of service in which they were working, type of work (full time or part-time) and audiology qualifications (See Table 8 below for a summary of participants’ characteristics). Such details were collected to aid data analysis, and, in particular, to identify if there were differences in the results that could be explained by the group’s different characteristics.

Participants were working for a variety of services located in various cities in the UK: 10 were working for the NHS; 6 were working in independent companies; 9 were working for independent companies that provide NHS services (AQP). Many of the independent company's audiologists reported working in the NHS at some point, and they reflected on their experiences in the NHS and made comparisons between their experiences in the different services. All the interviewed audiologists worked in adult rehabilitation, four of them worked in cochlear implant services, and a few worked additionally in other areas like tinnitus support, vestibular rehabilitation, hearing therapy and paediatrics. Their years of experience ranged from 2 to 38 years (mean = 13.5, standard deviation = 11.2). The majority were working full time (21 participants), while only four participants were working part-time. All participants had at least one qualification in audiology. However, the qualifications varied according to the time they obtained them.

Table 8: Characteristics of Study 1 participants.

Number	25 participants
Age	Range: 23-58 years Mean: 36.5 Standard deviation: 12.2
Gender	Female: 19 Male: 6
Years of experience in the audiology field	Range: 2-38 years Mean: 13.5 Standard deviation: 11.2
Area of work	Adult rehabilitation: all Cochlear implant services: 4 Additional areas of work (paediatrics, vestibular clinics or tinnitus support): 4
Type of service	NHS service: 10 Independent company: 6 Independent company providing NHS services: 9
Type of work	Full time: 21 Part time: 4
Qualifications in audiology	Bachelor in Audiology: 16 Masters in Audiology: 8 Doctor in philosophy: 3 British Association of Audiology Technician: 3 Medical Physics and Physiologic Measurements: 2 Registered hearing aid dispenser: 4 Hearing therapy qualification: 2 Others: British Society of Audiology certification: 1, MSc in clinical science (Neurosensory science): 1, graduate diploma in Audiology: 1, Ordinary National Certificates in Physiological measurements: 1
The cities where the audiologists were working when they were interviewed	Andover and Petersfield, Brighton, Cheshire, Dorset, Eastleigh (2), London (3), Oxford, Preston, Reading (2), Southampton (7), Surrey, Windsor, Worksop, Worthing, Yeovil.

4.2.3 The interview process

Eleven audiologists were interviewed face to face, 10 via telephone calls and 4 via online video calls. The interview method was mainly determined based on the geographic location and the participant’s preferences. The face-to-face interviews were conducted either in the participant’s workplace or at the Hearing and Balance Centre at the University of Southampton. Three of the participants had a pre-existing relationship with the researcher due to sharing the same academic environment at some point in time. The existing literature on interviewing study participants with whom the researcher is already acquainted contains many arguments on the benefits and limitations of this approach, and encourages the researcher to be pragmatic and consider issues related to confidentiality and the effect of any pre-existing knowledge (McConnell-Henry et al., 2010). The researcher took into account these issues, considered confidentiality issues, and practiced reflexivity while analysing data from those participants. In some aspects, the researcher perceived it as useful, especially in terms of building trust and rapport.

The participants were asked to discuss four open-ended, semi-structured questions and used some prompts if needed. These are available in Table 9 below. The duration of the interviews ranged from 12 to 37 minutes (mean = 24.6, standard deviation = 5.8).

Table 9: Study 1-interview guide. The questions are numbered, and the prompts are in italic font.

1. Can you tell me about your appointments with audiology patients who have HL and work?

   Prompts:
   - *What are your practices and routines in your audiology consultations with patients who have HL and work?*
   - *What questions do you ask?*
   - *How do you assess your patient's difficulties in relation to work?*
   - *What tests do you do?*
   - *How do you support them?*

2. What currently is helping or not helping you to support these people?

   Prompts:
   a. *What do you think are the current obstacles/ helpers?*

3. In an ideal world, what would you need or do to support these people better?

   Prompts:
   - *What do you think could be an ideal future setting that would enable you to provide ideal healthcare to working patients who have HL?*

4. How do you think HL impacts on the lives and health of workers with HL?

   Prompts:
   - *What are the direct and indirect consequences of having HL on the lives and health of workers?*

4.2.4 Piloting

At the beginning of the study, a few interviews were conducted and evaluated before conducting further interviews or analysis. Two of the PhD supervisors listened to the recording of one of the interviews independently, gave feedback to the researcher, and gave advice, e.g. allow longer pauses between prompts. This helped the researcher to become aware of any issues that could affect the results or influence what the participants would talk about. In addition, this evaluation resulted in minor amendments to the interview questions. As these amendments were made only to make the language of the questions clearer and easier to understand, the interviews that were conducted for piloting were included in the final analysis.

4.2.5 Analysis of the interviews

The interviews were thematically analysed. The initial coding followed the interview transcription. All the transcripts were coded inductively. For the first 12 interviews, open coding was used to code the interviews fully using very low-level codes. The initial coding of the first 12 interviews resulted in a large number of codes (551 initial codes). The analysis of the remaining interviews resulted in a very limited number of additional codes. The codes were then integrated together to form fewer and more powerful groupings. These were then developed into the final themes and subthemes. For a detailed description of the analysis, please refer to Section 3.2.3.

An independent coder coded some of the interviews to check the commonalities and discrepancies between the coders' results. The coding manual was shared with another researcher, KA, who is experienced in qualitative data analysis but not in the interview subject matter. Six interviews (24%) were analysed independently by KA, using the coding manual. Any inter-coder discrepancies were then discussed and inter-coder agreement was achieved (Campbell et al., 2013). This process resulted in no changes to the coding manual.

4.3 Results

4.3.1 Introduction

In the interviews, the audiologists reported a variety of insightful and interesting experiences and views regarding workers with HL and their appointments with them. Four main themes and 15 subthemes were generated and are shown in Figure 8. In order, the developed themes are 1. Current practices and routines. 2. Perceived challenges. 3. Scope for better support. 4. Various and variable negative impacts on workers. The following sections present explanations of all the themes and subthemes supported by extracts from the interviews.

Participants' identifiers at the end of the extracts include the participant's number and the area of work, to distinguish participants working in cochlear implant services from those working only in adult rehabilitation clinics, and the type of service they were working in at the time of the study. The abbreviation AR indicates the participants working in adult rehabilitation clinics, CI indicates participants working in cochlear implant services. NHS is used for participants working in the NHS, IC AQP indicates participants working in independent companies that provide NHS services under the AQP scheme, and finally, IC indicates participants working in independent companies that do not provide NHS services.

Current practices and routines

- “Same approach for most patients”.
- Variations between hearing care services.
- Audiologists’ personal experience of hearing loss.

Perceived challenges

- “Non-routine” and challenging cases.
- The role of hearing technology.
- Concerns about lack of awareness and knowledge.
- Communication difficulties between services.
- Limited funding and resources.

Scope for better support

- “Would like to be informed”.
- Other potential service improvements.

Various and variable negative impacts on workers

- “Depends on the person, the job, and the hearing loss”.
- Impacted psychosocial health.
- Occupational and employment difficulties.
- Risks to safety and physical health.
- Restricted hearing and communicative ability.

Figure 8: Study 1 overarching themes and subthemes relating to the experiences and views of audiologists concerning hearing loss and work life and audiology services.

4.3.2 Theme 1: Current practices and routines.

Audiologists spoke about their practices and routines during their appointments with workers with HL. Mainly, they talked about three main aspects, represented by the following subthemes: “same approach for most patients”, variations between hearing care services and audiologists’ personal experience of HL.

Before discussing those subthemes further, it is worth mentioning two points. First, some audiologists think their practices and routines have changed over time and that audiology services, in general, have improved. In addition, some found the experience of participating in the interview thought-provoking and that it made them reflect on what they do in their practice.

4.3.2.1 Subtheme 1.1: “same approach for most patients”

Most of the audiologists indicated that the appointments are the same whether the patient works or not. They perceived audiology appointments as very prescriptive and repetitive and that work might not be taken into account in consultations. Only a very small number said that work-specific needs dictated different support methods, but that the rest of the appointment would be the same.

“The appointments are very standard through all the patients. There is no differentiation if they are working or not.” (P 6 AR IC AQP)

4.3.2.2 Subtheme 1.2: variations between hearing care services

During the early stages of conducting the interviews, the researcher noticed differing practices and perspectives among audiologists, especially when comparing those who were working in different types of services. The analysis indicated that the services in which the audiologists worked were different in many aspects, influencing workers’ care. Moreover, the audiologists themselves had different approaches in their assessment of patients’ work difficulties, the tests they carried out and the support they offered to workers with HL, even within the same type of service. These two points are explained further below.

1. *Variations between the audiologists*

First, the audiologists discussed how they asked about their patients’ difficulties in relation to work during the appointment. Each audiologist had a different approach but very few of them reported asking specific questions about work. Most asked general questions like “What has brought you here today?” or used the COSI questionnaire and waited for the patient to volunteer this information.

"I must admit… I tend to ask them, 'How are you getting on with it?' generally, but… don't ask any specific questions about work… it's possible to miss it… unless they brought it up." (P 9 CI IC AQP)

They explained that exploring work life would require time and additional consideration beyond what they were accustomed to providing. Further, there are routines that are prioritised.

"It's the time pressure… I suppose it's harder to suddenly go out the box and look at a particular person's needs, if they're are not the average person coming through… because you're automatically going to do the hearing test… get the COSI and REMs {Real Ear Measurements} done, gotta get them out." (P 10 AR IC AQP)

Interestingly, two audiologists expressed concerns about asking patients about their work.

"You don't want to ask about work specifically because it might be that someone doesn't have a, like, paid job… you don't necessarily want to raise that. If you ask… then you're 'most implying that they should be working." (P 13 AR NHS)

Thus, it appeared that exploring patients' difficulties in relation to work varies between audiologists and cannot be considered a routine activity.

Second, the audiologists talked about the range of hearing tests they carried out for workers. Pure tone audiometry, including otoscopy, was the usual test undertaken by all and the sole test for many.

"We don't do any other tests, it's pure tone audiometry and otoscopy… for everybody." (P 7 AR IC AQP)

Other than pure tone audiometry, the tests performed varied and included tympanometry, speech perception tests, uncomfortable loudness levels, feedback tests and real ear measurements. Some do tympanometry routinely and irrespective of its need.

"We do tympanometry routinely on everybody, and not just if we think they might have something wrong." (P 4 AR IC)

Some of the audiologists thought that speech perception tests help in counselling working patients.

"A lot of patients who've got normal or very mild high frequency hearing loss are really struggling in their work environments… for those patients I would do speech in noise tests to help mainly with counselling really, for them to have an idea with why they're experiencing the difficulties… and what strategies we could work with them." (P 17 AR NHS)

Overall, the tests done for workers with HL, other than pure tone audiometry, exhibited diversity of practice between the different audiologists.

Third, provision of hearing aids or cochlear implants dominated the discussions about support and were found to be the main focus, if not the sole focus, of the management plan.

"The sort of things we normally do is talk to them about hearing device fitting, whether that be hearing aid… possibly cochlear implants." (P 12 AR NHS)

The criteria to fit hearing aids were different, however; some thought patients' difficulties dictated the decision while others relied on the results of pure tone audiometry.

"A lot of it is down to where the loss is on the graph." (P 8 AR IC)

"You have to be flexible, you can't really say 'I'd only fit hearing aids is going to be if A B C; you have to take into consideration… the difficulties they are having." (P 16 AR NHS)

One audiologist raised a similar issue regarding the criteria for obtaining a cochlear implant from the NHS and argued that some workers with HL could benefit from cochlear implantation, especially if their job was hearing demanding, but the current criteria for who can get a cochlear implant from the NHS does not take into account functionality issues like work.

"For candidacy of implantation, the work situation is considered completely irrelevant, unimportant… it has no bearing whatsoever." (P 9 CI IC AQP)

The additional support methods included offering or mentioning ALD, discussing communication tactics, advice on making adjustments at work, workshops and drop-in sessions for devices, providing written information and signposting to other services that could help (ATW, DeafPlus, hearing therapy services, social services, occupational services, lip-reading classes). The most popular suggestions were about ALD and ATW. Each of the others was mentioned by one or a few of the audiologists and they did not necessarily offer it to every patient.

"Sometimes we'll discuss listening tactics." (P 23 AR IC AQP)

Regarding offering, mentioning or demonstrating ALD, some audiologists said they did it if deemed helpful for work. However, many barriers prevented them from offering this kind of support (Further details in the theme 'Perceived Challenges').

"We may look at solutions for certain situations, for example, an additional microphone for meeting situations." (P 4 AR IC)

Similarly, many barriers hindered signposting patients to charities, organisations or services that can help them, especially ATW, to obtain help for devices. Nevertheless, a few audiologists said they sometimes mention that but with hesitance (more about this in Perceived challenges).

"Access to Work perhaps works a bit better for them, is to have more support from their employer… We sometimes mention that" (P 3 AR IC)

Generally, the audiologists reported that they supported workers with HL very differently, apart from advising on and fitting hearing aids and cochlear implants. The range of the other support methods seems to be narrowly utilised.

2. Variations between services

Finally, most of the audiologists spoke about how different the NHS, independent companies and cochlear implant services are when it comes to care for workers with HL. Mainly, the dissimilarities identified were either differences between the NHS and independent companies (this was the strongest) or differences between services which adopt a team approach, like cochlear implant services, and those who do not, like most audiology clinics.

The NHS audiologists and those in independent companies, as well as those who moved between services, spoke about two main areas of difference between the NHS and independent services: access to services and the support offered. It appears that appointments in most audiology departments in the NHS are less accessible for working patients compared to those in independent companies; however, there could be some variation between the NHS audiology departments.

"The only thing that possibly would impact on the service that we offer to that particular… demographic working population is our opening hours… it can be difficult for them to access the service." (P 15 AR NHS)

Moreover, the audiologists stated that hearing technologies offered in independent companies are more helpful to workers. Independent companies have more technology choices like ALD, and their hearing aids are more advanced. They also have better cosmetic options, especially that independent companies offer invisible hearing aids, which the audiologists thought to be demanded more by the working demographic.

"Those that do… have generally come to see us because anything else they tried, NHS hearing aids aren't helping them enough in work environments." (P 8 AR IC)

Regarding the difference between cochlear implant services, which use a team approach, and most adult rehabilitation services, that do not, audiologists considered that better HHC to workers with HL is delivered when there is a team who can discuss patients' cases together, especially if that team includes a hearing therapist.

"If they… need further support because they're not adjusting to their hearing loss at work, so they need further support for ALD, all that sort of thing… we can…refer in, into their service {hearing therapists} … they are part of the audiology team." (P 15 AR NHS)

4.3.2.3 Subtheme 1.3: audiologist's personal experience of hearing loss

Many audiologists found it helpful to have personal experience of HL, whether that meant being affected by HL themselves, knowing colleagues with HL at work, or even having a worker with HL within the family. They believed that this positively influenced the care they provided to workers with HL.

"I wear hearing aids… for me, that quite often of an advantage because they're talking to someone who can relate, can advise, so that helps… I've had the same sort of experiences." (P 8 AR IC)

"I work with people who have hearing loss… they have all this knowledge about… what someone with a hearing loss is entitled to, what they can be directed to and what people should be doing… I'm quite lucky to have that resource and if I had questions, I would go to them." (P 11 CI IC AQP)

4.3.3 Theme 2: Perceived challenges

A strong theme that was generated was Perceived challenges. The audiologists reported experiencing several challenges when dealing with patients who were working. The audiologists focused on five main issues, presented in the following subthemes: "non-routine" and challenging cases, the role of hearing technology, communication difficulties between services, concerns about lack of awareness and knowledge, and limited funding and resources.

4.3.3.1 Subtheme 2.1: "non-routine" and challenging cases

This theme describes how audiologists perceive workers with HL. All of the audiologists perceived workers with HL as a special kind of patient. Their appointments were perceived challenging and "non-routine"; first, because in the clinics, audiologists do not often come across patients who work, and second, because workers with HL have more specific needs, especially when compared to the average patient coming through (presbycusis). It seems that workers with HL require longer appointment times, are more informed about their condition, find it difficult to accept HL and have high expectations of services.

"Their {workers} listening situations are more complex than I would say for… traditional 70- to 80-year-old who's having hearing loss… that their listening needs, I guess, are less complex or less challenging… their expectations perhaps were a little different as well…I think people… who may be a little bit older… their expectations are lower… or it might be younger people at work, I guess they're more well-informed, so they may be read on the internet the sorts of things that might be available in terms of technology… They're coming with more specific questions… so you're trying to do your standard test batch and your standard... structured interview, but at the same time they've got additional specific needs… that you maybe wouldn't get in more routine patients." (P 12 AR NHS)

On the other hand, a few of the audiologists pointed out that since workers with HL are mostly younger, fitting them with hearing aids was more efficient.

"With the younger, working adults, it's a lot more efficient… because, for example, when you are fitting them… they more quickly get a grasp of like what's going on and so you can… get through things up quicker." (P 14 AR NHS)

4.3.3.2 Subtheme 2.2: the role of hearing technology

All the audiologists had a positive attitude towards hearing technologies that support workers with HL. The discussions were about hearing aids or cochlear implants, ALD, mobile applications and tele-audiology.

“A range of wireless devices… could be really helpful for working-age adults… and we've had good feedback that they work well.” (P 14 AR NHS)

The challenges that were brought up regarding hearing technologies were:

1. Hearing aids help but they still have their limitations and alone cannot fix all work difficulties.

“Hearing aids really are the biggest priority, but I know they don't always meet all of the needs.” (P 2 AR IC AQP)

2. The audiologists think they lack experience in dealing with some of the hearing technologies, mainly ALD.

“We’re not getting enough experience of using it (ALD) to build up… when we do use it we’re scared of it.” (P 5 AR IC AQP)

3. Audiologists find it hard to stay up-to-date: hearing technology is advancing quickly, the technology keeps changing, and there is so much out there. Not only the NHS audiologists, but also the independent companies audiologists expressed the same concern.

“There’s so much equipment out there that's… beyond our knowledge or beyond our professional boundaries… it's hard… to help them make that specific decision on what to buy… that's stopping me from helping them any more than what I do already.” (P 18 AR NHS)

4.3.3.3 Subtheme 2.3: concerns about lack of awareness and knowledge

The audiologists expressed concerns regarding their own lack of awareness and knowledge, and the lack of awareness among workers with HL themselves, people in the workplaces, such as colleagues and employers, and people in the general community. Most of the audiologists discussed at least one of these aspects. The most popular point of discussion was, interestingly, the lack of awareness and knowledge among audiologists themselves. Some of the audiologists talked about being unaware of the available help that can benefit working patients.

“Actually I, I tend not to be completely aware of the resources that are available.” (P 1 CI IC AQP)

Many others talked about ATW, commenting that they did not know much about it and were not confident that they knew how it works, which affected the advice they were offering to their patients.

“Access to Work, I know that it's there… but I don't necessarily know what they are exactly entitled or what they can do.” (P 2 AR IC AQP)

Many expressed significant concern that their education and training to become audiologists lacked specifics about the working population.

“I can't remember there being a topic on Access to Work when I studied… I don't really remember there being anything on… work situations.” (P 11 CI IC AQP)

A few others felt unsure whose responsibility it is to support workers with HL.

“There are so many barriers there are so many things we don't know. Um, I don't know whose responsibility is to, to help with that {helping workers with work}” (P 17 AR NHS)

4.3.3.4 Subtheme 2.4: communication difficulties between services

Many of the audiologists experienced difficulties communicating with other services or organisations to obtain information. This lack of communication was viewed as a barrier to the help they could give workers with HL, whether that was between audiology services themselves, between audiology services and other services like social services, or between audiologists and patients’ employers.

“It was a big barrier to get in touch, like with the social services, to know the extra solutions for my patients. And it is also a barrier from the NHS itself… we are suppliers of NHS hearing aids, but we have no communication with ENT {ear, nose and throat specialist} or GPs {general practitioners}.” (P 6 AR IC AQP)

One audiologist was upset because the way the service is structured under the AQP scheme meant the services did not talk to each other.

“The Qualified provider status, in theory, we're all competitors so we don't really talk to anyone which is a shame… I'm quite cross about that ‘cause... as an audiologist… all that shared knowledge is cut off. I don’t know what's going on in [city name] or [city name] or, you know? They might have some really good ideas but because we're in competition with them we can't really talk to them... it's fragmented.” (P 10 AR IC)

A few audiologists also spoke about the lack of communication between them and patients’ employers.

“We don't liaise with their work specifically. Occasionally people might ask us to write a supporting letter… if they're having trouble with their employers.” (P 19 AR NHS)

4.3.3.5 Subtheme 2.5: limited funding and resources

Funding issues, as well as lack of resources, were a concern of many of the audiologists. The resources mentioned included leaflets with helpful information for working patients, contact information of services that can help workers with HL, suitable speech tests and the ability to carry them out, technologically advanced hearing aids, ALD and, finally, the ability of audiologists to visit the workplace of their patients to assess its accessibility and make better recommendations. Most of these resources were perceived to be limited for financial reasons.

“A lot of the information leaflets they've got a lot of old people on them… people talking in in situations that are maybe not relevant to young working people.” (P 17 AR NHS)

“I would go into the place at work… that's what we do with children in education… that doesn't happen at work, and yet… one of the arguments about cochlear implants is that it improves people's productivity and makes them able to work. So, it's a kind of funny disconnection there… we're not paid to do that.” (P 9 CI IC AQP)

Many audiologists talked about the financial burden behind hearing aids and ALD. Most of them commented on NHS funding for hearing aids and ALD and argued that funded hearing technology is limited in the NHS. In addition, the NHS does not pay for ALD through its departments, despite that these ALD could help people who work.

"The NHS at the moment provides hearing aids, anything else is classed as hearing aid accessories… So… the bits and pieces like the Roger pen... we do not provide that… we don't have the budget for that." (P 16 AR NHS)

Some of the audiologists discussed access to ALD and their funding by the NHS through the ATW scheme. Two of them argued that, although the NHS can partially fund ALD, the kind of ALD given to patients are not necessarily the best for them, i.e. some of the audiologists thought that ATW is not an efficient resource.

"If they go around down the Access to Work route, they quite often get told that they can only have a Roger Pen, for which they need extra adaptors and everything, which makes it quite clunky. The whole idea here is it's supposed to be they are a working-age, they want something that's efficient that isn't really obtrusive." (P 14 AR NHS)

On the other hand, a few had a different, more positive view towards ATW as a resource.

"If you've got somebody… who's really struggling at work to enable them to stay at work, Access to Work is a very good tool to use… you're half government funded and half the employer." (P 15 AR NHS)

Finally, a very small number said that they did have enough resources, despite being financially constrained.

"I think that the resources that are available to us are fairly extensive… it tends to be more of a help than a hindrance. I don't think we are hindered particularly, other than possibly financially, but I think that's probably true across the NHS." (P 15 AR NHS)

In general, however, it is evident that most audiologists think there are limited resources and funding, which could be negatively affecting the service they provide to workers with HL.

4.3.4 Theme 3: Scope for better support.

This theme captured the participants' vision regarding the scope for improving the support given to workers with HL by audiologists. For that to happen, the audiologists had a standard view: they "would like to be more informed". Moreover, they made various suggestions that could help improve the support given to workers with HL by their audiologists. The following two subthemes will expand on these two points further.

4.3.4.1 Subtheme 3.1: "would like to be informed"

The audiologists envisioned providing a better service for working patients if they were empowered by knowledge. The majority of the audiologists emphasised that they would like to be well informed about workers with HL and the help they can offer them. This dialogue echoes another subtheme: Concerns about lack of awareness and knowledge (Section 4.3.3.3), where they voiced their concerns mainly about being not aware of the available help to workers with HL.

"I think there's… a huge scope for, for extra support in this area. Um, and it would be good to know the, the numbers of people affected really… we kind of speculate the number of our patients that are in employment or not, but we don't know that certain. And I suppose it's quite fluid population because that, that is going to change, yeah, I think we, we will be better able to support people if we kind of knew what we were dealing with, really." (P 1 CI IC)

"I suppose, we need a bit more information about how Access to Work works, you know, what employers /employees' rights are and what the employer's rights are, so that we can support them with that. That would be useful." (P 19 AR NHS)

In addition, many of the audiologists expressed the need for a directory containing information relevant to this population; in particular, they stressed that they would like it to contain information about what support is available for workers with HL, whether in terms of hearing technologies, support services, like social services and ATW, contact details for those services and information about what workers with HL are entitled to. This directory could save audiologists from having to navigate convoluted pathways to information, where they can get lost, especially when they face difficulties knowing what support is available out there, and have difficulties communicating with other services, as discussed in the previous theme: Perceived challenges. Thus, having all the required information in one place could help the audiologist to tell workers with HL directly what they are entitled to and what they need to do, which is likely to achieve better outcomes for patients.

"I think it would just be useful to know a bit more. I know that there is a lot of information out there about all the products but it's all quite all over the place so if it were to be able to put together in one kind of booklet or something that would be quite helpful." (P 2 AR IC AQP)

Two of the audiologists also suggested having work-related education in audiology training.

"You could have… the university courses do modules on work-based... information... that would be useful, so the students could refer to it. Um, so it's even before they start seeing patients they have these ideas of how they can help patients will be bubbling away, so that is a pretty good thing to do." (P 10 AR IC AQP)

Experience and ongoing learning were seen to be useful from the audiologist’s point of view, but they need more of it.

“Last year… one of my colleagues... she helped somebody through… went through to, to purchase a lot of equipment through Access to Work, so that… really opened my eyes to the possibilities of it.” (P 5 AR IC AQP)

Moreover, another audiologist emphasised the need for training:

“Additional training might help… I think it's important to make sure that you're you know you're up to date with… things you know, what other services are available or assistive listening devices, because its moving on so quickly.” (P 12 AR NHS)

The need for specific literature on workers with HL was also raised by a few of the audiologists, which reflects the significant gap the researcher found when reviewing the literature on workers with HL. One interviewee said:

“We, we kind of assume we know a reasonable amount, but that's probably not really based on anything… And often we draw on skills that we have from other areas of audiology, but aren't necessarily, where we kind of assume that they're relevant to that {relevant to workers with HL}, we don't really know that for certain. It's like this is, it's like kind of lack of research, isn't it really?” (P 1 CI IC AQP)

In contrast, two audiologists implied that they did not think there is more to know or do for workers with HL. One of those audiologists expressed a remarkable notion and said:

“I don't feel like I need to know any more, but then sometimes if you don't know what you don't know, do you know what I mean? Like {laughter}. I feel fairly confident with what I do know, but I don't know what else I could be doing to help people, if that makes sense.” (P 7 AR IC)

However, the same audiologist, later in the interview, said that she needed further information and training when asked what would enable her to support workers with HL better.

“So it's just... training on, yeah, training on keeping up with technology and new devices and then any changes in stuff like Access to Work. I don't know a lot about it, I'd know where to put someone towards it, but I don't actually know a lot of what employers are expected to do or not. So, it would be kind of learning about, you know, the advice I can, how I can then advise customers better, rather than just saying "Oh go to this website" You know, off they go and, you know you hope for the best, so yeah.” (P 7 AR IC AQP)

This subtheme demonstrates that the audiologists felt they could offer better help to workers with HL and that they needed information and training for that to happen.

4.3.4.2 Subtheme 3.2: other potential service improvements

The interviewed audiologists were inventive in their suggestions of methods to improve the service to workers with HL, which highlights the wide scope for potential improvements in the support given to workers by their audiologists. The main suggestion was laid out in the previous subtheme “would like to be informed”, which is empowering the audiologist with knowledge. This subtheme presents various other ideas. Most of them were brought up when the audiologists were talking about their experiences with workers with HL, particularly when they talked about the facilitators and barriers they experienced in supporting workers with HL. Therefore, they are closely linked to the challenges the audiologists identified in the previous themes, especially the theme Perceived Challenges. The suggestions made are available in Table 10 below.

Table 10: Audiologists' suggested improvements for audiology services supported by extracts.

Suggested improvements	**Example quotations**
Around half of the audiologists suggested liaising with the workplaces of workers with HL. Many of them suggested visiting patients' workplaces, communicating with the employer, and educating colleagues about the difficulties experienced by workers with HL and how to help them.	*"We can pass the message to the employer that this is what hearing-impaired people can do, that this is what hearing-impaired people… need from you… it's raising awareness for the employer." (P 18 AR NHS)*
Many audiologists suggested that workers with HL should also be educated, which could empower them and promote self-management. They argued that workers with HL need to take responsibility and be proactive, provided that the audiologists equip them with the needed resources.	*"it's like any kind of long-term health condition, like diabetes, you give them the tools that they need to able to manage the condition, we give patients, particularly the working adults… the opportunity to ask if they want to learn… And also give them a bit more responsibility about managing their hearing loss." (P 17 AR NHS)*
Better communication with other services and external organisations was the hope for many audiologists to facilitate information sharing.	*"It's anticipating a better interaction as between the private, NHS and the charity sector within the hearing community. That would be really really helpful." (P 20 AR IC AQP)*
Many argued that having written information relevant to working patients could help to inform the patient better.	*"Having, like, information on paper, they could give someone, that they could be like, "Oh, this is what you need to do to get through," that will be quite useful." (P 11 CI IC AQP)*
A few of the audiologists encouraged the idea of having multidisciplinary clinics, walk in clinics specific to working patients, workshops, support groups or even demonstration sessions for devices that could help them at work.	*"You could… have special clinics for people with hearing problems or at work age… where they can just walk in, 'cause obviously they're working-age. It's harder to get the appointments during the working day." (P 10 AR IC AQP)*
The audiologists who expressed some concerns regarding the efficiency of the ATW scheme suggested the following:	*"I think the access to things like the wireless devices... and funding available for the wireless devices... could be easier and more transparent... and more tailored to each patient." (P 13 AR NHS)*

Suggested improvements	Example quotations
The role of mobile apps and tele-audiology was also discussed. While only a minority mentioned this, those who talked about it seemed to be optimistic these tools could be of great benefit to workers with HL in particular. They argued that workers with HL could make changes by themselves to their hearing aids, through mobile apps, and they could also contact their audiologists to make real-time adjustments.	*"I am actually quite excited by the new hearing aids… because they do allow you to program them remotely. I think this is gonna be really useful for people at work… somebody at work could phone me at work and say: "I can't hear in this situation," and I can make real-time adjustments to their hearing aids while they are in that situation. Uh, which we haven't actually got the, uh, system in place to enable us to do that, but I know that it has been tried quite successfully in America." (P 21 AR IC)*
A small number of those interviewed suggested that the service should be structured in a way that allows more time with workers with HL.	*"Services, because of the way they're structured… you can't have that time… more time the better I suppose." (P 10 AR IC AQP)*

4.3.5 Theme 4: Various and variable negative impacts on workers

This theme frequently recurred throughout the dataset. It sums up the issues mentioned by the audiologists regarding the effect of HL on workers. The audiologists perceived the impact to be exclusively negative and big. To some extent, they identified almost the same key areas that are found in the literature but also offered new insightful perspectives. These results are explained in the following subthemes; "depends on the person, the job, and the hearing loss", "impact on psychosocial health", "occupational and employment difficulties", "risks to safety and physical health" and "restricted hearing and communicative ability". Before unravelling what the audiologists talked about specifically in each subtheme, it is worth noting two points. First, the majority of the audiologists expressed concerns about the magnitude of the implications of HL and the effect that HL has on workers' Qol. One audiologist stated that:

"I guess for any population, for people that work rather than people that don't work, they're probably going to have more difficulty, because they're in more social situations or group situations… Obviously, the social aspect of hearing is very important for quality of life, but I suppose for people's livelihoods and being able to earn money and have security in their job, it's quite critical." (P 4 AR IC)

Second, an interesting point noted is that, when asked about the impact of HL on their working patients, some of the audiologists were not sure whether they knew. Many of them talked about the impact of HL in general, but when prompted to think about working patients, some were unsure. Some audiologists used phrases like "I guess" or "I do not know", e.g. P 5:

Interviewer: "how do you think hearing loss impacts the lives of people who work? "

P 5: "I think, well… like everybody has a huge, huge implication… I don't know, but I can guess that it potentially stops people from progressing and fulfilling their full potential, maybe because of they think that they can't do it or they struggle so they're worried to try and push themselves to go further up the career ladder, or whether they really do get pushed back and maybe they... whether they go to interviews but don't get jobs or don't get promotions because of their hearing loss. I don't know" (P 5 AR IC AQP)

4.3.5.1 Subtheme 4.1: "depends on the person, the job, and the hearing loss"

The audiologists, on the whole, argued that the effects of HL on workers with HL vary a great deal. Three main determinants of the impact were identified by the audiologists. The first is the patient's personality, attitude and acceptance of HL. Second, the patient's job: for example, how noisy or to what extent it is hearing demanding. Third, the degree or type of HL they have, for example, its severity and onset, whether it is mild, moderate or severe, sudden or gradual and whether it is managed appropriately or not. One audiologist summed most of these issues by saying:

"I think that it probably depends on the person, the job, and the hearing loss… you might have somebody with a very mild hearing loss… but they're doing lots of telephone calls, lots of meetings, lots of conference calls and they are aware of the fact that they miss things sometimes and for some people that is hugely bothersome… It affects how well they feel that they're performing at their job, it affects their self-confidence... and all sorts and then you've got another person who might be... for the sake of it, say, doing a more manual outside job, who has a mild loss and doesn't really notice that they've got a mild loss very much. So, I think it really does depend on… and again some people, you know, I've had people that go into lots of meetings and I say, oh, you know, 'How does it, does it worry you that you're not necessarily hearing at the meetings?' And he goes, 'No, I just tell everybody they've got to talk up'. You know, and then I get other people that come in and say 'Actually, you know, it's embarrassing and I don't want to admit to it'. And they've got the same hearing loss and they've got more or less the same sort of lifestyle, but they've got a completely different personality and a different approach to it. So, I don't think you can sort of have a sweeping approach to it. I think it depends on the job, what that's doing, the person, the person's attitude to it and the hearing loss. So, it's… quite different for everybody." (P 21 AR IC AQP)

P 21, like many other audiologists, mentioned the change in work environments over time, indicating that currently there are more open plan offices, more emphasis on meeting culture and teamwork in the modern type of jobs. These are communication demanding and can be harsh environments for workers with HL; however, as P 21 argued in the previous extract, it is very dependent on the patient's attitude and personality.

4.3.5.2 Subtheme 4.2: impacted psychosocial health

Concerns regarding the psychosocial impact were the most widespread. Emotional problems, disclosure difficulties, lack of confidence, stigma problems and isolation at work were the most frequently mentioned. A few audiologists suggested that workers with HL might be facing other psychosocial difficulties, such as stress, exhaustion, depression, living in denial, lack of sympathy at work, difficulties that go beyond work life including personal life and family difficulties.

Some audiologists talked about the stress and lack of confidence among workers with HL.

"They're very anxious that they're not hearing. They're very anxious that they might get something wrong." (P 16 AR NHS)

"I guess at times hearing loss for anyone, it, it makes you feel vulnerable and it can do so... I see patients who comment that they then feel embarrassed when they're in large meetings… they've someone's directed a question at them but they've not heard it and it then kind of makes them doubt their ability and being able to do their job. It makes them feel uncomfortable at work." (P 8 AR IC)

Many audiologists talked about patients' disclosure difficulties to co-workers and employers.

"I think… quite a lot of people with issues would find it difficult, uh, talking about it to their work colleagues or to their line managers, just in case that could be an issue." (P 10 AR IC AQP)

Some audiologists expressed concerns about patients' fear of being stigmatised at work.

"People are loathe to admit to a hearing loss because it's, it's associated with age and, and you know stupidity, actually." (P15 AR NHS)

Inability to socialise at work was also commented on.

"I think just general frustration at not being able to join in, especially if they're in an office and there's a chat going round and they kind of sat there and can't follow a conversation around. So, I think it's kind of the actual doing the job but then also the being in work and wanting to be involved and included." (P 7 AR IC AQP)

4.3.5.3 Subtheme 4.3: occupational and employment difficulties

The second key area of the HL impact on workers with HL was the occupational and employment impact: a variety of perspectives were expressed in that regard by most of the audiologists. Many expressed concerns about the patients' ability to perform their job especially if their job relies on hearing, and missing information can be a problem that leads to job loss.

"And sometimes… it can be really important stuff, if they're in a meeting round a table and they miss something. You know that's especially private people want to go for the best technology they can get, that's those people that are in those jobs where at, you know, the end of the day they could lose their jobs, or they could be in, get themselves into trouble if they haven't heard what they needed to hear." (P 7 AR IC AQP)

A few audiologists suggested that people at the workplace might see the workers with HL as incompetent and less professional at work, which could cause tension at work and teamwork difficulties.

"Um, but then... that feeling that other people are, are judging you and somehow seeing you as, as less of a professional or, or this kind of thing." (P 14 AR NHS)

"Patients often say that they, uh, have difficult relationships with members of, of their work teams." (P 1 CI IC AQP)

Dealing with the employer can be difficult as well according to a few of the audiologists, and they expressed concerns that workers with HL might be facing discrimination at work.

"Um, I mean, I can't, you can't avoid thinking, uh, subtle, subtle, discrimination, I suppose, of the employer that would come up to say something but actually change their mind because they know you might not hear or assume that you might not be able to provide them with what you, what they think, uh, what they think, they the other people could provide better than you because of your hearing loss. So it's that subtle discrimination." (P 18 AR NHS)

Unemployment, inability to access some jobs or change jobs, early retirement, financial difficulties were other issues raised by many audiologists.

"It does seem to us that there are quite a large number of hearing-impaired adults that aren't in employment when they could be… I suppose there's a huge number of retired people that maybe retired early because their hearing got worse and worse and worse. I see that quite often with the older population." (P 1 CI IC AQP)

"Some people I've seen are depressed they won't work... because they're not able to... to function or feel that they're not able to function. Um, obviously then there's a financial impact." (P 12 AR NHS)

4.3.5.4 Subtheme 4.4: risks to safety and physical health

Only a few audiologists who were working with cochlear implant patients mentioned safety and physical health issues. Possibly because HL is more significant among cochlear implant patients, and consequently, their safety, as well as physical health, are more at risk compared to workers with HL with milder degrees of HL. The extract below shows the audiologist's experience with a manual worker who had HL, talking about the risk of accidents at work, and the role of the cochlear implant in minimising this risk.

"Um, but quite a few people I recall in assessment and then also who got a cochlear implant who've said... the big issue for them is, is they're gonna be knocked over or you know this is, this is kind of a safety issue. Quite a few of the manual workers have come of course and they've also said that it's, that it's useful {the cochlear implant}. Um, we have a number of people who do those sorts of manual jobs, you know, outdoor jobs and are obviously not hearing well. Now that, didn't you know that, you know that truck didn't run me over. {laughs}. It's, it's, it's good to remember that, I think, as well." (P 9 CI IC AQP)

4.3.5.5 Subtheme 4.5: restricted hearing and communicative ability

Finally, the audiologists discussed hearing and communication difficulties faced by workers with HL. The majority argued that telephone calls could be tough for workers with HL.

"Telephone seems to be the really major thing that most people say about, so using their phone at work." (P 7 AR IC AQP)

Several others talked about the current modern types of jobs where there are open plan offices, background noise, lots of group meetings and conference calls maybe, and how these can be challenging to workers with HL.

"Uh, I suppose most of that population will be younger population. So they'll be... they will be more into like modern day professions I suppose, and they will find difficulties in open plan offices." (P 21 AR IC)

Two audiologists mentioned language as a barrier, because many workers with HL have to deal with different accents or maybe different languages at work, and one audiologist even commented that some might struggle to localise sound.

“I've seen recently quite a number of what I class as high flyers that they are in seminars meetings board meetings where they're needing to hear, obviously, everybody talking in that environment and I have seen a number of people where they have a unilateral loss and they are struggling with the localization. I fitted cross aids but there are a few that still can't manage. They're still struggling in that environment. It's generally noise in the workplace and with quite a number of different accents that people are struggling even with hearing aids to hear better.” (P 3 AR IC)

4.3.6 Summary

The audiologists interviewed in Study 1 voiced many issues regarding dealing with workers with HL in their clinics and discussed how HL could influence workers with HL lives. They reflected on their experiences and views in all the themes. In the first theme, “current practices and routines”, the participants spoke about their practices during their appointments with workers with HL and expressed many interesting views regarding those practices and what influences them, such as approaching workers with HL similar to presbycusis patients despite having different needs. The audiologists also discussed the challenges they experience when having a working patient and how they conceptualise and reason those challenges in the theme “perceived challenges”. For example, they thought workers with HL are challenging because they have more questions, have specific needs and they are non-routine cases. From the audiologists’ point of view, hearing care for workers with HL can be pushed forward to better support them in the theme “scope for better support”. All of the audiologists agreed that the service could improve to offer greater benefit for working patients with hearing difficulties. They also discussed many methods to achieve that, where the priority was identified as informing the audiologists better.

Finally, the effect of HL on working patients can influence many aspects of their lives, including professional life, and mental, emotional and physical wellbeing, as the audiologists had learned from their experience or anticipated. However, the impact and its extent vary a lot between workers with HL, depending on their personality, work type and HL, as the theme “various and variable negative impacts on workers with HL” illustrated. Together, these results provide valuable insights into the audiologists’ experiences and views regarding working with workers with HL and the audiologists’ awareness regarding their working patients’ difficulties and QoL.

4.4 Discussion

This section discusses aspects and perspectives that are relevant to the audiologists and their interviews. The rest of the results were in line with or related to the perspectives of the workers obtained in Study 2 (Chapter 5) and are discussed together in Chapters 7 and 8. Chapter 7 includes a brief discussion of the triangulated perspectives of the audiologists and workers with HL obtained from Studies 1 and 2, and Chapter 8 includes a general discussion of all of the key results of the research (Studies 1-3).

4.4.1 Main discussion

This study presents new knowledge about audiologists' experiences when dealing with workers with HL and advances the understanding of the facilitators and barriers to providing efficient support for workers with HL. The perspectives of the audiologists relating to how HL affects workers were also unravelled. Obviously, the findings of this study are not generalisable in the common understanding used in quantitative approaches, but can be applied to audiologists in the UK who are similar to the sample and are working in similar contexts (Sandelowski, 1997, Miller, 2010).

The audiologists' accounts of their practices suggest that the HHC offered to workers is not standardised and not necessarily tailored to patients' work needs; nor is it sufficient, which echoes workers' accounts in previous research (Mathews, 2011, Shaw et al., 2013a, Arrowsmith, 2016). For most of the audiologists there appeared to be a lack of occupational perspective in their practice. Audiologists asking patients about their occupational life and offering help specific to work life difficulties were notably the exception. Some audiologists used validation outcome measures, mainly the COSI questionnaire, to explore the impact of HL in everyday individual' situations, and thought by doing so they offered opportunities to explore work needs. It is unclear, though, whether it helped in assessing their patients work needs or not. This can constitute an interesting area to research in the future.

It was also surprising that a few audiologists were reluctant to even ask patients about their work. This is expected to be routine practice during all stages of the care pathway. It is very important that audiologists identify if their patients have work difficulties, whether in terms of accessing employment or managing their existing jobs, so that the audiologists can provide informed support. Recognising patient-specific needs is one of the four principles which the British Society of Audiology have suggested are crucial in routine auditory rehabilitation appointments (BSA, 2016). However, the audiologists' approaches were reported to be the same whether the patient was working or not. This finding resonates with previous research indicating a lack of patient-centeredness in audiology appointments (Ekberg et al., 2014, Grenness et al., 2014c, Grenness et al., 2014b, Grenness et al., 2015c, Action on Hearing Loss, 2016, Shah, 2020).

The perspectives of the audiologists, however, pointed to an interesting aspect of service delivery, which is the variation perceived to exist between the HHC offered by different audiologists and different services (NHS, independent companies and cochlear implant services). Moreover, it revealed many barriers and some facilitators affecting their interactions with workers with HL and the care provided, including aspects related to access and accessibility of services, team care and the technologies offered. These perspectives are presented and discussed together with those of workers with HL in the triangulation and general discussion chapters (Chapters 7 and 8) due to their similarity. However, it is worth discussing a key finding from the audiologists data, which was the perception that they lacked information and training on how to support workers with HL. They reported having poor access to information, deficiencies in information sharing with the involved parties and the inability to keep up with the continuously emerging hearing technologies.

This result is not surprising; access to information is known to be a basic need of healthcare professionals and could be problematic for audiologists (Guo et al., 2008), which directly influence decision making in healthcare. Thus, it is not surprising that the audiologists saw addressing their informational and training needs as their priority when they were asked about improvements. This is borne out by the experiences of some of the audiologists who had personal experiences with HL and felt that this knowledge helped them to offer better care and support. This was deemed a remarkable finding and is in accord with other research findings in the healthcare field, which show that healthcare professionals’ personal experience of the same problem was found to help them deal with patients (Mallory, 2003, Woolf et al., 2007). To address these informational needs ongoing support for audiologists should be provided starting from their basic education and training through to continuous in-service learning.

The audiologists indicated that their audiology education and training appeared to have neglected the work aspect of patients’ lives. A previous study reported the similar issue of audiologists feeling undereducated in assessing their patients’ work environment in order to help them make adjustments in the workplace (Shaw et al., 2013a). Therefore, the difficulties they reported when conducting consultations for workers with HL could be because they were unprepared to deal with this population when they started their careers. In addition, they had not yet acquired the experience needed due to not frequently encountering workers with HL in clinics, meaning such encounters are regarded as “non-routine”, and also due to the lack of training opportunities and research focusing on workers with HL. Both audiology services and audiology research have been mainly focused on serving children and older adults and improving their care; for example, one of the NHS audiology service improvement documents focused on children and older adults and did not give attention to working-age patients (NHS Improvement, 2010). Consequently, not much information is available on those in the middle age groups, the working adults.

At the level of the workers with HL, the finding that audiologists consider workers with HL to be non-routine and challenging cases is reported for the first time in the literature. It was interesting that audiologists approach appointments with workers with HL as ‘routine’ in terms of the questions they ask and the tests they do, while recognising that this group is different and has specific needs. Are workers with HL really challenging because of being non-routine, being more informed, having specific needs and higher expectations and acceptance difficulties, as these audiologists thought? Or did the audiologists perceive them this way because of the reported lack of knowledge, training and experience needed to support this population? Or could it be that there are priority practices, such as doing tympanometry testing for all cases, that take a valuable time from the appointment that could be used in the interview or the parts of the appointment concerning management?

The answers are likely to be multifactorial. For example, if there were sufficient time in the appointment and the audiologist had sufficient resources and could easily access information, they might have not perceived workers with HL as challenging as they did. No doubt workers’ needs and attributes could be out of the comfort zone of the audiologists. Especially in that workers with HL are more likely to be informed and have more challenging questions to audiologists because they are likely to be younger and use the internet to access information compared to the older, routine audiology patients. The emerging ‘informed patient’ concept has been a matter of discussion in the field of healthcare and appears to cause constraints on healthcare professionals, as discussed in the paper ’Ignorance is Bliss Sometimes’ (Henwood et al., 2003), but has not been studied in audiology. This study has brought to light the informed patient concept in this area and the challenge it poses for audiologists, signifying a need for future research in this area. Overall, all of the issues identified by study 1 contribute to a picture of suboptimal audiology care for workers with HL, together with the audiologists’ own perceptions of not being sufficiently supported by relevant resources and funding at the level of their services and the health system itself. It would be interesting for future research to explore whether adequately prepared audiologists have different perceptions of workers with HL if they had access to the required information and resources.

Regarding the impact of HL on workers, the perspectives of the audiologists have been triangulated and discussed thoroughly alongside those of the workers with HL in Chapters 7 and 8. Nevertheless, the following discussion briefly touches on some of the audiologists' perspectives. The difficulties faced by workers with HL, as the audiologists perceived them, mirror those identified in previous research to a great extent. In the literature review, six main domains of the impact were proposed in the built conceptual framework and included auditory, occupational, employment, psychosocial, physical health and behavioural aspects of the lives of workers with HL. The audiologists, to a greater or lesser extent mentioned most of the issues related to the first five domains, and barely touched on the behavioural domain. For example, believing that HL leads workers to feel embarrassed, stressed and socially isolated at work replicates and confirms the findings of earlier research (Morata et al., 2005, Mathews, 2011, Cook, 2017).The audiologists thoughts that workers with HL might be facing occupational and employment difficulties such as job performance difficulties, difficulties dealing with employers, unemployment and early retirement were also in line with what previous research has suggested (Baker, 2006, Mathews, 2011, Cook, 2017, Action on Hearing Loss, 2018).

However, the audiologists' perspective regarding the impact appeared to include some speculations instead of actual knowledge gained from their patients' experiences. It seemed that many of the audiologists were not sure and were making suggestions when they used phrases like "I guess" and "I am not sure". This resonated with their view that they lack awareness about issues related to workers with HL and reinforce the need for raising their awareness. The audiologists, despite their uncertainties, believed that patients' hearing ability is critical to their wellbeing in work life and is worth focusing on more during audiology consultations, similar to the focus on presbycusis patients' social life. They also offered new information in this research:

1) Their beliefs about the importance of hearing in nowadays modern jobs. They thought that most of the current modern jobs are difficult for workers with HL as they are communication demanding and incorporate lots of teamwork, conferences, and meeting cultures. Moreover, modern jobs' acoustic environments can be difficult for workers with HL and need more consideration when managing workers with HL in audiology appointments. An example is working in open plan offices with background noise. It could be useful to further explore this finding in future research to determine how the acoustics in modern job environments affect workers' ability to hear, communicate and benefit from hearing technologies, and how audiologists can use this knowledge to find problem-focused solutions. It would be also helpful to consider and assess

the usefulness of the universal design in workplaces to control noise levels, improve the acoustics and aid workers with HL through making workplace adjustments and providing ALD.

2) Interesting new knowledge was generated from this study regarding the variation between working patients with regard to the impact of their condition. The audiologists suggested the variation between patients, depends on their personality and attitude towards their HL, including HL acceptance, the kind or work they do and its environment, and their HL specifics, such as severity, nature of onset and management. They suggested that the workers with HL that are most affected are those who have difficulties accepting and disclosing their hearing difficulties, especially at work, those with communication-demanding jobs and noisy work environments, and workers with HL who have severe and profound HL or those who developed HL suddenly. Such patients may need personal or psychological support, besides what the audiologists can offer. This further supports the argument discussed in the literature review relating to the need for personalised support by audiologists to help each worker according to their personality, work needs and HL. For instance, a worker who has disclosure difficulties and whose work includes lots of meetings can benefit from counselling on how to adjust and disclose HL to the employer or colleagues and can use an ALD that does not require asking the speaker to wear a microphone, such as the Roger select technology. Another worker with the same HL but who works alone on a computer and needs to phone colleagues, might need only a hearing aid and an amplifying telephone.

4.4.2 Limitations

General research limitations are reported in Chapter 8 (Section 8.4.3) for the whole project. This study was also limited by some technical details related to the study sample. First, the majority of the audiologists who participated in this study worked in the south of the UK (Table 8), although the researcher tried to sample audiologists from different locations. It would have been preferable if there were more audiologists from the north. It was deemed better to interview audiologists who worked in different geographic locations, because the workers with HL might be doing different kinds of jobs (Office for National Statistics, 2018a) and consequently audiologists in different places could have different experiences. Nevertheless, no noticeable differences were identified in the results obtained from analysing interviews of audiologists working in different geographical locations.

Second, the study sample comprised more audiologists working in independent companies (15) than audiologists working in the NHS (10). Possibly this occurred because recruitment from independent companies started earlier than recruitment of NHS audiologists, due to the time spent waiting to gain NHS ethics approval. In addition, it is possible that audiologists working in the NHS have more time constraints that could have prevented them from participating. This issue could have affected the results, because the practices in different types of services could be different; however, many of the independent companies' audiologists reported working in the NHS and moving between services. They reflected on their experiences when they were working in the NHS and made interesting comparisons, which fed into the results. In addition, many of the independent companies provide NHS services under the AQP scheme and the participants deliberated on the differences in their experiences with the NHS and private patients in their clinics. It would have been ideal, however, if the study had captured the perspectives of more NHS audiologists to add weight to the study in terms of practice changing in the NHS.

Finally, in this study, the researcher interviewed three audiologists of whom she had pre-existing knowledge, due to sharing the same academic environment. Although this is considered a privilege, the literature contains arguments around the issues that could arise when interviewing participants who might have a pre-existing relationship with the researcher (McConnell-Henry et al., 2010). These issues include concerns about confidentiality, building trust and rapport, over-disclosure and role conflict (McConnell-Henry et al., 2010). To minimise the risks associated with that, the researcher made sure she maintained participants' confidentiality, considered the pragmatics of this issue.

4.4.3 Implications

From reviewing the literature, and the findings of this study, it is clear that there is a large scope for conducting future research in this area (HHC for workers with HL). Research focusing on audiology care for workers with HL is scarce, especially in the UK. A lot of questions could be asked and answered in the future. Many of those questions were mentioned in the discussion. For example, the experiences and views of audiologists have revealed a positive view towards team care including a hearing therapist in supporting workers with HL. Perhaps, patients' and hearing therapists' views on these services could be explored. This could be of importance, because in many services the audiologists indicated that the hearing therapists in their departments are the ones who mainly take care of patients' work life, and currently, hearing therapy is less taught in universities in the UK than before, with only two universities offering a bachelor's degree. This could result in a lack of hearing therapists in the future, and, consequently, this could affect the care workers with HL are offered. Currently, The British Academy of Audiology offers hearing therapy courses to certified audiologists, but it is not considered a requirement. In addition, even if audiologists were trained in hearing therapy, the appointment's structure and the agenda pre-determined for the appointment can hinder paying attention to work life needs of patients. If future studies evaluated the role of hearing therapy and found it beneficial, this could encourage hearing therapy as a profession or training audiologists and giving them the opportunity to rehabilitate their patients via providing more sessions or longer appointments for patients who have specific needs, like workers with HL.

The results of this study also revealed many facilitators and barriers influencing how audiologists support workers with HL in their clinics, and those factors could be investigated further to gain a better understanding of how and to what extent they influence that support. One study could be conducted to investigate the audiologists' need for information and the factors influencing it. It is also important to link that to audiology educational and training programmes. The results of this study showed that those programmes did not seem to be offering sufficient focus on patients who work and were more geared towards learning about paediatric and geriatric hearing needs. Future studies are therefore required to explore this suggestion and validate these results, and take action to shape audiology education and training to be more holistic and take into account the care needs for specific populations like workers with HL. The results of this study suggest research is also needed to examine audiologists' ability and confidence to advice patients on ALD in relation to work. The results of such studies might be useful to encourage provision of appropriate training in audiology departments or professional bodies, such as the British Academy of Audiology and the British Society of Audiology, or maybe early on through the education and training of audiologists.

The results of this study could also be turned into a questionnaire that can be used for clinical research purposes. This study intended to capture as many of the main issues related to workers with HL and their appointments with audiologists as possible. It does not judge which is the most prevalent or the most important issue, but the results provide a rough idea of the key issues. This study was not designed to answer questions like "What is the most prevalent issue facing audiologists in appointments for workers with HL?", but a questionnaire could be developed and validated, based on the results of this study, that might be useful for answering such questions. Ultimately, this could help to progress more quickly towards some kind of intervention and help to conduct clinics more effectively for working patients.

Finally, as argued earlier, there is an increasing need for optimised support for workers with HL by audiologists, especially as HL can have detrimental effects on their health and life, and can result in job loss and early retirement. This study highlights the need to raise awareness among audiologists, people in the workplace and the general population about HL. Surprisingly, it clearly showed that the audiologists do not think they are sufficiently aware of issues relating to workers with HL, such as what support is available for workers with HL, especially those out of audiologist's abilities. Thus, there is a need to empower audiologists with knowledge to be able to meet special needs of workers with HL and help patients remain in work and do their work efficiently. One implication that was mentioned above is the need for training and education programmes that equip audiologists with the skills and knowledge to better communicate with and support workers with HL, and encourage ongoing learning in audiology departments through workshops or seminars or communicating with the other services that can help. It also seems essential to enhance interprofessional communication to allow sharing of information and good practices.

It might also be helpful if audiologists paid extra attention to adults with demanding and stressful jobs, to identify their work-specific needs, explore their needs for hearing technologies and identify assistive devices that could help them to do specific tasks like answering the phone or attending meetings. This study also indicates a need to empower workers with HL with information and by teaching them communication strategies that could help at work. Finally, it is vital to conduct research that explores strategies to do all these things in the settings of busy clinics. Ultimately, the results of this research could be useful to audiologists, will inform government policies, and will benefit people with hearing disabilities, allowing them to have a better QoL and remain effectively engaged in the labour force.

This study can be utilised to provide clinical insights for readers as well, in particular for those involved in audiology practice and decision making. One unexpected outcome of the study was that some of the audiologists were prompted to reflect on what they do in their practice with workers with HL:

"I'm gonna still be thinking… when I see… working adults now a lot more really." (P 17 AR NHS)

The results can also be used to inform the development of standards of care for workers with HL and service quality improvements. The audiologists offered plenty of suggestions that could potentially facilitate their role in the care for workers with HL and improve patient support. However, first, the experiences and views of workers with HL need to be taken into account to form better understanding of all their needs. The perspectives of workers with HL were explored in Study 2 and are presented in Chapter 5. Chapter 7 then includes comprehensive synthesis of the results of Studies 1 and 2 through triangulating the perspectives of the audiologists and workers with HL. The triangulation of their perspectives offers a fuller picture of the common and differing needs of the audiologists and workers with HL to improve their care.

4.5 Conclusion

This is the first study presenting audiologists’ perspectives of their appointments with workers with HL and their perspectives on the impact of HL on workers. It also offers fresh insights into the audiologists’ perceived facilitators and barriers to providing quality HHC for workers. Overall, the results suggest a lack of focus on occupational issues in audiology consultations. The audiologists faced several challenges leading many workers with HL to not be sufficiently well-supported, with variations in care between audiologists and services. These include variations in the ease of access to services, work needs assessment and support and the technology provided and team care.

The audiologists showed awareness of the magnitude and the range of adversities described in literature such as occupational and psychosocial impacts and the importance of audiology support in that regard. Nevertheless, there perspectives incorporated many speculations instead of actual knowledge for which they voiced their informational and training needs. The audiologists also regarded workers with HL as challenging cases when conducting appointments and felt underequipped with information and training regarding methods of supporting the working population of adults with HL. There were many other barriers reported by the audiologists, including poor communication between services and insufficient resources and funding.

Areas where improvements are required were outlined, at the audiologist, service level and beyond. The responsibility for change should be a shared one and should not be left in the hands of the audiologists alone. Professional bodies, universities, the NHS and other audiology practice need to alert to their responsibilities and intercommunicate. A core improvement is required to ensure that audiologists are well-informed, trained and supported by their employers and health system to enable them to explore and support their patients’ work life in audiology appointments to the best of their abilities. This is key to uncovering any difficulties related to work and achieving effective care through personalised goal-setting and informed support. To further this research and enhance the validity of the results, the perspectives of workers with HL on the same topic were explored and were triangulated with audiologists’ perspectives (Chapter 5 and Chapter 7 respectively).

Chapter 5 Study 2: the perspectives of workers with hearing loss

5.1 Introduction

The literature review (Chapter 2) has illustrated a wide range of issues workers with HL might be struggling with, based on their experiences around the world. Study 1 (reported in Chapter 4) has explored these issues further, from the experiences and views of audiologists working with workers with HL in the UK. The literature review also revealed a lack of information on how they are being cared for by audiology services in the UK, as well as around the globe. This was explored partly by interviewing the UK audiologists in Study 1. To gain a fuller picture, this study (Study 2) explored patients' perspectives as well. This study aimed to investigate the HHC offered to workers with HL as experienced and viewed by them and to identify the facilitators and the deficiencies in their audiological care from their own perspectives. It also aimed to explore the impact of HL on their lives to get a deeper understanding of the issues.

Study 2 addressed three main research questions:

1. What are the experiences and views of workers with HL with regard to their audiology appointments?
2. What do workers with HL think are the facilitators and barriers to being supported effectively by their audiologists and audiology services?
3. What is the impact of HL on the lives and health of workers with HL?

Achieving those aims is essential to address the scarcity of evidence regarding the effectiveness of HHC for workers with HL, and to provide an insight into the key issues encountered by workers with HL in their work lives and in the care and support they are offered by their audiology services, which then can be used to guide service improvements where needed.

5.2 Research methodology and methods

The general research paradigm, design and methodology for Studies 1-3 are discussed thoroughly in Chapter 3. The following sections present some methodological specifics for this study (Study 2). Please refer to Chapter 3 for further information.

5.2.1 Recruitment

Ethics approval was obtained from the Research Ethics Committee of the Institute of Sound and Vibration Research.

Purposive sampling was used to recruit workers with HL. The sampling at the beginning aimed to recruit adults of working-age (18 to 65 years old) who have HL. The sample included participants who had either subjective hearing difficulties, verified HL (objectively tested hearing), or wore any kind of hearing technologies (hearing aids, assistive listening devices, cochlear implants) and had at least one consultation with an audiologist in the UK. The selected participants had to be working, whether this was paid full time or part time work or voluntary work. No exclusion criteria were set by gender, ethnicity, nationality, work type or experience. Variations in these demographic characteristics were allowed to encompass heterogeneity in the sample. This variation in sampling is a suitable strategy when the goal is to gather common perspectives and behaviours among people for whom the topic is relevant (Braun and Clarke, 2013).

This study was advertised through the internet. Adverts were posted on social media platforms such as HL blogs, Facebook, LinkedIn, Twitter and Instagram as well as on websites of HL charities and organisations. A few working-age participants were approached by email. These participants with HL were known to researchers at the University of Southampton and their details were available on hearing research mailing lists. A few others sharing the academic work area with the researcher were approached verbally. Potential participants communicated with the researcher through emails. They received a study information sheet and were encouraged to ask questions before deciding to participate. Interested participants were then asked to fill and sign a consent form and a demographic questionnaire to make sure they fitted the inclusion criteria. The questionnaire aimed to gather demographic information about the participants to aid the analysis (Appendix E). The questionnaire asked about work details such as type and area of work, job title, and noise at work, and contained basic questions about their HL, including hearing device usage, audiology appointments and the services they used. This information became important in reflecting on the relationship between the study sample and the results, since participants with different characteristics could hold different views and experiences.

The sample initially comprised mainly female workers with HL who wore hearing aids and worked in an office environment. The researcher then attempted to focus on selecting male participants and those who worked in different work environments or did different kind of jobs. For example, purposive sampling was undertaken to include male participants and people working in more or less noisy environments or more or less hearing-demanding jobs to capture the range of experiences of workers with HL and not restrict the study to females working in offices. Finally, the researcher attempted to recruit workers with HL who had been using hearing technologies other than hearing aids.

5.2.2 Participants

Table 11 below summarises the participants' characteristics. 24 workers with HL (18 females and 6 males) were interviewed. Their age range was 22 to 62 years (mean = 45.8, standard deviation = 12.9). The sample was heterogeneous with respect to occupational characteristics. The participants worked in different sectors, including healthcare, agriculture, administration, education, sales, research and charities. Table 12 below lists the jobs of the participants: 14 were working full time, 9 were working part time and 2 were undertaking voluntary work at the time of the interview. The sample included 19 hearing aid users. Three had a hearing aid and a concomitant cochlear implant. One participant had just a cochlear implant and one did not use hearing technologies. All participants had seen an audiologist on at least one occasion. The majority had had more than one appointment. The interviewed workers with HL were receiving their hearing care from the NHS (17 participants), independent companies (3 participants) or both (4 participants) in various locations in the UK as shown in Table 11.

Table 11: Characteristics of Study 2 participants.

Number	24 participants
Age	Range: 22-62 years Mean: 45.8 Standard deviation: 12.9
Gender	Female: 18 Male: 6
Times seen an audiologist	One time only: 2 Two to nine times: 7 >=10 times: 15
Usage of hearing technology	Hearing aids: 19 Cochlear implants: 1 Both a hearing aid and a cochlear implant: 3 None: 1
Type of service	NHS service: 17 Independent company: 3 Both independent company and NHS service: 4
Type of work	Full time: 14 Part-time: 9 Voluntary work: 2 (one of them was also a part-time worker)
The cities/ towns where the interviewed workers with HL were receiving their audiological care when they were interviewed.	Bristol (2), Belfast, Doncaster, East Grinstead, Edinburgh, Glasgow, St Albans, London (3), Londonderry (3), Manchester, Milton Keynes (2), Newbury, Norwich, Portsmouth, Southampton (3), Southend-on-Sea, Tonbridge, Winchester. *(a few participants were seeing more than one service in different locations at the time of the interview).*

Table 12: Study 2 participants’ work at the time of the interview.

Participant	Work at the time of the interview
P 1	Academic scientific research assistant
P 2	Care worker in the healthcare system
P 3	Pharmacy dispenser
P 4	Childcare play worker in an educational facility
P 5	Customer assistant in a supermarket
P 6	E-commerce manager in footwear and clothing marketing
P 7	Sales assistant in a retail shop
P 8	Production technician in biotechnology
P 9	Regional information coordination and outreach worker for aged veterans with deaf charity
P 10	Senior clerical assistant in an educational facility
P 11	Senior product development manager in a company and a tutor part time for lip-reading and managing HL classes
P 12	Curricular assistant in an educational facility
P 13	Tribunal member in the justice system
P 14	Events funder in a hearing loss charity
P 15	Contracts manager in an administrative company of computers software
P 16	Social worker in healthcare
P 17	Secretary/ administrator in a commercial company
P 18	Meat inspector in the agriculture industry
P 19	Configuration specialist in the defence system
P 20	Civil servant in agriculture policy
P 21	Social care worker in a care agency and cleaner in private
P 22	Administrator in civil services
P 23	Fellow surgeon in a hospital
P 24	Senior fellow surgeon in a hospital

5.2.3 The interview process

The participants’ preferences and geographic locations guided the interview mode. Five interviews were carried out face to face, 7 were conducted through online video calling, 6 participants chose to be interviewed through a telephone call and another 6 chose instant messaging. The researcher used an interview guide, as the interviews were semi-structured. The interview guide is shown in Table 13 below.

Table 13: Study 2-interview guide. The questions are numbered, and the prompts are in italic font.

1. Can you tell me about your hearing loss?

   Prompts:
   - *How do you think the HL has been affecting you, your work, and your life?*

2. Can you tell me about your appointments with your audiologist?

   Prompts:
   - *What questions did your audiologist ask? How did your audiologist assess your difficulties in relation to work? Did you have a discussion about your difficulties in relation to your work life?*
   - *What tests did your audiologist do?*
   - *How did your audiologist support you?*
   - *Did you and your audiologist discuss technologies beyond hearing aids or cochlear implants that could help you at work?*
   - *Have you discussed other things that could help you at work, such as skills, devices, or written information?*
   - *Did you talk about the availability of other services such as charities or governmental organisations that could help you?*
   - *Did you face any difficulties during the appointment?*

3. Currently, how well do you feel supported by your audiologist?

   Prompts:
   - *What do you think are the current obstacles/helpers?*

3. In an ideal world, how would you like your audiologist to support you?

   Prompts:
   - *What do you think could be the ideal care given by your audiologist? What do you want from your audiologist in the future? What do you think can be improved? What support would you like to receive from your audiologist?*

5.2.4 Piloting

Four interviews were done at the start and the interview process and analysis were discussed with the PhD supervisors before conducting further interviews. This resulted in minor amendments to the interview guide to include further prompts for Question 2 in Table 13 above. During piloting, the participants talked very briefly about their appointments with their audiologists and were keener to talk about their work life struggles. To elicit in-depth information about their experiences and views of their audiology appointments, more specific questions were added as prompts to help them to remember and discuss these aspects. The pilot interviews were included in the final analysis.

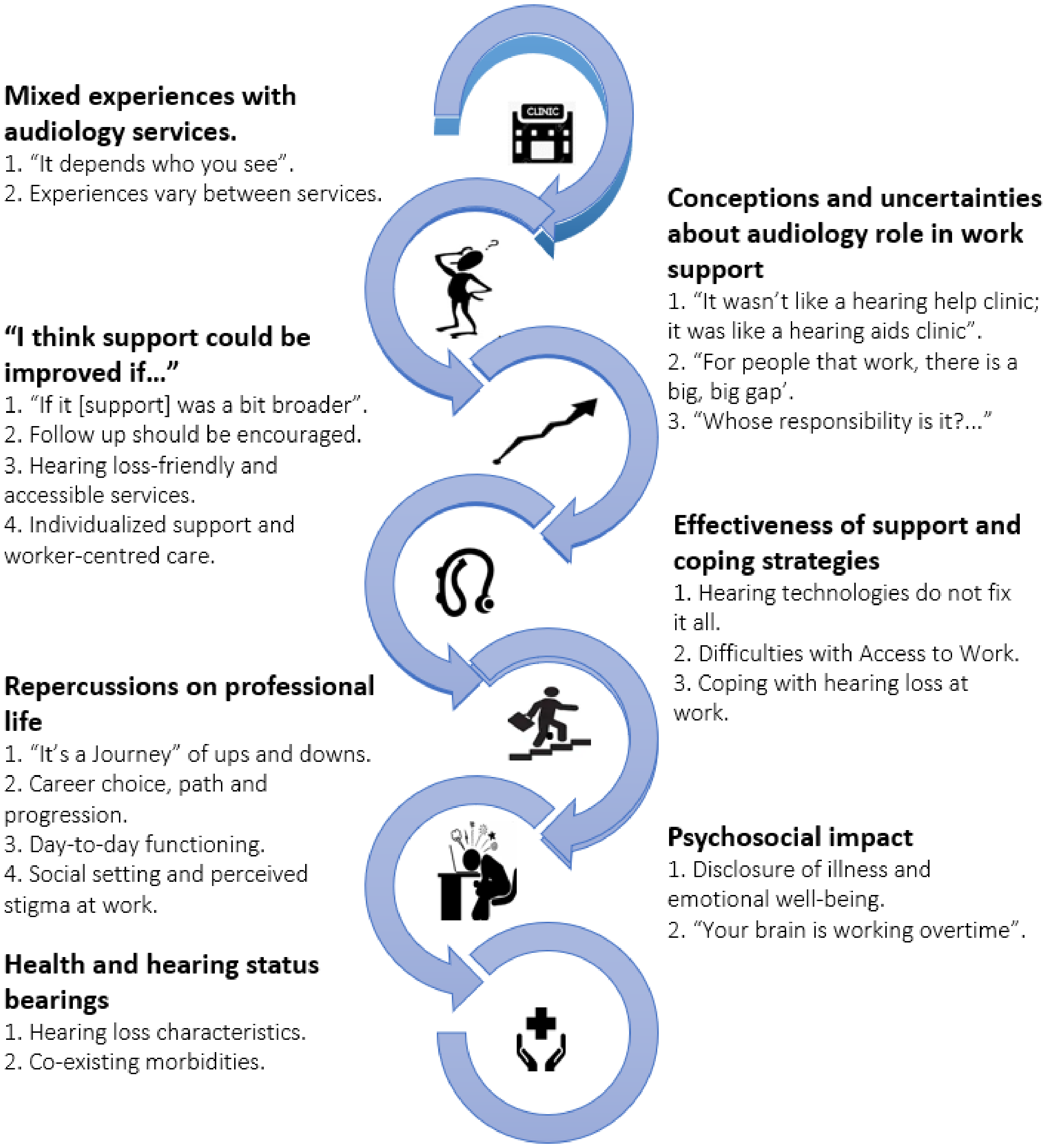
5.2.5 Analysis of the interviews

The audio-recorded interviews were all transcribed verbatim. The text was copied from the instant messaging interviews as written. Only names were anonymised. Thematic analysis was used. A few grounded theory analysis techniques were also used. Inductive coding of the first 15 interviews resulted in 369 initial codes. Those were then organised and regrouped to form the final themes, subthemes and sub-subthemes where needed. The analysis of the remaining interviews added a very small number of codes. For a detailed description of the analysis, please refer to Section 3.2.3.

5.3 Results

5.3.1 Introduction

Patients' perspectives obtained in Study 2 are presented in the form of themes, subthemes and sub-subthemes. Each participant was assigned a number as an Identifier, which is available at the end of each extract. The interviews revealed a range of matters that were perceived as key during the analysis or was emphasized by the workers with HL. Seven main themes were generated. Those are 1. Mixed experiences with audiology services. 2. Conceptions and uncertainties about audiology role in work support. 3. "I think support could be improved if…". 4. Effectiveness of support and coping strategies. 5. Repercussions on professional life. 6. Psychosocial impact. 7. Health and hearing status bearings. These seven themes were subdivided into 20 subthemes. Figure 9 below shows the main themes and subthemes. The following sections provide detailed explanations of the results, with supporting extracts. At the beginning of each result (theme), a diagram is available to show the theme with its subthemes, and sub-subthemes were present (Figures 10-16). The first three themes relate to the participants' experiences and views of their audiology appointments and services. The later four themes relate to the workers with HL experiences of HL in their work and life overall.



Mixed experiences with audiology services.
1. "It depends who you see".
2. Experiences vary between services.

Conceptions and uncertainties about audiology role in work support
1. "It wasn't like a hearing help clinic; it was like a hearing aids clinic".
2. "For people that work, there is a big, big gap'.
3. "Whose responsibility is it?..."

"I think support could be improved if…"
1. "If it [support] was a bit broader".
2. Follow up should be encouraged.
3. Hearing loss-friendly and accessible services.
4. Individualized support and worker-centred care.

Effectiveness of support and coping strategies
1. Hearing technologies do not fix it all.
2. Difficulties with Access to Work.
3. Coping with hearing loss at work.

Repercussions on professional life
1. "It's a Journey" of ups and downs.
2. Career choice, path and progression.
3. Day-to-day functioning.
4. Social setting and perceived stigma at work.

Psychosocial impact
1. Disclosure of illness and emotional well-being.
2. "Your brain is working overtime".

Health and hearing status bearings
1. Hearing loss characteristics.
2. Co-existing morbidities.

Figure 9: Study 2 overarching themes and subthemes relating to the experiences and views of workers regarding their hearing loss and work life and their audiology services.

5.3.2 Theme 1: Mixed experiences with audiology services

When the workers with HL spoke about their perspectives on their audiologists and services, there were mixed experiences within the sample and for the individuals as well. They had had various positive and negative experiences with their audiologists and audiology services. Most participants had had both negative and positive experiences during their hearing care journey, and sometimes even within the same appointment. Only a few described solely positive or negative experiences. Overall, the participants made slightly more negative comments than positive ones. The participants positive and negative experiences were attributed to certain factors that will be further discussed within the following sections as subthemes and sub-subthemes. These are shown below in Figure 10.

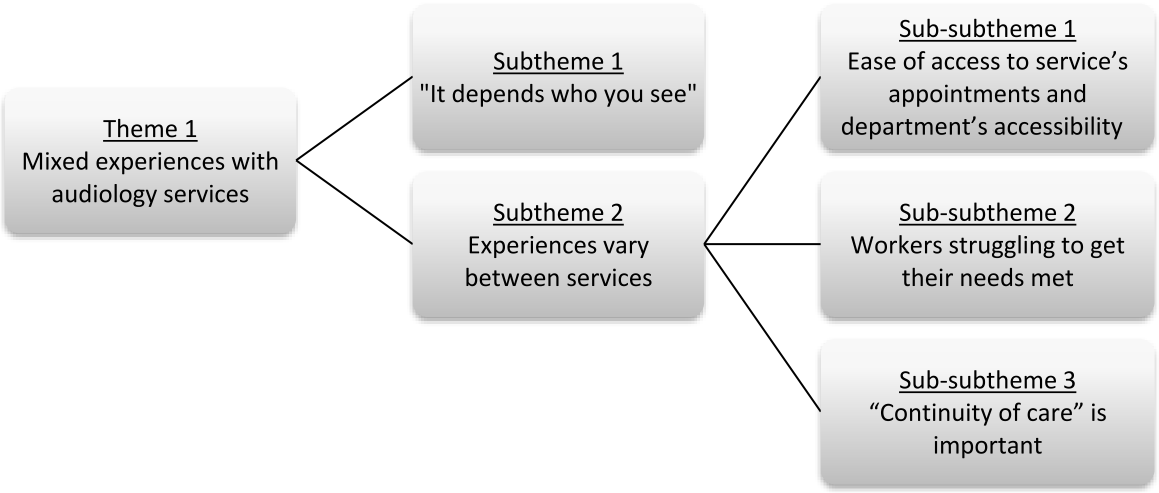


Figure 10: Theme 1 Mixed experiences and its subthemes and sub-subthemes.

5.3.2.1 Subtheme 1.1: "It depends who you see"

All participants (except two) saw more than one audiologist. They described having different experiences with the different audiologists. The variations were attributed by most of them to audiologist-related aspects. The most prominent of those aspects was how the audiologists interacted with them during the appointment. In particular, the participants discussed the extent to which the different audiologists communicated in a deaf-aware manner.

"You'd think that audiology would be more deaf-aware, really… it depends who you see… I've seen various people. The first time I had my hearing tested the audiologist immediately like turned around so I could see her face and made sure that I could lip-read her… but, funnily enough, not all audiologists do that. Quite often, audiologists are on their computer and they talk to the computer screen and not face the patient… It's a simple thing, but I think it'd make a big difference." P 11

The participants also described their audiologists depending on their perceived attitude, how empathetic, approachable, experienced, skilled and patient-centred they thought they were. They mentioned whether their audiologists listened to their complaints, answered their questions and provided them with information and support according to their needs, especially their work-related needs. Two different experiences are described in the extracts below.

"The audiologist was quite snappy with me and said I was being fussy about what I wanted to hear… I felt like she was very busy, and she was more concerned with what the computer said than me. That hearing aids had been matched to the computer recommended settings… she wasn't interested in what I was telling her, that some sounds were hurting… I've had hearing aids for many years and know sounds shouldn't be hurting… It was quite upsetting it made me cry afterwards... In contrast, the other audiologist had plenty of time.... I can still even now just send her email with any problem and she will write back within 1 working day." P 16

"It was helpful that he took the time to listen to why I was there and what I was finding hard - i.e · hearing colleagues in meetings and on the phone. He seemed sympathetic and was honest about what the HAs {hearing aids} could and would not resolve. It was helpful that not only did he tell me about the i-loop ,but also had one to hand and let me test it to understand what it would be like and whether I believed it would help me to hear people better on the phone at work." P 6

Finally, it was interesting that a few participants expressed feeling that some audiologists were not happy for patients to ask questions.

"I don't think they like you asking too many questions… I think some audiologists think that, you know, they're the professionals. But, the thing is I am the user. You know what I mean?" P 21

Overall, the participants thought that the audiologists they encountered were variable with regard to the previously mentioned issues and emphasized that the principal issues were if the audiologists seemed deaf-aware, well-trained and offered individualised care.

A few also attributed the different experiences with audiologists to where they work (independent company vs. NHS, or cochlear implant services vs adult rehabilitation clinics) which affects how they interact with patients and the kind of care and support they offer workers with HL. Some suggested that they had a good experience with their audiologists because the audiologists work in a certain service that allows more time with patients during the appointment, which facilitates a better interaction, because then audiologists can listen and interact with them in a better way compared with if they were working in a busier service. For example, a few patients who had both a cochlear implant and a hearing aid reported having had better experiences with cochlear implant audiologists compared with adult rehabilitation audiologists. It was perceived that they have the time, they listen, understand the patient, ask the patients about their coping or if there is any improvement or not. They were also perceived to be superior in some of the previously mentioned points like deaf awareness, and were better in terms of the continuity of care (to be explained in sub-subtheme 3 below). As one participant put it:

P 2: "Considering its a deaf unit {adult rehabilitation clinic}. Not very deaf-aware… They talk to you while facing away."
Interviewer: "Can you please tell me more about it?"

P 2: "Yeah, they just generally try hurry you along. Instead of spending time with you. The cochlear implant centre are amazing."

Interviewer: "Why do you think the cochlear implant centre is better?"

P 2: "I had a half hour appointment yesterday at {Hospital name}. Turned into an hour and a half. As I was stressed… as I'm newly implanted. They took the time to talk to me. Cochlear implant services are amazing. Can't fault. But room for improvement for the hearings aids."

Interviewer: "What would you like to improve?"

P 2: "Better understanding staff. Spend time with you. Make you feel less nervous. More accessible contacts. Instead of phones which would make us deaf more independent and not rely on people to call for you." P 2

5.3.2.2 Subtheme 1.2: experiences vary between services

Different experiences were also perceived between the different hearing care services. Almost all participants discussed or touched on this. The differences were most significant when comparing independent companies with NHS services. Some also noted differences between the different audiology departments within the NHS, and a few compared their cochlear implant services with adult rehabilitation services. The most prominent variances that the participants spoke about can be summarised in three sub-subthemes (shown in Figure 10, above). The sub-subthemes start with variances noted relating to ease of access to service's appointments and department's accessibility (Sub-subtheme 1), variances related to workers with HL struggling to get their needs met (Sub-subtheme 2). Lastly, the variances noted also regarding the continuity of care (Sub-subtheme 3).

- **Sub-subtheme 1: ease of access to service's appointments and department's accessibility**

Access to and accessibility of audiology services were discussed by the majority of the workers and were considered important. The majority of the participants indicated that for the NHS services it is harder to get appointments with an audiologist compared with independent companies, due to the complicated and lengthy referral pathways they have to go through, especially that they had to see their general practitioner to get an appointment with NHS audiologists.

"Through the NHS, you can't just ring up and say, 'I have a problem.' You have to get referred. So, from my point of view…I could ring up tomorrow {to independent company}. Say 'how quickly can you fit me in to discuss?'… I'd like to think the NHS audiologists… would be as accessible so you don't have to wait for referrals." P 17

However, this did not seem an issue for a small number of the participants.

"It's easy to get an appointment… that's not been an issue, although you have to wait a while." P 4

Many participants reported that the NHS waiting times can be long.

"It can be a long wait for a hearing test, over 6 months." P 7

Moreover, they spoke about the difficulty of contacting NHS audiology departments, as well as accessing healthcare in general, and having to call, which is not convenient for people with HL. This was a particular struggle for cochlear implant users.

"Another way we hearing impaired struggle is with accessing healthcare... It's not as simple as phoning up if you cannot hear on the phone." P 8

"'Excuse me,' I said, 'I'm deaf. I can't use the phone… How am I getting in touch with you? I don't want to rely on my parents or my friend. It's me'. It's personal. And she {audiologist} went, 'Oh, I'll give you the email,' … but I could give the email… I don't know if they've read it… I'm still waiting. It's the lack of communication even by email reply to say, 'Thank you we've got your email, you are on the waiting list'… No reply… then I have to make an appointment to have to book for a new hearing aid, and I said, 'I cannot use the telephone… Have you got an email?' 'Why?' And I said, 'I can't use the phone.' 'Oh, okay, I'll give you one.' Here we go again It's like, it's a circle…They're very, very difficult… then they say 'Oh, yeah, we'll mark you down. It mustn't happen.' It's all talk and no action." P 9

Issues were also raised regarding hearing accessibility of the department or clinic room. Many reported facing problems when in their audiology departments. The kind of problems they talked about were related to not hearing their names when they were called in the waiting area. Another issue was the noise level, which affected their ability to communicate with their audiologists or do the hearing testing.

"Where they do the hearing test, believe it or not, it's quite noisy… I could still hear things in the corridor and things in the next room. So, it's actually quite hard for me to do the hearing test… it seemed a bit silly… It's quite noisy in the waiting room and there's no like display board when they call your name. And as audiologists, you'd think they'd like shout or try and get your attention… but… it's quite easy to miss them calling your name." P 11

A couple of the participants had a better experience, however, in accessibility issues, such as P 6.

"The level of noise in the department and the audiology reception and rooms are all extremely quiet which is really good. Even when they came to get me from the waiting room, they make a point of being in my line of sight rather than just standing and shouting my name like in other hospital departments." P 6

❖ Sub-subtheme 2: workers struggling to get their needs met

A few expressed feelings that their NHS audiology services were not meeting their work needs, and that they do not offer much overall, which led them to see audiologists in independent companies. Many also commented on independent companies as being superior in offering work-specific help, including better range of hearing technologies including hearing aids and ALD, and cosmetically better or invisible hearing aids. A few extracts are available below to illustrate this sub-subtheme.

"The NHS doesn't really sort of offer that many work services… Your audiology department wouldn't be able to get a device for you like a streamer… it's more kind of down to you if you wanted to get any extra help with work aspects, I suppose." P 1

P 16: "I see both private and NHS. Private for my hearing aid and NHS monitor my HL as it's related to another health condition."

Interviewer: "Can you tell me why did you go to see private audiologists?"

P 16: "I felt NHS was not meeting my needs…The private audiologists were really helpful firstly in getting the best hearing aids for my loss, to maximise my communication in work. They also were able to tell me about different types of assistive listening devices to help with groups etc and set them up for me with my hearing aids…I actually set up the appointments with them because I'd been struggling in work and so that helped them to recommend particular hearing aids and settings. Also the first audio {independent company audiologist} in particular was the one who told me about roger pen and how that could help in groups." P 16

"I went to private audiologist to buy in the canal hearing aid to avoid stigma." P 24

However, a few held the view that independent services are commercial and just want to sell and pointed out that they have costly hearing aids or service.

"All they {independent companies' audiologists} wanted to do was sell two hearing aids for £3,000… I got the impression that that's all they wanted to do, they were all too willing to sell me two hearing aids, regardless of what the outcome of the hearing test would be." P 18

"I don't want to go private, because I can't afford to pay for it." P 14

- **Sub-subtheme 3: "continuity of care" is important**

Seeing the same audiologist each time helped, from the point of view of some of the participants, as well as being continuously followed up during adulthood, as in childhood, without needing to go through general practitioners and the referral system. You can see the same audiologist in independent services frequently, but in the NHS, most of the time you get someone different each time, which some of the participants found not efficient. They preferred to be followed up continuously by the same audiologist because then the audiologist would look at them less technically and then know more about their life.

"Audiologists at my local hospital {NHS hospital}, not good… Every time I went, you'd see somebody else. So there was no continuity of care or you felt like you were going back to the beginning… So my experience there was not particularly positive." P 19

"I think the audiologist I always saw, she definitely was nice. But then, all the couple of times I went and it was someone else… I guess like they don't really know you compared to the audiologist you always see… they're just looking at it more technically than personally." P 1

Overall, Theme 1 revealed important clinical aspects of audiology HHC that were perceived important from patients' point of view and influenced their experiences in their journey of hearing care.

5.3.3 Theme 2: Conceptions and uncertainties about audiology role in work support.

This theme was developed from participants' discussions about how they perceive audiology services in general, whether those perceptions came from their own beliefs and expectations or were based on their experience. Three subthemes were generated and are shown in Figure 11 below. Each subtheme is explained in the sections below.

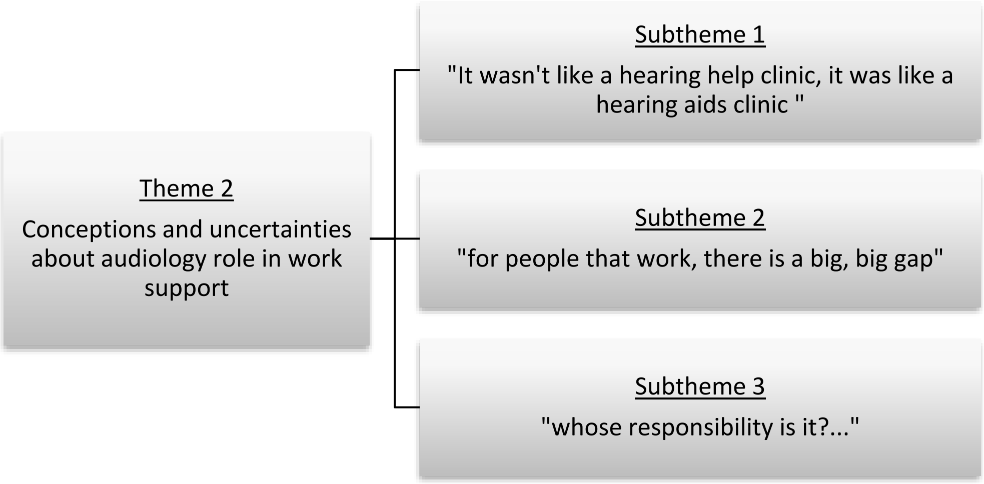


Figure 11: Theme 2 Conceptions and uncertainties about audiology role in workers with HL support and it's three subthemes.

5.3.3.1 Subtheme 2.1: "it wasn't like a hearing help clinic, it was like a hearing aids clinic"

Many workers with HL perceived audiology services as hearing aids services and that they have little, if anything, to do with their work life. They perceived audiology services as places for fitting and fixing hearing aids.

"It's purely, 'Let's try and get your hearing adjusted to the hearing aids.'" P 12

"They're purely focused on fixing the hearing aids and putting new tubes in and you're in and out in a couple of minutes… and you might have wanted to ask something but they haven't really given you a chance." P 13

And the participants also thought that less emphasis is given to patients' struggles and needs.

"I don't think they would go out of the way to say, 'Is there something at work that is difficult for you listening wise?' And then even if they said, yes, I guess they'd probably find out whether your hearing aids were good enough by themselves." P 1

"Generally speaking, it's more about the performance of the hearing aids rather than how I'm adapting to certain scenarios." P 15

Some of the participants spoke about the expectations they had from their audiology services, and those expectations were not restricted to hearing aids care. Although some of those expectations were related to the care they received for their hearing aids, a few others had additional expectations that were unmet. They spoke about needing personalised care, psychosocial support, counselling, self-management support, coping support and help to understand their problem better.

"I wanted to understand my HL better, get hearing aids that make life easier for me, and that were also comfortable (and pink!), and learn how I could help myself more with difficult situations." P 6

"There needs to be more to it than just than the hearing aid. It would almost be a mixture of practical and emotional and psychological scores, person-centred." P 13

Clearly, there is a general impression that audiology services are mainly helping adults with HL only technically, with hearing aids, rather than managing and supporting the whole person based on their specific needs.

5.3.3.2 Subtheme 2.2: "for people that work, there is a big, big gap"

From the point of view of the majority of the interviewed workers with HL, the role of audiologists in caring for and supporting work life seems to be limited, generally, whether that be in terms of discussing patients work difficulties or providing support for those difficulties.

"They've never given me nothing about what with the need for work or anything like that, that's why I become an employment advisor, to help deaf people with Access To Work and get everything they might need for work, but there's nothing, they couldn't give you anything. I knew about Access to Work because of my job." P 9

A small number of the workers interviewed stated clearly that there is a gap for working-age people in terms of hearing care and that it is focused on older people or children.

P 11: "I don't think an audiologist ever asked me… is it difficult at work? Can you still go to the meetings?... Can you do work?'... They never really… asked me about work or talked about some of this equipment… or the reading lips… I do know about sort of adjustments you can make now, but only really because… I've researched them myself out of interest. They don't really offer a lot of support... As far as I know, they don't have… equipment that you can have a look at or try out which… would be useful… they don't think about the whole person and… what adjustments you might need to make at work. There are a lot of things you can do… but they never… talked about like… assistive listening equipment or… anything like that. What some tend to do is just give you loads of leaflets and tell you to go and read them… and most of the leaflets they give you… seem to be aimed at older people. And you sort of look at this thing and think… so what's this got to do with me?'"

Interviewer: "Did you have a discussion with your audiologists about ways to support your work difficulties?"

P 11: "No, not really… they didn't really talk about work… I got the impression they mainly deal with elderly people and they haven't really thought about… what the issues are for younger people to be honest… I just think it's interesting that somebody is looking at this… I do believe there's a big gap in the middle, where people don't kind of think about what hearing loss and work, what it means for work." P 11

Many participants reasoned that not discussing work related difficulties during their audiology appointments was due to audiologists' time pressure and funding issues. A few others thought that their audiologists were not interested in knowing about work issues.

"They're {audiologists} not really the kind of people who have time to have a chat with you… they're just so busy to talk to me, which is quite bad really because that's the kind of situation where they could, you know, 'Well have you got problems at work?' Or, 'Have you got technology?'" P 14

"P 2: "I didn't really know what to expect {from the appointment}. Basically. I'm deaf. Get on with it kinda attitude. Felt they didn't wanna know."

Interviewer: "Felt they did not wanna know about what?"

P 2: "How my deafness effects my working life."

Interviewer: "Why do you think that?"

P 2: "Cause it was in and out asap {as soon as possible}." P 2

Only a few reported experiencing good and specific care for their work problems. A few others stated that their audiologists asked them about their work; however, that did not influence the support they received. The few participants who reported receiving good care for their work life from their audiologists spoke about receiving advice about what could help. This included advice about hearing technologies that could be used, advice about disclosure of HL at work and how to deal with certain situations like a noisy environment, advice to contact charities and governmental schemes that could help with work, and a few were informed that lip-reading classes could be beneficial.

Interviewer: "How did your audiologist support you in relation to work?"

P 6: "I think giving me the confidence to speak up and tell colleagues that I can't hear them." P 6

"When I first got my hearing aids they talked me through how to get used to a noisy environment . They gave me the settings to change. They did suggest I spoke with the charity deaf action to see if there were any aids that could help more .We did have someone come in and access the workplace…There are other things which were suggested like the Roger pen." P7

"If there's any difficulty that I have at work… like the phone systems… I would chat to the audiologist about that during the reviews… they have referred me to some specialists, outside people that work with the Access to Work programs… they've been discussing any queries I have about the work." P 20

5.3.3.3 Subtheme 2.3: "whose responsibility is it?..."

The interviews revealed uncertainties among some participants or muddling through to find out who can or who is responsible to help them with work problems. Some expressed feeling unsure if it is their audiologists' job to assist in that area.

Interviewer: "And when you see your audiologist, do you discuss your work difficulties?"

P 8: "With approaching health services and workplaces no as didn't feel that was their area to assist…I never thought audiologists were responsible for assisting in any way to do with work... as I felt my hearing aid was their area." P 8

Some also indicated that there seem to be a blurred inter-professional role regarding support for workers with HL. It seemed unclear to some whether this support should come from their audiologist or other professions or bodies. Some stated that support does not necessarily come only from audiologists but also possibly from external sources such as local councillors, governmental organisations, community support or social workers, volunteers, hearing therapists, occupational therapists, charities and other patients, as well as volunteers or in the form of support groups. One participant even suggested that it is not the audiologists' role to give advice about work-related issues and that the support should come from employers. Another suggested that there should be a professional other than audiologists to help with work issues.

"I'm not expecting a great deal from them {audiologists}… what I would expect is there to be sort of like government organisations or… local authority organisations where there may be some extension of provision beyond… what is provided to the retired… To me… I would split the role into two. An audiologist just check about… the hearing and make sure everything's working okay. Then somebody provides support. It doesn't have to be an audiologist, it's just somebody who has the ability to have experience of working with HL… I think you can have a local… counsellor or some sort to help… in terms of the social and work side of things." P 15

Two of the participants suggested that there is no one to help with work life. They said:

"There is no professional that you can talk to… there's no one you can see about hearing equipment... you don't always know what's available or who to ask." P 12

Interviewer: "Have you discussed other things that could help you at work, such as skills, devices or information?"

P 10: "No. But I'll certainly be asking if I know audiology can answer that… Naive of me to think there would be someone who would be knowledgeable on hearing loss and be able to tell me what's available to me. It would seem this doesn't exist." P 10

Clearly there seemed to be confusion and uncertainty about where the support should come from and very little clarity around the audiologist's role in supporting work life.

5.3.4 Theme 3: "I think support could be improved if…"

Workers with HL offered their views regarding the key ways in which the care they received from their audiology services could be improved and what other non-audiology services could offer them. Workers with HL described various ways to improve services, and these are closely related to the challenges they face during their hearing care journey. These perspectives are represented in four subthemes and five sub-subthemes that are shown in Figure 12 below. The following sections present these subthemes and sub-subthemes.

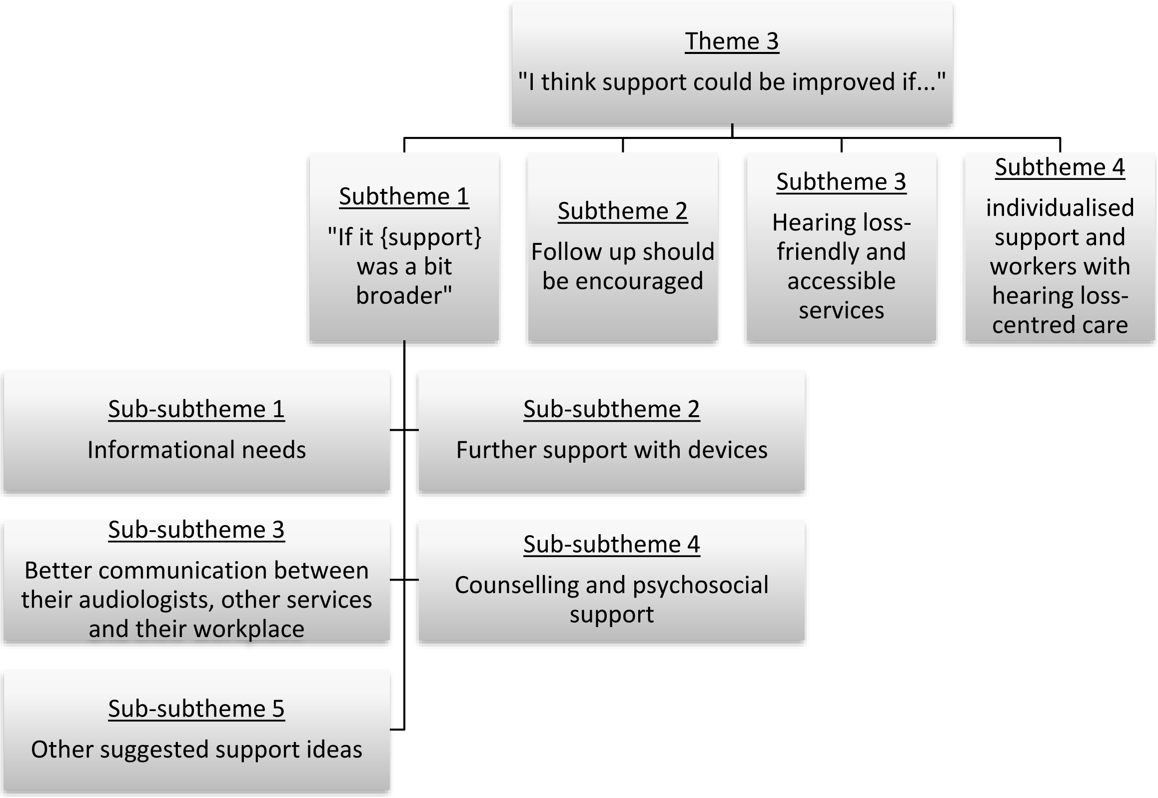


Figure 12: Theme 3 “I think support could be improved if” including its subthemes and sub-subthemes.

5.3.4.1 Subtheme 3.1: “if it {support} was a bit broader”

The majority of the workers with HL in this study stated a desire for extended support, whether that comes from audiology or non-audiology services. Overall, they would like to receive a broader level of support that is not limited to hearing aids or cochlear implant support. Most of them reported the areas where further support is needed but for some it was unclear where these areas of support were expected to come from (please refer to Section 5.3.3.3. “Whose responsibility is it?...” for further details). The areas where they believe further support is needed in are grouped into five sub-subthemes. These are shown in Figure 12 above and explained in the following text.

- **Sub-subtheme 1: informational needs**

The workers with HL indicated that they needed more access to information to be better supported.

“I need to know more information.” P 13

Many of the participants reported not receiving information from their audiologists and said that they had to carry out research to help themselves.

"I spend a lot of my time on the internet researching… like what your rights are at work in case I get any problem… I do know about sort of adjustments you can make now, but only really because I've gone and researched them myself out of interest… They {Audiologists} don't really offer a lot of support…" P 11

A few others found out about ways to get help through their friends and not from their audiologists.

"I don't think they {audiologists} gave me a lot of information. A friend told me about Access to Work and all this stuff, and I was totally clueless… So, just having this hearing aids and that was that." P 13

Interestingly, a few of the participants indicated that they lacked awareness of what support is needed and what is available to them, which led them not to ask their audiologists for information.

"The trouble is… people don't ask for it because you don't always know what you need, if that makes sense." P 11

The things they said that they needed more information on included where to get support from.

"It would be nice to be informed which service would support me next time." P 10

They wanted more information about sign language and lip-reading.

"Need info {information} on lip-reading and sign language classes. That sort of thing." P 16

They also reported needing information about tools to be able to self-manage at work. like hearing devices and their gadgets.

"What I would like to see is… some sort of information about knowing what you could use with your hearing aids... it's not always clear, and I think that needs to be clearer for patients. And there is this assumption that for a lot of people who, or other people who are not as aware as I am, that there are other gadgets out there to use. That information is not going out the same way." P 21

- **Sub-subtheme 2: further support with devices**

Many of the participants pointed out their need for extra help to better deal with hearing devices. They requested an easier introduction to hearing aids. Some talked about needing a gradual introduction to hearing aids in terms of loudness, learning how to clean them and how to wear them as well.

"It would be good… like more of a gradual introduction to like wearing the hearing aid and stuff. Because when I first had it, I found it really… overwhelming and they used to make me have headaches and I felt so tired because there was so much… noise going into… like, to process it in your brain… because I know sometimes they can make it a bit quieter. So maybe just like… gradually increase it so that you just like get used to it gradually rather than like it being really intense for a period. And maybe just, like, following that up because... It took a lot of getting used to, and I could hear everything in double. So, it was hard to communicate with people." P 3

A few of the participants talked about their need to be offered cosmetically appealing hearing aids. A couple of the younger female participants wanted coloured hearing aids, and another couple of male participants demanded discreet in the canal hearing aids.

"I would like… colours, but not all adult services offer colourful hearing aids. So, if I… got sent somewhere that only did, you know, like a beige one, I'd be devastated. I'd be like, 'No. I'm not wearing them. Get me some red ones and I'll be fine.'" P 1

A few others wanted affordable ALD because it is costly and the NHS does not cover them.

"If the equipment was cheaper it would be great." P 17

A few others mentioned they want to be trained on devices through hands-on demonstration

"Maybe have equipment available for demo." P 16

Given that audiology clinics are ideally quiet, a couple of the workers described it as unrealistic to fit hearing aids in those clinics and demanded a real-life-like sitting when fitting hearing aids.

"When you get HAs {hearing aids}, you are testing them in a very quiet room with just the audiologist speaking to you. It's when you leave and hear people's shoes on the hard floor, the lift ping, the horrible sound of sirens outside that you get a real feel for whether your HAs have been set up ok. But then it's too late, the appointment is over… It would be great to have some kind of outdoor simulation that audiologists play when they fit HAs to check how everything sounds." P 6

It was interesting that one participant demanded support to self-manage, in terms of being taught how to adjust his hearing aids without needing to see audiologists for every adjustment.

"I would prefer if audiologists can offer, if there is way they help me to keep adjusting the hearing aids by myself rather than needing the audiologist every time." P 24

Finally, one cochlear implant user argued that audiologists should refer more patients to receive a cochlear implant, and they need to get training in that regard.

"There needs to be a lot more training with all local audiologists about when they can and should… refer for cochlear implants. 5%, that's awful… that's definitely an area, that audiologists need to… improve on." P 19

- **Sub-subtheme 3: better communication between their audiologists, other services and their workplace.**

The workers with HL in this study envisioned a better service if their audiologists could work with other services and their workplace to improve their situation at work. For example, they mentioned needing their audiologist to work with their workplace, ATW, social therapists and have links to employment advisers. The following extracts demonstrate these perspectives:

Interviewer: "In an ideal world, how would you like your audiologist to support you?"

P 2: "To be in contact with Access to Work and support those who need it." P 2

"Social services currently supply visual doorbell and fire alarms and alarm clocks perhaps audiology should work directly with sensory officers to provide this service." P 8

"It would be good for them {audiologists} to aim to help in workplace issues too. Perhaps even do deaf awareness to employers as the education in this field is virtually non-existent… you know like managers training etc." P 8

- **Sub-subtheme 4: counselling and psychosocial support**

Throughout the interviews, the need for counselling and psychosocial support came up frequently. This was noticed to be a particular issue when the participants discussed the variation in hearing care between independent companies and NHS audiologists and cochlear implant audiologists vs adult rehabilitation audiologists, as discussed in Section 5.3.2.2. Some of the workers thought the psychosocial support and counselling within audiology appointments were better when seeing independent service audiologists and cochlear implant audiologists, especially because they have time to talk and empathise with them.

Interviewer: "In an ideal world, how would you like your audiologists to support you?"

P 16: "I think that NHS audios {audiologists} should offer same level of empathy and support that is found in private audios. Even if they can't see you as often, they can still be supportive." P 16

"The main thing {needed}, to provide some sort of counselling or coaching on how to cope." P 12

- **Sub-subtheme 5: other suggested support ideas**

Some participants proposed a variety of other ways to obtain further work life support from audiology and other services. Those were random and therefore were grouped in this sub-subtheme.

A few of the workers with HL in this study expressed the need to receive support through a joined-up unit. They described the need for one place that can offer all forms of support, including hearing aids, ALD, counselling and psychosocial support.

"We need someone… that knows your HL… that can show you equipment, so you don't have to go to a separate place and this is… what a lot of people were saying. This audiology is one service. Equipment is another service. And you don't always know what's available or what to ask for... It's not joined, they need some kind of joined up unit… So counselling and support or where the person needs coaching… and equipment where you can get your hearing tested and get your equipment in the same place or… at least be told this is the equipment you need." P 12

A couple of the workers suggested having a HL hub in audiology departments for working people with support groups for working-age people to support each other.

"I think audiology departments could be expanded more to become HL hubs. For example, having full-time volunteers or community support workers attached who they could refer people to." P 16

One participant thought that telephone use is essential for many people at work and suggested that workshops to help with using the telephone would be helpful.

"I think one of the things that {Name of a cochlear implant centre} do is a telephone workshop. I've never seen anything like that for hearing aids... in an audiology department. Using the phone is pretty key in most jobs… it's a skill about asking closed questions or... how you go about that telephone conversation... to make the most of the hearing you've got and the techniques that you can use, and they teach all that. Something like that for hearing aid users… struggling at work with the phone… maybe offering telephone workshops as to techniques that you could then use to try and make the best of what your hearing aid is giving you, I think maybe that would be good." P 19

One participant suggested that it would be good if audiologists could visit patients' workplaces to see the work environment and offer tips that could help, as teachers of the deaf do for hard of hearing children in schools.

"I think workplace assessment or workplace visits would help… So that they can understand the environment that you're working in... and how the equipment that you use can be adapted, so that the hearing aids are prescribed for you… in a clinical room, It's a different environment, uh, in a work location for these hearing aids. Surely audiologists should have an understanding of what the equipment can do and its limits and then suggest to the manufacturers how these bits of equipment can be changed or improved for people in work environments. I think that would be the most useful thing." P 20

5.3.4.2 Subtheme 3.2: follow up should be encouraged

Many of the participants expressed their need to be followed up by their audiologists, and some of them suggested that that could help to keep their management up to date. Some stated that they would like audiologists to encourage patients to come back if things did not work well after hearing aids fitting. They felt that they need to be followed up more to see if their hearing aids were adjusted well, because it takes time to get it right.

"Interviewer: In an ideal world, how would you like your audiologists to support you?"

"I suppose through a follow-up phone call or something, a month or two after the appointment to see if things were okay or if things were getting better or worse, it'd say that would be nice. Yeah, I'd say some sort of a follow-up connection or contact." P 22

One also mentioned the need to be seen by the same audiologist each time.

"If you could get continuity care… where you see the same person each time, then it would help. I can understand that's not necessarily going to be feasible. Not with the funding and the constraints that the NHS is now working under. I certainly get pretty much continuity at Southampton for my cochlear implant… but that's a whole different set up there." P 19

5.3.4.3 Subtheme 3.3: hearing loss-friendly and accessible services

Convenient and approachable services that take into account accessibility issues for the hearing-impaired were demanded by some of the study participants. For example, they wanted their services to be approachable. They want to be able to contact their audiology services by email, because it is difficult to use the telephone.

"Given that its hearing loss, it would be easier to have an email address to liaise with the audiology office… In an absolute ideal world, being able to contact an audiologist via email or live chat to discuss issues and arrange appointments would be even better!" P 6

A few others stated they wanted to be able to contact audiology services without going through the general practitioner, because they think it involves a delay, and this affects their work life.

"I think it could be easier… I understand why I have to go through a GP for a referral, but it seems like a waste of time. I mean, you could probably phone and ask for a referral." P 1

5.3.4.4 Subtheme 3.4: individualised support and workers with hearing loss-centred care

Many of the study participants indicated a need for individualised support through audiologists knowing about their lives and struggles and having the knowledge of how to care for them in a personalised manner.

"It would have been nice for them to want to… know what my work and lifestyle are like… to be able to help me a bit more. It… would have been good if they could have made it more like personalized, maybe that's the word, rather than just... getting me sort of a hearing aid." P 3

"Audiologists need to have that knowledge to find out more what's out there for each individual really… it's like more thinking about the person. How to talk to them, and listening to what they want and then find what suit them. And let them find out themselves if it works or not." P 9

One participant described the care she would like to get from her audiologist as 'whatever suits her' rather than the audiologist behaving in an autopilot mode.

"I think it's always nice when they're like… like, 'Whatever suits you', sort of thing. Rather than just being like, 'Out you go. Next patient.'. Well, obviously I understand that like it's, you know, busy department so people can just end up… just get into a bit of an autopilot mode. It's quite hard to snap out of that. But as a patient I think you can feel it when people are in like this zone." P 1

P 14 thought that audiologists could ask patients more about their work life and advise accordingly, without needing patients to volunteer what they need, because they do not always know what they need or what can help.

Interviewer: "How would you like your audiologist to help you?"

P 14: "Maybe ask how we've been getting on at work… All the different needs… like Access to Work with technology, microphones… I shouldn't really know what I need. But they're waiting for me to say what I need, and most of those deaf people don't know that." P 14

Overall, Theme 3 presented the workers' views relating to how their hearing care can become better-quality. The following four themes present dimensions of their experiences and views other than those related to their experiences with audiology services. Theme 4 includes the perspectives obtained regarding the effectiveness of hearing technology, ATW and their coping strategies in alleviating their struggles at work. Themes 5 and 6 unravel in-depth the psychosocial and occupational life issues they encountered due to HL, respectively. Finally, Theme 7 presents the effect of patients' general health and HL specifics on their experiences.

5.3.5 Theme 4: Effectiveness of support and coping strategies

This theme presents some of the factors that the participants perceived as influencing their experiences in the workplace concerning HL. This theme includes three subthemes that are shown in Figure 13. Each of the following subthemes is a factor that contributed to the impact of HL on one or more of the participants, especially in their day-to-day work lives.

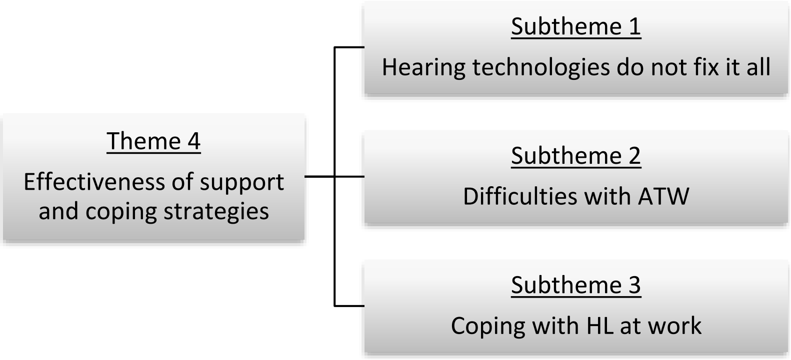


Figure 13: Theme 4 Effectiveness of support and coping strategies and its three subthemes. ATW (Access to Work).

5.3.5.1 Subtheme 4.1: hearing technologies do not fix it all

The participants discussed the role of using hearing technologies in their work lives as one of the major influencing factors of their experiences. All the participants used hearing devices, apart from one (P 23). The majority used hearing aids, many reported using ALD, and a few had had cochlear implants.

Regarding hearing aids, most of the workers found these devices beneficial in improving their ability to communicate at work, although not in all scenarios.

“With the staff I work with, if they speak, I can't really hear what they're saying… But since I've had my hearing aids, it's been really good cause I can hear what they're saying as well and say the right answer instead of saying the wrong answer when they ask a question ‘cause you've heard it wrong.” P 4

Hearing aids were not only useful to improve the participants’ hearing abilities, but a few expressed that they were feeling more confident because of using them.

“It's definitely a confidence booster, because having the hearing aids… that was the real turning point getting the hearing aids.” P 17

However, most of the participants indicated that their hearing aids offered limited benefit, especially when it came to hearing speech.

“It {hearing aid} has helped, uh, obviously in some ways but I still, like, struggle with really like specific words.” P 3

Moreover, hearing aids often amplify background noise at work, which can be uncomfortable and lead to non-use in some cases.

“Unfortunately, when I come into a work situation in the… open-plan office, I do find them {hearing aids} very noisy. The hearing aids… bring up all the noises, which can be very daunting... So quite often… I don't wear the hearing aids”. P 18

Furthermore, a few of the workers perceived hearing aid programs as not efficient for noisy situations.

“I've told them {audiologists} about… background noise… all they can say is, "Well, you've got a program on your hearing aid. You can adjust it… to focus," Which is sort of true… but I don't think it really makes any difference.” P 11

A few also commented on the cosmetics of hearing aids, which influenced the patients’ acceptance and use of hearing aids.

“I was given ugly 'granny beige' hearing aids. I wore them for a while but didn’t like how loud some sounds were and felt embarrassed by them so I stopped.... later, I returned to try again... I was given new pink hearing aids which I was so happy about. But the high pitch noises wear painfully loud, so again, I stopped wearing them.” P 6

“Maybe I didn't like it because it was external and big, and I felt at that stage that I can't deal with it.” P 23

Regarding ALD, most comments were positive for those who tried them, and especially the comment that ALD had helped their work life.

“My experience with the Roger Select so far would be a deal-breaker for someone that could be a difference between keeping a job, or having to need that job, or being able to return to work even, or stay at home.” P 19

“I've invested in something called a phonak so that… I'm in a meeting and I'm minuting, I can adjust the volume but, of course, everyone has got a hearing aid and they got volume, they try and put it on to the loudest. And I know that in a way I'm glad I don't have to use it all the time. Um, I sit in on meetings, I attend conference calls, and I think that, yes, these tools to help me.” P 17

As mentioned before, ALD helped most, but not all, of the participants significantly at work. A few reported that there were some limitations in some scenarios.

“I bought a Roger Pen… I thought that was going to be a dream come true, and it's… a bit of a help, but it doesn't help in every scenario… I did my first couple of tribunals like that, with just using my Roger Pen, and… I was fine in the actual hearing bit where the appellants were there and I could look at them… but then when it came to the discussion with the judge and the doctor, who were sitting alongside me… I couldn't cope with that.” P 13

In addition, ALD are not regularly offered by audiologists. Most of those who have ALD did not get information about them from their audiologists.

“There are a lot of things you can do to help yourself… but they never… talked about like… assistive listening equipment or… anything like that.” P 11

Further, many participants stated that there is no one to help with ALD.

"I got this Roger Pen from Access to Work… They ordered it from the company and it's arrived and they said, 'Oh, you have to get your audiologist to set your hearing aid. I suppose it works with a Roger Pen'. So she {audiologist} said to me herself, 'We don't really deal with all the other things, we only deal with hearing aids'… there's no one you can see about hearing equipment… there's nowhere you can go where someone tries it all out with you, you either have to order it on a 'let's hope it works' or send it back." P 12

And a few touched on the issue of the cost.

"There are other things which were suggested like the Roger Pen. But with me only being in there two days a week, personally I don't feel it was worth the cost." P 7

Those who had cochlear implants had only positive feedback. For example, a cochlear implant helped some start working or continue working, and to them, it was life-changing.

"I was getting excellent results from my cochlear implant… so come the spring, I said, 'You know, I need to do something, I need to work'. I've wouldn't have been able to, without my cochlear implant in a setting, in an office environment… without a cochlear implant I don't think I could deliver a code. But the cochlear implant had been so good for me… I thought it was time to return to work. And I went for an interview and got it, and I started my job." P 19

One of the cochlear implant users was keen on talking about the problem of patients' referral to get a cochlear implant saying that patients do not get referred easily.

"Five percent of people who could benefit have a cochlear implant in this country. Why aren't they going through the system? Why aren't they getting referred? I mean, some of it may be choice… Fair enough, but… I noticed from the people coming through our Facebook group that… they say, 'I actually have been referred ages ago'. Or, 'We had to fight to get referred'… You know, 'Please refer me'. 'Oh, we don't think you need to do that yet.' 'Oh, would you really want to do that?' So I see some stories coming through as well where people are having to fight to get… referred through." P 19

Overall, the participants' work life was positively influenced by the use of hearing technologies, yet, it seems that improvements in hearing aid services are needed, as well as further help with ALD and cochlear implants, especially in terms of the referral system, criteria and funding.

5.3.5.2 Subtheme 4.2: difficulties with Access to Work

The participants also discussed the role of non-audiology services in supporting them. They talked frequently about the governmental scheme ATW, with which they had had varied experiences. Many of the participants indicated that, although the ATW scheme was helpful to some extent, it had many drawbacks. To them, ATW help had a lengthy pathway that affected their work life.

P 19: "I had my Access to Work assessment in… January the fourth and just to give you some idea, last week was the first time I had all the equipment in place to be able to make the phone call."

Interviewer: "Six months?"

P 19: "Yeah and my colleagues had been having to step in and help me, which I have not liked at all. but I made my first phone call and received my first full phone call last week… and that was… a major step forward." P 19

ATW was also found to focus the most on providing the Roger pen to workers with HL and they think the service is not personalised.

"I have recently had an Access to Work appointment which… I was a little disappointed with… Access to Work attended and the lady was lovely. But all she recommended was a Roger pen… It sounds good, but I was hoping there might be more that could be done to help me." P 6

"Access to Work… I don't think they have a full understanding what the client really needs." P 9

Further, it was pointed out that many of the participants had found out about ATW through the internet or other people and not through their audiology services.

"A friend told me about Access to Work." P 13

Finally, it was noted by one participant that HL organisations are geared up to helping the elderly with HL.

"I've also reached out to hearing organisations, but they always seem to be geared up towards people who are retired… the times that they meet always during the working week, during the working day." P 15

5.3.5.3 Subtheme 4.3: coping with hearing loss at work

After conducting and analysing the interviews, it was unexpected and significant how much information came out about coping with HL among workers with HL, and it was especially noteworthy that the participants were keen to talk about this at length. This motivated looking into coping issues in depth in a separate chapter. The coping process of the workers with HL is explained in detail in Chapter 6.

5.3.6 Theme 5: Repercussions on professional life

The workers with HL detailed the various issues they encountered in their professional lives and the difficulties posed by their condition. According to their reports, HL had caused them to experience many struggles in their work life and made it difficult. As two of the participants put it:

"It's {HL} making my life, my work more difficult." P 22

"Work life. Oh, God… when I… lost my hearing about three years ago, I felt like I had been thrown to the wolves really." P 12

Four sub-themes were developed under this main theme, as shown in Figure 14. These are explained in the following four sections.

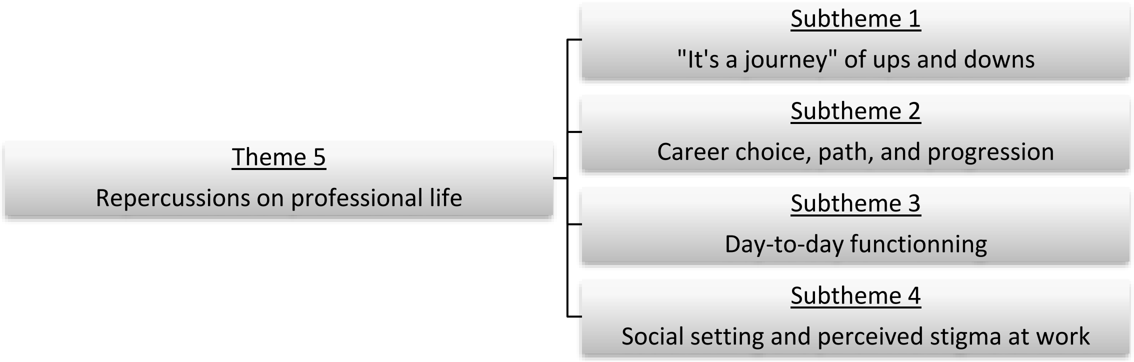


Figure 14: Theme 5 Repercussions on professional life and it's four subthemes.

5.3.6.1 Subtheme 5.1: "it's a journey" of ups and downs

Most of the participants described their experiences of HL in their career life as a journey. They narrated stories of facing challenges at the different stages. Most of the participants had to go through ups and downs, like facing work life difficulties, inability to cope and some had had to change or quit jobs, then find solutions and start a new experience that could be better than the previous work experience or made a change such as using a hearing device. The journey reported by P 21 is an example:

P 21: "I have done all variety of jobs. I don't really stay in the jobs a great deal because I think the hearing loss affects me, especially if people want to keep talking all the time whereas I want to just get on with my job… So I have tended to work on my own and I'm a lot better… I worked for 20 odd years in hotel and catering. And now I work as a carer because there's less telephone work for me to do… but I do have to listen to people talking… So all in all, I probably had… 30 plus jobs in my working career. And some of my jobs have lasted for a few months. And the longest job I had was for about seven years."

Interviewer: "Do you think… that is affected by your hearing loss?"

P 21: "Yes. Because… when you have to work alongside somebody so you have to keep talking, and unless I'm within a couple of feet distance of them, I can hear them quite well. If they move away or in another room, I can't hear them. However good your hearing aid is, you know? So I have avoided those kinds of jobs in the past. I tried them but I… this job is quite good because, I do have to make the calls to the office, but most of the time they send me text messages or e-mail. So that works really well. And I'm just lucky at the moment that this agency I'm working for… have been really good." P 21

Others reported the opposite, where they were managing well but their hearing worsened, or they changed job and the work situation worsened. The following extract is an example:

"About 12 or 14 years ago, I had an operation on my right ear to remove the little bones… I was fine at the start… of my working life… It got more difficult as the years went on after I had the operation… the hearing seem to deteriorate and after that… now, the hearing got much worse three-four months ago. I just found my hearing was getting too low that I couldn't pick up people talking in the office. I was starting to struggle. I knew people were talking to me but I couldn't hear them." P 22

This subtheme was generated to illustrate how the workers with HL perceived that work experiences were constantly changing for them because of their HL.

5.3.6.2 Subtheme 5.2: career choice, path, and progression

Overall, the interviewed workers with HL felt that they were being held back in their career. They reported difficulties at the different stages of their career paths. These difficulties are detailed below.

● Feeling there was difficulty in accessing employment: Some participants thought that HL often presents barriers to job opportunities. Some faced difficulties in CVs when applying for jobs and getting a job and felt unsupported in that regard.

“There appears to not be much support for people like me who have hearing loss for entering the workplace, the GP does not really help and the job centre were completely useless…Well it is difficult enough to get a job as a hearing person... There is competition but a hearing-impaired person may for instance struggle with cv and job applications.” P 8

A few did not think that their HL affected their ability to find a job.

“I don't think I considered it as a barrier to jobs… I wouldn't have viewed it as a difficulty.” P 20

● Job choices are influenced: Some of the participants talked about their career choices and described them as limited because they had to choose a job where they could fit in and be able to do work tasks rather than choosing to work in an area that they liked.

“Now I work as a carer because there's less telephone work for me to do.” P 21

A few chose to work in HL-related jobs, which they perceived better for them.

“I just got my new job as an events fund raiser… for a deaf charity… My old job, it was so hard, you can't manage… They're, just say things and pass through… that was marketing with a different… perspective, so i changed… just to get out of there. To get into the deaf world.” P 14

● Many participants worked part-time instead of full time because of their HL.

“I'm going to be nowhere near working full time… And so right now, I'm just working very little, really. Part-time, a couple of days a week… All my work and voluntary work doesn’t add up to full time work.” P 13

● Promotions and progressing are harder: A couple of the participants touched on this and expressed the feeling that their HL was the reason behind them not getting promotions and progressing in their job.

“There were 12 members on the call and 11 of us got promoted. I didn't get promoted… I got promoted six years after that. So there's something… not right. I was seen as a merely capable, competent manager.” P 13

“I know from past experiences that it would be extremely difficult for me to progress because of my HL.” P 16

● Cessation of employment**:** Quitting jobs because of the HL were reported by some of the participants.

"I was absolutely fine… then I started struggling over the phone…. I spoke to my manager and said, "I'm sorry but I just can't do this anymore." So... I finished." P 19

● Financial challenges: A few touched on the financial effect of their HL and it was mainly due to them doing part-time work.

"Its only part-time and I'm struggling money wise it means there is no money left over when bills are paid." P 8

5.3.6.3 Subtheme 5.3: day-to-day functioning

The participants spoke at length about the effect of HL on their daily work activities and performance. Their restricted communicative and hearing abilities at work were described by all as very influential on their daily functioning and wellbeing at work.

"If there's somebody talking to me in the office there, I would struggle to hear what they're saying or sometimes I don't even realize they're speaking to me." P 22

HL was not only problematic to communicate with people at work, but also to be able to localise sound, which was considered challenging to a couple of the participants who had unilateral HL, and to hear loud-speaker signals or announcements, which was also reported by a couple of participants.

"It's open plan {office}, people come up behind me… obviously my direction of hearing is quite bad… cause... I'm deaf in one ear and not the other… If somebody says my name it's really hard for me to tell where the sound is coming from." P 11

"We have different sirens and different announcements over the system, and I can't hear the announcements… my colleagues have to tell me what the announcements are… I can't hear them." P 19

The main issues they discussed regarding their daily functioning were summarised in the following points.

● The majority reported difficulties carrying out some work-tasks. The type of work tasks was variable and depended on the nature of the job, but the most common ones the participants mentioned were conversation-related tasks, especially telephone calls, groups meetings, teamwork and conferences.

"I found I could not do everyday task like normal ppl {people} can." P 2

"I can't do the telephone...They want me to do a supervisor role... I couldn't use the phone. So they gave me what we call sort of someone to work on a supervisor assistive role… she deals with all the phone call queries. P 9

- Some of the participants found multitasking difficult.

"My job was involving a lot of meetings… there's not knowing where the sound was coming from... Not being able to follow the conversation. Not being able to write notes at the same time as listening, because I, I had to watch people." P 13

"I can't concentrate to do my work and listen to somebody… I have to concentrate doing one thing." P 21

- They often felt that they could not be in control and their performance at work was affected.

Some of them described how they had to think ahead all the time, work harder and spend extra working hours compared to their normal-hearing colleagues. They also felt that they needed to be creative to keep going.

"I was working too many hours because I was trying to catch up with work after everyone had gone home. That I… hadn't been able to do when everyone was around me. I was taking work home to do." P 13

"I worked in a high school before and I can't even imagine being suitable to work there now... High school is so fast paced...You need to think on your feet quicker and with all the cutbacks I'd say they need sharp shooters working for them not people who are hardly able for the tasks on the remit." P 10

"I worked in the private sector and was sacked because of performance issues, I told them prior that I would not hear because of loud machines but they made no attempt to help me… I was signed off and they just terminated my contract." P 8

However, it was interesting that one participant said that the HL resulted in more concentration at work, which positively affected her job performance.

"All deaf people… when they do their job, they focus and never get what is happening around them, and that's probably why I got to do good work, and I love doing that. I like to concentrate... sometimes we got deadlines, 'come on', my friend couldn't finish hers, because they talk but I got on with my work." P 9

- The tasking difficulties described were linked by the majority of the participants to three main factors: workplace acoustics, their inability to lip-read in some situations at work and demands of the job. Regarding workplace acoustics, the participants mainly spoke about their struggles when working in noisy workplaces and in offices, especially large open-plan offices. Those struggles were further complicated due to the inability of some of the workers with HL to lip-read people at work.

"The Civil Service is all open plan work… there is… so much going on… it's more exhausting for me to work in open plan offices than it was in a quiet environment." P 20

"I work in a pharmacy... I used to work in a vets before, which I found more difficult… dogs barking and… there's a lot of… background noise… Before that… I worked in a laboratory where we wore masks a lot… I found it very hard because … the mouth... it was covered." P 3

"When my hearing loss wasn't that bad it affected mainly my ability to follow and understand conversations in meetings and lectures, as most of these meetings are done in rooms where the lights are dim (because of the projector used) and also not facing my colleagues when they ask questions. But over the course of few years this became more difficult and started to affect me in other parts of my job, such as using landline phones for communication… and talking to patients in very noisy parts of the hospital such as emergency department and to a lesser extent in the ward. But in the clinic setting it was fine because it is more quiet." P 24

Regarding demands of the job, many participants argued that jobs that involve tasks relying on hearing for communication and functioning are harder and caused them to struggle more. For example, jobs that involved frequent phone calls or having to be in meetings, group situations or conferences caused them a great deal of struggle.

"I really don't like doing telephone work because it's quite difficult. If I know the people who are calling me and their voice is good, then I don't have a problem. But if you're dealing with customer services, I can't do it because everybody's accent is very difficult. I try to avoid jobs with a lot of telephone work. My hearing loss has affected me over my working years." P 21

On the other hand, it seemed easier to work in the type of jobs that do not need hearing to communicate and perform work tasks. For example, P 12 expressed her feeling that she was lucky to have a job where she had been doing mostly computer work and involved fewer telephone calls, which she found manageable.

***"**I'm lucky that I do the job I do, because I can manage. It's a lot of computer work and emailing… if I've done any other job… on the phone all day, I think I would have been out of a job by now. Some jobs just… it's not physically capable of doing some jobs… I suppose I'm quite lucky that the job that I do that's a saving grace." P 12*

In addition, P 2 was happy that her voluntary work did not need hearing ability, because it is was all conducted in British sign language, so she was not affected.

"It {HL} doesn't affect my voluntary work. Were all on same wavelength. brilliant. All BSL {British sign language} is used." P 14

Many of the participants added that having to hear and communicate with certain people at work is strenuous, especially if that person is unfamiliar to the participant such as customers in retail shops, or if the person speaking has an accent or speaks quietly or where the context is not clear or they do not have a context.

"It is difficult to have group conversations, conversations in noisy places and to speak with people who are quiet or with strong accents I'm not familiar with. This means I have to work hard to communicate and be quite creative in terms of finding the right support and managing different situations in work. It makes working so much harder for me than someone without HL." P 16

Finally, some mentioned having to take more time off work than their colleagues because of their HL and the appointments with their audiologists.

"I couldn't do the PC [personal computer] tasks as my glasses made me fizzy and I couldn't hear on the phone.... Two of my main duties... So I struggled for a week then went off sick for seven days. I've never been off with a hearing related illness before, so it was a big thing for me." P 10

5.3.6.4 Subtheme 5.4: social setting and perceived stigma at work

Most of the workers with HL talked about the social environment at work and the difficulties they faced with people at work. This might be from the employer, but could also be from work colleagues who they were working with day-to-day or from strangers, such as customers or service users. The workplace social environment was perceived as very influential, whether positively or negatively. The biggest issues were the level of awareness at the workplace and the support provided by employers and co-workers, such as communication support or adjustments to help accessibility. In addition, many reported that the attitude of people at work often made them feel stigmatised and labelled at work, or deemed incompetent at their job. A few also struggled with issues such as marginalization and discrimination at work. Avoidance of social situations at work and feeling isolated were further common issues encountered by many of the participants. P 16 talked about some of the issues mentioned above.

"I have to book communication support in advance of meetings, use different pieces of equipment and challenge access issues and discrimination… It can be very stressful at times and you have to be quite resilient and quick thinking too… It can be frustrating and upsetting. As an example, I use NGT {Next Generation Text services} text relay to make calls and from time to time will come across people who refuse to use this. They won't speak to me on text relay, so then I feel discriminated against, frustrated that I can't do this aspect of my job and that power has been taken away from me because I then need to challenge that person and find another way to communicate with them or possibly even ask a colleague to talk to them instead. Overall having hearing loss is isolating and marginalising… I can't join in office chit chat so harder to develop close rships {relationships} with colleagues… All social workers have to complete… a lot of training courses. Often there is little notice about training, we might be told it has been arranged for 2 days' time. Or we might be told to do online training. I need advance notice, at least 3-4 days bare minimum for this sort of thing so that I can get more information on the format and find out what support I need. If it's face to face training with more than 2-3 other people, I'll need formal communication support… like a speech to text reporter, which is very expensive and almost impossible to get at short notice… And online training well if there's any videos or audio, I need them subtitled and that takes time too. People even big organisations like the city council don't take these things into account." P 16

P 19 also felt labelled at work because of her HL, although she understood that this was not intentional.

"It's just a continual reminder that you've got a problem… you've got a hearing impairment and it's reinforced that you have a hearing impairment. And this is the, this is a worst bit, in order to use the Roger Select on the docking station by my telephone… the security department… have insisted that there were signs placed around my office to say I am, "There is… employee here using a… Bluetooth hearing device. Please limit conversations to official sensitive." There's one over my desk, there's one in the desk on the table where we meet. There's one on the door as you come into my area. I am surrounded by these signs, literally stuck up, pop into the wall and it just feels like I've been badged… I appreciate why, but I don't like it." P 19

P 9 also talked about feeling socially isolated during lunch breaks because of her HL.

“I remember when we… have breaks, with like a long table, and I will sit on the edge. so that I try to pick the conversation. But they all faced in that way so I couldn't lip read. so I start to read my book. So I have my coffee and read a book, and when they would get up to leave, I thought, ‘Oh, it might be time to go back to work’, and that been a regular thing, a long time. They all go out. I go on my own, come back about… feel quite lonely.” P 9

A few talked about how their employers or work colleagues were supportive.

“Answering phones is always difficult also and customer can be very rude to me… My colleagues and I have a good relationship and we are able to joke about a lot of it, due to some of the things I pick up wrong, makes for interesting conversations. They do support me when I am having difficulty with customers or the phone and will always protect me if someone is being rude. The customers, I just tell them I’m hard of hearing and point to my ears, most of the time that works. And they are either embarrassed or apologetic.” P 7

Regarding the lack of awareness, many argued that people at work are not deaf aware and do not know how to deal with them.

“I do come across standard things like them turning away speaking or putting the photocopier on while I'm on the phone.... It's right behind me… I do find once I make them aware, they try their best to accommodate that. Like everywhere it's a general lack of awareness.” P 10

Two participants suggested that workers with HL should raise awareness at their workplace by educating people about their HL, which could be hard at times.

“You have to educate your team that you do have hearing problems… that is very difficult whenever you change the team members because you have to start from the beginning again… I expect work doesn't… do enough for… staff to make them aware… So… it's a big effort from my point of view to… show a team member how I communicate. Other than that, once they get over that hurdle, then the work is fine.” P 20

5.3.7 Theme 6: Psychosocial impact

The interviews in this study revealed the great impact of HL on workers' psychosocial health and this was the most frequently mentioned theme. As shown in Figure 15 within this theme, two subthemes were generated: Disclosure of illness and emotional wellbeing and "Your brain is working overtime".

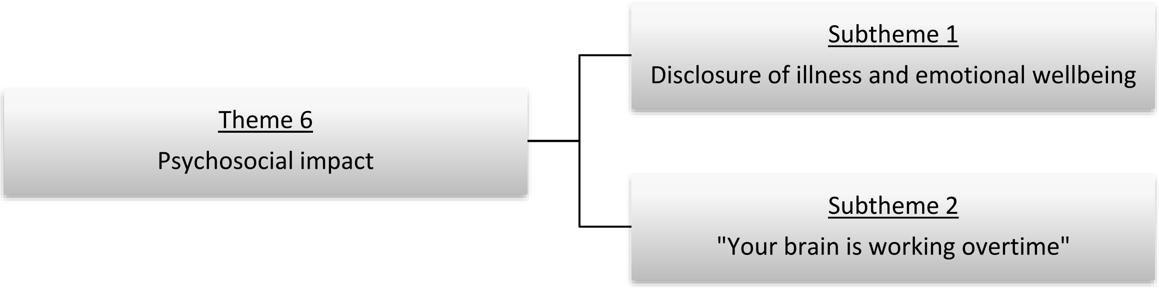


Figure 15: Theme 6 Psychosocial impact and it's two subthemes.

5.3.7.1 Subtheme 6.1: disclosure of illness and emotional wellbeing

Stress, emotional difficulties like frustration and embarrassment and disclosure difficulties were the most commonly reported issues.

"It makes you feel stressed and frustrated especially when you know that you are going to be embarrassed when you keep asking your colleagues or patients to repeat what they are saying or the worse when you misunderstand what you have been told." P 24

"I also sometimes need a moment to process what I have heard and try to work out what was said, but a lot of people don't understand this and I feel stupid if I'm just sat in silence trying to work out what was said." P 6

"You can't tell them {people at work about the HL}. It's embarrassing." P9

A few talked about feeling sad and low at times, as well.

"It's not easy. And in group conversations is a no-no for moat deaf ppl {people}. I didn't manage. I left. I felt very sad." P 2

It was interesting that one participant expressed feeling lonely in this situation as a worker with HL.

"I do feel kind of on my own on this… well I don't know anybody else that has a hearing loss that also works. So it's… just a question of just struggling through… not knowing what is the norm... I don't know… what is expected and what's not expected and how other people cope. So I don't know how I handle things is the normal way or not. I have no templates to work from." P 15

A few also reported having family difficulties due to the psychological effect of their HL at work.

"I'm told at home that it {hearing loss} affects… my mood, and… I certainly wouldn't have the same… temperament that I used to have." P 18

Appearing rude when they do not hear or respond quickly to people in the workplace and negative self-image were other issues that some of the workers spoke about.

"It was quite a sort of emotionally like coming to terms with it all and going from being this sort of fairly senior management, and the name known by everybody in the council cause I was the person who did that job you know. And going from having that sort of level of status and income and so known, if you like, to just being {paused}. I'm now I'm just you know, that's all I do now and so realizing that that isn't who you are, that is just a job that you did. That was a big thing really together, profound I think." P 13

A few mentioned losing their independence and how there could be a feeling of being vulnerable or humiliated.

"And it's almost feeling like being vulnerable when you say things like 'I can't hear you… could you write it down? Could you slow down on the phone?… feeling very vulnerable sometimes." P 12

"I'm very independent and I hated having to rely on my colleagues whenever my phone rang" P 19

A few participants expressed their worries and concerns about being at higher risk for safety dangers at work, like concerns of not hearing the fire alarm. It is worth mentioning that none of the participants reported injuries or accidents. Trouble hearing sirens and announcements were also reported.

"Everything from fire alarms because that's… another thing with… I should mention that I always have to say to people, if the fire alarm goes make sure you get me." P 17

5.3.7.2 Subtheme 6.2: "your brain is working overtime"

The impact of HL on workers' feelings of tiredness and mental exhaustion came across strongly in the interviews. The participants talked about how HL caused problems related to the extra effort they put in at work, leading them to feel more fatigue and tiredness than their normal-hearing colleagues did or themselves when they were not having hearing problems.

"The sense of fatigue is a big thing." P12

They reported feeling that they needed to concentrate harder than others at work due to their HL, and that they put in a great deal of effort to lipread people at work. This led them to feel tired both during working hours and at the end of the day, affecting their work life and general life.

"It gets tiring because… I do two or three hours with one person, two or three hours with somebody else. You do have to really listen to… what they're saying… It is tiring. When I get home, I am more tired than what I used to be, and it's the concentration. I just get really tired." P 21

A few of the interviewed workers seemed particularly deaf aware due to working in HL services like lip-reading classes or HL charities. They talked about the sense of tiredness and one spoke about its link to Alzheimer's disease. This links to the current discussion in the literature about the link between dementia and HL, and for the participants to volunteer this information was remarkable.

"You have to work so much harder to try and listen to a conversation. Your brain is working overtime, and there's also the thing of Alzheimer's… it's not something that people talk about much." P 17

Two workers also emphasized how they felt they needed to put in extra effort at work to be as good as their colleagues, finish their job tasks or to stand out, which led them to exhaustion.

"I'll have to concentrate harder than everyone else just to keep up, so I need to be careful though, I don't, that I take breaks and that I don't… take too much and get overtired." P 11

5.3.8 Theme 7: Health and hearing status bearings

Theme 7 illustrates how the workers with HL in this study experienced the effect of their general health and HL characteristics on their work and life in general. This theme is subdivided into two subthemes as shown in Figure 16: Hearing loss characteristics and co-existing morbidities.

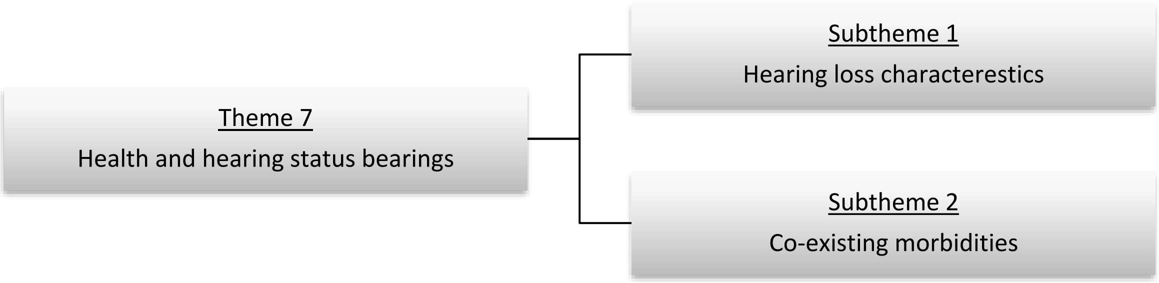


Figure 16: Theme 7 Health and hearing status bearings and it's two subthemes.

5.3.8.1 Subtheme 7.1: hearing loss characteristics

When the participants were asked to talk about their HL and work life, issues related to their HL characteristics were mentioned by most of the participants. A variety of perspectives were expressed. First, the fear of HL progressing over time and fear of the future were the most common. Some indicated concerns about HL progressing or worsening, leading them to be further affected by their HL and experiencing more psychosocial problems and occupational difficulties.

"I think ahead all the time, how will I manage if my hearing deteriorates." P10

Second, some other participants related the impact to the severity of their HL.

"My hearing loss was getting worse, and the job was getting harder." P 13

Third, a few others argued that the sudden onset of their HL was the hardest part and that it affected their work life.

P 11: "If you lose your hearing suddenly, you just suddenly… become disabled, that's actually quite a shock emotionally. I know what some of the issues are around work. But if you've just suddenly lost your hearing, it's not obvious… So, obviously I had to tell people in my team that I couldn't hear properly." P 11

Finally, a few talked about the effect of having bilateral versus unilateral HL and suggested that it is easier to manage with unilateral HL.

"I have HL… just in my right ear… my HL... on that little chart… it's not-- I'm not deaf but… it's pretty bad… obviously it's only on the one side so it make things a bit easier. Obviously, I can use the phone without a hearing aid in. like today." P 3

5.3.8.2 Subtheme 7.2: co-existing morbidities

There were a few participants who explained that having additional illnesses caused their HL experience at work to be worse. The reported health problems were visual impairment, disabling arthritis, a brain tumour and back pain, while a few reported being impacted by tinnitus and balance problems. Having other illnesses complicated the situation at work for those participants, and this is not surprising, as it is accompanied by many added health problems from the co-morbidities.

"I couldn't do the PC {personal computer} tasks as my glasses made me fizzy and I couldn't hear on the phone. Two of my main duties… Could get really woozy and disorientated by the end of my working day. So I struggled." P 10

They also suggested that having to prioritize one of the health conditions could have an additional effect. For example, the participant with arthritis prioritized her arthritis condition over her HL.

"In 2013… that was about the time I got referred for cochlear implant… But that coincided with me needing… ankle replacement surgery, and that had to take priority cause I was in lots of pain. So I deferred the cochlear implant." P 19

5.3.9 Summary

The workers with HL described the challenges and disadvantages they faced in their work life and when seeking HHC. Their work lives can be full of difficulties, including professional challenges and psychosocial health detriments. These were reported to become exacerbated in the presence of other illnesses or the HL getting worse. A few good experiences in the workplace and with audiology were described. For the most part, work life constituted an area that was not given sufficient attention by audiology. There seemed to be an impression that audiology care is not personalised and focuses only on hearing aids, and that there is ambiguity regarding the role of audiology in providing support for work needs. Workers with HL found shortcomings related to deaf-awareness issues such as accessibility to services and audiologists lacking basic deaf-awareness behaviours such as facing patients when talking to them. Independent companies and cochlear implant services were perceived as offering more assistance in the occupational aspects of patients' lives, especially with hearing technologies. This was deemed important, as hearing devices were seen beneficial to working life, with room for improvements.

5.4 Discussion

This section focuses on discussing the aspects and perspectives that are relevant to workers with HL and their interviews. The rest of the results were in line with or related to the audiologists' perspectives obtained in Study 1 and are discussed together in Chapters 7 and 8. Chapter 7 includes a brief discussion of the triangulated perspectives of the audiologists and workers with HL obtained from Studies 1 and 2, and Chapter 8 includes a general discussion for the whole research key results (Studies 1-3).

5.4.1 Main discussion

This study brought to light important aspects of workers with HL experiences in and out of work and their experiences and views of their audiology services. Their responses focused on the challenges workers with HL confront when interacting with their audiologists and service providers as well as people in the workplace. The participants worked in a variety of jobs and were cared for by a wide range of audiology services in the UK, yet, they shared common key perspectives. This underlines the significance of those perspectives, especially what they perceived was needed in order to improve their professional lives and their overall wellbeing.

Regarding their HHC, the workers with HL talked about some positive experiences, such as having deaf aware and empathetic interactions with their audiologists, receiving work-specific care by some audiologists or receiving advice about hearing technologies that helped them at work. They also discussed, to a greater extent, negative experiences such as difficulties in accessing audiologists and services and audiologists not interacting with them in a deaf aware manner. The participants described a range of issues and difficulties they encountered in the different stages of their HHC journey, starting from seeking work support and accessing audiology service. These are demonstrated in Figure 17 below.

Whose responsibility is it?	Access to services	Accessibility of services	Interactions with audiologists	Goal setting and management	Referrals to get extra support	Follow up
•Unclear where to get work support from. •Unsure if audiologists are supposed to or can help with work issues.	•Feeling disabled by their services because they have to call to get an appointment and it is difficult to hear over the telephone. •No efficient email system to communicate with audiologists and services. •Have to be referred by the GP to get an appointment causing added difficulty and resulting in longer waiting times.	•Noisy rooms or department. •Calling patients names in the waiting room instead of having a screen.	•Audiologist using non-deaf aware communication like not facing patients to enable lip-reading. •Audiologists not actively listening or not showing empathy. •The workers perceiving audiologist not allowing them to ask questions. •The workers perceiving a negative audiologist's attitude. •The workers perceiving the audiologist not experienced or skilled. •Audiologists not using the patient centred approach. •Audiologists not asking about hearing-related struggles in work life and workers not asking for work-help or even talking about work difficulties with audiologists. •Time pressure that does not allow discussing work issues.	•Goal setting and management are largely and sometimes purely focused on hearing aids fitting and care. •Audiologists not giving attention to work difficulties when setting goals. •Audiologists not providing information and support related to work needs. •No support with getting assistive devices or their maintenance. •The workers perceiving independent companies as commercial and offer costly hearing aids and services. •The workers perceiving NHS hearing aids not efficient in the workplace and cosmetically not appealing. •Not referring patients to other services like ATW.	•When some workers were referred, they perceived the pathway complicated and lengthy. •The support provided by ATW was not necessarily personalised to their needs.	•Seeing a different audiologist every appointment. •A lack of follow up after the three appointments of assessment and hearing aids fitting.

Figure 17: The barriers to hearing healthcare at the different stages of workers' hearing care journey. ATW: Access to Work, GP: general practitioner.

The most frequently reported difficulties were related to workers' interactions with their audiologists and the support provided as Figure 17 shows. Despite the presence of many negative experiences, there were some positive ones. This discussion aims to focus on key patient experiences that demonstrate the need for improvements in services, instead of generalising (more about the generalisation issue in 8.4.3). It is worth noting also that some of the participants reported difficulties, such as accessing services, might already have been changed due to service changes during the COVID-19 pandemic. The pandemic has led to many accelerated shifts in the ways the NHS and independent companies work and deliver HHC to all patients, including workers with HL. The COVID-19 pandemic has led to changes could be positive, such as improving online support, or negative, such as delays in receiving hearing care, hearing device maintenance and support. This is worth exploring in future research.

The results showed that patients had varied experiences that were strongly linked to their audiologists' communication patterns and finding that some audiologists demonstrated lack of deaf awareness during appointments came as a surprise. Many patients had to struggle hear and lipread audiologists in their appointments. This finding mirrors that of previous research which has reported low satisfaction among deaf-blind patients that was due to the lack of professional awareness in deaf-blind issues by opticians, audiologists, ear, nose and throat specialists (Mulla et al., 2014). Therefore, it seems crucial to train professionals by bringing awareness to patients' perspectives. This would help them to be conscious of their patients' needs and provide better patient experiences. Fortunately, the participants indicated that not all audiologists were difficult to interact with, and some of their experiences were very pleasant.

Besides professional deaf-awareness behaviour, workers with HL favoured audiologists who gave attention to and focused on their work life and showed patient-centred traits in general. This was expected, as patient satisfaction and outcomes from healthcare are clearly connected with patient-centeredness (Swenson et al., 2004, Laplante-Levesque et al., 2010) and has a particular importance for people with chronic illnesses (Coulter and Ellins, 2007). As the workers conveyed in their stories, this approach would include audiologists endeavouring to understand workers with HL through empathetic listening, conveying a positive attitude, welcoming patients to ask and discuss what matters to them and enable workers with HL work out what support they would like to get through information sharing about available help, and not confine support to hearing aids provision (for the discussion about limiting hearing care to hearing aids support please see Section 8.3.4).

Another important aspect of the experiences of workers with HL was their perspectives on hearing technologies. To start with, some workers had never received information about technologies that could help them at work from their audiologists. Those who used ALD with hearing aids and cochlear implants found them beneficial in carrying out certain work tasks, but information about them was not passed to all patients and support for using and maintaining them was difficult to get. Moreover, the technologies that could help in working life were not found in all services. The workers with HL detailed that different services or departments offer different hearing technology and device support, even within the NHS. This influenced many participants in terms of choosing where they get their hearing care from. Many described the NHS hearing aids as less advanced and there were limited choices (including cosmetic aspects) compared with the devices in independent companies, which some of the participants thought would affect their profession and they thought these companies offered more advanced service in that regard. Nevertheless, the independents were perceived to be selling hearing aids, which matches the views of older adults with HL in a previous study (Grenness et al., 2014b).

As indicated above, the results showed that hearing technologies were overall found helpful by workers with HL, although not in every scenario. This evidence supports the scarce research available for audiologists, commissioners and policy makers on the use and benefits of assistive devices (De Ceulaer et al., 2016, Maidment et al., 2018). Maidment et al. (2018) systematically analysed the available literature concerning ALD usefulness. They included studies with patients having mild to moderate HL. Their search found very limited number of good quality papers on this subject. The kind of ALD in the included studies are relatively old and advanced technologies are currently available and keep on improving. For example the review does not include papers investigating the Roger pen, which seems to be popular currently. Moreover, benefit of ALD could be more for certain populations of patients such as those who have greater degrees of HL and the working population of adults with HL. These issues probably concealed the actual effectiveness of ALD. There is a need to look into the role of new technologically advanced hearing devices in promoting better performance and wellbeing of workers with HL. ALD in working life constitute a topic ripe for research and it is crucial to deliver evidence-based information to audiologists, decision-makers, and consequently patients. It is thought that working adults who are younger are more likely to engage with ALD than the older population, but most of the research looking into the benefit of ALD is on older people and is more likely to be biased.

Overall, the workers with HL raised a range of issues related to their interactions with their audiologists and services. They expressed a range of concerns relating to the quality of their HHC and the need for improvement. These have been triangulated with audiologists' perspectives in Section 7.4. They were also used to inspire the clinical practice recommendations in Section 8.5.

Regarding perspectives of how HL affects the working population, the results support most of the previous research findings that were outlined in the conceptual framework (Figure 4). They also mirror the perspectives of the audiologists in Study 1, and therefore, these were triangulated and discussed in chapters 7 and 8, respectively.

Regarding this study, It is worth highlighting here a number of issues relating to its contribution to understanding the perspectives of workers with HL: First, an exhaustive and prolonged search of the literature found no research investigating the experiences of UK workers with HL in the workplace as explained in the literature review. One source of information in this area was *Unlimited Potential*, a study carried out by the RNID (Mathews, 2011). This publication is considered grey literature as it was not peer-reviewed and contained some methodological ambiguities. Nevertheless, the experiences of workers with HL in their study mirror many of those reported in this present study, such as emotional and social struggles in the workplace. The exploration of the perspectives of workers with HL in this study provides a fuller and deeper picture of this range of experiences. It also brings to light important issues such as the constant struggle to communicate at work and the effort necessary for that, as well as workers' sense of being forced to make changes in their lives such as changing jobs or quitting and what that is like for them.

Second, feeling disabled by HL in the work environment was clearly found to be disruptive to daily work life and was perceived as being responsible for limiting career opportunities, triggering frequent job changes, and workers reducing their work hours or deciding to leave their jobs entirely. Some workers with HL made adjustments which resulted in positive changes in their working lives, such as using technologies, disclosing their HL to people in the workplace and asking for help from their colleagues and audiologists (perspectives on coping are presented in Study 3 (Chapter 6)). However, others are struggling, feel unsupported, and are at a loss to know where to seek support, as the previous discussion indicated. These issues highlight the need for counselling on how to cope.

Third, interesting and new insights were gained from workers with HL regarding the factors they perceived to be influencing their experiences. These are discussed in the general discussion chapter (Chapter 8). These included acoustic and social environments at work, as well as additional health conditions and the use of hearing technologies. Finally, the issue of work-related fatigue among adults with HL is very worth attention. Fatigue was found to have a detrimental effect on other areas of life, such as family and social life. In the past few years, researchers and audiologists have acknowledged the association between HL and listening effort, fatigue, and cognitive load, especially since HL was linked to the risk of dementia (Bernabei et al., 2014, Nadhimi and Llano, 2020). It is interesting to note that the workers freely volunteered the information that they felt mentally exhausted from having to concentrate on listening and lip-reading as well as doing their work tasks. This result is discussed in the general discussion in Chapter 8, Section 8.2.2.3.

5.4.2 Limitations

The general limitations of this research and its methodology are outlined in Section 8.4.3 (Chapter 8). A few limitations specific to this study are presented here. First, how workers with HL experienced work life and audiologists and audiology is likely to be influenced by external factors that were not captured in this study. For example, the patient’s HL (childhood vs acquired HL or Sign vs English language user), personality and attitude or their relationship with their family, friends and employers will inevitably cause them to experience their HL and HHC differently, and this study was not able to capture that. Further research is needed to explore if there are differences in experiences between those who have HL since birth or acquired it later, or between sign language users and English speakers. The relationships of workers with HL with their employers, as well as to their family and friends, can also be investigated and linked to experiences in the workplace and HHC. It is indeed complicated how human experiences are shaped and perceived. The context we live in every working day can be very influential and is worth more research.

Second, only participants who were actively working full or part time were included in this study. This decision could be responsible for concealing the important perspectives of those who decided not to work, or could not access employment or could not stay in their jobs. For example, those who could not access employment might point to aspects of their lives that are possibly responsible for them not working, like their level of education and its relation to their HL. previous evidence indicates that persons with HL who have a low level of education exhibit higher rates of non-participation in work life compared with HL adults with more education (Hogan et al., 2009).

Third, this study included only one participant not using any hearing technology. This was unintentional and it would have been possibly better if the study had included more non-technology users in order to understand why they had not sought audiology support. Alternatively, it may be that workers with HL who do not use hearing aids or other technology are in denial about their condition or are not ready to make changes or deal with hearing technologies in the workplace. There could be many other reasons why workers with HL are not benefiting from hearing technologies. Non-users could also have different perspectives and experiences of HL in their work lives compared with hearing-technology users. Therefore, it is worth exploring their perspectives in future studies.

Finally, most participants were recruited online from social media platforms, such as Facebook and Instagram. Online recruitment is time and cost efficient and can reach more people compared with the traditional patient recruitment methods such as hospital-based recruitment (Benedict et al., 2019). Nevertheless, it can influence the results through recruiting a biased sample (Benedict et al., 2019). Not only that, the online advert wording could be responsible for recruiting a biased sample (August et al., 2018). The participants may turn out to share specific characteristics or motives for participation such as boredom or dissatisfaction with the healthcare services. On the other hand, they could also be more motivated and active in learning about their problems and finding solutions. Some of the participants, however, were recruited through non-online methods and no differences in perspectives were noted. The triangulation of patients' and audiologists' perspectives (Chapter 7) can aid in the validation of the results and checking for bias issues. A larger sample in future studies can also help in making better judgments about differences between the perspectives of patients recruited via different methods. The generalisation of the results should constitute the mission of future research.

5.4.3 Implications

The earlier discussion (Sections 5.4.1 and 5.4.2) includes many suggestions for future research. The general discussion chapter (Chapter 8) includes additional ideas in Section 8.6, as well as a thorough discussion of the clinical implications of this research in Section 8.5, that were inspired by the perspectives of both audiologists (Study 1) and workers with HL (Study 2). Below is a brief discussion of three ideas stimulated by the workers' interviews.

The evidence from this study and earlier research clearly shows that workers with HL are prone to suffer employment and financial difficulties, as well as the fatigue they experience at the end of their working day. All of these can influence family and social life, as well as relationships with employers and co-workers. The perspectives of employers has been explored in one study (Svinndal et al., 2020a) but no research was found that gave attention to the experiences of co-workers, family or friends. The participants in this study talked about the influence of the social environment at work and reported many negative experiences relating to the lack of deaf awareness and the sense of social isolation at work. Improving these experiences can be planned and achieved if there is a good understanding of the experiences and perspectives of the people who interact with them and can offer some assistance in dealing with the difficulties. This constitutes an important research area to explore. One study, for example, could triangulate the perspectives of a group of workers with their co-workers, employers, family and friends in the form of case studies. The narratives of the different groups might help in getting a deeper understanding of challenges faced by each and identify common and differing perspectives among these groups. Then the results can be used to guide changes that could have positive influence on the worker as well as the people who can support them.

In addition, a further study could assess the extent to which the perspectives of workers with HL in this study are common to other populations with HL, and whether the results can be generalised or if they are specific to the present sample of participants. This would also help estimate the scale of many of the issues revealed. For example, a survey based on the research results involving a larger number of workers with HL could be conducted to explore whether their audiology appointments incorporated an assessment of their work life needs and considered that when setting the management goals.

Finally, the immense lived experiences of effort and fatigue add to a growing body of literature on the association of HL with listening effort. The mechanism, magnitude, implications and prevention of which are worth exploring among the working population in future research, especially in the light of new evidence on the potential links between increased mental effort, cognitive load and the increased risk of developing HL-related dementia. There also could be a role for hearing technologies in alleviating these.

5.5 Conclusion

This study has explored the experiences and perceptions of workers with HL regarding their audiology hearing care and how HL affects their lives. Workers with HL have shown that HL in their social and physical work environments can impose negative consequences on most aspects of their career, health and wellbeing. This includes work choices (such as profession, full vs part time work, and decisions to leave work), day-to-day tasks, job performance and progression at work. Social integration in the workplace was also found to be constrained due to communication difficulties and the general lack of deaf-awareness among people at work. The ability of workers with HL to have an ordinary professional life like normal hearers can be clearly restricted. This study also revealed that hearing technologies appear to ease patients' experiences and assist them to function better at work. Still, there remains the need for improvement in the areas of hearing aid and ALD support from audiologists, as well as funding to obtain hearing technologies designed for the workplace.

Regarding workers' HHC, the evidence indicates the presence of many shortcomings affecting the different stages of their HHC journey, from first accessing services to the continuity of HHC. There is a notable variation between workers with HL in how well-supported by their audiology hearing care they feel. A few feel well-supported, while others feel insufficiently supported by both their audiologists and the audiology service. Two aspects of hearing care that seemed to strongly influence how well supported workers with HL felt were: (a) workers with HL, in general, want work-related support that is tailored to suit their specific needs; a few reported receiving that and most reported not receiving that; (b) workers with HL referred to the importance for them of seeing audiologists who demonstrated HL-aware communication skills; some reported experiencing that but most reported not receiving that (e.g. audiologists not facing them when speaking).

Acknowledging the perspectives and needs of workers with HL and using them to drive service improvement initiatives could be key for supporting them with individualised quality care and improve their wellbeing. It has been demonstrated in the literature that positive patients' experiences translate into better health outcomes (Doyle et al., 2013), therefore, their perspectives should not be criticized for subjectivity and should be considered meaningful. This research also indicates a lack of understanding among workers whose responsibility it is to sort out work problems. To ensure that workers with HL are adequately supported, this needs to be a shared responsibility. Audiologists, employers and patients themselves all need to take an active role in finding shared and person-centred solutions. Audiologists and employers can facilitate the individual's adjustment in the workplace. At the same time, the individual is ultimately responsible for changing and maintaining behaviours, while being supported by their audiologist and employer.

Chapter 6 Study 3: workers' perspectives on coping with hearing loss

6.1 Introduction

The literature review (Section 2.4.3) discusses theories about how people cope with disabilities and difficult situations overall. It shows that the ability to adapt to HL and manage difficult listening situations have been investigated and discussed thoroughly in the literature. Many strategies have been described as coping mechanisms among disabled people in general and adults with HL specifically. Examples include problem-solving coping such as the use of hearing aids to help communication, and cognitive coping such as acceptance of the disability versus the use of avoidance-based strategies. Studies investigating how workers cope with HL are, however, very limited and largely outdated, and appear to be non-existent in the UK context. This research, therefore, aims to investigate the coping experiences and views of workers with HL in the UK.

Research aims:

1. To explore the experiences and views of workers regarding their coping with HL.
2. To identify the facilitators and barriers to coping with HL.

Research questions:

1. What are the experiences and views of workers with HL regarding coping in the workplace?
2. What are the facilitators and barriers to coping among workers with HL?

6.2 Research methodology and methods

To answer the research questions, the researcher re-analysed uncoded versions of the transcripts of the interviews conducted with the workers in Study 2. This secondary analysis focused on the workers' experiences and views regarding their coping with HL. It is worth mentioning that the interview questions were not originally designed to answer these research questions, hence it is considered a secondary analysis (Hinds et al., 1997, Szabo and Strang, 1997). However, the participants were keen on talking at length about their coping experiences. Moreover, the interviewer frequently prompted with questions like 'how did you deal with that?' during the interviews when the participants were describing a difficult situation. These prompts encouraged the participant sometimes to elaborate further and discourse details about their coping experiences. An example excerpt is provided below.

P 17: "It was fine at first because it was a small office… then I moved to… a large global company, all open plan, and that's when I started to struggle."
Interviewer: "How did you manage?"
P 17: "You apologize, 'Oh, I didn't hear that.' And then… you do try and compensate… um, send someone an email and say, 'Just to confirm our conversation.'… Now it's- I'm more open about it." P 17

For the general methodology, please refer to Chapter 3. For the details specific to the participants, such as their characteristics, recruitment, the interview process and the analysis, refer to Section 5.2.

6.3 Results

6.3.1 Introduction

The analysis process developed two main themes: Determinants of coping and mechanisms used to cope. These were subdivided into six and seven subthemes, respectively. Figure 18 shows the themes and their subthemes, and the following two sections report these results in detail.

6.3.2 Theme 1: Determinants of coping

Many enablers of and barriers to coping in the workplace were discussed in this theme. The workers talked about six main determinants that influenced their ability to cope. These are represented by the following subthemes.

6.3.2.1 Subtheme 1.1: the support received from work and audiology

The participants explained how work and audiology support affected their ability to cope in their workplaces. Many of the participants expressed feeling frustrated because they felt unsupported by their work.

P 8: "I had told them prior that I would not hear because of loud machines but they made no attempt to help me… and in my job at the hospital, Access To Work recommended deaf awareness. The line manager refused."
Interviewer: "Why? "
P 8: "No idea. I think she was ignorant to my needs but that's just my opinion" P 8.

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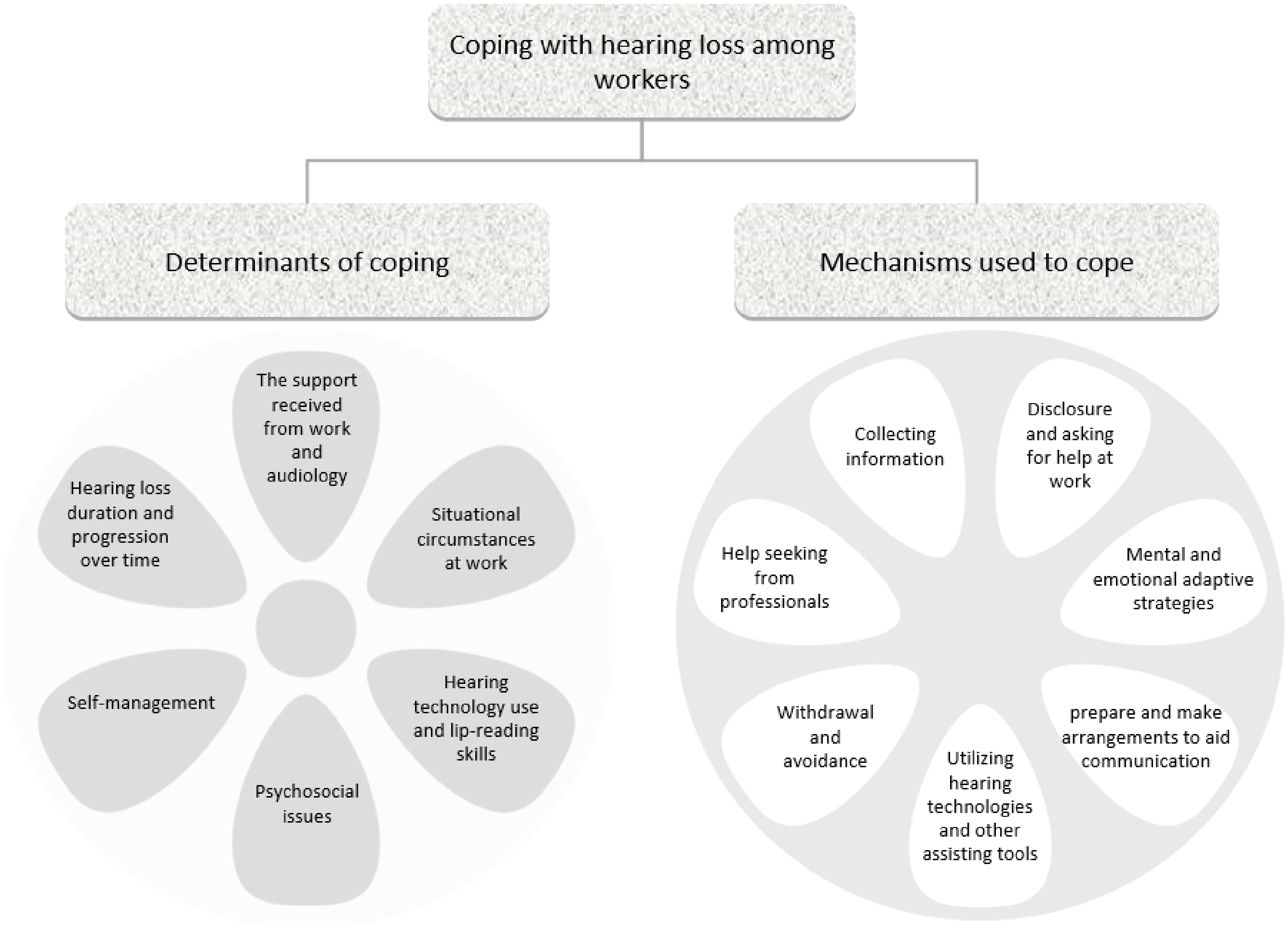

Figure 18: Study 3 overarching themes and subthemes relating to the experiences and views of workers regarding their coping with hearing loss in work life.

On the other hand, a few had better experiences as their employers helped them to accommodate and showed some level of deaf awareness and showed they care to help.

“The manager came in, he was very good and he realized that there were people coming up behind me all the time and he said, "{participant’s name} needs to move desks.". He asked my colleague if she'd be prepared to swap and she was.” P 12

Regarding audiology support to cope, some participants touched on that. Mainly, they found no help in that regard.

“They {Audiologists} treat you like, "If your ear's broken, we're gonna mend your ear" but, they don't think about…what adjustments you might need to make at work.” P 11

Only a few said they received advice on to how to cope at work from their audiologists. This included advice about hearing technologies that could be used, advice about lip-reading, advice about disclosure of HL at work and how to deal with certain situations like a noisy environment, advice to contact charities and governmental schemes that could help with work.

Interviewer:” How did your audiologist support you in relation to work?”

P 6: “I think by giving me the confidence to speak up and tell colleagues that I can’t hear them.” P 6

6.3.2.2 Subtheme 1.2: situational circumstances at work

Being in difficult listening situations that are beyond the worker’s control prevented many from coping. For example, they talked about how difficult it is to cope with many people talking at the same time, such as in group situations, conferences, open plan offices and noisy areas. They perceived this type of situation as beyond their ability to control and cope with.

“I can't do anything about um, meeting my needs in that scenario. It's fine doing the ceremony, delivering it, but then if somebody comes to talk to me at the end of the ceremony, and it's a big crowd of people there… I can't have a conversation with them… and really understand what they're saying.” P 13

On the other hand, a smaller number of the participants thought that it was easy for them to cope when dealing with a small number of people at work and if it is quiet.

"When its quiet I can manage. But sometimes I can’t, there is too many people in the shop. I think I’m lucky, it’s a small workplace. Imagine it is much harder to deal with a large team or workplace.” P 5

6.3.2.3 Subtheme 1.3: Hearing technology use and lip-reading skills

Hearing technologies overall were seen helpful in work life. Two participants clearly stated that they were helpful in terms of coping at work.

“I coped with decent hearing aids for about two or three years.” P 13

However, it was interesting that difficulties related to hearing aids caused several participants to feel unable to cope. The main problem was that hearing aids can pick up a lot of background noise in many workplaces.

“They {hearing aids} are too noisy… I can't cope with it. Too loud, too much.” P 9

Two of the participants expressed feeling unable to deal with the NHS ‘behind the ear’ hearing aids due to cosmetic reasons.

“It {hearing aid} was external and big, and I felt at that stage that I can't deal with it and cope with it.” P 23

Besides hearing technologies, lip-reading was a skill learned by a few of the participants and was found helpful by most of them.

“I did find a local lip-reading class and I joined it and I found it was so useful.” P 11

The lack of funding for hearing equipment, lip-reading classes, and other ways of support was a problem for many workers with HL and prevented them from coping.

A few participants commented on being unable to deal with some situations at work due to the lack of funding for equipment and other ways of support such as lip-reading classes.

“He {Audiologist} told me about lip-reading classes in the local area. I was unable to go ahead with them as it was £100.” P 6

“If you want to go on a training course… it's very difficult for me to follow in a group unless I have a Roger pen or something… And there's no real concessions now unless you're on a particular benefit to get a concession to do this, and HL is very difficult to get on… the PIP {personal independence payment}.” P 21

6.3.2.4 Subtheme 1.4: psychosocial issues

Embarrassment, stress, worry and fear prevented many of the participants from coping. These feelings made it difficult for them to disclose their HL, educate colleagues in how they can help, and ask them to repeat or clarify what they have said.

“You can't tell them {people at work about the HL}. It's embarrassing.” P9

It was interesting that two participants talked about tending to overthink and challenge themselves to work to high standards, which sometimes caused them to feel unable to manage.

“I set myself high standards at work and don't cope well if I can't keep them up.” P 10

Many mentioned putting extra efforts to come up with solutions to cope and compensate for the HL at work and to overcome any productivity problems.

“Quite often I would lip-read… which can be tiring at the end of the day because you're concentrating more. You're also concentrating to try and hear more, and you're also concentrating trying to operate as well.” P 18

6.3.2.5 Subtheme 1.5: self-management

Almost half of the participants talked about how they had to rely on themselves in terms of managing their difficulties at work and received no help in that regard as explained in subtheme 1.1 or on to how to self-manage.

“The {audiology} support was removed so once I hit 16 and I've just been trying to cope in workplaces thereafter pretty much on my own.” P 15

Some of these participants felt that they were able to self-manage because of their personality. They thought that their self-perceived personality and attitude had an impact on their coping at work. They explained that they tended to be proactive in terms of looking for solutions and managing any difficulties at work. Some of them compared how they handle their HL with other adults with HL. The ones who discussed this issue thought they handled it better than others and were less impacted by their HL at the workplace.

“I think I did adapt to it very quickly… I think that's just my personality... I don't personally let things get me down generally… I sort of managed to think "Okay, right this is what it is and I need to sort of just go on with it" And that's what I did… I know I manage it a lot better than a lot of people… I've tended to pretty much get on and cope for myself and find things out for myself… but I do know that there's a lot of people really struggle. And you know, it gets them down and they end up losing their job and when they don't particularly want to lose their job. I kinda wasn't worried about it.” P 13

6.3.2.6 Subtheme 1.6: hearing loss duration and progression over time.

Having HL for a long time was seen helpful by several participants, as it helped them to develop their own coping mechanisms.

“I think I can cope with it quite well; I think because I've had it for a long time. I feel like, if I need to move nearer someone or I'm confident enough to say to someone, "Can you speak up or something?". So, I think in that sense I've kind of coped. I've got my own coping mechanisms as such.” P 1

However, for those whose HL worsened over time, coping was hard.

"In March this year, I finally realised that my hearing still felt like it was getting worse, and it was harder to cope.” P 6

6.3.3 Theme 2: Mechanisms used to cope

The workers with HL elaborated how they were managing working with HL at length. They exhibited a diverse range of coping strategies that will be explained in the following seven subthemes.

6.3.3.1 Subtheme 2.1: disclosure and asking for help at work

Most of the workers said that they had had to tell work colleagues about their HL, or at least had made them aware that they couldn’t hear in certain situations. Disclosing HL was found helpful for the majority of them.

“The people I work with… they know that I have HL, so I've told them… That's helpful because um, they then know if I don't sort of respond, that's because I haven't heard them.” P 4

“The customers, I just tell them I’m hard of hearing and point to my ears, most of the time that works.” P 7

Most of the participants had to make it clear they couldn’t hear in certain situations, even if they did not directly call it HL. They would ask for repetition or for people to speak up, speak clearly, come closer or face them. The outcome of these strategies had a positive impact and helped the workers with HL to adjust to the workplace environment.

“They {children at school} talk and I thought I can't hear you. You have to speak clearly. So they start to talk clearly.” P 9

Many asked their colleagues to help them do some tasks sometimes.

“I sometimes ask my colleagues to help me when communicating with patients in very noisy environments.” P 24

Several participants elaborated on the issue of making people in the workplace aware of their deafness and deaf-aware in general saying that it helped. A few participants also said they keep repeating what they heard to check and ask direct question to make sure they understood what had been said correctly.

“I do find once I make them aware, they try their best to accommodate that. Like everywhere it's a general lack of awareness… And I just repeat back to the person what I've understood and check we are on the same wavelength regarding the task in hand.” P 10

It is worth noting that disclosing HL and raising deaf awareness at work were strategies exclusively used by the female workers in this study. None of the male participants talked about clearly disclosing their HL in their workplaces or using it as a strategy to cope. If fact, a few male participants were keen on hiding their deafness in the workplace in an attempt to get or keep their job, normalise themselves, blend and minimise the impact at work so they did not cause any trouble or be a burden.

“I didn't usually declare initially that I had hearing aids or HL… I've not mentioned anything like that at work, no. So, it could be that I could improve things, I don't know… whenever I'm in a work environment, I've always tried to minimize the impact of the HL so that it doesn't make my position less tenable… I tried to be as much like a normal employee as possible, so I try not to cause a fuss about this… It's about finding the middle ground between asking for something that will improve my work performance and not being a nuisance… Don’t rock the boat is the expression.” P 15

6.3.3.2 Subtheme 2.2: mental and emotional adaptive strategies

Most participants described a variety of psychological ways they used to cope at work. It includes acceptance of their HL and the situation at work which helped many build their confidence to deal with it at work.

"I am 'owning' my disability and am trying to build my confidence to say to people how they can make it easier for me." P 6

A few mentioned having to thinking quick and stay resilient at the same time when at work.

"You have to be quite resilient and quick thinking too." P 16

A few talked about handling it with humour.

"My colleagues and I have a good relationship and we are able to joke about a lot of it, due to some of the things I pick up wrong, makes for interesting conversations." P 7

6.3.3.3 Subtheme 2.3: prepare and make arrangements to aid communication

Some participants emphasized the importance of making arrangements ahead of time to ease communication at work. These arrangements included location adjustments like choosing or changing where they sit to be close to speakers and avoid noise as much as possible.

P 23: "During the MDT {multi-disciplinary team} meeting sometimes I cannot hear and sometimes I lose the track with the one who is talking."

Interviewer: "How do you deal with that? "

P 23: "I try to avoid the noisy area and to sit in a quiet area or near the one who is speaking." P 23

Some of them needed to ask for communication support like getting a speech to text reporter, interpreter, or subtitles in conferences, well ahead of the actual time of meetings or conferences.

"I now use a BSL {British Sign Language} interpreter at work for meetings, making phone calls and chatting to others… after watching a couple of interpreters in meetings I realised I understood a lot more than I thought." P 14

"At the end of the event, I emailed the person who had organized it and said "when the camera cuts away like that and you lose the lips, you've got no subtitles, perhaps you could pass this information on to the production company who made the video. And the next big event that I went to had subtitles… that helps." P 19

Several participants thought that focusing on email and text use to minimize telephone use as much as possible made work easier.

"Most of the time it is text messages or e-mail. So that works really well." P 21

A small number said that they tended to familiarise themselves with the people, places and tasks at the workplace to prepare themselves and facilitate their adjustment.

"It is again familiarization once I'm in the job sufficiently long enough I got to recognize voices and I've got to recognize, uh, customers so I can anticipate some of the questions." P 16

6.3.3.4 Subtheme 2.5: utilising hearing technologies and other assisting tools.

Most participants found hearing technologies useful in terms of coping in the workplace. They talked mainly about hearing aids, cochlear implants, ALD, mobiles connected by Bluetooth to hearing aids, and other methods like text relay or subtitling applications.

"I don't think without it {cochlear implant} with two hearing aids, I would have coped… the Roger select, um, in the early days of being used, but it's definitely already proving useful and, um, I don't think I would have coped without it." P 19

6.3.3.5 Subtheme 2.4: withdrawal and avoidance.

Physical or mental withdrawal behaviours were adopted by some of the participants if they found themselves in a difficult situation at work.

"With the staff I work with, if they speak, I can't really hear what they're saying… In the end, you just… sort of move away and don't join in so much for conversations" P 4.

Many avoided doing some job tasks or avoided some situations at work.

"I avoid any unnecessary conversations with colleagues." P 24

A few chose to work alone to avoid the need to engage with colleagues who talk a lot.

"People want to keep talking all the time whereas I want to just get on with my job. So, I have tended to work on my own and I'm a lot better." P 21

6.3.3.6 Subtheme 2.6: help seeking from professionals

This subtheme was interesting. It showed that only a small number of the participants asked for help and advice from their audiologists on how to manage HL in their work.

"If there's an issue that's come up, then I will give him {audiologist} a call or send him an email and ask him to advise me." P 17

And only one participant mentioned asking for occupational health professionals' help.

"I asked to be referred to occupational health." P 12

6.3.3.7 Subtheme 2.7: collecting information

Some of the participants used the internet to search for information about HL and how to deal with it in the workplace. They most commonly used social media platforms for that.

"I spend a lot of my time on the internet, researching and stuff and looking out, you know, what your…your rights are at work, in case I get any problem." P 12

A few made efforts to build up contacts in the deaf world, share tips with other adults with HL, and to stay up-to-date.

"I was building up contacts in the deaf world, um and trying to understand what I could do and what I could do, what support I needed to actually do a worthwhile job again." P 13

6.4 Discussion

This study centres on finding out how workers with HL adapt to and cope with their work environment. Studies over the past three decades have provided important information on how people with HL cope in general, but much less data have been collected on how workers with HL cope in the workplace and, remarkably, there is a complete absence of peer-reviewed research on this in the UK context. Given the exploratory nature of this study, the sample of participants was purposely diverse. It included UK workers with all ranges and types of HL, whether aided or not, which is not the case for the few available studies at the international level. This research also brought to light the factors influencing the participants' ability to cope with HL in working life and the range of coping strategies used at work and what strategies were found useful as self-reported by the participants.

6.4.1 Coping strategies used in the workplace

When conversing about how they adapt at work, the study participants discussed seven strategies they used. These are shown in Figure 18 above and are discussed below. The coping strategies of the study sample were to a great extent similar to those used by people affected by other disabilities, such as strategies of disclosure, acceptance, planning and withdrawal (Holland et al., 2019), although there was some variability in the challenges they faced in adapting to working conditions, such as deciding whether to disclose the fact of their HL to colleagues and employers (Lindsay et al., 2019). The workers in the sample described hearing-specific coping strategies directed at problem solving and these were similar to strategies identified in previous research, such as the use of hearing technologies, requests for help during communication like asking for repetition, or having a person helping when communicating (Grimby and Ringdahl, 2000, Punch et al., 2007, Tye-Murray et al., 2009, Jennings et al., 2013, Svinndal et al., 2020b).

Not disclosing HL to people in the workplace, working alone, avoidance and withdrawal in difficult situations were also discussed but to a lesser extent and mirror previous research findings (Hallberg and Barrenäs, 1995, Southall et al., 2011). These were used when the participants either could not control the situation and solve the hearing problems or to avoid unnecessary conversations and avoid negative feelings such as embarrassment and stigma. The study results support prior studies which suggest that workers try to avoid certain circumstances and retreat emotionally or physically during and after work (Shaw et al., 2013a, Hua et al., 2015). Some strategies were notably less utilized, such as seeking help from audiology or learning to lipread. Why is unknown and it needs to be explored in future research.

The participants also noted the strategies they found useful. They talked about owning and accepting their HL and searching for solutions themselves, which they reported to be beneficial. They also dealt with it in a humorous manner at times, which is a tendency that may demonstrate disability acceptance and is also a finding that is backed up in previous studies (Tye-Murray et al., 2009, Svinndal et al., 2018). The participants reported using hearing aids and assistive devices, which were found to be helpful, especially as a communication strategy for certain work tasks. This supports the results of Hua et al. (2015), who advised more research to investigate the usefulness of communication strategies such as assistive devices among the working HL population. All of the behaviours described in this paragraph appear to be in the self-management category and appear in line with the social-cognitive theory of self-efficacy by Bandura that was discussed in the literature review (Section 2.4.3) (Freire et al., 2020); i.e. the individual can cope with hardships through taking a proactive role in accepting and adjusting to difficult situations.

Notably, the participants reported using problem-solving coping strategies at work more than emotional strategies. The emotion-focused strategies were used by some when they felt unable to manage or cope in a positive way. This is consistent with Haan's ego processes theory (Haan, 1977). The participants attempted to cope (adaptive behaviour) if this were at all possible and to defend (maladaptive behaviour) if they could not cope positively. It is also worth noting that these coping strategies were common to most of the participants regardless of the cause, type, or severity of their HL or their work environment or demand. Moreover, some problem-solving (adaptive) strategies such as disclosure were exclusively used by the female participants and not by any of the male participants, supporting research findings of gender discrepancies of coping style, but contrasting their results that suggested that females tend to use emotion-focused (maladaptive) coping strategies (Hallberg, 1999, Gellerstedt and Danermark, 2004). It is difficult to make solid statements about the variation between female and male coping differences because the male participants constituted only 25% of the sample and the overall sample size was small. Although this research was not designed to examine the coping differences between the different populations of workers with HL, such differences are worth noting and may prompt future studies to investigate coping style variation among the different populations of workers.

6.4.2 Factors influencing coping with hearing loss in workplaces

The results revealed a range of factors that influenced the workers' ability to cope and shaped their coping styles. Figure 18 shows these factors, including the support received from work and audiologists, situational circumstances at work, hearing technology use and lip-reading skills, psychosocial issues, self-management, and HL duration and progression over time. Some of these such as the psychosocial factors, were reported in previous research (Hallberg and Carlsson, 1991a, Hallberg and Carlsson, 1991b, Hallberg and Barrenäs, 1995). Some constitute fresh insights such as workers' self-management skills and HL progression over time. Some of the factors found in previous research pieces did not show up in this study, for instance, the motivation factor (Picou et al., 2014). One reason for this could be that this research’s participants worked mainly in modern jobs where communication is necessary. They had to find ways to cope with keeping their jobs and progress in their career, which already provided motivation enough. Motivation could be a very significant factor in its own right; however, the study participants did not talk about it.

❖ Psychosocial factors

This study shows that the impact of HL on workers (mainly the psychosocial impact) influenced their coping. This result supports the proposition of the framework developed in the literature review in that there is an interaction between the framework domains. For example, the psychosocial issues were found to affect the occupational and coping domains of the framework, and all eventually affect the health and wellbeing of workers with HL. The results show that psychosocial experiences appeared to be of particular importance in relation to coping in the workplace. Many previous studies found a link between the psychosocial experiences of people with HL and their coping experiences (Hallberg and Carlsson, 1991a, Hallberg and Carlsson, 1991b, Hallberg and Barrenäs, 1995, Garnefski and Kraaij, 2012, Hua et al., 2015, Heffernan et al., 2016, Barker et al., 2017, Holman et al., 2019). This study revealed that the psychosocial element of workers’ experiences plays a substantial role in their ability to cope in the workplace and can influence the strategies they choose to use. For example, this study found that the extent to which workers were anxious, stressed, or embarrassed influenced their openness to disclosing their condition and asking for help, and rendered them feeling unable to cope. Overthinking and challenging themselves to work harder also caused some to feel unable to cope.

Coping in the work environment can also influence psychosocial health because it requires extra effort and planning, as this study and earlier research has found (Holman et al., 2019). Coping behaviour (adaptive or maladaptive) has been also linked to the risk of developing anxiety and depression in people with HL (Garnefski and Kraaij, 2012), and adaptive coping behaviours are associated with better social life (Warringa et al., 2020). Therefore, improved workplace coping may improve the psychosocial health of workers with HL and vice versa, emphasizing the importance of psychosocial health and coping support.

Maintaining a normal self-image and avoiding stigma did not come up as a strong variable affecting the choice of coping strategy (Hallberg and Carlsson (1991a), Hallberg and Carlsson (1991b), Hallberg and Barrenäs (1995)). Participants were more concerned about their performance in that others might think they were less intellectual when in reality, they had simply misheard or misunderstood spoken information. It might be different in the UK than in other countries where HL and its related stigma are perceived differently. It also may be that work values like the value of professional life, hard work, and financial aspects of work life are different for this generation compared to previous generations (Aydemir et al., 2016). Two of the participants stated that they would be unable to cope if they could not meet the high standard they set for themselves at work. Anxiety was discovered to be connected with such experiences (Garnefski and Kraaij, 2012). Anxiety, in particular, was found to be related to an inability to discontinue efforts to reach goals that people with HL are not able of achieving. Overall, the results show that psychosocial experiences appear to be of particular importance to those with HL in relation to coping at work. This finding should stimulate further research and needs to be considered in clinical care.

- **Self-management skills**

In a similar way to psychosocial characteristics, the self-management abilities of the study participants affected how they dealt with work challenges. For example, it influenced decisions to seek information and assistance from specialists, as well as whether to include healthcare professionals in the resolution of work-related issues. Participants' experiences of coping on their own were indisputable and very much in line with Bandura's social cognitive theory of self-efficacy in coping that was discussed in the literature review (Section 2.4.3) and previous research (Shaw et al., 2013b). The findings indicate a lack of self-management assistance as well. This outcome is consistent with previous research finding of inadequate self-management assistance in audiology documents (Barker et al., 2014) as discussed in the literature review (Section 2.3.1). According to the CCM discussed in the literature review (Section 2.3.1 and Figure 1), self-management assistance is critical to producing improved patient health outcomes. No one else appears to be assisting workers if the workers do not do it. Patients with chronic health issues, according to contemporary thought, should be helped to self-manage their illness based on their requirements. This should be discussed with clinicians. However, the workers in this study were not stating or experiencing such in the person-centred model. That is intriguing, and it represents an essential topic for further research.

❖ Support from people in the workplace and professionals, including audiologists

Support is essential, and colleagues at work must be reminded regularly to help workers with HL to cope. HL, unlike other disabilities, is invisible, and employees at work may require frequent reminders of how to interact with and assist their colleagues who have HL in adapting to tough conditions. As illustrated in this study, workers' adaptation in the workplace is not solely dependent on their ability to self-manage. Still, it is largely influenced by the support they receive from work and audiology, consistent with earlier research (Detaille et al., 2003). Most of the workers in this study reported that they do not feel supported by their employers, managers, colleagues, and audiologists, who, by leaving them to handle their difficulties alone, create barriers to coping.

An intriguing finding of this study was that a small proportion of individuals sought assistance from their audiologists in coping with their HL at work. This service appears to be underused and there is much scope for development in this area. A previous study has indicated that even individuals who seek assistance are unable to find audiologists who are willing to help them address the challenges and demands of working life (Trotter et al., 2014). Another found that audiologists themselves may be ignorant of ways in which they can help workers with HL to cope better in the workplace (Yoder and Pratt, 2005). Ideally, audiologists should provide people with HL with the information they need and involve them in decision-making related to the management of their condition. This is thought to promote self-management rather than dependence (BSA, 2016), and improves patients' ability to cope. From reviewing the literature, it is not clear whether there is a good understanding within the audiology profession about what self-management is and what the audiologist's role is in promoting it.

Support from colleagues and employers was found to be a highly influential factor in coping successfully. Most of the participants described their experiences with work support as negative. Despite employers' sense of responsibility towards their hearing-impaired employees, workers felt that their needs were easily forgotten by employers and that many barriers, such as managers' poor access to information, prevented adequate adjustments from being made at work (Svinndal et al., 2020a). More study is needed to investigate how businesses and employees might do things differently to build a more flexible work environment for workers with HL. Employers are supposed to make appropriate adaptations for their employees, as discussed in the literature review (Sections 2.4.2 and 2.4.3), but this is a murky area that requires clearer guidelines and regulations.

❖ Hearing loss duration and progression

This study suggests that the longer the worker has had HL, the better they adapt. This could be related to increasing acceptance of HL with time or gaining emotional strength with time and experiencing less stress and worry. Earlier research has shown that as people grow older, they become better at regulating their emotions (Carstensen et al., 1997). Workers with HL may also, in time, develop expertise in dealing with difficult situations and having more information about how to help themselves. The improvement in their ability to cope as time goes by is key because HL is commonly progressive, and the participants reported fears of HL progression over time and uncertainty about how to deal with that.

❖ Using hearing technology and situational hindrance

Hearing aids were shown to be good for coping in the workplace, although the degree of usefulness or benefit could not be judged based on the findings of this study. Hearing aids received favourable comments from participants, who said they helped them cope, supporting the findings of a recent meta-synthesis (Barker et al., 2017). Nonetheless, their cosmesis and noise effectiveness were two drawbacks that reduced their contentment. Similarly, a prior study indicated that while hearing aids were effective for employees with mild to moderate HL, they were considered cumbersome in loud work situations (Hua et al., 2015).

HL is more than simply a lower sense of sound level; it also includes other complicated sensory experiences such as loudness distortion and frequency perception. Despite constant advancements, hearing aids still need improvement to provide the user with a near normal hearing experience since residual difficulties will always exist, particularly in noisy situations. As a result, hearing aids alone are insufficient for employees’ auditory and occupational rehabilitation, particularly those working in challenging auditory settings or with high job demands that need further coping assistance. For most individuals, the situational conditions were more of a hindrance. They felt unable to manage and cope with difficult acoustic work environments, even with hearing aids, which led to non-use, withdrawal and avoidance behaviours. This might be related to what (Hallberg and Carlsson, 1991a, Hallberg and Carlsson, 1991b, Hallberg and Barrenäs, 1995) highlighted in their research about individuals preferring to regulate or avoid situations when they have hearing trouble that they perceive is beyond their ability to control. The results also suggest that the drawbacks of hearing aids experienced in working life can trigger workers to use the defence behaviour of the ego processes model (Haan, 1977) discussed earlier in Section 2.4.3.

6.4.3 Limitations

The findings of Study 3 may be limited since the data analysis was secondary, and the interview questions did not expressly inquire about the participants' coping. Nonetheless, most of the participants discussed it and were eager to talk about it, which prompted this re-analysis. Furthermore, several of the interviewers' enquiries aided in exploring the participants' coping experiences. Also, when the results were shared with the study participants for checks and validation, a few responded and validated the results. Another limitation is that the literature on disability shows a causal association between a person's education and their coping, including coping in the workplace. This study did not collect information about the participants' education. It was a secondary analysis. This would have been influential in the participants coping at work.

6.5 Conclusion

This study aimed to investigate the experiences of adults with HL concerning their coping in working life. At the UK level, this is the first study offering information about workers’ coping with HL in the workplace. The coping mechanisms adopted by workers with HL were identified, as well as the factors influencing their coping process, including their coping ability and behaviour. At the international level, this study offers a comprehensive understanding of the range of factors that influence the coping process of workers with HL. Some of these factors are distinct and specific to dealing with HL-related hardships such as using hearing technologies, but others can be generalised such as the role of personality and self-management abilities.

Most of the coping strategies used by workers with HL were similar, despite interviewing workers from a range of different jobs and environments. The strategies also appeared similar across the general population of adults with HL and people with other disabilities. Examples are acceptance of the disability, disclosure, planning and withdrawal. The strategies also align with the general human coping theories such as Bandura’s and Psychodynamic coping theories. The workers were keen on initially engaging with a wide range of problem-solving coping mechanisms that helped them, such as disclosing their HL in the workplace and using hearing technologies. However, they had to adopt disengaging mechanisms such as avoidance and withdrawal when they perceived the situation unmanageable or to avoid psychosocial distress.

Organizational, personal, and psychosocial factors clearly impact the coping process of workers’ with HL. Therefore, it is not the sole responsibility of people with HL to influence their coping ability in the workplace. First, a primary determinant of coping among this population is the difference between individuals in self-management skills and their psychosocial experiences. These are worth exploring in future research to better understand how they are shaped, possibly by exploring the role of the worker's personality, values, gender, motivation, and priorities. Second, audiologists can assist in assessing workers' needs and offer counselling and practical suggestions to help them cope better with their daily activities and tasks. The participants who sought or received help from their audiologists to better cope in the workplace were notably few, and this issue warrants further investigation. Third, employers need to ensure that they offer help, assign tasks appropriate to the workers' abilities, and create a structural and social organization that ensures workers with HL can work efficiently under more suitable working conditions.

Overall, a wide range of factors influences the ability of workers to cope with HL in the workplace and influences the coping strategies used. However, more literature is needed to explore these factors and strategies in-depth to help work organizations and health systems drive forward improvements in coping support.

Chapter 7 Triangulation of the perspectives of audiologists and workers with hearing loss

7.1 Introduction and rationale

Studies 1 and 2 pointed to the need to combine and contrast the perspectives of both samples in a rigorous way to gain novel, useful and reliable information. Triangulation in research was chosen for that purpose and the rationale for this choice and approach used to conduct it is explained in the following paragraphs. Triangulation involves using multiple research methodologies (qualitative and quantitative) or using multiple methods within a qualitative investigation (more common) (Patton, 1999, Kelle and Erzberger, 2004, Flick et al., 2012, Denzin, 2017). At its inception, triangulation was largely used to test the trustworthiness of research, while its usefulness in extending knowledge was undervalued (Flick, 1992). Currently, triangulation in research is viewed to serve both purposes: enhancing the trustworthiness of the research and providing a wider understanding of the research topic and consequently improving research quality (Patton, 1999, Vogl et al., 2019). Some social science researchers believe that triangulation is valuable but criticise its role in evaluating the trustworthiness of findings, describing it as a “chimera” (Bloor and Wood, 2006). They argue that comparing results obtained by different methods cannot be used as a validation tool; nevertheless, comparison is a valuable supplement to deepen analysis and extend knowledge. Later in this introduction, I describe the role of the pragmatic approach adopted in this research in handling these differing views around triangulation.

Many types of triangulation have been discussed in the literature, including triangulation of data, methodologies, theories and investigators. Refer to any of these (Johnson et al., 2007, Flick et al., 2012, Denzin, 2017) for an extended overview of triangulation types. The most frequently used is data triangulation, which uses multiple data sources to answer research questions via triangulating the multiple perspectives. Flick (1992) refers to multi-perspective triangulation as the “systematic triangulation of perspectives” and describes it as combining research perspectives as well as tackling disagreements between them. An example can be looking into the perspectives of health service users and providers to understand a certain health-related matter by combining their views and addressing any dissonance.

The use of multi-perspective triangulation has been advocated in many fields, including health research (Kendall et al., 2009, Vogl et al., 2019). It has been found particularly useful in research seeking to understand patient-professional relationships, by appreciating similarities and differences in perspectives, identifying the needs of each group and bringing together their ideas to improve patient care (Kendall et al., 2009). Therefore, it seemed suitable and useful for this research to assist in achieving its aims. In particular, triangulation of the perspectives of audiologists and workers seemed helpful to bring together and compare the perspectives of workers with HL and audiologists and ensure the inferences made are valid and decrease the chances of bias related to information sources. This is referred to as assessing the convergence and divergence when triangulating information obtained from different sources (Kern, 2018) by combining the add-on information obtained from two perspectives which complement each other (Vogl et al., 2019).

This triangulation of workers' and audiologists' viewpoints has revealed important issues that significantly contribute to our understanding of where policy/practice changes are needed and has created an extra source of knowledge that enhances explanations of many of the issues (Flick et al., 2012). It is hoped that this new knowledge and understanding will be recognised by decision-makers and facilitate vital changes in clinical practice. The importance of data triangulation was recently acknowledged in an NHS guide for clinical commissioning groups concerning services for people with HL. This document recommends the use of data triangulation in identifying service users' needs so that they can be taken into account in planning hearing services (NHS England, 2016).

7.2 Methodological approach

Having decided to use multi-perspective triangulation, the next step was to consider how to do it. The absence of clear guidance on how to triangulate data sources in qualitative health research presents a challenge for researchers conducting this type of research. Some investigations in audiology research have used triangulation of service users' and service providers' perspectives. However, only a few, such as Gopaul (2018), describe their triangulation methods. Leuffen et al. (2013) suggest five different general strategies for aggregating data in triangulation and discuss their merits and limitations. The five strategies are: 1. Random selection, 2. Unweighted average, 3. Weighted average, 4. Winner takes it all and 5. Majority strategy. According to Leuffen et al. (2013), random selection (1) involves reliance on a randomly selected information source, which is considered an ineffective approach. The unweighted average approach (2) assumes that all sources have the same value or bias risk, and therefore the information obtained from the various sources is averaged, with the same weight assigned to each. In contrast, the weighted average strategy (3) involves giving more or less weight to different sources based on data quality or risk of bias, at the researcher's discretion. For example, more weight may be given to data from certain participants because they show a clear and sound understanding of the topic as well as consistency in discussions, and hence this data may carry more validity. (4) The winner takes it all strategy is similar to the weighted average in that it considers data quality and risk of bias, but unlike the weighted average it derives knowledge solely from the source the researcher considers of better quality and ignores data from the other sources. Finally, the majority strategy (5) means drawing on knowledge based on the participants' most frequently expressed observations or points of view. This strategy supposes that common consensus among independent data means that the information obtained is likely to be the closer to reality or truth. At the same time, the less common perspectives are not to be dismissed.

The selection of each of the five strategies is dependent on the nature of research, the type of data, and the researcher's assumptions about the sources and the information obtained. For this thesis, the majority strategy was chosen for aggregating the data. Random selection was considered the poorest strategy and thus was excluded. The decision to choose the majority strategy over the others was made primarily because the perspectives of the workers with HL and audiologists as independent sources showed a great deal of agreement, making the majority strategy applicable. At the same time the researcher chose to keep and report any participants' differing accounts or the less common accounts and not disregard them, as in the winner takes it all strategy. This was mainly because even if only one of the participants expressed a viewpoint that disagreed with the majority viewpoint, that does not mean this point of view is less likely to be valid or common in the wider population or important. In addition, the majority strategy seemed to be the most straightforward one, given that both participating groups were considered knowledgeable about the topic and would offer information of the same quality level and were unlikely to have a differing risks of bias.

In adopting the majority strategy it was necessary to decide how the multiple perspectives would be tied together. Since the interviews of both groups were analysed separately, the themes (including their subthemes) and the reflexive and analytic diaries produced from Studies 1 and 2 were used to conduct the triangulation. The convergent and divergent viewpoints were then linked. Linking convergent perspectives is relatively straightforward using the majority strategy, as these perspectives can be viewed as either increasing data trustworthiness, or can simply mean that both parties share the same view of reality (Vogl et al., 2019). The real challenge is in linking and explaining dissonant perspectives, but these rarely appeared in the data.

Divergences can be interpreted in various ways, depending on the researchers' epistemological and ontological stance and the researchers' own views or preconceptions (Vogl et al., 2019). Although divergence could indicate the presence of bias or lack of trustworthiness, it could also mean that both parties have multiple views of their realities (Vogl et al., 2019). For this thesis it was decided to accept and report both convergent and divergent perspectives. Coming from a pragmatic position, an extensive search for an explanation of differing views was not sought, and the multiplicity of opinions was accepted, leaving further interpretations open to the reader and for future research to explore, rather than attempting to force one story or to question the credibility of either perspective. There are other ways of handling divergence: for example, positivists might question the trustworthiness of multiple perspectives when they diverge and will seek a coherent convergent story, refusing to acknowledge the presence of more than one reality. Pragmatically thinking, there could be more than one reality and it is possible that both perspectives are valid. Moreover, if participants' divergent views are investigated further they may prove to be equally valid. Although each participant is expressing their view from their own side, they may also be able to acknowledge the truth of the other group's point of view.

The next two sections (7.3 and 7.4) will link audiologists' and workers' perspectives with regard to the impact of HL on workers and the HHC on offer. A detailed discussion of these two topics is provided in Chapter 8, Sections 8.2 and 8.3 respectively. Section 7.5 reflects on the process of conducting multiple-perspective triangulation in this research as well as in audiology research generally. Sections 7.6 and 7.7 then discuss the limitations of triangulation and draw conclusions.

7.3 Triangulation of perspectives on the impact of hearing loss on workers

The majority of the audiologists and workers with HL believed that HL can have a drastic impact on work life and wellbeing. Both the audiologists and the workers with HL spoke about all the domains identified in the framework discussed in the literature review (Section 2.4.2). Overall, there were more comments and details from the workers with HL and fewer from the audiologists. This is not surprising as the workers with HL were voicing their own stories and experiences with illness and work life; it was personal to them. In Study 1 the audiologists' awareness of the impact of HL was found to be influenced by certain factors, such as having had personal experience of HL in work life, or professional experiences with working patients. A few audiologists expressed uncertainty about their understanding and could only speculate; nevertheless, they recognised that the impact could be critical for working-age adults.

“I don’t know, but I can guess that it potentially stops people from... fulfilling their full potential.” (P 5 AR IC AQP)

Table 14 below provides a comprehensive summary of the main findings synthesised from Studies 1 and 2 relating to the impact. The discussions that follow can be considered as simple illustrations of how multiple perspective triangulation can be useful in obtaining a comprehensive understanding of the topic under investigation. In this research, it helped to capture additional dimensions of the same topic so that a fuller picture was gained. Dissonance between the two groups’ perspectives on the impact of HL on work life was not detected; rather, they showed a considerable agreement.

The perspectives in Table 14 show a great deal of convergence. No discordant views were detected between the two groups regarding auditory difficulties, which increases research confidence in the results generated. The perspectives of the workers with HL offered extra information about the challenges, which helped in gaining a fuller understanding. For example, they described difficult situations in the workplace, such as finding multitasking difficult and being disturbed by loud noises and facing difficulties when communicating with unfamiliar people and people facing away or wearing masks. The interviews were conducted before the COVID-19 pandemic, and so masks here refer to those worn in jobs such as laboratory or hospital work. Since the pandemic, however, wearing masks has become mandatory in many workplaces and constitutes a major new problem for workers with HL in and out of the workplace. Audiologists need to be aware of these issues. This new development from patients perspectives may influence changes in audiology services; for example, audiologists could offer to fit hearing aids and give options for ALD even in mild cases of HL in order to address the attenuation of sound as well as the loss of lip-reading and facial cues caused by masks (Corey et al., 2020). It is important for audiologists who choose to wear masks during appointments to consider this issue, especially since transparent face masks are not available in all audiology departments and, in any case, are also proven to attenuate sounds (Corey et al., 2020).

Table 14: Perspectives on the impact of hearing loss on patients' work life and wellbeing. Previous research that specifically supports the findings is cited where appropriate. A: Audiologists, WHL: Workers with hearing loss.

Aspects affected	**Summary of results**
Auditory difficulties	
Restricted communicative and hearing abilities	· Difficulties hearing speech (telephone calls, group situations etc) in noise and in quiet (Scherich, 1996, Scherich and Mowry, 1997, Backenroth and Ahlner, 2000, Laroche and Garcia, 2001, Morata et al., 2005, Punch et al., 2007, Mathews, 2011, Hua et al., 2015). (A, WHL) · Difficulties communicating with people with an accent (Kramer et al., 2006). (A, WHL) · Difficulties communicating with unfamiliar people, people who speak a different language or accent (Mathews, 2011, Action on Hearing Loss, 2015) or quietly and where the context is unclear. (A, WHL)
Challenging work environment and acoustics	· Struggling to hear in large open-plan offices (Jahncke and Halin, 2012). (A, WHL) · Higher level of disturbance from loud work-related noise (Kramer et al., 2006, Hua et al., 2014). (WHL) · Inability to lipread in some situations, such as people at work not facing the worker or wearing masks (WHL)
Difficulties localising sounds	· Sound localisation difficulties (Kramer et al., 2006). (A, WHL)
Occupational and employment bearings	
Difficulties in day-to-day work life	· Struggling with tasks that are conversation-related, including telephone calls, conferences, group situations (Scherich, 1996, Scherich and Mowry, 1997, Backenroth and Ahlner, 2000, Laroche and Garcia, 2001, Detaille et al., 2003, Morata et al., 2005, Mathews, 2011, Hua et al., 2015). (A, WHL) · Multitasking difficulties. (WHL) · Job performance (Morata et al., 2005, Kramer et al., 2006, Jahncke and Halin, 2012). (A, WHL) · Feeling not in control in the workplace (Gellerstedt and Danermark, 2004, Morata et al., 2005, Kramer et al., 2006). (WHL) · Teamwork difficulties causing tension at work. (A, WHL) · Difficulties with some employers, colleagues and other people in the workplace such as customers. (A, WHL) · Lack of deaf awareness in workplaces. (A, WHL)

Aspects affected	**Summary of results**
Effects on employability, career path decisions and progression	· Lack of sympathy at work. (A) · Having to take time off work for appointments. (WHL) · Discrimination (Hétu et al., 1990) (A, WHL) · Unemployment and underemployment (Blanchfield et al., 2001, Baker, 2006, Jung and Bhattacharyya, 2012, Stam et al., 2013, Emmett and Francis, 2015, Department for Work & Pensions and Department of Health & Social care, 2020, Shan et al., 2020, Office for National Statistics, 2021). (A) · Inability to access some jobs or change jobs. (A, WHL) · Frequent need to keep changing jobs (WHL) · Getting promotions and progressing at work is harder (Backenroth, 1997b, Jennings and Shaw, 2008). (WHL) · Working part-time instead of full time. (WHL) · Cessation of employment. (A, WHL) · Early retirement (Andersson and Hägnebo, 2003, Mathews, 2011, Christensen and Gupta, 2017, Cook, 2017, Action on Hearing Loss, 2018). (A) · Financial difficulties (Shield, 2018). (A, WHL) · Going through a journey of constant changes including career peaks and troughs. (WHL)
Impacted psychosocial health	
Emotional difficulties	· Stress (Gellerstedt and Danermark, 2004, Morata et al., 2005, Kramer et al., 2006, Mathews, 2011, Cook, 2017). (A, WHL) · Negative self-image and embarrassment (Mathews, 2011). (A, WHL) · Depression or feeling sad at times (Monzani et al., 2008, Mathews, 2011). (A, WHL) · Lack of confidence. (A, WHL) · Concerns about risks to safety and physical harm (Morata et al., 2005, Girard et al., 2015). (A, WHL) · Concerns about and feelings of being stigmatised (Hétu et al., 1990, Tye-Murray et al., 2009, Wallhagen, 2010, Southall et al., 2011). (A, WHL) · Worries about future quality of life and employability (Morata et al., 2005). (WHL) · Anxiety and fear (Monzani et al., 2008, Mathews, 2011). (A, WHL) · Feeling vulnerable. (A, WHL) · A sense of losing independence. (WHL) · Frustration and feeling alone in this situation. (WHL) · Living in denial (Mathews, 2011). (A)
Social difficulties	· Social isolation at work (Punch et al., 2007, Mathews, 2011, Canton and Williams, 2012). (A, WHL) · Disclosure difficulties at work and uneasiness in talking about the HL (Mathews, 2011, Southall et al., 2011). (A, WHL) · Personal life and family difficulties. (A, WHL)

Aspects affected	Summary of results
Mental exhaustion	· Effortful listening, mental exhaustion, tiredness and fatigue (Morata et al., 2005, Hua et al., 2015, Svinndal et al., 2018, Holman et al., 2019). (A, WHL)

Generating a synthesis of the perspectives of both groups yields far richer insights into the effects of HL on day-to-day work life as well as on employability, career path decisions, and progression. The two groups each offered extra insights on this matter; for example, the workers with HL brought up the problem of multitasking at work and having to keep changing jobs to find a suitable one for their condition. This led many of them to describe their work life as a journey of ups and downs. The audiologists participants did not discuss these issues. Possibly, they were not aware of them. For audiologists and services to gain insight into these issues would be highly useful in terms of awareness of workers' needs for consistent follow-up appointments to discuss their work life and HL journey rather than dismissing them after the standard NHS three appointments protocol is fulfilled. The audiologists also offered other important viewpoints. They suggested there could be a lack of sympathy towards workers with HL in the workplace. Neither the workers in this thesis or previous studies reported this issue. This viewpoint could be true, and it might be that the lack of sympathy and awareness by the public and in workplaces is a core problem that needs to be addressed.

Early retirement due to HL was another viewpoint discussed only by the audiologists. It is difficult to distinguish from the interviews whether that viewpoint was merely speculation or whether they learned about it from patients who experienced it. None of the workers with HL talked about it. Nevertheless, it is likely to be true as it has been documented in the literature as shown in Table 14. It is not surprising that the sample of workers in this research did not mention early retirement, however, since the inclusion criteria meant that they were all working and had not yet retired. This is another example of how triangulation of perspectives can help obtain complementary data leading to a fuller and detailed understanding of the topic under investigation.

Quitting a job due to the inability to hear is another important issue that was brought up in the interviews. The interviews with the workers with HL suggest it is not uncommon, as many of them had gone through that experience. On the other hand, only one of the audiologists brought this issue up and suggested that it is an extreme case scenario. Such significant disruption to people’s work lives has not been investigated thoroughly in previous research. The little available information in the literature on ceasing employment due to HL focuses on early retirement and not on leaving work or changing career path due to HL difficulties. This research is therefore unique in shedding light on this important aspect. It also suggests that audiologists are not well-versed in this phenomenon and that they consequently may not be offering adequate support to workers with HL. Hopefully, this information will stimulate further research to estimate the size of the problem and its impact on workers with HL, employers, and overall society, and how to avoid it or mitigate the consequences.

Psychosocial impact is another area where the perspectives of both groups were in accord and where complementary results were obtained via triangulation. This was especially apparent in discussions relating to emotional aspects and mental exhaustion at work. While the audiologists and earlier studies touched on these issues, much more information was gained from the workers, who expressed feelings of loneliness and frustration at the lack of independence. These feelings are documented here for the first time and would have been missed had the audiologists alone been interviewed. Triangulation also revealed agreement between the audiologists and workers with HL on the factors influencing how and to what extent workers experience difficulties in the workplace. HL characteristics, personality and job type were all found to play a part. This information was volunteered by both groups and the interviewer did not ask questions about them. For both groups to bring up these issues and agree on them signifies their importance and implications. Both groups offered variations in these perspectives but all were complementary and are discussed in detail in Section 8.2.3.

7.4 Triangulation of perspectives on audiological care

This section includes discussions of the convergent and divergent perspectives of the audiologists and workers with HL relating to audiological rehabilitation. It also talks about the differences and common ground between the needs of workers with HL and the views of audiologists, and discusses the service improvements necessary to promote a healthy work life for patients.

7.4.1 Convergent perspectives

The interviews with both the workers with HL and the audiologists revealed an overall concordance in their points of view regarding audiological care. This was manifested in their general agreement that there is under-provision of audiology care for workers with HL, mirroring the findings of earlier research (Mathews, 2011, Shaw et al., 2013a, Trotter et al., 2014, Arrowsmith, 2016). They also agreed that there was widespread confusion about where the support should come from, which is an issue that has not been raised before. The audiologists were not sure if it was their job, or the job of hearing therapists or occupational therapists, indicating a lack of guidance for audiologists in that regard. Correspondingly, the patients stated that they need extended support for work problems but were not sure who is supposed to help with that, for example, support in raising awareness in the workplace. Some believed audiologists should help with that while others thought that it was not their role.

Both groups revealed a number of facilitators and barriers to increased and higher quality audiology support, as well as factors that could facilitate it. Table 15 below summarises these factors. As the table shows, both groups agreed on certain barriers and facilitators and each described additional factors affecting the HHC offered by audiologists and other services. To start with, there seemed to be general agreement that there are few opportunities to talk about work in audiology appointments, blocking chances of exploring work needs and support. Moreover, even if work was discussed, overall the audiologists and workers with HL found audiology care focused mostly on hearing aid care. The workers with HL expected additional personalised and work-related hearing care, but most of the audiologists experienced difficulties in providing this.

Table 15: The facilitators and barriers to efficient hearing care for workers with hearing loss as perceived by the audiologists and workers with hearing loss. A and WHL between brackets refer to who expressed the point of view (A: Audiologists, WHL: workers with hearing loss), and the type of service being referred to (NHS: National Health Services, IC: Independent Companies, CI: Cochlear Implant services, ATW: Access To Work).

Factors	Summary of triangulated results
Facilitators	
WHL-related facilitators	› Fitting WHL with hearing aids is efficient as they learn quickly due to being relatively young patients. (A)
Audiologist-related facilitators	› Deaf-aware audiologists. (WHL) › Audiologists with good communication and counselling skills. (WHL) › Experienced and skilled audiologists. (WHL) › Audiologists offering personalised support. (WHL) › Approachable audiologists. (WHL) › Audiologists with a personal experience of HL. (A)
Service-related facilitators	› Easy access to appointments by some services (IC) (quick appointments, flexible times available out of working hours). (A, WHL) › Services accessible to people with HL (quiet departments, making sure patients are faced, and called clearly and in a deaf-aware manner in the waiting area). (WHL) › Services offering sufficient time in the appointments to talk about and sort out work issues and needs (IC and CI). (WHL) › Audiology departments showing a higher level of deaf-awareness, and good at counselling, like CI. (WHL) › Services offering work-specific support, especially in terms of offering advanced hearing technologies that are cosmetically appealing (IC). (A, WHL) › Services allowing continuity of care (patients are seen by the same audiologist every time, and are being continuously followed up) (IC). (A, WHL) › Services with a multidisciplinary team including hearing therapists (CI and some NHS). (A)
Health system, government and community-related facilitators	› The presence of governmental and charity work-related support through the ATW scheme, involving funding for hearing devices. (A, WHL)
Barriers	
WHL-related barriers	› WHL have specific needs (A) › WHL are more informed than the average audiology patient (A) › WHL have high expectations (A) › WHL are non-routine cases (A) › WHL have acceptance difficulties (A)

Audiologist-related barriers	› Audiologists showing no deaf awareness in their communication with patients (WHL) › Audiologists showing weak communication and counselling skills (WHL) › Audiologists not aware of the help that can be offered to WHL (A) › Audiologists lacking knowledge, experience and skills (A, WHL) › Audiologists insufficiently trained and educated about work (A) › Difficulties in finding an audiologist or a professional who is experienced in dealing with the advanced technologies like ALD (A, WHL) › Audiologists finding it challenging to stay up-to-date with the numerous hearing technologies and their continuous advancements. (A)
Service-related barriers	› Difficult in accessing appointments and services (NHS) (complex referral pathways, long waiting times to get an appointment, appointments are usually during work times). (A, WHL) › Accessibility problems in audiology departments (NHS) (Cannot hear their names when called in the waiting area, noisy departments, having to call to contact services which is not convenient for hard of hearing persons, and cannot be contacted by email, or emails used but inefficiently). (WHL) › Services offering insufficient time in the appointments (NHS) (WHL) › No continuity of care (seen by a different audiologist every time or most of the time, and no continuity of follow up) (NHS). (A, WHL) › Services not offering work-specific support, especially in terms of the availability of beneficial and advanced hearing technologies that suit work needs and cosmetically appealing devices (NHS). (A, WHL) › Costly care for some services (IC). (WHL) › Limited benefit from hearing aids at work, especially NHS devices and in some situations, e.g. in the presence of noise and when used alone. (A, WHL) › ALD not being offered or made available in services or even mentioned to WHL in audiology appointments (NHS). (A, WHL)
Health system, government and community-related barriers	› Restricted resources and funding for the audiologic rehabilitation of the working population (no WHL-relevant written information e.g. leaflets, lack of contact details available to audiologists for the non-audiology services helping WHL, audiologists being unable to visit patients’ workplace or conduct suitable speech in noise tests, limited hearing technologies in some departments). (A, WHL) › Lack of communication and information-sharing between services and other supporting bodies (occupational services, social services, otorhinolaryngologists, employers, and between the different audiology services). (A, WHL) › ATW scheme-related barriers including under-signposting by audiologists, complicated lengthy pathway, non-personalised care. (A, WHL)

7.4.2 Divergent perspectives

Contradictions in the perspectives of the two groups were not found, but views that seemed convergent at the subtheme level turned out to be divergent when elaborated further. For example, both groups agreed that workers with HL face difficulties accessing audiology services, but on further elaboration, they interpreted the problem in different ways. While the audiologists thought the main problem was appointments at times unsuitable for working adults, the workers were more concerned about the time it takes to get an appointment and the complex referral route via a general practitioner. Only one of the workers with HL mentioned the problem of obtaining appointments outside working hours. Using the majority strategy to triangulate the data (see Section 7.2), the majority of both groups clearly suggested the presence of difficulties in access to appointments. The pragmatic approach accepts the finer differences between groups in terms of how the problem is perceived. Both perspectives could be right or real to the participants, meaning that the two aspects of the appointment problem are perceived by both: finding flexible appointment times and the complexity and length of the referral process.

Similarly, the interviews revealed that both groups agreed on the importance of cosmetically appealing hearing aids. However, the audiologists believed that workers wanted invisible hearing aids, whereas some workers only wanted aids that were attractively coloured (i.e. not NHS beige). Pragmatically, it seems that both views can be accepted and can be valid. Such low-level divergence expands the understanding of all the potential issues that may be affecting personalised care and offers fertile ground for future studies.

7.4.3 The different needs of workers with hearing loss and audiologists

One of the advantages of multi-perspective triangulation research is enabling the individual needs of the participants to be identified (Kendall et al., 2009). This research has taken a big step forward in identifying some of the specific needs of both the audiologists and the workers regarding audiological care. These are summarised in Table 16 below. The needs of the workers with HL can be subdivided into those specifically requiring the audiology service and those that could be addressed by other bodies and organisations. Identifying the specific needs of the different groups of participants is as important as identifying their common needs, especially in terms of forming recommendations for improvements in audiology care and wellbeing. For a further discussion on the recommendations, please refer to Section 8.5.

Table 16: The different needs of the audiologists and workers with hearing loss

Specific needs of audiologists:
1. Information about the population of workers with HL and a directory collecting together all the information about the available support. 2. Work-related teaching in audiology basic education and training. 3. Constant learning and training to keep up with advancements in hearing technology. 4. A check list of questions to ask workers with HL in appointments to help remember what to ask. 5. More research and specific literature about workers with HL.
Specific needs of workers with HL:
• *From audiology:* 1. Accessible and HL-friendly services. 2. To be followed up more, and preferably to see the same audiologist each time. 3. Information about where to get support from, and for the audiologists to signpost them towards extra help, including support, lip-reading, tools or gadgets that can be used at work, charities and government schemes supporting workers with HL. 4. Individualised and holistic support that takes into account work needs and is not just focused on hearing aid care. 5. Better support with technologies and using the telephone at work, such as demonstrations of devices and telephone workshops. • *Not necessarily from audiology*: 1. Counselling. 2. Psychosocial support. 3. Coping support, including advice on dealing with certain situations and disclosing HL at work. 4. Self-management support. 5. Support groups for working-age people with HL.

7.4.4 Common needs for service improvements

Some common needs were also synthesised from both groups’ perspectives. These are summarised in Table 17 and discussed further in Section 8.5.

Table 17: Common needs among audiologists and workers with hearing loss for service improvements.

Common needs:
1. Structuring services in a way to allow more time and opportunity to explore and assess patients’ work needs in audiology appointments. 2. Multidisciplinary or joined-up units or clinics specific to working patients, where specific work-related issues can be discussed and all forms of support can be offered, such as hearing aids, ALD, counselling and psychosocial support. 3. Facilitated communication and information sharing between audiologists, the other services, and employers to improve workers with HLs’ situation at work. 4. Funding and resources to be made available (funding for a better range of hearing aids and technologies, leaflets, workplace visits). 5. Deaf awareness to be raised in workplaces.

7.5 Reflections on multi-perspective triangulation in qualitative audiology research

Finding reliable guidance in the literature on rigorous multi-perspective triangulation was challenging. Audiology researchers and decision-makers endorse the use of this type of triangulation to enhance research quality and improve clinical practice (Knudsen et al., 2012, NHS England, 2016) and many published audiology studies have collected data from patients, family members, carers, audiologists and other healthcare professionals. However, studies describing the processes involved in triangulation are scarce. Most of the papers found in audiology field only report collecting data from different participants’ groups and very few mention the type of triangulation they used and there were no papers found to report the methodological approach utilised for the triangulation of the multiple perspectives.

In this chapter, the approach utilised to triangulate the perspectives of the audiologists’ and workers with HLs’ was described in detail in Section 7.2 and further clarification was attempted by giving examples in the sections following it. This was done to ensure methodological transparency and consequently, research the approaches utilised in multi-perspective audiology research is an issue that often goes unnoticed and is worth further attention.

The researcher found many issues that needed to be considered in multi-perspective triangulation, based on the available literature on triangulation in health and social sciences research and audiology qualitative research. First, the severe lack of methodological information in multi-perspective audiology research could weaken the credibility and transferability of research outputs. Second, the lack of triangulation methodology hinders or prevents confident identification of clear implications and practice recommendations in a piece of research. To overcome this, it is proposed that researchers could report in their publications the following information, to enhance their research clarity, quality and usefulness: 1. The purpose of conducting multi-perspective triangulation (e.g. validation, greater understanding of the phenomenon, or both). 2. The epistemological and ontological assumptions adopted in their research. 3. Data collection methods (e.g. interviews, focus groups, open-ended questionnaires). 4. Whether data were collected at the same time or sequentially. 5. Whether the data of all groups were analysed together or separately and the analysis methods that were used. 5. How the results were triangulated (triangulation approach)?

Besides the lack of clear guidance on multi-perspective triangulation and its under-reporting in academic audiology publications, there are other challenges with triangulation in research. Two issues reported in the literature are expense and time; however, these did not constitute a problem in this PhD project. Another issue is that triangulation can yield an overwhelming amount of results, especially in explorative research. This occurs after exhaustive attempts to assess the convergence and divergence of large amounts of data. Because of this, there is a risk that perspective triangulation may be criticised as selective and that interesting results can go unacknowledged. In an attempt to handle this issue, the researcher focused on triangulating most of the high level themes and some of the lower level subthemes. Decisions about what to include were based on 1) topics the participants focused on and what the majority talked about 2) the field notes and diaries kept by the researcher while conducting the interviews and using these when analysing the results. These two strategies helped to appreciate and emphasise the issues that were important and interesting to the participants as well as to the researcher at that time; 3) the researcher’s own reflections on what seemed relevant and what would serve clinical practice.

7.6 Limitations

One limitation of this research relates to coping among workers with HL. It was not possible to triangulate both groups' perspectives on coping due to lack of data from the audiologists. Specific questions were not asked about coping in the interviews because, initially, exploring coping was not one of the project aims. The audiologists' interviews were conducted first and coping was hardly brought up at all in the discussions. The workers with HL, on the other hand, were keen to talk about their coping at work, which motivated the researcher to re-analyse the workers' interviews to look further into this area. Gathering audiologists' perspectives on coping and triangulating the results with those of the re-analysis could yield highly interesting findings in a future study.

The audiologists and workers with HL were interviewed separately in this research. It would probably have been better if the workers and their audiologists were interviewed as a pair (although not necessarily together at the same time), and on multiple occasions, including pre- and post-consultations. The audiologists were interviewed first in this project, followed by the workers with HL a few months later. The audiologists were not matched with their patients and could not be interviewed together or around the same time because of practical issues relating to the timing of ethical approvals. It would have been interesting to explore the perspectives of both before the consultations and gain information about their concerns and expectations, then to conduct follow-up interviews with both just after the consultations to explore whether their expectations were met and record their immediate perceptions and experiences to minimise the risk of memory bias. Both groups could then have been interviewed a few weeks later to look at the long term perceptions and views. This could be a recommendation for subsequent research.

7.7 Conclusion

In this chapter, the data obtained from both groups on the impact of HL on work life, the audiology appointments, and the facilitators and barriers to effective audiology support were triangulated using multi-perspective triangulation. The purpose of this was to achieve the main aims of the research questions using an approach that would reinforce the validity of the inferences made and render them more useful in terms of knowledge formation and serving clinical practice.

Triangulating the perspectives of workers with HL and audiologists was found useful in validating the inferences made in Studies 1 and 2, which function as separate pieces of research. Triangulation showed a clear harmony between the experiences and views of the audiologists and the workers with HL. This agreement, along with concordance with previous research findings, boosts confidence in the results generated. Furthermore, new knowledge has been generated that provides a rich and wide understanding of topic and suggests interesting directions for further research.

The triangulated perspectives, as well as the literature, affirm the immediate and non-immediate consequences of HL on workers. HL was found to complicate patients’ work lives and significantly affect their psychosocial health. The triangulation of perspectives also shows that, broadly, these adversities are not addressed by adequate audiology care and that many areas of patients’ work lives need to be considered in forming HHC policies and protocols (NICE, 2018). Most of the underlying factors facilitating or hindering workers’ audiological care were found to be common to both the audiologists’ and the workers’ points of view and a new, coherent understanding of HHC for workers with HL has been generated. Some differing perspectives were also identified and were found to be complementary rather than contradictory.

Regarding the multi-perspective approach to ideas for service improvements, linking the audiologists’ and workers’ views on care deficiencies and desired improvements may be insightful for decision-makers working on service quality to support patients’ work lives and wellbeing. The linked perspectives can also be used to make direct suggestions and recommendations to audiologists and service providers (see Section 8.5). Altogether, the triangulation has generated a broader and richer understanding of the audiologists’ and the workers’ perspectives. The results can be used to design follow-up studies to validate these findings and explore the feasibility and usefulness of the suggested interventions and recommendations.

Chapter 8 General discussion

8.1 Introduction

This thesis reports an empirical investigation of the perspectives of audiologists and workers with HL of the impact of HL on workers, how they cope, and their audiological care in the UK. The overall aims of the research were to:

1. Explore how HL affects workers' work life, health and wellbeing.
2. Explore the coping experiences and views of workers with HL, as well as the facilitators and barriers to coping.
3. Explore the experiences and views of audiologists and workers with HL regarding audiology appointments, services and care.
4. Explore the facilitators and barriers to providing effective audiology support to workers with HL.

An interview-based qualitative research paradigm was adopted and 25 audiologists and 24 workers with HL were interviewed for Studies 1 and 2, respectively. The study results are presented in detail in Chapter 4 and Chapter 5 and the outcomes of the triangulation are presented in Chapter 7, to achieve the aims of both studies (Aims 1, 3 and 4). Issues relating to coping came up strongly from the interviews with the workers with HL, which motivated a secondary analysis in a third study, presented in Chapter 6, which sheds light on the key issues revealed (Aim 2).

This chapter provides a summary and a discussion of the results in the light of the literature reviewed in Chapter 2, as well as a discussion of the key findings in the context of earlier research. Some aspects that are relevant or specific to the perspectives of the audiologists or the workers with HL are discussed in the chapters devoted to the studies (in Sections 4.4, 5.4 and 6.4). Common and key results of the individual studies are brought together and discussed in this chapter, to avoid repeated discussions. In this chapter, Section 8.4 below offers reflections on the whole research project, including reflections on the methodology, research quality and the overall strengths and limitations of the thesis. Section 8.5 then presents a discussion of the research implications and recommendations for practice. Suggestions for future research are offered in Section 8.6. Finally, Section 8.7 presents the conclusions of this thesis.

8.2 The ripple effect of hearing loss on working-age adults

8.2.1 Summary of results

Working adults suffer many disadvantages and challenges in their working lives due to HL. The knowledge generated from the perspectives of both audiologists and workers on how HL affects the auditory, psychosocial, occupational and employment aspects of the lives of workers is summarised in Chapter 7. The results also offer some unprecedented evidence for issues perceived to be influencing workers' experiences, including coping aspects and patients' personality and work life context. Finally, an interconnection was found between all these impacts and different influencing factors. This knowledge was used to develop the conceptual framework of workers' wellbeing that was proposed in the literature review Chapter 2 (Figure 4) to take its final form in Figure 19 below. All of these results will be discussed in the following sections.

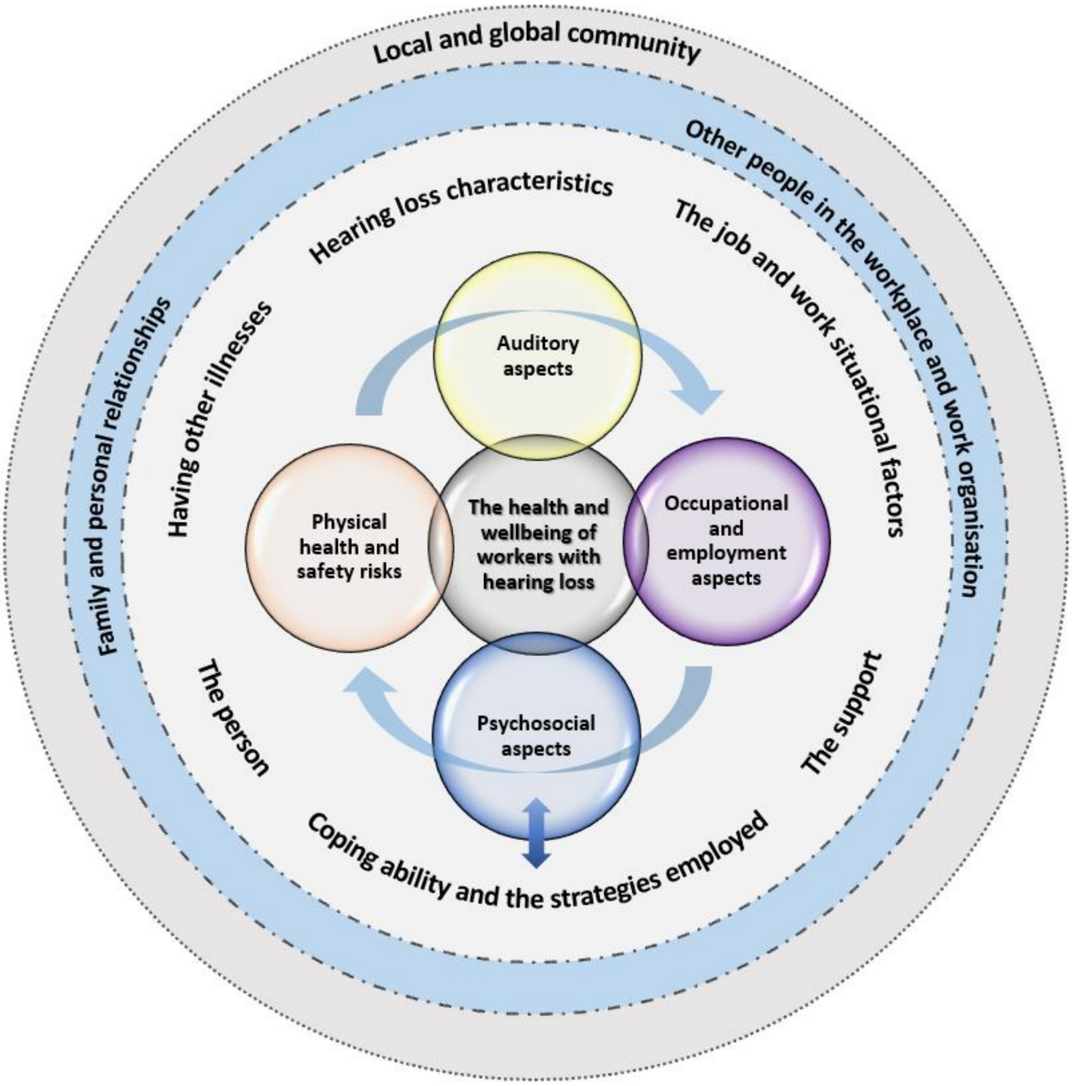

Figure 19: Diagram showing the developed conceptual framework for the wellbeing of workers with hearing loss, showing the different inter-related aspects of having hearing loss and being a worker, and the contextual factors influencing the QoL of workers with hearing loss.

An initial conceptual framework was created based on the literature review concerning the impact of HL on working-age adults (Figure 4). This was an attempt to analyse, construct and understand how HL can affect the health and wellbeing of workers with HL, based on the evidence available in the literature. The initial framework proposed six main aspects that are affected by the adversities of HL in the workplace and suggested that these are inter-related. These aspects were: auditory aspects, occupational aspects, employment status, behavioural aspects, psychosocial aspects, and physical health. Conducting the three studies and then triangulating the results formed a better understanding and allowed gaining more in-depth knowledge, which has all motivated the further development and editing of this framework to take on its final shape, as demonstrated in Figure 19 above.

Figure 19 of the framework aims to illustrate 4 main points:

1. Four main domains are affected by HL. These are auditory aspects, occupational and employment aspects, psychosocial aspects, and safety and physical health. All were found to be negatively impacted and lead the person to live with poor health and an inferior QoL. For a detailed summary of the impacts, please refer back to Table 14 in Chapter 7.
2. Each of the four domains should not be viewed alone; rather, the results showed that there is an interaction between them. For example, the inability to hear speech in a meeting (auditory aspect) can affect job performance (occupational aspect), leading the patient to feel embarrassed and stressed, in addition to putting in extra effort to concentrate during meetings and causing tiredness (psychological aspect). As a result the patient might avoid social interactions at work or after work times (social aspects).
3. The wellbeing of workers with HL is not solely dependent on their experiences in relation to the four domains. The evidence from this research and the literature indicate that contextual factors play a role in determining and shaping the experiences and wellbeing of workers with HL. These are related to the person (personality and attitude), HL characteristics, having other comorbidities, such as visual problems, the job and work situational factors, the individual’s coping ability and strategies, and the support received.
4. The negative impact on the individual can extend to the workers’ family, social relationships, people in the workplace and the local and global community. This “ripple effect” is explained further in Section 8.2.4.

This conceptual framework has evolved from the initial one in Figure 4 (Chapter 2). The differences are:

1. The occupational and employment domains in the initial framework have been merged into one domain, mainly because they each reflect the same aspect of the worker’s professional life. These domains only differ in that the occupational aspects focus on day-to-day issues such as task performance, while the employment aspects focus on the patient’s overall professional life, such as career choice or stability.
2. The results of this research revealed important contextual factors influencing the workers’ experiences and wellbeing and were therefore added to the diagram.

3. The category of coping, or, as labelled 'behavioural aspects' in the initial framework, has been changed from a main domain to a contextual factor influencing the other main domains and wellbeing. The name was also changed from behaviours to coping because mental strategies are also used and not all coping strategies are behavioural.
4. The evolved framework recognises the rippling out of the consequences of HL on individuals in the personal and work lives of workers as well as on the work organisation and the local and global community. The ripple effect is discussed in Section 8.2.4.

As this research was progressing and the researcher was learning more about the impact of HL via further insights from the research and the literature, it became harder to separate some of the impacts into the main domains. There were some overlaps and decisions had to be made as to where to categorise the impacts. For example, social isolation at work can be categorised in both the occupational day-to-day difficulties at work and the psychosocial domain. This overlap could not be completely resolved; however, it was necessary to categorise the impacts, which can be seen in Chapter 7. Discussion with the supervisors helped in making these decisions.

Another issue that was considered relates to the safety and physical aspects domain. Some evidence in the literature suggests that physical harm may result from workers having HL (Girard et al., 2015). However, this was not reported by participants in the present research. Rather, the participants described having worries and concerns about being harmed, for example, due to being unable to hear announcements or fire alarms. This can be categorised in the psychosocial domains as they are worries and concerns rather than actual physical harms. However, a decision was made to keep the physical aspects domain despite not being a part of the results of the present study, mainly because this aspect is important and cannot be eliminated based on the present participants' experiences. It might be that the sample in this study was constituted mostly of people working in environments that do not risk their safety, such as office based work, and if different workers with HL working in higher risk jobs, such as drivers, factory workers or rail workers had been interviewed, injuries could have been reported. A quantitative study with a larger sample might be more appropriate to examine risks of injury in the workplace due to HL.

Further, the domains in the framework interact with and are influenced by many contextual factors, as shown in Figure 19. This is an unforeseen result of this research project. It resonates strongly with the biopsychosocial model of health, which sees wellness and illness as a result of the interaction between the biological, social and psychological status of the person and holds many implications for clinical practice. Workers with HL should not be simply seen as patients having HL and needing a hearing device (biomedical model of care) without acknowledging their work life context and their individual differences.

8.2.2 Challenges and disadvantages in relation to hearing loss in working life

A variety of challenges for workers with HL were identified in the different aspects of life represented in the conceptual model. These are discussed below.

8.2.2.1 Auditory aspects

Both the audiologists and the workers with HL pointed to the same main auditory difficulties that workers with HL struggle with. These are also reflected in the literature and are listed in Chapter 7. All of these difficulties focused to a large extent on communication problems rather than issues related to hearing non-speech sounds at work. The participants in the present study identified the same or similar communication difficulties (e.g. telephone calls, group situations) as those reported by previous studies (Scherich, 1996, Laroche and Garcia, 2001, Detaille et al., 2003, Morata et al., 2005, Mathews, 2011). The audiologists, and to a greater extent the workers with HL, in this study, have extended this knowledge to reveal other difficult situations at work. These included being unable to lipread the speaker, the speaker having an accent, unfamiliar speakers' voices, people who speak quietly, conversations lacking context, and being in large open-plan offices. The workers with HL also mentioned feeling a high level of disturbance from workplace noise, an issue which has also been reported by previous studies (Kramer et al., 2006, Hua et al., 2014). In the present research, only a couple of the audiologists and workers with HL mentioned sound localisation troubles and concerns about not hearing alarms. Morata et al. (2005) reported that workers with HL struggle with hearing the noise of machinery but none of the participants in the present research touched on that. This may be related to the kind of jobs these participants were doing at the time of the study.

It is worth noting that all of the interviews had taken place by the time of the COVID-19 outbreak. This was briefly discussed in Chapter 7 (Section 7.3). The pandemic has unfortunately only served to exacerbate the auditory challenges of workers with HL. Masks constitute an obvious barrier to lip-reading and have also been found to attenuate sound transmission, even in transparent visors (Corey et al., 2020). Workers with HL have had to deal with the problem of masks both in the workplace and when accessing HHC. In addition, contracting COVID-19 was found to be associated with a high prevalence of HL (54.4% in one study) (Dharmarajan et al., 2021, Savtale et al., 2021) and more demand for hearing aids (Ertugrul and Soylemez, 2021). Thus, the COVID-19 pandemic could be imposing epidemiological changes for the population of workers with HL and consequently more health and economic detriments. It is anticipated that the number of workers with HL across the globe has been rising further because of the pandemic. This warrants investigation and steps should be taken towards estimating the size of the problem, implementing preventive measures and alleviating the difficulties for workers with HL.

8.2.2.2 Occupational and employment aspects

While some of these have been documented by previous research, as shown in Chapter 7, others are novel findings. For example, the participants revealed for the first time that teamwork difficulties and tension at work could be a problem caused by the HL of a worker. Further, the workers with HL revealed two new issues: the problems of multitasking and the need for time off work to attend audiology appointments. Although Kramer et al. (2006) reported previously that workers with HL take more time off work than normal hearing colleagues, this was attributed to stress and not to having audiology appointments during working time. Thus, making appointments available out of working hours could be imperative to avoid work problems and ease access to audiology services.

The impact of HL on general employment prospects and financial status is clearly demonstrated in the results and in preceding research (Table 14 in Chapter 7). The impacts described start from choosing a career, accessing employment, progressing in it and maintaining it, and end with the imposed financial consequences due to working fewer hours instead of full time, quitting the job or early retirement. The workers with HL in this study have, however, reported for the first time how they have experienced these impacts at different points in their working lives and have described it as a journey of ups and downs. This is linked to their making changes and learning to cope over time (refer to Chapter 6 for further discussion about coping). This highlights the imperative role of coping support, not only to help improve the person’s overall employment status and achieve financial security, but also to help to achieve that in timely manner.

8.2.2.3 Psychosocial aspects

Chapter 7 (Table 14) also lists the psychosocial problems of workers with HL, as found in this research and previous research. HL clearly triggers many negative emotions for workers with HL in the workplace. The audiologists showed their awareness of the stress, worries, sadness, embarrassment, frustration, vulnerability, stigma, the shaken confidence and the negative self-image reported by the workers with HL and in previous literature. The workers with HL expanded on these issues and expressed their feelings of being alone in this situation, lacking independence, and having worries about their future. Some of the audiologists felt that workers with HL could be living in denial about their HL and their need for hearing aids as well as suppressing their emotions. This did not show up in the interviews with the workers; however, RNID research reports the denial issue from workers' perspectives (Mathews, 2011). The workers with HL in this study seemed to be aware of these issues and were already using hearing technologies, and had their own coping strategies. It is likely that the workers with HL who took part in the study were past the denial as they reported accepting the hearing loss and were keen on adopting problem-solving coping strategies. However, there are probably workers with HL who are still in the denial stage, and need support by the audiologist to move forward in their awareness, acceptance and understanding of their HL and to acknowledge and accept their need for support and an intervention (Laplante-Lévesque et al., 2013) to reduce the impact on work life and its duration.

Social disadvantages among the general population of adults with HL have been well researched, but not enough research has been dedicated to the social disadvantages of workers with HL in the workplace. The audiologists and workers with HL discussed the isolation experienced in the social environment of the workers with HL workplace, for example, in lunch breaks, supporting the findings of previous research (Table 14 in Chapter 7). The barriers to social inclusion in the workplace have not been fully identified and can be explored in future research. However, one can think that despite the social isolation experienced among workers with HL, it is likely to be less than that for their unemployed age-matched counterparts. A minimum level of social interaction will still exist for workers with HL in the workplace, and opportunities to improve this interaction exist with the appropriate support from work and hearing care professionals. Being employed could have positive implications for the mental health of workers with HL and could reduce their odds of developing HL-related dementia due to social isolation (see Appendix A for discussion of dementia risk among workers with HL). Thus, efforts to improve support for workers with HL are highly likely to be worthwhile. Such support would promote better social integration at work and may also improve unemployed patients' prospects of joining the labour market, leading to improvements in mental and physical health.

This research has also suggested for the first time that workers with HL experience social disadvantages at the level of personal and family life, outside of working hours. The workers with HL attributed these disadvantages to leaving work tired and not feeling able to engage in activities. Such experiences could impose additional tension on family and social life. No studies have previously identified or explored the hardships of workers with HL with their families and personal relationships, especially those resulting from work-related consequences such as fatigue, underemployment and financial constraints. This constitutes an interesting direction for future research.

One of the key results in this research was the perceived sheer amount of work-related effortful listening, tiredness and fatigue. HL-related fatigue can have a physical, mental (including emotional), and social nature (Davis et al., 2020). The workers with HL said that they experienced physical and mental fatigue due to the effort of lip-reading, communicating in general, and concentrating on completing work tasks in a timely manner. A few of the audiologists mentioned these difficulties, but most of the workers with HL spoke about them in greater depth and it came out as a strong theme in the workers' interviews. Studies have reported workers' sense of effortful listening, fatigue and overtiredness (Ringdahl and Grimby, 2000, Kramer et al., 2006, Holman et al., 2019), leading them to have an increased need for recovery after work (Nachtegaal et al., 2009). This sense of fatigue in working life is thought to be even more acute for those with other sensory illnesses (Svinndal et al., 2018). Moreover, some research in the literature also suggests that HL affects a person's listening effort (Hicks and Tharpe, 2002, Kramer et al., 2006, Luts et al., 2010) and consequently could cause this sense of tiredness and exhaustion. However, a systematic review by Ohlenforst et al. (2017) did not find consistent and high-quality evidence in the literature to support this suggestion (for a review see Appendix A). Nevertheless, consistent with this research, Holman et al. (2019) indicated that workers with HL experience a sense of effort and fatigue in relation to work life and coping in the workplace.

Given that adults with HL in research studies have repeatedly reported this feeling of effort in their real life, including in the workers in this study, it seems worthwhile to conduct a high quality mixed methods study in the future, using a real-life setting or life-like simulation that includes studying the sense of effort qualitatively and quantitatively at the same time.

8.2.2.4 Physical health and safety risks

Another aspect of the consequences of HL on workers which was considered in the literature review is its effect on physical health, including risks of hearing deterioration, sleep problems, or involvement in accidents and safety problems at work. Little research appears to have reported on these issues. Both the audiologists and workers with HL in the samples commented similarly on this issue (Table 14 Chapter 7). None of the participants from either group reported an actual experience of harm or accident or hearing deterioration because of work and none mentioned sleep problems either. However, both groups reported that workers with HL worried about safety issues at work, such as not being able to hear fire alarms. This is why this impact was subsumed into the psychosocial experiences in Table 14 rather than placing it in a separate subtheme. There are undoubtedly workers with HL who have experienced actual harm at work due to their HL, but the sample interviewed in the present research did not capture that. The different findings could also be related to the shift to modern jobs involving less manual work and more white-collar work, where the risks of hearing-related accidents are fewer compared to traditional jobs where workers with HL were working in the military, factories or railways, for example. Given that manual labour still exists, it is possible that interviewing or surveying a different sample of workers with HL could have yielded different results regarding this matter. Therefore, research involving a bigger sample of workers with HL who work in a wider range of jobs than those represented on the present sample could be conducted in the future to estimate more accurately the impact of HL on workers’ safety and physical health.

The next section will discuss the factors that were found to influence the experiences of workers with HL and their wellbeing.

8.2.3 Factors influencing the experiences and wellbeing of workers with hearing loss

One of the outcomes of this research was compiling information about elements perceived as key in affecting the experiences and wellbeing of workers with HL (Figure 19 above). These elements, which include the characteristics of workers with HL, their personalities and jobs, their comorbidities and their different coping strategies, are discussed in the following paragraphs. The last factor, which is support for workers with HL, is then discussed below in Section 8.3.

8.2.3.1 Hearing loss characteristics

Both the audiologists and workers with HL believed that the characteristics of the particular HL influence how it impacts work life. The audiologists thought that the key factors were HL degree (mild, moderate, severe or profound) and onset (sudden or gradual). This is supported by the findings of a previous study that found a link between the degree of HL and risk of earlier retirement from work (Helvik et al., 2013). Likewise, the workers with HL spoke about degree and onset of HL a little, but they were more concerned about their hearing deteriorating over time. This was reported in a previous study (Morata et al., 2005). From the point of view of the workers, HL progression over time had been causing them the most concern and had the greatest impact.

However, none of the audiologists made any comment about this issue or seemed aware of it. Audiologists' awareness of this matter is vital, as this could affect the advice given to workers with HL in audiology consultations. Although in some cases it could be difficult to prevent progression, for others there could be some role for audiologists in advising workers with HL on preventive measures and hearing protection. It also highlights the importance of the need for follow-up that was voiced by both groups in the interviews, and the need for regular hearing checks. This would help monitor for any changes requiring hearing aid adjustments or further support, in a timely manner.

8.2.3.2 The personalities and jobs of workers with hearing loss

In addition to the nature of the HL, the audiologists believed workers with HL were each affected differently, even those with the same degree of HL. The audiologists thought that the patient's personality and job play a major role in influencing how HL affects them. The interviews with the workers with HL provided further details regarding the role of personality when they talked about their adaptation at work. Some explained that because they have a proactive personality and think they are able to self-manage, they perceived themselves as adapting better than others with the same HL and, therefore, were less likely to lose their job and felt less impacted. This knowledge can form a basis for designing research investigating the value of personality and self-management support for workers with HL who need it. Further discussion of self-management and personality is available in Chapter 6 (Section 6.4).

Another interesting and new point of view that both groups brought to the researcher's attention was how tough modern-world jobs can be for workers with HL, compared to more traditional jobs. In the modern workplace, communication is at the heart of most businesses. The interviews with both the audiologists and workers with HL revealed that in modern professions, workers with HL struggle to perform conversation-related tasks, including telephone calls, meetings, conferences and teamwork. They also struggle with the noise and acoustics of modern work environments, especially in open-plan offices. As discussed in previous chapters, most of the evidence in the literature on the struggles of workers with HL was obtained from research conducted in the twentieth century. For the most part, the study samples of workers with HL were doing manual jobs in industry, which resulted in much of the research focusing on occupational, noise-induced HL, such as that experienced by people working in factories and mines. Workers with HL working in modern professions clearly have different hearing needs and should therefore receive audiology support that reflects their work needs and the jobs they do. For example, workers in open-plan offices who deal with telephone calls, meetings, teams, and customers could benefit from advice on communication tactics such as lip-reading, rearranging office furniture, and using advanced hearing aids that connect to the Roger pen or mobile apps so that adjustments can be made according to the situation to minimise the missing of important information. These tactics may help workers with HL to thrive at work but may not be useful for those in manual work or retirees. This finding highlights the need for more research focusing on current and future workers with HL and to move audiological care forward by taking practical steps to innovate for adults with HL working in modern careers.

The issue of HL being an invisible disability, along with the lack of deaf awareness in workplaces, has created a challenging work environment for workers with HL. The workers said they could overcome this to an extent by making people in their workplaces aware of their hearing difficulties and asking for assistance. The literature review (Section 2.3.1) argues that there appears to be a gap between the perspectives of audiologists and adults with HL in terms of understanding and appreciating the importance of social environment, based on a comparison of evidence from previous studies (Grenness et al., 2014c, Grenness et al., 2014b). The results of this research and the results of a recent scoping review (Granberg and Gustafsson, 2021) all are consistent with that as they show that work context and social and professional work environments are perceived as influential from the workers' point of view, yet appear to be under-recognised by audiologists. This is a gap between audiologists' and patients' perspectives in terms of understanding HL as a long term health condition that has multiple dimensions affecting patients' lives. Therefore, it is key to bridge this gap and raise audiologists' awareness to improve patients' experiences and support.

In support of the results of this research, previous research has reported that some workers with HL struggled due to challenges in the work environment (Kramer et al., 2006, Hua et al., 2014). However, discussion of these challenges tends to be absent in the literature, as noted by Granberg and Gustafsson (2021). Most of the challenges reported in this research and previous research have not yet been discussed or researched in depth. For example, the problem of dealing with unfamiliar speakers or different speakers' accents at work was reported in this research and in a couple of earlier studies (Mathews, 2011, Action on Hearing Loss, 2015), but has never been a matter of discussion in a work-related context. Accented speech-hearing difficulties had been the subject of experiments in previous research (Gordon-Salant et al., 2010). Adults with HL were not only found to experience difficulties hearing accented speech, but they were also found to experience such difficulties to a greater extent when there was background noise compared to hearing accented speech in a quiet environment (Gordon-Salant et al., 2010). Given that some work-related barriers are unmodifiable, such as dealing with unfamiliar people, customers in retail, or people who have accents, there is a need to find practical and efficient ways to deal with this problem and ease the situation. In the simplest forms, employers should make sure workers with HL work in a quiet place and audiologists should place a noise reduction program on hearing aids. Work environment and context can be very important and need to be considered in workers with HL HHC and in hearing technology innovations.

8.2.3.3 Having other illnesses

This research showed that some workers with HL perceived their work life experiences to be worse due to having other illnesses and having to prioritise accommodating and managing the other illnesses at times. This knowledge is reported for the first time in the literature and has many implications. Having added worries, dealing with more difficulties and thus neglecting hearing management could explain the stress-related exit from the labour market found in previous research (Kramer et al., 2002) and the lower employment rate for workers with HL who have additional morbidities (Hogan et al., 2009, Svinndal et al., 2018, Dammeyer et al., 2019). Moreover, having sensory co-morbidities contributes to an enhanced sense of fatigue among workers with HL, less work participation and more sick leave (Svinndal et al., 2018).

People with HL showed higher prevalence of other illnesses, such as visual, cardiovascular, cognitive and neoplastic conditions, arthritis and mobility problems (Besser et al., 2018) and this was apparent in the small sample of workers with HL in this research. Currently, there is no evidence that research and audiological clinical practices offer special or additional care to adults with HL who have multiple morbidities. It could be that some audiologists or service providers consider the additional needs of those patients but this is mostly not systematic or standardised or even documented. Adults with HL who have multiple illnesses need extended support and those who work need extra care as well. HL and most of these comorbidities are associated with aging. In the light of the changing demographics due to aging populations, the number of older workers with HL is likely to increase. Consequently, the number of older workers with HL with multiple morbidities will be on the rise. Therefore, there is a need for more research and some guidance for audiologists in this area.

8.2.3.4 The coping abilities and strategies of workers with HL

Coping is an interesting and important topic to be investigated and discussed in the field of rehabilitation for disabilities. A considerable amount of research has investigated coping among adults with HL but very little research has focused on coping among workers with HL. Moreover, the available information about workers with HL coping is scattered and some could be outdated and appear to be non-existent in the UK context. The interviews with the workers with HL revealed interesting information about how they coped with HL and stimulated the researcher to analyse the interviews to gain in-depth insights into their coping experiences. The results produced rich knowledge about two main themes. First, the results revealed the factors enabling or inhibiting their degree of coping in the workplace. These were: the support received from work and audiology agencies, situational circumstances at work, hearing technology use and lip-reading skills, psychosocial issues, self-management, HL duration and degree of HL worsening over time. Second, the interviews revealed the strategies they used to manage the difficulties they faced at work. These were: disclosure and asking for help at work, mental and emotional adaptive strategies, preparation and making arrangements to aid communication, utilising hearing technologies and other assisting tools, collecting information, and, to a lesser extent, seeking help from professionals and, at times, withdrawal and avoidance. Chapter 6 includes Figure 18 which outlines these results, and Section 6.4 discusses the perspectives in the light of existing research and touches on the implications and some potential future research directions. Overall, coping with HL at work, which was spotlighted in Chapter 6, was shown to have a tremendous effect on workers' experiences and how it impacts them, which was not something the audiologists gave much attention to, either in the interviews, or in their practice. Coping support can be the cornerstone of workers with HL counselling and rehabilitation and it seems worthwhile for clinicians and stakeholders to dedicate more research and attention to this aspect.

8.2.3.5 The support

The perspectives obtained from this research illustrate that support from work and audiology can have a great influence on workers' experiences. Nevertheless, this support seemed to be infrequently obtained, for various reasons. A detailed discussion of audiology support for workers with HL is offered in Section 8.3 below.

Regarding work support, the workers with HL interviewed for Study 2 described both positive and negative experiences. Some received communication and adjustment support from their employers and co-workers and found it very helpful in improving their sense of adaptation in the workplace, supporting earlier research (Detaille et al., 2003). Some others (the majority) expressed that they felt unsupported by their managers or colleagues and found it hard to adapt. The lack of work support appeared to be an important barrier to coping. Potential reasons for insufficient or lack of support in the workplace could be related to HL being an invisible disability and workers' hesitance to disclose their HL and ask for help. In addition, there was a general lack of deaf awareness and information on how to support workers with HL by their employers and employers' were not active in making changes to assist their HL employees (Mathews, 2011, Svinndal et al., 2020a). There is abundant room for research exploring the barriers to workers with HL assistance by people in the workplace. A few studies have explored employers' perspectives on these issues (Svinndal et al., 2020a) but, to the author's best knowledge, no research has yet studied co-workers' perceptions and experiences.

8.2.4 The ripple effect of hearing loss impacting working adults

HL among workers with HL can have a ripple effect. This research shows that the consequences experienced by the person in any of the framework domains (auditory, psychosocial, occupational and employment and safety and physical health) can lead to a propagation of consequences in the other domains (Figure 19 above). Without a proper intervention, this ripple effect can result in the augmentation of patients' struggles and can extend to affect other people in their personal and working lives as well as having an economic impact on society, as Figure 19 above shows. The economic impact is further discussed in section 8.3.6 below. Workers with HL reported family constraints, teamwork difficulties, difficulties with employers, and having to ask colleagues for help. Previous research also found that the employers of workers with HL sometimes face challenges to make accommodations for workers with HL (Svinndal et al., 2020a). Research, so far, has not explored this ripple effect on the people surrounding workers with HL and it would be useful to gain insight into the perceptions of co-workers and people in the personal lives of workers with HL in future studies.

The ripple effect and the framework domains interacting with each other are not exclusive to HL and have been recognised in other chronic health conditions such as depression and diabetes (Gorin et al., 2008, Wittenborn et al., 2016). Understanding the ripple effect and how it affects interaction processes in such long-term health problems can be quite useful. In the present case, it can help to explain the patterns in which HL alters the behaviour and wellbeing of workers with HL and can provide a helpful structure to target interventions; for example, offering emotional support or counselling on how to cope can ameliorate difficulties at work, avoid tension and misunderstandings in the workplace and prevent workers from losing their jobs and having family difficulties. The sequence of ripple effects is a kind of chain reaction that needs to be stopped. Research has shown that supporting diabetic patients to lose weight is associated with positive health changes to their partners (positive ripple effect) (Gorin et al., 2008). Similarly, HL support in any of the main domains or the factors influencing them could help to improve the other domains as well as the workers' QoL, and could generate a positive ripple effect on people in their personal lives and workplace as well as in wider society.

8.3 Conceptions and inadequacies in the hearing healthcare of working adults.

8.3.1 Summary of results

Overall, the experiences and views of the participants described a picture of suboptimal HHC for the population of working adults by audiologists and services in the UK. There were a few variations between the experiences of the participants; however, all agreed on the existence of common shortcomings in the care provided. The main shortcomings included an insufficient focus on patients' work life challenges and needs, restricting audiology care to hearing aid care and a lack of clarity around who should help with patients' work life needs. Another important outcome of this research project was identifying the facilitators and barriers to efficient HHC to workers with HL. Although the audiologists and workers with HL varied in their perspectives, many challenges were held in common at the level of workers with HL, audiologists, services, the healthcare system, charities, the government and the workers' community. Details of these facilitators and barriers are presented in Table 15 (Chapter 7), while Figure 20 below maps and summaries the main facilitators and barriers described by the participants.

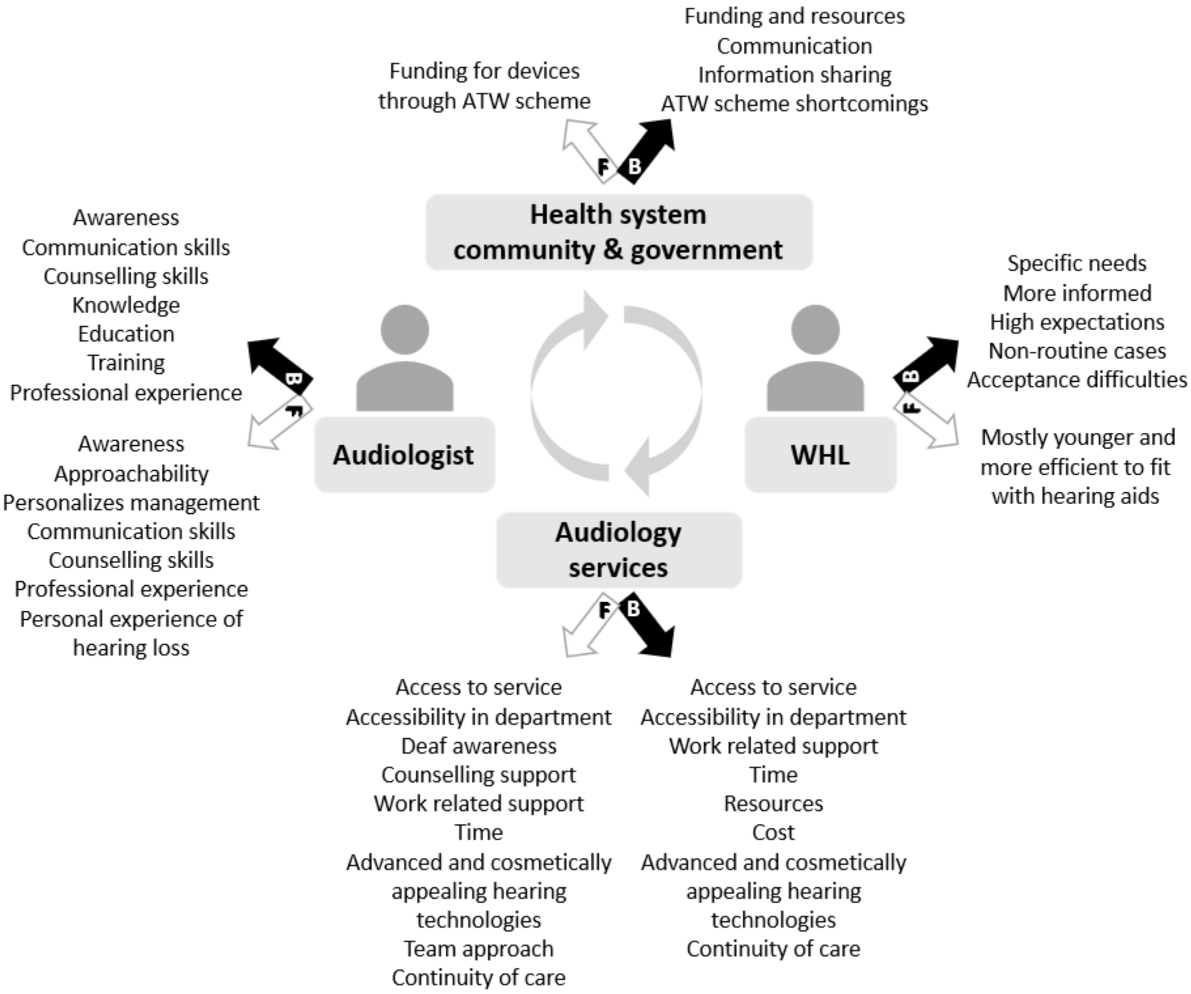

Figure 20: Facilitators and barriers affecting the hearing care of workers with HL. F: Facilitator, B: Barrier, ATW: Access to Work, WHL: Worker with hearing loss.

The triangulation of the audiologists' perspectives obtained from study 1 with the workers' perspectives obtained from Study 2 resulted in a comprehensive understanding of both, the impact of HL on workers with HL and the HHC they receive from audiology services. The triangulation showed a high level of agreement between the perspectives of the audiologists and workers with HL, which increased confidence in the results generated. It also helped to capture the wide range of perspectives from differing viewpoints. For example, the triangulation helped to identify common facilitators and barriers as well as those perceived only by the workers with HL or only by the audiologists. Moreover, it helped identify their common needs for service improvements as well as the differing needs of both groups, as well as providing in-depth understanding of the topic rather than obtaining surface level information from one source. For a full overview of the results of triangulation please refer to Chapter 7.

8.3.2 Reflecting on the patient-centred approach and the chronic care model

At the start of this research project, the HHC for workers with HL was discussed in light of the CCM and under the umbrella of PCC in audiologist-patient interactions. The literature review in Chapter 2 delved into the evidence on patient centredness in audiologist-patient interactions and discussed how the CCM can be a useful framework to identify the elements involved in shaping health outcomes for patients with HL. The evidence suggested deficiencies in audiologists' patient-centred communication skills (Ekberg et al., 2014, Grenness et al., 2014c, Grenness et al., 2015c, Action on Hearing Loss, 2016) and in many of the elements of the CCM (Barker et al., 2014). The results of this research support this evidence. It shows that audiologists' communication with workers with HL can lack basic deaf aware communication skills, like facing patients when speaking to them, and that the care they provide commonly ignores individual work needs and is hearing-aid focused. The workers with HL desired individualised hearing care but this is not what most received, similarly to the case of patients in general practices (Little et al., 2001). Moreover, most of the audiologists acknowledged being repetitive and using a "one size fits all" approach. There is no literature found that refers to audiologists being in this "autopilot mode" in audiology. This could constitute an interesting topic to explore, as it can be a barrier to the implementation of PCC in the hearing care field.

One of the failures of the PCC notion is the degree of ambiguity associated with it, and this can be seen in the present results. To some extent, it is vague when translated from "the should" or "the ideal" to actual clinical practice and settings. Although the audiologists demonstrated awareness that it should not be "one size fits all", most were not confident or able to personalize the care they offered to workers with HL, for various reasons (time pressure, sticking to routines, finding workers with HL challenging to deal with, and the lack of personalised resources). It is also suggested from the results that some audiology appointments may be more person-centered than others because of variations between the different audiologists and services. This is in line with previous research which has found significant variability in the extent to which different audiology consultations are person-centered, based on the relative frequency of biomedical and psychosocial speech made by audiologists and patients in recorded appointments (Grenness et al., 2015c, Grenness et al., 2015b). Further guidance is needed to make clear what the audiologists' responsibilities are in supporting workers with HL and how to meet them and personalise their approaches in real clinical settings. It is worth remembering that workers' varying experiences with services or audiologists could also be attributed to their own varying perceptions, personalities, attitude, awareness, and involvement in self-management, as this research has highlighted.

Many insufficiencies in all the elements of the CCM were also detected. Figure 21 below, representing the CCM, includes examples of some of the insufficiencies identified from this research and maps them onto the CCM elements. It was not surprising to find some of these deficiencies. As discussed in the literature review, earlier research examining audiology documents suggested deficiencies exist in self-management support, delivery system design and decision support (Barker et al., 2014). Care improvements for workers with HL are needed for all of the elements of CCM: the local community's policies and resources, the local health system with its various elements, as well as the audiology team and patients. See Section 8.5 for recommendations and suggestions for service improvements.

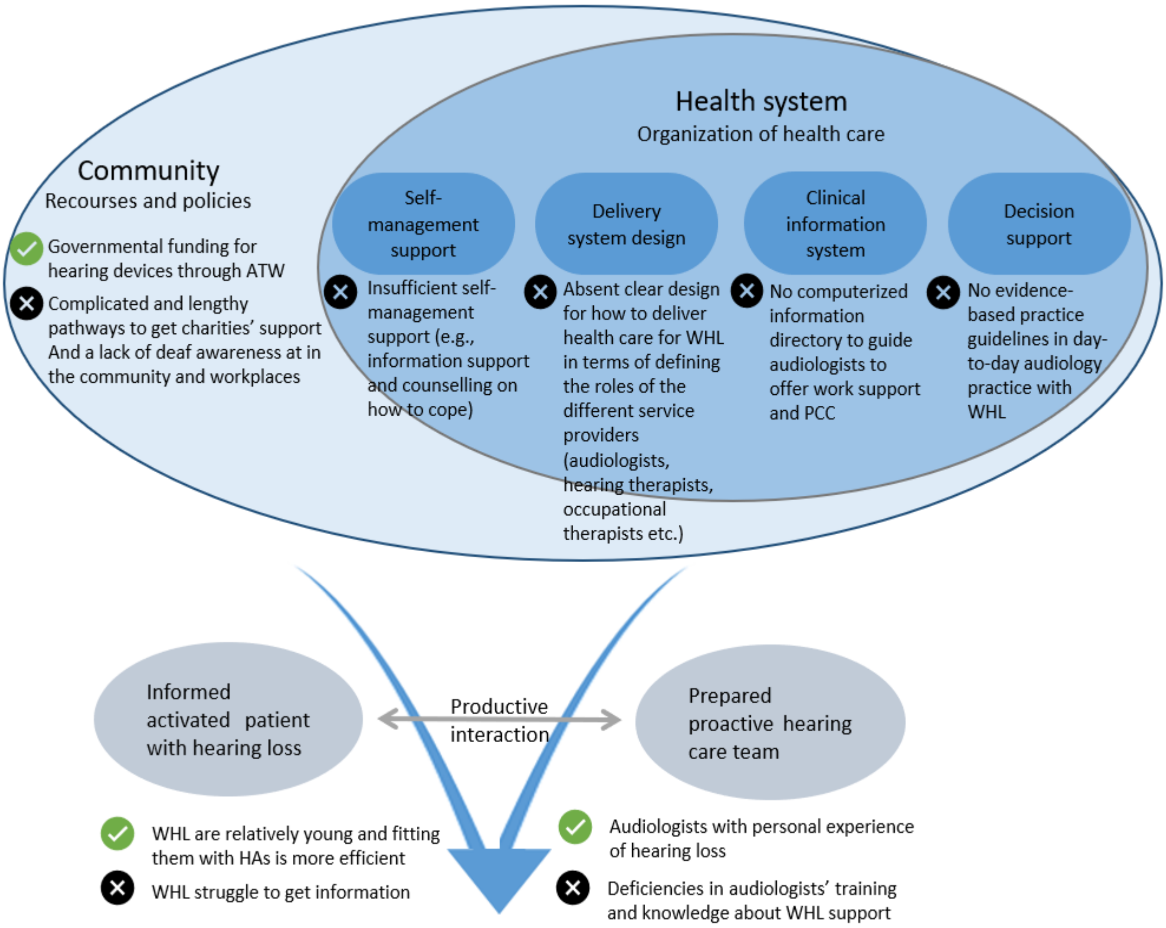

Figure 21: The Chronic Care Model diagram with examples of positive and negative aspects of audiology care that affect the health outcomes of workers with hearing loss. These are mapped onto the Chronic Care Model elements. ATW: Access to Work, HAs: hearing aids, PCC: patient-centred care, WHL: worker with hearing loss.

8.3.3 Mismatch between understanding and behaviour for both the audiologists and workers with hearing loss

The understanding of both the audiologists and workers of the consequences of HL on work life and wellbeing and the significance of audiology support was clearly apparent, and the overall results revealed the significance of the topic, at least in most of the interviews. Interestingly, there was a mismatch between what they said happened in their appointments and the views they expressed, i.e. that they thought audiology support is important for work life and wellbeing. Their understanding appeared to differ from their attitudes and behaviours during appointments, and in particular during the interview and the management parts of their audiology consultations. Most of the audiologists were ambivalent about asking their patients about work struggles and taking this into consideration in the management plan, and some workers actively talked about their work life and asked for help during appointments, while others were uncertain and tentative about whether to ask or what sort of help they needed or could expect.

This mismatch could indicate that worker-audiologist interactions and decision-making about work issues are differ according to the individuals involved rather than there being a general approach or the straightforward following of recommended guidance. It is possible that the audiologists were not provided with sufficient training, experience, recommendations or guidance to be able to clarify their role in helping workers with HL, and the workers, for their part, were not clear what to expect from their audiologists or whose responsibility it is to help them with work difficulties related to their HL. This perceived ambivalence regarding responsibility is one possible explanation suggested for these results. The perspectives of the participants exposed many other potential reasons for case-by-case variation and mismatch, manifesting in the facilitators and barriers suggested by both. These included inadequacies or variation between audiologists and services in the following aspects: ease of access to help, offering personalised care, informational support for both audiologists and workers with HL, the audiologist’s experience and training, the patient’s personality, attitude and self-management skills, funding, resources, and communication between services. Many of these have been previously reported by Shaw et al. (2013a), such as the lack of informational support for both audiologists and patient and the lack of communication between services.

8.3.4 Hearing aid-focused care

Despite some limitations, hearing aids generally proved helpful for the interviewed workers with HL, as has also been found in previous research (Backenroth, 1997a, Hua et al., 2015). Nevertheless, hearing aids can be insufficient and can also be challenging in some work environments leading to non-use (Jennings and Shaw, 2008, Kramer, 2008, Hua et al., 2015). Finding that their audiologists' support was mainly restricted to hearing aid care was not favourably received by the participants. The hearing aid-focused approach to workers with HL was previously reported by Jennings and Shaw (2008) and reflects the focus by services and professionals on the product and the immediate problem, which is the sensory disability, rather than on a holistic approach designed to consider the consequences of chronic HL on workers' day-to-day activities and QoL.

The focus on hearing aids to manage chronic HL is similar to health professionals' focus on treating the immediate symptoms of other chronic illnesses while neglecting the context. Mirzaei et al. (2013) explored the challenges perceived by chronically ill patients regarding their experiences with a wide range of healthcare services, including general practitioners' clinics and speciality clinics. Their study included patients with long-term diabetes, pulmonary and cardiac illnesses and also healthcare professionals. They found that patients perceived it as challenging when their healthcare professionals were focused on their immediate symptoms without appreciating the context or their other complaints. Furthermore, the practitioners in their study also commented on this narrow focus, indicating that a more holistic approach is needed. The present findings regarding the audiologists' narrow focus on hearing aids and the workers' opinions that they need broader care resonate with the research findings of Mirzaei et al. (2013).

The results of this research also pinpoint to an issue relating to referrals for cochlear implants, whereby the work needs of patients are not considered in the NHS criteria for cochlear implants. Evidence from this study and previous research shows that having a cochlear implant plays a major role in helping individuals to get into employment and improves their satisfaction (Fazel and Gray, 2007). Therefore, it appears worthwhile to revisit the criteria and improve workers' access to implant services. Again, all of this reinforces the suggestion of non-PCC being a problem in workers' consultations and explains the perception of most of the workers in this study that audiology services frequently ignored the fact that they were working and thus had different needs to non-working older adults. Workers with HL live in a different context to older adults and have different needs, such as practical adjustments of layout and office furniture in the workplace or advanced technologies to adapt and be productive at work. Thus, the lack of patient-centeredness evident in the lack of holistic and absence of individualised care compromises the effectiveness of service support and, consequently, patient outcomes and wellbeing.

8.3.5 The facilitators and barriers to efficient hearing care for workers with hearing loss

For the first time, this research reports the underpinning factors affecting the HHC audiology services offer to workers with HL in the UK. The facilitators and barriers as perceived by the audiologists and the workers with HL are outlined in Figure 20, above, and are summarised in detail in Table 15 (Chapter 7). The participants also highlighted important issues that should be prioritised and where there is scope for service improvements (see Sections 7.4.3 and 7.4.4 in Chapter 7 and Section 8.5 below). Generally, the aspects identified in this study which facilitate or hinder efficient HHC for workers with HL were found to be present throughout all levels of the health system, including community and government, audiology services, audiologists, and patients themselves, as mapped in Figure 20. When all the barriers at these levels interact, it is not surprising that this results in challenging interactions and suboptimal HHC for workers. Figure 20 clearly shows the presence of many barriers influencing audiologist-worker interactions and the HHC received by workers with HL, leaving their needs unmet. Some of these factors were found to be specific either to the audiologists or to the workers with HL and are discussed in Study 1 (Chapter 4: Section 4.4) and Study 2 (Chapter 5: Section 5.4), respectively.

For example, one barrier from the workers with HL side was that audiologists perceived them as more informed, as discussed in Section 4.4.1. This result replicates previous research that examined the constraints healthcare professionals experience when dealing with informed patients (Henwood et al., 2003). Still, it is reported for the first time for hearing loss patients to the authors best knowledge. Ideally, information is considered vital for empowering patients with long term conditions to self-manage themselves, and it should be viewed as a facilitator to efficient hearing healthcare. However, it is perceived as a barrier by the audiologists and other healthcare professionals (Henwood et al., 2003). One reason could be that the audiologists lacked sufficient training and knowledge to deal with the information working-age adults bring to the appointment. Nowadays, most people have access to and use the internet, and current generations are more likely to research their problems and be informed. Therefore, it could be worthwhile to dedicate more research to the informed patient concept and audiologists competency in interacting and supporting these patients.

In addition to audiologists and workers with HL' factors, some common factors relating to the services, health system, community and government are discussed here. Both audiologists and workers with HL appreciate the presence of funded governmental and charity work-related support through the ATW scheme. The resources dedicated to providing work-specific support by audiology are clearly limited, making ATW a valuable addition. Nevertheless, the participants' perspectives on this initiative revealed many barriers related to it. A range of difficulties in accessing ATW support were brought to light, starting from audiologists under-signposting the availability of ATW to their ignorance of its details. Moreover, if referred, workers with HL encounter long waiting times to get ATW support, which can be disconnected from the audiologist's advice and is often not personalised to meet the person's needs. The funding dedicated for this support could be used more efficiently, according to the audiologists. Therefore, re-evaluating and improving this resource could be very worthwhile.

The present results support previous evidence indicating the presence of many challenges in accessing healthcare for adults with HL (Smeijers and Pfau, 2009, Kuenburg et al., 2016). The flexibility needed to facilitate access to audiology appointments for workers with HL and the hearing technologies offered were two key service aspects perceived to be affecting care. Independent companies were perceived to be superior in both. Previously, patients in the UK have reported not being able to attend general practitioners' appointments due to their inability to take time out from work (Neal et al., 2005). The audiologists had similar concerns, especially for NHS services. This research adds to this evidence other layers of complexity in accessing healthcare: the workers with HL reported difficulties and long waits to get referred to NHS audiology services, which affected their jobs. When accessing audiology services, workers with HL have added worries regarding whether they will manage to make an appointment over the telephone or be able to hear their name in the waiting area of the audiology clinic. Thus, they worried about communication with audiologists and departmental staff rather than focusing on the reason they were seeking HHC.

Difficulties in accessing hearing care services and communication barriers in audiology departments are elemental issues that should be addressed and should instigate a wider investigation across other healthcare fields. An NHS commissioning report has called for easy to access hearing services (England, 2016). However, the way some services and audiologists work could be disabling workers with HL instead of supporting them. Services that allow adults with HL smarter options for access to service providers, such as emails instead of having to telephone improve the quality of service. Above and beyond this, reasonable adjustment of the services for people with disabilities is a legal requirement under the Equality Act 2010. Given that audiology services are supposed to be by their nature aware that their clients have hearing disability, difficulties in access and accessibility can be considered discriminatory and against the Equality Act 2010. According to the Office for National Statistics (2020), 96% of all UK households had access to the internet in 2019, which makes it a worthwhile option to have an efficient email or online system to contact service providers easily. As well as improving deaf awareness and accessibility to audiology services, other ways to make HHC more efficient could be considered. For example, tele-healthcare has advanced significantly in the past years and might be a solution to overcoming barriers for workers with HL related to time and accessibility. It would be interesting to investigate the use of tele-audiology and its benefit for the diagnosis and management of workers with HL.

The results also indicate that advanced and cosmetically appealing hearing technologies are offered for purchase by independent companies but not by the NHS. The NHS started offering free behind-the-ear hearing aids in the 1970s, which was a great step forward. Nevertheless, the study participants indicated that these hearing aids were less helpful to workers with HL as well as being cosmetically unappealing when compared to the advanced and more visually attractive hearing aids available from independent companies. Further, the participants indicated that, overall, hearing aids alone cannot help in all work scenarios. Hearing aids do not always work very well in noisy work environments and this may lead to non-use replicating previous research findings (Backenroth and Ahlner, 2000, Barker et al., 2017). The participants also suggested that ALD could be of special value for helping at work, and many of the workers with HL reported finding ALD useful to carry out some work tasks.

Having to deal with difficult listening situations at work and hearing-device-related stigma (Wallhagen, 2010, Mathews, 2011, Barker et al., 2017) is a big undertaking and is critical for employees' occupational stability. Workers with HL need smart and effective technologies to handle their complex hearing needs at work and they could be looking for 'discreet, modern fittings' (Kirkwood, 2008) to avoid the reported stigma and embarrassment they experience at work (Mathews, 2011) and function to the best of their ability. Therefore, powerful and advanced hearing technologies that are cosmetically acceptable should not be considered a luxury, but rather a necessity that need to be considered by the NHS to keep people in work.

The recent advances in hearing technology appear to be promising. Some hearing aids can now be adjusted remotely by an audiologist, and one of the interviewed audiologists suggested this could be useful to help workers when they are in a difficult situation at work. Previous research also suggests it has promising outcomes (Glista et al., 2020). Even better, some hearing aids can be connected to smartphones, which was found beneficial by NHS users in one study, especially to make adjustments through an app and to control the volume in noisy situations (Habib et al., 2019). One of the barriers to coping was workers' inability to control certain difficult work situations, such as noisy environments. These tools can allow workers with HL to at least control how they perceive difficult situations. Such interventions (ALD, tele-audiology and smartphone-connected hearing aids) could be useful to empower self-management and coping among the population of workers with HL and were demanded by the audiologists and workers with HL in this research. Their cost-effectiveness, however, should be first established. Up to now, there appears to be no strong evidence for their benefit to workers. The perspectives in this research indicate that ALD helped the workers with HL but the rest of the evidence in the literature on ALD is still ambivalent and focuses on older users (Maidment et al., 2018) rather than targeting younger working users.

Continuity of care constitutes an additional interesting issue affecting HHC efficiency. Workers with HL found it useful if they could build a relationship with the same audiologist at each consultation. This was found to be achievable when seeing an audiologist in independent companies but not for most in the NHS. Evidence from the literature as well as this research suggests that continuity is highly valued by patients and healthcare professionals alike, particularly for people with chronic conditions, multi-morbidity and other complex health needs. Studies have found numerous benefits of continuity with regard to the clinician-patient relationship (Freeman and Hughes, 2010) but not for hearing aid-related outcomes (Bennett et al., 2016). The benefits include increased patient and staff satisfaction, greater accountability, increased trust within the clinician-patient relationship (with positive effects on treatment compliance), improved disease management and better health outcomes (Freeman and Hughes, 2010). Loss of continuity is challenging for workers with HL receiving NHS HHC. At each appointment they have to explain their difficulties and work context to a different audiologist in time-pressured consultations, which can be difficult.

Another service-related factor found to be influential is team care especially, when incorporating counselling. Services offering team care and where audiologists offer counselling, such as cochlear implant services, were perceived to be superior by workers with HL. The present research, like previous research, indicates that counselling is often omitted in audiology appointments

(Coleman et al., 2018), although one of the most frequent needs workers demanded both in this research and a previous study was counselling regarding how to manage workplace difficulties (Graaf and Bijl, 1998). Counselling related to hearing aids was the only aspect of audiology counselling discussed by the audiologists. However, workers with HL also need counselling on how to deal with their psychosocial struggles and how to cope in the workplace. In-depth interviews with workers with HL after they had participated in a rehabilitative counselling programme in Sweden revealed positive patients perspectives (Backenroth and Ahlner, 2000). The workers with HL in that study perceived improved QoL and work due to better awareness, attitudes, self-confidence, hearing aid use and the ability to cope in their work life after the counselling sessions.

Backenroth and Ahlner (2000) investigation, however, did not adopt and report a clear methodology. Details of the counselling programme are not available and there also appears to be no coding or any clear form of analysis of the interviews. The results reported were the participants answers reported as they were uttered. Moreover, no clear outcomes were used to evaluate changes in workers' QoL following the counselling programme. There are numerous non-experimental publications such as reviews and expert opinion which recommend adult rehabilitation and counselling in clinical practice, as it improves people's ability to cope in day-to-day life and learn from their experience (Hawkins, 2005). However, there needs to be a stronger evidence base in this area derived from experimental case control studies or systematic reviews. If counselling for workers with HL proved beneficial, it would be important for audiology services to consider incorporating some specific counselling relating to work difficulties. Allowing time to counsel and educate workers with HL and training audiologists appropriately to improve their ability to counsel workers and enable them to offer personalised care in audiology appointments could then be considered (Muñoz et al., 2017). However, audiologists may be time-pressured, hearing-aid-focused and underequipped with the skills and knowledge to educate and counsel workers with HL, as this research indicates. Therefore, opportunities for counselling support and workers with HL education are prone to be eroded, as happens in general practitioners' appointments (Baird et al., 2016). If it is not possible to provide counselling by audiology professionals, consideration needs to be given to involving other health professionals to assist, including hearing and occupational therapists.

8.3.6 A glance at the economics of hearing loss in the labour market

Good health in any society is fundamental for its economy. Efficient healthcare, therefore, is considered an “economic good”. HL imposes educational and medical costs on the economy, as well as labour market economic losses (McDaid et al., 2021). Work-related financial losses at the individual and societal levels occur due to HL-related underemployment, diminished productivity, reduced work times and early retirement. Previous studies and this research showed that people who have HL are less likely to be working (Chapter 2, Figure 5), less likely to work full time, more likely to take sick-leave, and are probably less productive and have performance issues if working; they are also more likely to earn less than normal hearers and that the situation worsens if the person has other health conditions (Blanchfield et al., 2001, Kramer et al., 2002, Baker, 2006, Kramer et al., 2006, Hogan et al., 2009, Jung and Bhattacharyya, 2012, Stam et al., 2013, Emmett and Francis, 2015, Cook, 2017, Shield, 2018, Dammeyer et al., 2019, Department for Work & Pensions and Department of Health & Social care, 2020, Shan et al., 2020, Office for National Statistics, 2021). Over and above these issues, the number of workers with HL is on the rise, causing more economic losses and healthcare costs to the community.

To act, there is a need to improve patients’ work participation, health and QoL. Efficient HHC can be the gateway. Research has shown that a simple intervention like fitting hearing aids is associated with better household income when compared with the income of households of people with unaided HL (Scholes et al., 2018). Therefore, basic interventions like fitting hearing aids need to be facilitated through easier access to audiology services. This research has outlined many barriers to healthcare necessities and efficient HHC for workers with HL, which include difficulty in accessing audiology services, insufficient funding and lack of resources. These barriers need to be removed to promote the quality of care and reduce the associated financial losses. The economics of HL in the labour market is a national matter and consideration of governmental HHC reform seems very worthwhile to counteract the economic impact of HL.

8.4 Reflections on the whole research

This section offers some reflections on the whole research methodology, quality considerations and research strengths and limitations. These will be discussed in the following three subsections.

8.4.1 Reflections on the methodology

This research project constituted a preliminary exploratory investigation. It was designed to accomplish that, especially with regard to exploring perspectives of healthcare for workers with HL. However, it is by no means enough by itself; rather, the results constitute preliminary insights that can help determine future research needs and clinical practice priorities. This exploratory research started with limited expectations, due to the dearth of evidence in this area, but with a lot of excitement and enthusiasm about learning how to conduct research and learning about workers with HL in the UK and their hearing care. Before undertaking this project, the researcher had had no previous experience of designing or carrying out qualitative research, and so this made it a challenging and interesting learning experience. There were many times during the different stages of the research process, as well as after the results were generated, when questions were raised and often changes were made.

There are plenty of ways to learn about something and generate knowledge in research. There is no single way that can yield complete awareness of a certain topic and achieve absolute accuracy. Therefore, what is important is maintaining thoughtfulness during and after the research. Reflexivity in research is necessary to refute assumptions and pre-conceptions, take actions and make mindful changes where and whenever possible to promote the researcher’s educative process and obtain as much mindful awareness as possible regarding the research products and what needs to be done to enhance them in future work.

Turning back and reflecting on this research project led me to reflect on some aspects of the methodology and how the results were constructed. Here, a few of these thoughts are explained. With regard to the patient participants, more thought should have been dedicated to considering their gender, cultural and educational differences when recruiting, and when collecting and analysing the data. These can constitute contextual factors that influence workers’ experiences and views of their HL, adaptation in the workplace and perspectives of audiology services. For example, people with disabilities have been found to cope better if they are better educated (Bengtsson and Datta Gupta, 2017). Gender differences have also been found among workers with HL; previous research suggests that women are more vulnerable and more affected by HL in the labour market (Gellerstedt and Danermark, 2004). The present research did not place enough focus on the gender, level of education or cultural diversity of adults with HL and these need to be considered in future research.

Reflecting on the analysis, thematic analysis revolves around generating themes or meanings from the data. It is seemingly easy but rather challenging. A common mistake is using thematic analysis to summarise data or topics (Braun and Clarke, 2019). Describing this matter, Braun and Clarke (2019) suggest that:

> *"Our conceptualisation of themes – as stories about particular patterns of shared meaning across the dataset – is confused with 'domain summaries' – summaries of the range of meaning in the data related to a particular topic or 'domain' of discussion."*

For the initial analysis of study 1, the researcher fell into this trap. The themes generated were more like summaries of the participants' answers to the interview questions rather than capturing the range of meanings (topic summary). To address this, the interviews and the results were revisited and amended repeatedly with the aid of the research team to make sure the analysis discovered the participants' shared meanings and used these to generate themes and subthemes of an adequate depth of information. The results then were improved to better capture meanings, behaviours and processes from the participants experiences and views. If the researcher could turn back the clock, more time would be dedicated to researching good and bad examples of thematic analysis in publications and theses in order to avoid this mistake.

8.4.2 Research quality considerations

Conducting the three studies with no previous experience in qualitative research required thinking about and evaluating the quality of this work critically. A few quality issues have already been explored briefly in each study chapter; however, they are explored here further to provide a comprehensive overview of how such issues were considered. Korstjens and Moser (2018) identified four primary quality criteria for qualitative research: credibility, transferability, dependability and confirmability. Those were used as an approach to research quality assessment.

Credibility

Credibility is one of the critical quality elements in qualitative research. It is concerned with making sure that the results are true or complete for the participants (Yin, 2015). To ensure credibility, reflexive notes were kept throughout the studies to reflect on myself and the strategies the researcher used. Doing that was of importance to emphasise self-awareness (Braun and Clarke, 2013). For example, the researcher kept notes of the following: the motivations to research this topic in particular, the decisions made while developing the study design of and why they were made this way, the researcher’s impressions after each interview, the researcher’s preconceptions and expectations regarding what the participants might be perceiving. For example, the researcher considered whether having been present in actual audiology appointments for workers with HL before conducing this research led to her having preconceptions and judgements on the data. To minimise this influence, the researcher noted those preconceptions, which encouraged self-awareness during the analysis and reporting. Peer examination was also applied. The researcher discussed the process step by step with the research supervisors, who have experience in qualitative research as well as clinical audiology practice. Having other researchers examine the work and seeing if they regarded the information as accurate helped ensure the credibility of the themes that were developed from the data (Krefting, 1991).

Another method that was used to ensure the credibility of the information was rephrasing the questions during the interview or asking the participants to expand on their answers (Krefting, 1991). Phrases like “Can you tell me more about this?” were frequently used. In addition, the researcher reframed the questions frequently and asked the same question to the participants more than once in the interviews. For example, the researcher asked the participants, “How do you think HL affects workers’ lives?” and then later asked, “What do you think are the direct and indirect consequences of HL on the lives of workers with HL?” Another example was when the researcher asked the audiologists, “Can you tell me about your appointments with workers with HL?” and on another occasion asked, “How do you think you assess your patients’ difficulties in relation to work?” or “Can you tell me to what extent do you think you assess your patients’ difficulties in relation to work?” This rephrasing helped to check that the participants gave consistent answers, which helped to establish if the information they were giving was probably true to them. In addition, it gave the participant a chance to expand and share more information and clarify any points that could be otherwise misinterpreted.

Finally, participant validation (called member checking) was carried out by sending a summary of the interim results of Studies 1, 2 and 3 to the participants and providing an opportunity for them to change and add information. Five participants responded for Study 1, 7 for Study 2 and 6 for Study 3, and all confirmed that the results corresponded with their experiences. Their feedback was taken into consideration, and minor amendments and additions were made to Study 1 results only.

Transferability

In this study, transferability concerns the applicability of the results to other audiologists/workers with HL in the population. The key to achieving this is having a representative sample (Krefting, 1991, Braun and Clarke, 2013). Attempts were made to purposefully sample a group of audiologists and workers with HL who were as diverse as possible. The audiologists exhibited a wide range of ages, qualifications, years of experience in the field, work in all types of audiology services and locations across the UK. The workers with HL were also diverse in many aspects, including age, location, area of work, work type and environment, onset, type and degree of HL, hearing technology use and where they were receiving their hearing care. The purpose was to make the samples as representative of the audiologists and workers with HL populations in the UK as possible. Furthermore, with the help of my supervisors, who have knowledge of the population of audiologists in the UK, the researcher nominated the sample of audiologists. In addition, online advertising was used to recruit workers with HL with as much diversity as possible in their characteristics. To enhance the transferability of the results, the characteristics of the participants are made available to the reader so that the reader is able to check if the results can be applicable to other audiologists and workers with HL (Braun and Clarke, 2013).

Dependability

Dependability is the consistency with which the researcher has analysed the data and the consistency of the results (Korstjens and Moser, 2018), and the instrument of consistency is the researcher. One of the methods that were used to check for dependability was the code-recode procedure (Anney, 2014). In this procedure, the researcher would examine the data and analyse it on one day, and later, on another day, analyse it again without looking at the previous analysis. Both analyses were then compared to check for similarity. This re-coding was conducted repeatedly for the three studies and resulted in no different results, and hence it helped in confirming the consistency in performing the analysis.

Another common strategy used to check dependability is checking replication of the results by asking an independent coder to code some or all of the interviews or parts of them and check the commonalities and discrepancies between the coders' results. For Study 1, the coding manual was shared with another researcher, KA, who is experienced in qualitative data analysis but not in the interview subject matter. Six interviews (24%) were analysed independently by KA, using the coding manual. Any inter-coder discrepancies were then discussed and inter-coder agreement was achieved (Campbell et al., 2013). This process resulted in no changes to the coding manual.

Confirmability

Although qualitative researchers admit that the researcher's characteristics, such as background, values and attitude, can have an effect on the research and it is impossible to separate the researcher from the research, those characteristics should not overshadow the reality as perceived by the workers with HL and audiologists, and the results should be to some extent confirmable if the research was done by another researcher (Anney, 2014). Keeping reflexive notes and having the research frequently discussed and examined by other researchers in the research team (peer examination) helped achieve this.

Moreover, to ensure that the interviews were conducted appropriately, a sample of the recorded interviews was sent to two of the research supervisors during the piloting stage of Study 1 to assess the interviews independently. Both supervisors have experience in qualitative research and are audiologists in clinical practice themselves, and the feedback helped me to advance my interviewing skills from the beginning of the research. Finally, it is hoped that the triangulation of perspectives in Chapter 7 helped to validate the research outcomes.

8.4.3 Strengths and limitations

As in any thesis or research, there are strengths and weaknesses. These can be thought of in two dimensions: topic related or methodology related dimensions. In the thesis, the researcher touched on many of these and here the researcher discuss some.

In relation to the research topic, this research offers key perspectives related to the UK population of workers with HL and audiology services. Similarly to many research projects, this research fills a gap in knowledge. The main points that need to be emphasised about this research are summarised below.

1. This research captured the multidimensionality of workers’ struggles from a work life and health perspective and placed it into a conceptual framework, Figure 19, above. This offers a synthesised summary of the available evidence. A recent scoping review criticised earlier studies of workers with HL for not using theory, for producing and reporting scattered results, and focusing on the topic from a HL perspective (Granberg and Gustafsson, 2021).
2. The same review by Granberg and Gustafsson (2021) emphasised the need to consider the interaction between the person and their work life context and the multi-level factors participating in this interplay (individual, work organisation and society-related factors). The perspectives reported and discussed in this research have given attention to various concepts around these factors. For example, the findings and discussion touched on the role of the patient’s personality, multi-morbidity, the social and physical work environment and deaf awareness in audiology departments, in work and in general society. This research showed how these influenced how workers with HL perceive the challenges at work and affected their coping behaviour and perception of audiology services. Many of these issues, including individual factors such as personality and attitude and deaf awareness have been overlooked in research about workers with HL so far.
3. It can be considered advantageous that the perspectives on audiology services were discussed in the context of the CCM and under the umbrella of PCC. These are trendsetting and innovative approaches in dealing with chronic health conditions, and are believed to be beneficial for patients, as discussed in the literature review. The results were mapped onto the CCM framework to offer a visual representation of the key issues affecting service delivery and health outcomes of workers with HL (Figure 21 above). Using the CCM helped to segregate the identified insufficiencies and frame them into the various elements and levels of the CCM, which helps guide practical and organised advancements in care delivery and future research.
4. The research in this project was implication-focused. It revealed a variety of opportunities for clinical and research advancements. These are discussed in previous sections and in the following Sections (Implications and recommendations and Emerging areas for future research).

5. The topic of this research is timely. As discussed in the literature review, the population of adults with HL is growing, for various reasons, including the working ones. Workers with HL as a population have not received much attention from the HL community until recently, especially in the UK. The focus has been on older adults and children affected by HL, bearing in mind that modern work life imposes additional challenges on top of what workers with HL already have to deal with, efficient support by audiology services appears to be becoming increasingly crucial to avoid or at least alleviate some of the detriments affecting the individual, society and the economy.

In terms of methodology, this research is considered to include the following strengths:

1. This research took into account the perspectives not only of patients but also service providers, to identify the services' constraints and needs. It is common in research to focus on service users' perspectives to guide improvements. Despite their importance, the perspectives of service providers' have received less focus in audiology research. Particularly, audiologists' perspectives in this particular area (workers with HL-focused research) have not been previously explored. Key issues and requirements were identified and would have been missed if the audiologists had not been interviewed. An example is their need for informational and educational support to offer better care for their working patients.
2. The triangulation conducted for audiologists and workers with HL perspectives in Chapter 7 helped in enhancing the validity of the inferences made and renders them more useful in terms of richer knowledge formation. The individual and common needed improvements were made more apparent in order to serve clinical practice.
3. There has been constant consciousness of the limits of this research, and reflexivity was practiced from the start. Although important insights were reported, it should not be looked at as a fact-finding approach. This research can be considered a preliminary explorative investigation. The first-hand knowledge produced can be used to probe and plan for more studies to validate the results and derive more knowledge.

Regarding the weaknesses, limitations specific to each study were reported in the relevant chapters (Study 1 in Section 4.4.2, Study 2 in Section 5.4.2 and Study 3 in Section 6.4.3). The following points touch on some general shortcomings in relation to the topic and methodology.

1. Richer insights could have been obtained if this research had included the perspectives of employers, work colleagues, significant others, decision-makers and policy-makers in services, hearing technology companies and other professionals such as hearing and

occupational therapists. Some research has reported on employers' perspectives (Gustafsson et al., 2014, Svinndal et al., 2020a) which contributed to the decision to prioritise exploring audiologists' perspectives, but no research has looked into the perspectives of the other groups, to author's best knowledge. Exploring their perspectives offers research opportunities in the future.

2. As in most research, the people who agree to take part in the research are classically perceived as more motivated. Their perspectives and behaviours can be influenced by their personality and thus influence the results. Therefore, the audiologists and workers with HL who agreed to participate may be not representative of their populations and could have different experiences and views from those who did not participate. This kind of bias in research is common and often hard to avoid. To minimise this problem, attempts were made to recruit participants through different methods (online adverts, audiologists recruited through their employer or department, word of mouth and snowballing).
3. The results of this study may have been influenced by the potential for self-reporting bias, which is common in health research (Althubaiti, 2016) and it could be particularly relevant to experiential research that looks into participants' experiences, as in this research project. Self-reporting bias could arise from recall bias or social desirability (Althubaiti, 2016). Regarding social desirability, the audiologists in this study could, for example, have over-emphasised how they care for and support their patients in relation to work life, to gain approval or social desirability. To minimise this, the researcher assured them at the beginning of the interview that the anonymity and confidentiality of their identities and the information they shared were guaranteed.

   Regarding recall bias, there is a risk that the audiologists and workers with HL provided biased information because of their memory abilities, and this is more common in health research than social desirability (Althubaiti, 2016), especially among patients. Patients commonly forget information from their appointments with their health professionals (Kessels, 2003). In the audiologists' interviews, it was interesting that occasionally, the audiologists mentioned not being sure about their ability to remember. The analysis could have yielded results biased by the participants' accuracy of recall; however, having many participants expressing the same experience makes it less likely. In an attempt to overcome any recall issues, the audiologists were asked to recall a case that they had in their clinics and the workers with HL to recall their conversation with their audiologists and comparing the different audiologists and services. Asking them to do that helped the participants remember their experiences and revealed further insightful information. Moreover, triangulation of the perspectives helped in assessing the validity of the information obtained from both the audiologists and workers with HL and reduced recall and data source-related bias.

4. Another issue worth mentioning is related to the psychology of asking and answering questions in research interviews. It is possible that the participants did not understand the question as it was intended. It is also possible that the researcher might have misinterpreted what the participants were trying to convey. To deal with this risk, the researcher committed to use the interview guide questions that were checked for clarity by the research supervisors and in the first four interviews when piloting. In addition, the questions were repeated or rephrased if the participant suggested that it was unclear. This was more of a problem with a few of the interviews conducted over the telephone, for workers in particular. However, after repeating or paraphrasing the questions, the problem was solved. To avoid misinterpreting what the participants were saying, the researcher asked them to further clarify what they were trying to say if the researcher did not feel confident that the participants perspectives were understood. the researcher used phrases like: “Can you please clarify this further?”. The results were also sent to all of the workers with HL and participating audiologists to be checked, and none of the participants complained about data misinterpretation.

5. Qualitative research in general terms is not the approach to take when looking for generalisable information. Trends can be identified in the data and can offer important common perspectives among the participants. But the samples in qualitative studies are usually smaller and it is difficult to know if their perspectives are similar to those of most of their populations (in this case, the UK population of audiologists and workers with HL). Therefore, as noted earlier in the thesis, this research does not aim to generalise the results. For the purpose of obtaining generalisable information, conducting a quantitative study utilising the results of this research would be more suitable.

8.5 Implications and recommendations

The evidence obtained from this and previous research demonstrates that workers with HL need support to address their work life needs beyond what is currently provided for them. There are difficulties in finding out where to get this support from, uncertainties regarding audiologists' role in that support, and difficulties in sustaining support, if it is found. Moreover, there is no clear evidence-based guidance to employers and audiologists regarding how to support the working population of adults with HL. There need to be more guidance to employers and monitoring of their support to workers with HL to commit to the Equality Act 2010, especially that workers with HL still report feeling stigmatized and discriminated against in the workplace. Based on the views of the audiologists and workers with HL in this thesis and previous research recommendations, there is a strong view that audiological rehabilitation should incorporate more personalised assessment and management for patients work life needs. The workers with HL demanded more support by audiologists and the audiologists also thought this could help; thus, it is suggested that healthcare policy makers and audiology services should consider the provision of more support. Policy recommendations are needed in this area, imposing a need for sufficient evidence to be collected to decide what interventions are practical, applicable, beneficial, cost-effective, and would positively impact workers with HL and should therefore be a priority.

Nevertheless, the current evidence, including that from this research, advocates many support methods and improvements. Based on this and previous research it is proposed that promising methods including counselling and assistive technology utilization and support should be looked at further and knowledge can be turned into action with positive outcomes. The results of this research have several implications for research, education, clinical practice and policy. Emerging areas for future research are discussed in Section 8.6 and a comprehensive list of recommendations is offered in Table 18 below. Taking these recommendations into the policy level still needs a lot of work. However, clinical practice recommendations include many simple steps, such as improving the way patients can contact audiology services. This should not be difficult to implement but can have a very positive influence on patients' experiences. Overall the suggested methods of improvement are thought to help facilitate better experiences for workers with HL in audiology clinics and in work.

Table 18: Recommendations for audiology researchers, clinical audiologists, services and policy makers.

Recommendation	**Elaboration**
Equipping audiologists and professionals dealing with workers with HL with updated knowledge and providing them with continuous training.	➢ Work-related learning in basic audiology education and ongoing learning and training during practice, to make audiologists aware that workers with HLs need a tailored approach that is holistic at the same time. For example, audiologists need to be aware that there are help services they can signpost workers with HL to, such as occupational therapists or ATW. ➢ Audiologists to take deaf awareness and counselling courses. For example, learning to listen with interest and empathy and maintain eye contact during the consultation, especially being aware that looking at the computer while speaking to patients makes it harder for them to lipread and see facial expressions. Previous research highlight the need for more focus on counselling in audiology education and training (Saunders et al., 2021). ➢ Developing an updated information database as a reference source that includes all the relevant information for audiologists and maybe patients to use. E.g. an online webpage that contains basic information related to workers with HL, including legislation and a list of help services with contact details. This directory could save audiologists from having to navigate convoluted pathways to information, especially when they face difficulties knowing what support is available out there, and have difficulties communicating with other services. Having all the required information in one place could help the audiologist to tell workers with HL directly what they are entitled to and what they need to do, which is likely to achieve better outcomes for patients. ➢ Establishing audiology guidelines on how to approach the workers with HL population. This might help ensure quality standards are followed and promote best practice. It might also aid audiologists in interacting efficiently with workers with HL, and ensure audiologists pay attention to the specifics of patients' work life needs and do not lose sight of "the bigger picture" at the same time.

Recommendation	**Elaboration**
Improving patients' access to services and the accessibility of audiology departments	➢ Offering flexible appointment timings, such as appointments convenient to their work time (extended working day or weekend appointments). ➢ Using HL-friendly modes of communication with audiology services, such as text messages, emails or online chat services. ➢ Tele-audiology can be used to get help without needing to visit an audiology clinic, and audiologists can make real-time adjustments when the patient needs them. ➢ Encouraging follow-up especially after the three "assess and fit" appointments, because many patients might need further advice when difficulties at work occur and they might need further advice and adjustments to their devices. Workers with HL demanded consistent support by allowing more appointments and limiting the number of audiologists for each patient, to maintain continuity of care. ➢ Maybe assign some clinics for working adults just as there are paediatric audiology clinics. ➢ Professionals in the department including audiologists and receptionists to face patients, to ensure they can lipread properly; repeat and, even better, rephrase sentences when not heard and make sure the room is quiet and well lit and use visual display boards in their waiting areas to alert patients when it is their appointment time.
Developing relevant resources	➢ Allow more time for appointments, when needed, to enable audiologists to discuss work needs along with general life needs and write down important information like goals, diagnosis, plan, and next appointment. This could also offer opportunities to ask questions and explain issues in the appointment. ➢ Leaflets and booklets relevant to working-age adults to provide patients with written information from the consultation. Written information has proved to have a variety of benefits for patients in various health fields (Harrison-Woermke and Graydon, 1993, Humphris et al., 1999, Little et al., 2001) and could be helpful. At the least, this would ensure patients receive important material from audiologists and can later remember what

Recommendation	**Elaboration**
	has been discussed in the appointment to avoid recall problems. ➢ Check-list of specific things that audiologists could ask working-age patients about. They can ask patients if they have difficulties in meetings, for example, or ask about their employment status, without forgetting to ask about their wellbeing ➢ Workshops, such as telephone workshops, to aid workers with HL to function better at work. For example, hearing professionals can inform patients about helpful strategies to improve telephone accessibility at work (for a review please see (Koerber and Jennings, 2020). ➢ Support groups of working-age people with hearing difficulties could be helpful for sharing practical tips and getting information and psychosocial support. ➢ Suitable speech tests and time in the appointment to be able to conduct them. This could assist audiologists with counselling workers with HL.
Improving patients' access to and utilisation of hearing technologies	➢ Obtain funding for assistive devices besides hearing aids and cochlear implants to address work needs. ➢ Consider patients' specific work needs and psychosocial concerns when choosing between the available hearing technologies. ➢ Making allowance for work needs in the criteria for getting a cochlear implant from the NHS. ➢ Making equipment available in audiology departments for demonstration. ➢ Continuously training audiologists with regard to ALD.
Promoting and enabling self-management	➢ Enable workers with HL to take part in their own management by empowering them with information, skills and methods of self-support. Many workers with HL stated they found information online instead of taking it from the professionals. For example, audiologists could give patients information about self-care at work, including coping tips. Another example could be audiologists instructing workers with HL how to change their hearing aid tubes, how to clean them or how to troubleshoot them if the aids are not functioning properly. Another example could be advising patients to use certain devices to suit their needs at work and mobile apps to make adjustments to their hearing aids at work, when needed.

Recommendation	**Elaboration**
Multidisciplinary team approach	➢ Having a team of professionals trained in offering specific parts of the support might aid audiologists and patients. Teamwork is considered beneficial in healthcare (Mesmer-Magnus and DeChurch, 2009). Splitting support between more than one specialist might help solve the restricted time issue in audiologist-workers with HL appointments and allow them to have better interaction. For example, hearing therapists can help in counselling and offering coping and psychosocial support. They also can help in the practical side of work issues, including giving patients tips on what can help them at work, whether in terms of adjustments or devices. Social services and occupational therapists can also help in obtaining funding and making accommodations.
Establishing effective communication strategies between audiology services, the other support services (e.g. charities and external organisations) and the workplace	➢ Allowing efficient collaboration and information sharing. Audiologists can pass information to patients' workplaces to inform their employers and colleagues and advise them how to ease the situation at work and help workers with HL function better at work. ➢ Employers can contact audiologists to ask for information or advice. ➢ External organisations and charities funding support programmes such as ATW can communicate with audiologists to make shared support decisions that are tailored to patients' needs.
Raising deaf awareness in patients' workplaces	➢ Audiology or non-audiology health professionals can work on increasing employers and co-workers deaf-awareness and advise them on how to support workers with HL in the workplace. ➢ An online resource can also be developed to offer awareness training for workers with HLs' colleagues and employers.
Encouraging the design of high quality research relevant to workers with HL	➢ This is needed to establish a bank of evidence-based knowledge about this population and help inform audiology practice. Research in this area is much lacking and is urgently needed with the growing numbers of workers with HL. Making cost-effective management decisions with the absence of high-quality evidence that is directed to this population can be very hard.

8.6 Emerging areas for future research

The work life and healthcare of workers with HL are increasingly important areas for research at the UK and international levels. Research in this area is still insufficient, and there is abundant room for designing and conducting future studies. Although this thesis offers plenty of future research directions throughout, some additional thoughts are offered in this section. The results, supported by previous research results, suggest that patients' personality, attitude and gender all influence the extent to which workers with HL are impacted by the HL or how they perceive the challenges faced at work and how they cope. Thus, the role of personality and factors pertaining to the individual worker could constitute the object of future studies in the disciplines of both audiology and psychology. Moreover, there is a need for research onto how to minimise the detriments and challenges faced by workers with HL.

The results of this exploratory research suggest that there are multi-level issues concerning the delivery of workers with HLs' hearing care service that need to be further looked at and addressed. Research is required at the micro level (patients and audiology service providers), meso level (local health systems and local organisations such as hospitals), macro level (national health system) and international level. There is also a need for more high quality research to look at matters relating to HL in work life from many angles, including the theoretical, behavioural, epidemiological, psychological, socio-cultural, financial, technological and interventional aspects, as well as health policy and system research. The thesis includes numerous suggestions for future studies in these areas. The results of this research also encourage investigating governmental and charity support to identify areas for improvements. It would be valuable as well to research the education and training needed for audiologists regarding how to support workers with HL as discussed earlier in the thesis.

Although the results of this research concerning the facilitators and barriers to efficient HHC for workers with HL in the UK are insightful, they are not intended to fully theorise at a deep level the underlying causes of the reported shortcomings in HHC because the reality of these factors is likely to be more complex. However, these results could serve as first-line knowledge in forming the basis for more research in the field. For example, this research indicates deficiencies in self-management support, especially with regard to informational support. A study can be designed to empower audiologists and patients with information and self-management support tools and examine the outcomes. Convery et al. (2019) argue that self-management support can improve clinical practice and patients outcomes, as the CCM suggest, making it a worthwhile area for future work.

The facilitators and barriers can also inspire other research ideas. For example, this research has suggested that the availability of advanced hearing technologies in audiology services influences how both audiologists and workers with HL perceive this support. A mixed-methods study could initially quantify how often this management is offered and used and assess subsequently the benefit to workers with HL who used them. This could be followed by a qualitative grounded theory investigation to theorise, for example, why this management is not being routinely offered or mentioned in audiology consultations. This could be followed by designing a feasibility study for an intervention such as improved access to hearing technologies to improve support by audiology services. Another example is research based on grounded theory to theorise why investigating patients' work life needs is not routine in audiology consultations.

Conducting Health Policy and System Research also is very much needed to better understand how HHC for workers with HL is planned, arranged, funded, provided and used (Gilson and Organization, 2013). It can also be used to investigate how policies relating HHC are developed, prioritised and implemented (Gilson and Organization, 2013). This information can then be used to develop policies and implement positive changes to the healthcare of workers with HL, at both UK or international level. Health Policy and System Research would be of particular importance in this area because this study and previous research have indicated the presence of multi-level deficiencies (at macro, meso, micro levels) in the components of the health system operating to deliver the hearing care for workers with HL. These components are considered important elements of Health Policy and System Research (Gilson and Organization, 2013). Health Policy and System Research can be conducted following the new insights gained from this primary exploratory project to further understand the identified issues through descriptive, explanatory and emancipatory research (Gilson and Organization, 2013).

In addition to what has been covered here and in previous chapters, other research recommendations can be a priority and should be considered vital for translating findings into real-life action. The priorities for future work can be split into two types of research: first, it would be helpful to quantify the generated knowledge. For example, conducting a quantitative survey to estimate how generalisable the results of this thesis are can help show what issues are common among the populations of audiologists and workers with HL. It can also help in identifying what issues could be worth designing an intervention for at the level of the UK. The triangulated perspectives of the audiologists and workers with HL can form the basis of the survey questions targeted to audiologists and workers with HL from all across the UK. Alternatively, future work can use the themes generated from each group (audiologists and workers with HL) to create separate surveys for audiologists and workers with hearing loss. Then, integrating the qualitative and quantitative elements of the generated knowledge can form a solid evidence base to guide health policy changes.

Second, Patient and Public Involvement research can be conducted to design an intervention. It could be very useful as a next step moving forward from this project. Patient and Public Involvement research can be a significant tool of implementation research despite its underutilisation in the field of audiology. Through it, workers with HL, audiologists and people in the workplace can get together to plan and conduct research, e.g. a study of an intervention to help workers with HL adjust better in the workplace. The intervention could be, for example, a mobile application that allows workers with HL and employers to communicate with the audiologist and allows the audiologist to make real-time changes to the hearing device of the workers with HL when in difficult listening situations. The application could also contain information for workers and employers on tips and useful resources and enable adjustments to be made to hearing devices. Research on hearing telehealth indicates that this medium could be a feasible way to improve the efficiency of HHC and can benefit adults with HL and empower self-management (Swanepoel et al., 2010, Eikelboom and Swanepoel, 2016, Habib et al., 2019). This intervention would be of particular benefit for current and future generations of workers with HL who are relatively young and can use technology. It could also be time-efficient for the patient, employer and audiologist, who are all time-constrained due to workloads. The workers with HL, employer and audiologists could be interviewed in a series of three qualitative studies to help design, develop, assess and optimise this intervention. Digital behavioural interventions supported by technology is flourishing in healthcare and audiology, and in the context of this thesis, it could transform the work lives of many adults affected by HL.

8.7 Conclusions

The literature review indicated that there is a lack of adequate and quality knowledge about workers with HL and their rehabilitation. Overall, this thesis suggests that individuals with HL in the UK experience and cope with numerous challenges and disadvantages in their working lives. This is consistent with previous research at the international level. Workers with HL need personalised, multifaceted and constant support to adapt to their working lives. Nevertheless, their needs appear to be largely unmet by audiology services, despite these being the main point of contact for most workers with HL in the UK. According to both audiologists and workers with HL, various factors render audiology support for the working environment ineffectual and underutilised. Key conclusions and contributions of this thesis are summarised in the points below.

- HL can have a substantial and multidimensional impact on working adults that has been explored in-depth in this thesis. Many aspects of their lives, including auditory elements, professional life, and psychosocial health can be adversely affected and are directly influenced by significant contextual factors such as work environment, personality, and choice of coping strategies. These lead many of them to have unfulfilled career and life prospects and jeopardises their health and wellbeing.

- The most pronounced and commonly reported detriment appears to be to the psychosocial health of the individual, which influences coping ability and vice versa. HL in the workplace can impose substantial emotional and mental struggles, including experiences of stress, embarrassment, stigma, mental exhaustion, and physical fatigue. These negative experiences appear to trigger emotional and maladaptive coping behaviours such as avoidance and withdrawal instead of problem-focused coping approaches.

- This thesis presents a conceptual framework constructed using previous research and the triangulated results of this research to demonstrate the complex interplay between the impacts of HL and the various factors influencing them. It also demonstrates the proposed negative ripple effect on the inner circle of personal and professional relationships and work organisation and the outer circle of communities and national economics. It is hoped that this framework can constitute a useful template for researchers, health professionals and decision-makers to inspire further research and guide the issues needing attention in workers' healthcare.

- How audiology services support workers in the UK appears to be variable between audiologists and services but can be generally considered inadequate. Significant barriers at the level of the patient, audiologists, audiology services, charities, government and health system contribute to a picture of suboptimal and non-personalised care. Most barriers constitute fundamental healthcare quality benchmarks such as access to services, staff deaf awareness, information support and audiologists' competencies. Moreover, audiologists' and other professionals' roles in work support, such as occupational therapists and social workers, are blurred and require clarity to establish clear standards of care for this population and encourage interprofessional communication and knowledge sharing.
- Recommendations for clinical services: Improving audiology care for workers with HL will be a big step towards improving individual wellbeing, work practices, society and the economy. Audiology assistance needs to extend from a hearing aids-focused approach to involve person-centred support with communication aid tools, self-management support, information, and mental, emotional, and social support in adapting to and dealing correctly with the work conditions that workers with HL believe to be unmanageable.
- These forms of support should originate not only from audiologists but also from the individual, work organisation and the healthcare system. It is not the sole responsibility of workers with HL and audiologists to influence the workers' capacity to cope in the workplace. Audiologists also need to be supported by their departments and the healthcare system to offer improved care for their patients, for example, via improving resources, funding, education, training and informational support.
- This research is timely as the number of workers with HL is increasing. It is essential to attend to workers' and audiologists' concerns and needs to inform services and help take down the barriers, remove inequalities and develop practical steps to innovate and advance hearing care quality to improve patients' outcomes. This thesis offers plenty of insights into future research and clinical practice recommendations to deliver equity, inclusion and quality in the hearing care for workers with HL.

Appendix A The risk of dementia among workers with hearing loss

Hearing loss: a modifiable risk factor for dementia

Recently, there has been an increasing focus on the relationship of HL, cognitive decline and dementia. In this section, the relationship between dementia and HL is discussed and in the following section of this appendix (Dementia risk among workers with HL), this relationship will be linked to work life. Dementia is not a disease by itself; it is a collection of symptoms related to decline in cognitive performance, such as impaired memory, impaired decision-making and inability to perform a task. The causes and risk factors of dementia are numerous. The most common cause is central nervous system disorders, of which Alzheimer’s disease is the most common. In contrast with HL, dementia is not considered a regular age-related phenomenon, it is pathological, and at the same time, it is strongly associated with ageing (Vardarajan et al., 2014). Dementia is most common among people over 65 years old (Vardarajan et al., 2014).

Both HL and dementia are increasing in prevalence over time, and both are associated with ageing. It is estimated that by the year 2050 the prevalence of HL will double (WHO, 2018a) and the prevalence of dementia will triple worldwide (WHO, 2017). The global burden of HL and dementia is expected to rise as a result. Interestingly, there is an increasing belief that HL and dementia are linked in some way; however, the nature of this link is still vague, and the WHO did not acknowledge this association in its latest statements about dementia (WHO, 2017). There is a growing body of research demonstrating that HL is an independent risk factor for dementia, and suggesting that treating HL can modify the risk of dementia and possibly prevent it (Lin et al., 2011, Thomson et al., 2017, Wei et al., 2017, Amieva et al., 2018). The mechanism of their association is still under investigation, and many researchers have developed theories to explain how HL can increase the risk of dementia (Figure 22). Figure 22 shows the three commonly argued theories; the common cause theory, the cognitive load/ listening effort theory and the social isolation theory.

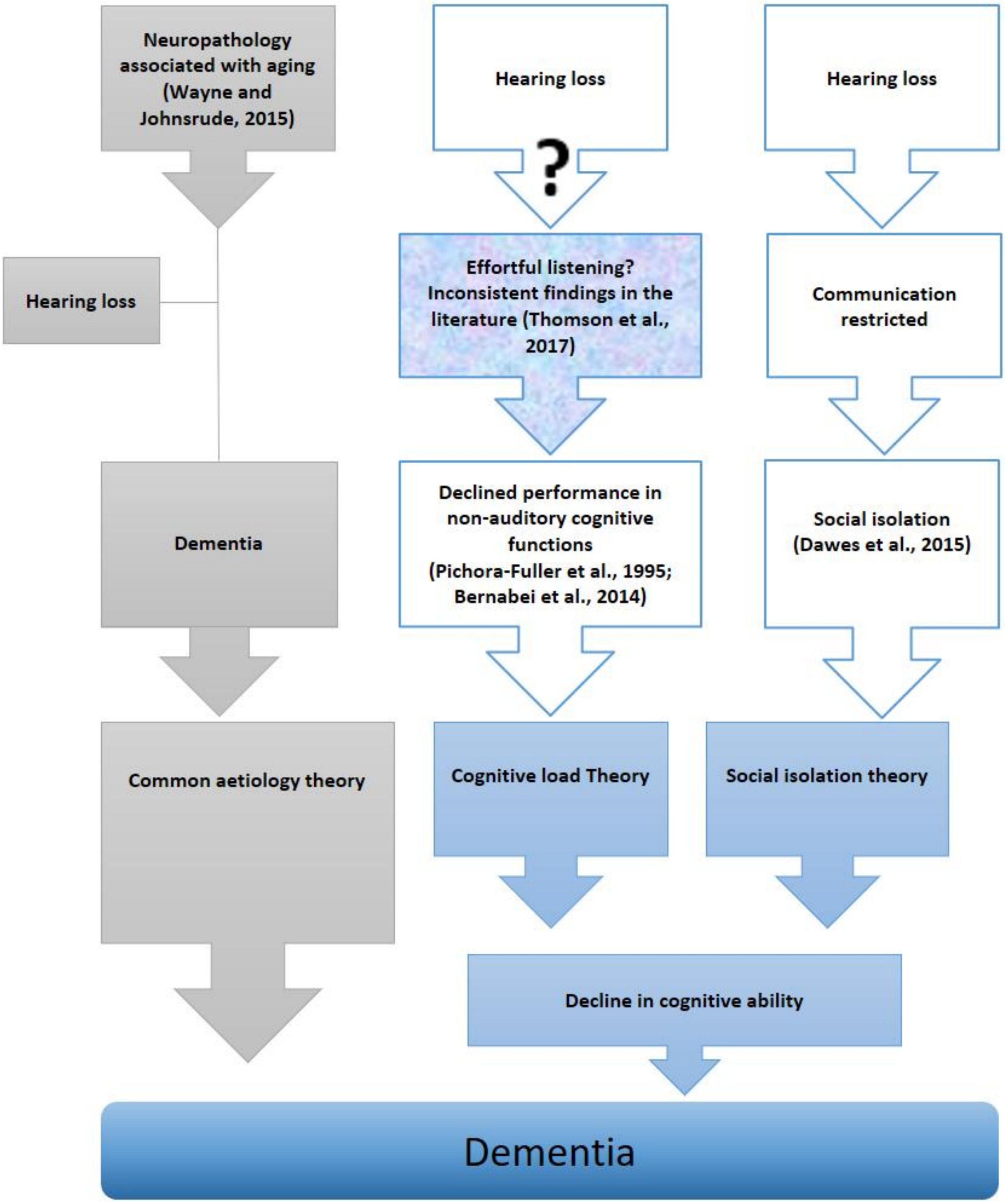

Figure 22: A diagram showing the three theories explaining the reason behind increased risk of dementia due to HL (Pichora-Fuller et al., 1995, Bernabei et al., 2014, Wayne and Johnsrude, 2015, Thomson et al., 2017).

As mentioned previously, dementia symptoms occur due to declining cognitive function. It is also well known that HL is associated with cognitive decline, independently from age-related diminished cognitive ability (Uhlmann et al., 1989, Lin et al., 2013). Possibly, there might be one common aetiological factor that causes both HL and dementia. An example can be small vessels disease affecting the cerebrum and the cochlea leading to increased risk for dementia and HL respectively (Eckert et al., 2013, Bos et al., 2018, Tan et al., 2018). Some authors suggest that peripheral as well as central nervous system changes that occur with ageing (loss of neurones, and decreased synapsis) might be the reason behind the development of dementia in elderly with HL (Martini et al., 2014). Nevertheless, it is most likely that this potential common cause is affecting the cognitive processing part of both, because it is the common process between them (Gates et al., 2010). Gates et al., (2010) studied the cognitive function (executive task performance) and peripheral and central auditory status (Pure tone audiometry, auditory evoked potentials, synthetic sentence identification with same side competing stimuli, dichotic sentence identification, dichotic digits) for 313 elderly adults, to explore the relationship of central auditory processing with cognitive decline and dementia. They found that central auditory processing dysfunction is associated with lower performance in cognitive tasks. This association was not present between peripheral hearing status and cognitive functioning. Their findings suggest that the higher psychological processes of hearing and cognition are interrelated, and it is not unlikely to have a neurological pathology that interferes with both hearing and cognition. Martini el al.(2014) debates the idea that HL is a risk factor for dementia, especially if we consider that a common cause leads to both. They argue that if the common cause theory is the sole correct theory, HL should not be considered a risk factor for dementia; instead, it can be considered an early manifestation of it. The fact that there are numerous recent studies confirming that HL is indeed an independent risk factor for dementia (Lin et al., 2011, Livingston et al., 2017, Thomson et al., 2017, Wei et al., 2017, Amieva et al., 2018) makes the common cause theory less likely to be the sole explanation.

The second possible explanation of the relationship of HL and dementia is the psychosocial theory. This theory suggests that the social isolation that results from inability to communicate due to HL is likely to be responsible for cognitive inactivity, and consequently cognitive decline and dementia. Social isolation is known to be associated to dementia independent from hearing status (Fratiglioni et al., 2004). The social isolation theory seems reasonable, but there is some evidence that the association of HL with cognitive decline is independent from social isolation (Dawes et al., 2015). This suggests that it cannot be the sole theory, like the common cause theory. The third theory is the cognitive load theory. Pichora -Fuller, Schneider and Daneman, (1995) reviewed this theory and suggested that HL leads to increased demand for cognitive auditory signal processing, and because human cognitive resources are limited, this diverts cognitive functioning away from other cognitive activities, leading to negligence over time and consequently dementia. This increased demand for cognitive processing is perceived as effortful listening. The literature contains numerous studies evaluating listening effort in hearing impaired people, and still there is no definite answer regarding whether HL makes listening effortful or not (this is further discussed in the following section). Generally, the current three theories have advanced the understanding of how HL can lead to dementia; however, each of the common cause and social isolation theories are unlikely to be the sole acting pathways, and the cognitive load theory needs further validation. It is also likely that the three theories together contribute to the increased risk of dementia and not only one of them. The next section will look further into those theories, especially the cognitive load theory, and relate them to the work life of hearing impaired people.

Dementia risk among workers with hearing loss

Audition in the workplace is not only determined by speech hearing and listening. It is essential to recognise other aspects in relation to audition, such as cognition. Auditory cognition seems to be the missing piece of the puzzle. The literature contains less research focusing on the real life auditory experience that considers auditory cognition compared with speech hearing. Many of the available studies test the patient’s ability to hear speech sounds in different background noise. However, real-life listening is influenced by many other variables such as cognitive ability, and the presence of demanding cognitive tasks such as communicating in an important work meeting, which includes processing for sound localisation, listening, semantic processing, visual processing, emotional status and mental health. In addition, the acoustic factors of the workplace could be influential, such as reverberation.

There is a strong pattern of shift in the workforce overtime as the available jobs are becoming less physically demanding and more cognitively demanding because technology has taken over a lot of manual work (Mermin et al., 2008, Deloitte LLP, 2015). Cognitive ability has become more and more essential for current and future jobs. As machines have taken over some manual work, new jobs have been emerging over the last few decades, and those jobs require a higher need for efficient cognitive functioning such as reasoning and decision-making. According to Mermin, Johnson and Toder, (2008), jobs that require high cognitive ability increased by 35% between the years 1971 and 2007, and they are likely to increase at a fast pace in the future. The implication is that future workers will need their cognitive ability to be maintained and enhanced to be able to stay in work, which is challenging. Having hearing-impairment makes the workers’ cognitive functioning even more challenging. For example, one of the imposed challenges on workers with HL could be multitasking with HL. workers with HL, when in a conversation, have to work hard to work out what was said, and at the same time, they need to deal with other cognitive tasks such as why the speaker said it, and what the speaker meant, and how to respond. All of these are required for effective communication with others in the workplace (Boothroyd, 2010).

Researchers have shown that Workers with severe/ profound HL suffer from overtiredness, and they elaborated on that suggesting that workers with HL strain at the workplace to participate in meetings or communicate with co-workers (Ringdahl and Grimby, 2000). People spend a significant amount of their day at work. If workers with HL work hard to communicate effectively and multitask at work, their demand for cognitive processing might increase. For example, if a workers with HL was in a business meeting, they might need extra effort to hear people talking, especially if the background was noisy. At the same time, they need to process the language for its meaning, to understand what others are saying. In addition, there might be other cognitively demanding tasks that occur effortlessly and spontaneously in normal hearing people, such as working out the source of sound, to know who is speaking, or maybe their thoughts and concerns during the meeting if they did not pick up everything that is being said, and thoughts about what they should do, such as asking people to repeat what they said. Having to work out all of this at the same time might be overwhelming for a hearing-impaired person. It does not only take them extra effort to hear, but also to process the picked-up auditory signal, to identify its source, and to react to it, if needed. This increased effort may become further complicated in people who experience cognitive decline due to ageing or social isolation, and in people who have certain conditions such as visual or memory difficulties that require further mental effort.

It is believed that humans have limited cognitive capacity (Kahneman, 1973, Buschman et al., 2011) that varies between people (Fukuda et al., 2010). Consequently, when there are simultaneous cognitive processes, they compete for the available cognitive resources, and this could lead to detrimental influence on task performance or incur a time cost to be able to juggle cognitive resources between the different tasks (Delbridge, 2002). If HL makes listening effortful, a workers with HL may need to exert extra effort to communicate effectively at the workplace, and much of their cognitive capacity might become occupied by the listening task, leaving less space for other tasks: the cognitive load theory (Thomson et al., 2017). The core question is: is listening effortful in hearing-impaired people? Some research in the literature suggests that HL affects listening effort (Hicks and Tharpe, 2002, Kramer et al., 2006, Luts et al., 2010) and consequently increases the cognitive load. Ohlenforst et al., (2017) challenged this suggestion and did not find high-quality evidence to support it. They also found inconsistent findings regarding this issue.

In their systematic review, Ohlenforst et al., (2017) reviewed the literature to answer two questions: 1. Is listening effortful for hearing impaired people? 2. How does hearing aid usage affect the listening effort? Forty-one studies were included in their review. Regarding the first question (is listening effortful for hearing-impaired people?); they found that different methods of measuring listening effort produced different results. Subjective and behavioural measures, such as self-rating and dual task performance test (DTP) respectively, did not demonstrate an increased effort with HL. On the other hand, physiological tests, such as electroencephalography (EEG), showed a higher listening effort with HL. The authors attributed these discrepancies to various factors, for example, the EEG findings could be reflecting the change in brain electrical activity due to incoming sound signals (whether from speech or background noise), rather than the response to it, such as the perceived listening effort or the behavioural reaction to sounds. Another explanation is that the measured listening effort of hearing impaired people might be affected by various factors that are unknown, such as age, gender, and the severity of HL or the characteristics of the sound stimuli used. Overall, it is still unclear whether HL increases listening effort or not. What further supports the fact that the current evidence is inconclusive is the lack of significant improvement with amplification, based on reviewing the results of subjective, behavioural and physiological methods (Ohlenforst et al., 2017). The systematic review of Ohlenforst et al., (2017) has shown that there is a need for high quality research, with consistent methods and outcome measures to understand the effect of HL on listening effort. Moreover, their review has thrown up many questions in need of further investigation: one question could be: What are the factors that influence the listening effort of people with HL? Or: What is the most valid method to measure the listening effort?

If HL has been proved to cause increased listening effort, as the physiological tests have shown, managing HL might alleviate it, and subsequently inhibit the development of dementia. Similarly, minimising social isolation due to HL might lessen the risk of dementia. Can working modulate these two pathways? Possibly, being a worker while having HL increases the listening effort demanded, and the stress associated with it, causing higher cognitive load and consequently, earlier dementia. Fatigue, stress, and the need for recovery after work are known to be at higher levels for workers with HL, as discussed previously, and it is possible that these effects result from mental fatigue due to increased listening effort in the workplace. It would be interesting therefore, to explore with patients and understand what they actually feel, and why they feel tired at work and distinguish tiredness, fatigue, stress and effort from each other. It would be also interesting to measure their listening effort at work to understand their difficulties.

Social isolation and the risk of dementia among workers with HL can be thought of in a different way; some evidence suggests that being at work might lessen social isolation and consequently decrease the risk of dementia (Ringdahl and Grimby, 2000). Ringdahi and Grimby (2000) studied the QoL of people with severe and profound HL using questionnaires including the Nottingham Health Profile. The QoL was estimated according to several outcomes, including subjective rating of lack of energy and social isolation. They found that hearing-impaired people who have full-time employment are less affected by social isolation and lack of energy than part time workers and those on disablement benefit. Full-time workers with HL might be less prone to social isolation than those who do not work or part timers, because they potentially communicate with people in the workplace for a significant amount of their daily life. Nevertheless, some studies showed that workers with HL report feeling isolated within the workplace because of their HL (Mathews, 2011); therefore, engaging workers with HL socially in the workplace is important and might improve their QoL and diminish their risk of getting dementia. This indicates that not only managing HL might modify the risk of dementia, but also keeping people with HL effectively engaged in the workforce may also do so.

As discussed above, HL has been proven an independent risk factor for dementia recently, and the mechanism is still a vibrant research material. This would, therefore, lead us to the question of whether managing HL would prevent or delay the onset of dementia. There is still a paucity of evidence into that; however, the use of hearing aids is known to reduce social isolation and therefore might lessen or prevent the cognitive decline associated with social isolation due to HL. Dawes et al., (2015) investigated whether use of hearing aids leads to better cognitive functioning, and if social isolation is the mediating factor. They used the UK Biobank data and tested 164,770 participants aged 40 to 69 years for their hearing using the Digit Triplet Test, and for their cognitive function using computerised cognitive tests in the period from 2006 to 2010. They found that better cognitive performance was associated with hearing aid use, and this association was independent from social isolation. Maharani et al., (2018) also showed that hearing aid use profited cognition in a longitudinal study among older adults. These preliminary evidences indicate that intervening with HL to counteract dementia could be promising. Therefore, hearing care services should be involved to help workers with HL maintain their jobs, and minimise the negative impact of their HL on their lives, as they play a quintessential role in HL management.

Appendix B Data analysis excerpt

An example extract from one of the audiologists interviews showing the development of initial codes. ENT: Ear, Nose and Throat specialist, GP: General practitioner, NHS: National Health Services.

Excerpt	Low level code	High level code
"Social services, I just discovered this, because I chase them and I said, "Look, I have several patients with this type of loss. What can I do?" "Oh, I don't know, I'm going to pass to this department. Oh, I don't know, I'm going to pass to this lady." And then, "Oh, this lady will mail you next day, to tell you," no email c:ame through. So, it was a big barrier to get in touch, to know the extra solutions for my patients. And it is also a barrier from the NHS, itself. So, for example, we are suppliers of NHS hearing aids but then we have no communication with ENT or GPs. And when you try to approach them, they are too busy for you." (P 6 AR IndC)	Audiologist recently knowing about social services	Finding communication with other services difficult
	Audiologist contacting social services	
	Audiologists asking social services what to do	
	Difficulty communicating with social services	
	Seeing communication difficulties as a big barrier	
	Contact social services to obtain information about patient support	
	Communication issues are a barrier from the NHS	
	Lack of communication with NHS ENT	
	Lack of communication with NHS general practitioners	
	NHS ENT and GP don't have time to talk to audiologists	

Appendix C The Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist.

Topic	Item no.	Guide Questions/Description	Additional information	Reported on page No.
Domain 1: Research team and reflexivity				
Personal characteristics				
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	Margaret Zuriekat	57
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	Margaret Zuriekat: PhD (in progress), MSc, CHSOtorhinolaryngology (Certificate of higher specialisation in medicine (Otorhinolaryngology) from the university of Jordan), JB (ENT) (Jordanian Board in Otorhinolaryngology (Ear, Nose and Throat)), MBBS (Medicine Bachelor and Bachelor in Surgery). Hannah Semeraro: PhD, BSc. Victoria Watson: PhD, MSc, CS. Daniel Rowan: MSc, PhD. Sarah Kirby: PhD, MSc, BSc.	-
Occupation	3	What was their occupation at the time of the study?	Margaret Zuriekat: PhD candidate. Hannah Semeraro: lecturer in Audiology. Victoria Watson: Senior teaching fellow (Audiology) Daniel Rowan: Associate professor in Audiology and Director of programs (Audiology) Sarah Kirby: Associate professor in psychology.	-
Gender	4	Was the researcher male or female?	female	57 (herself)

Experience and training	5	What experience or training did the researcher have?	MZ was trained through several qualitative research workshops offered by the University of Southampton. She also attended a qualitative research course (module) before conducting the research which covered the principles of qualitative research in detail. Some of the other authors (Sarah Kirby and Vicky Watson) are experienced in qualitative research and published audiology qualitative research papers. They helped in training MZ how to conduct the research.	-
Relationship with participants				
Relationship established	6	Was a relationship established prior to study commencement?	Only for the purpose of the research for most of the participants. The researcher had a pre-existing relationship with 3 of the participants due to sharing the same academic environment.	67 (that a few participants were known to the researcher)
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	All the participants had the research topic explained and knew that the interview is for research purposes and is part of a PhD study.	57
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. bias, assumptions, reasons and interests in the research topic	The researcher reflected on these issues in page 209 and explained how she practiced reflexivity and dealt with preconceptions.	209 and 211
Domain 2: Study design				
Theoretical framework				

Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Thematic approach with some grounded theory methods borrowed.	58
Participant selection				
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Purposive sampling.	56
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	The participants were approached through a broad range of methods including face to face, email, telephone and social media. The details are available in each study chapter.	Pages 64, 67, 100 and 102
Sample size	12	How many participants were in the study?	Study 1: 25, Study 2: 24	Pages 66, 67 and 101
Non-participation	13	How many people refused to participate or dropped out? Reasons?	Non	-
Setting				
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	Data was collected through a wide range of methods and included online video calls (Skype, Facetime), telephone, face to face in a professional location e.g. the participants workplace, or a meeting room in the University of Southampton or instant massaging.	Pages 67 and 102
Presence of non-participants	15	Was anyone else present besides the	No	-

		participants and researchers?		
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	Presented in Tables 8, 11 and 12	Pages 65, 97 and 98
Data collection				
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Yes, they are provided in tables 9 and 13. Yes, the few initial interviews where conducted for piloting and were included in the final analysis.	Pages 66 and 99 58
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	No	-
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	Audio-recording	57
Field notes	20	Were field notes made during and/or after the interview or focus group?	Yes	60
Duration	21	What was the duration of the interviews or focus group?	Study 1 mean= 24.6 minutes Study 2 incorporated varied methods of interviewing including instant messaging and the duration was not calculate.	68
Data saturation	22	Was data saturation discussed?	Yes	57
Transcripts returned	23	Were transcripts returned to participants for comment and/or correction?	No	-
Domain 3: analysis and findings				

Data analysis				
Number of data coders	24	How many data coders coded the data?	Only the main researcher for the whole project. For study 1, an independent coder coded some of the interviews to check for reliability.	58 Pages 60, 69 and 211
Description of the coding tree	25	Did authors provide a description of the coding tree?	Yes	Figures 8-16
Derivation of themes	26	Were themes identified in advance or derived from the data?	It was derived from the data (inductive approach).	58
Software	27	What software, if applicable, was used to manage the data?	Yes, nVivo software was used.	59
Participant checking	28	Did participants provide feedback on the findings?	Yes. The results were sent to all the participants and some responded with feedback.	210
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Yes. These are available in the results sections of each study (Sections 4.3, 5.3 and 6.3)	Pages 67, 100 and 142
Data and findings consistent	30	Was there consistency between the data presented and the findings?	Yes	-
Clarity of major themes	31	Were major themes clearly presented in the findings?	Yes, and these are clear in the results sections of each study (Sections 4.3, 5.3 and 6.3)	Pages 67, 100 and 142
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	Yes, all minor themes are explained in the results sections (Sections 4.3, 5.3 and 6.3)	Pages 67, 100 and 142

Appendix D Study 1 participants' demographic questionnaire

Study title: Hearing healthcare for hearing impaired workers: Audiologists experiences, views and awareness

Researcher name: Margaret Zuriekat

ERGO number: 40993

Participant number: Age: Gender:

1. **What is your current work status?** (*Encircle your answers please)*
    - Type of work:
      Full time worker Part time worker
    - Area of work:
      Adult rehabilitation clinics Vestibular clinics Paediatric clinics
      Others: *(please specify)* ____
    - Type of service:
      Any qualified provider (AQP) (this includes the NHS) Private sector
      Others: *(please specify)* ____
2. **Please state which qualifications you currently hold**

   (You may state more than one)

1.
2.
3.
4.
5.

3. **Please state your job title in the space provided:**

   ____

4. **Please indicate how many years of experience you have in Audiological clinical practice.**

5. **Do you work in adult rehabilitation clinics?** (*Encircle your answer please)*
   Yes (if yes, please specify how often) ________________________________ No

Appendix E Study 2 participants' demographic questionnaire

Study title: Hearing healthcare for hearing impaired workers: patients' experiences and views.

Researcher name: Margaret Zuriekat

ERGO number: 47185

Participant number: **Age:** **Gender:**

1. **Do you have hearing difficulty? Yes / No**
   a. Do you use hearing aids or any other type of hearing devices? Yes/No
   If yes please answer the following question
   b. What is the type of your hearing device? (e.g. hearing aid, cochlear implant or other)____
2. **Have you seen an audiologist in the UK? Yes / No**
   If yes please answer the following questions
   a. When did you first see an audiologist?
   ____
   b. How many times you have been seen by an audiologist?
   ____
   c. How often do you see your audiologist (per year)?
   ____
   d. When was your last appointment with the audiologist?
   ____
   e. What kind of appointments do you have with your audiologist (Appointments for assessing your hearing and how you are managing, repair for your hearing devices, follow up for reassessments)?
   ____
3. **Regarding your work:**
   - Type of work: (*circle your answers please)*
     - Full time worker Part time worker Not working
     - Voluntary work Retired (if retired, when you retired? _________)
     - Others: *(please specify)*
     ____
   - How many hours per week do you work?
   ____
   - Please state your job title in the space provided:
   ____
   - Area of work: e.g. healthcare, construction, sales etc.

Please specify ____

- Work environment and the type of daily activities at work: E.g., office based, shared office, outside work, meetings, conversations, in fieldwork like railway and construction work, work in dirty areas like construction etc. *Please specify.*

  ____

  ____

- To what extent do you think your work is noisy? *Please circle one of the following answers:*

  1. Quiet 2. A little noisy 3. Much 4. Very much

4. Is your audiology service (choose one of the following please):

  ○ National health service (NHS) audiology department
  ○ Independent company dealing with NHS cases (private company but the NHS covers the costs)
  ○ Purely independent audiology service (private company that you have to pay for privately).
  ○ Not sure, explain please

  ____

  ____

1. In what city is your audiology services is located?___________________________________

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