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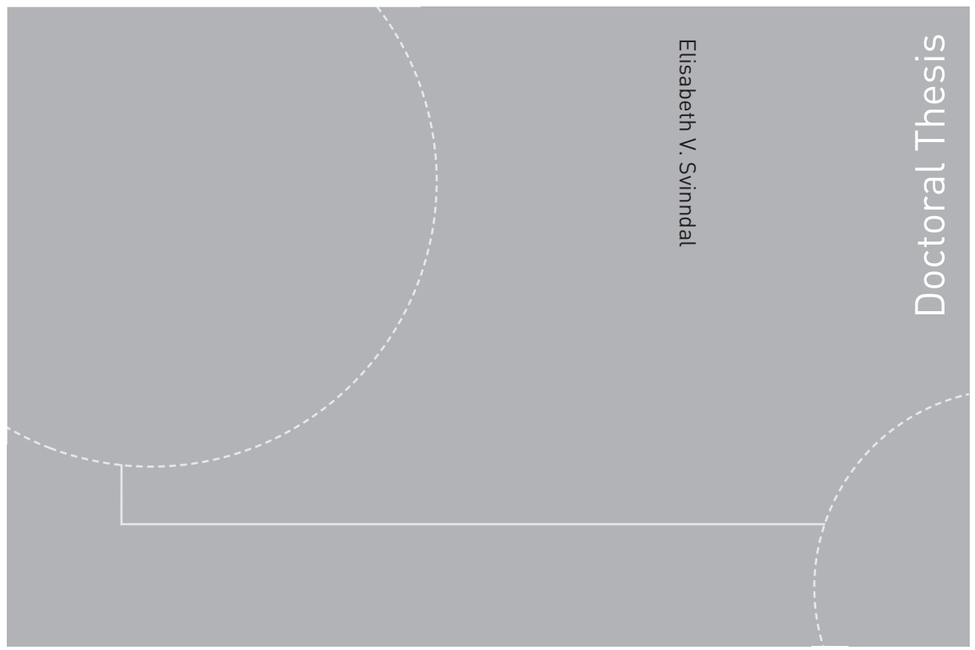

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Elisabeth V. Svinndal

Hearing loss and work participation in Norway

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Hearing loss and work participation in Norway

Thesis for the degree of Philosophiae Doctor

Trondheim, December 2018

Norwegian University of Science and Technology
Faculty of Medicine and Health Sciences
Department of Public Health and Nurcing

NTNU
Norwegian University of
Science and Technology

Rehabiliteringssenteret AiR
KOMPETANSESENTER

Nasjonalt kompetansesenter arbeidsretta rehabilitering

STØTTET AV EXTRASTIFTELSEN

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Hørselstap og arbeidsdeltakelse i Norge

Nedsatt hørsel er hyppig forekommende med anslagsvis 1.4 milliarder mennesker på verdensbasis og en av de fem viktigste årsakene til antall år en lever med nedsatt funksjonsevne. I Skandinavia er forekomsten blant personer i yrkesaktiv alder beregnet til mellom 10 og 13 %. Ulike studier viser at personer med nedsatt hørsel er en sårbar gruppe i arbeidslivet med redusert deltakelse og større belastning enn befolkningen for øvrig.

Formålet med denne avhandlingen var å belyse arbeidslivsdeltakelsen blant personer med nedsatt hørsel i Norge og hva som påvirker deltakelsen. I sin helhet var hensikten å identifisere hva som hemmer og fremmer deltakelse for denne gruppa.

Arbeidet bestod av en tverrsnittsundersøkelse og to intervjustudier. I tverrsnittsundersøkelsen svarte 3300 personer med nedsatt hørsel på en spørreundersøkelse som omfattet deltakelse og fungering i arbeidslivet. Den første intervjustudien bestod av 21 intervjuer med personer med nedsatt hørsel hvor de beskrev sine erfaringer i arbeidslivet, mens den andre intervjustudien bestod av intervjuer med 10 ledere om deres erfaringer med å ha ansatte med nedsatt hørsel.

Den første studien viste at økt grad av hørselstap kan gi økte utfordringer med blant annet høy grad av utmattelse (fatigue). Særlig kvinner så ut til å oppleve hørseltapet som en belastning. Den andre studien viste at både ytre og indre faktorer påvirket graden av belastning over tid. Arbeidstakerens egen kunnskap om og erkjennelse av hørseltapets betydning på eget liv var en forutsetning for igangsetting av viktige tilpassinger. Arbeidsplassens evne til å møte behovene og bidra til løsninger spilte en rolle for grad av belastning. Tilgang til bredde i tjenester og tjenesteytere som bidro til kunnskapsheving var viktige bidrag til å øke erkjennelse og dermed forutsetningene for mestring av egen hørselssituasjon. Den tredje studien viste at lederne var positive til å tilrettelegge, men manglet forutsetninger for å bidra til gode, permanente løsninger. De anså hørselstap som en begrenset utfordring og hadde tillit til at arbeidstakeren selv visste hva som var nyttig å gjøre. Følgelig ba de ikke om bistand i tilretteleggingsarbeidet.

Avhandlingen identifiserer faktorer som hemmer og fremmer deltakelse i arbeidslivet for personer med nedsatt hørsel. Det er behov for å øke oppmerksomheten på risikoen for utmattelse i et langsiktig perspektiv for disse arbeidstakerne. Kunnskapsoverføring fra tjenesteytere til arbeidstakerne vil være viktige bidrag mot bedre forutsetninger for å skape seg en god arbeidssituasjon. Systematisk kartlegging av negative konsekvenser av nedsatt

hørsel samt utmattelse ved oppfølging av personer med nedsatt hørsel i helsetjenesten vil kunne avdekke en negativ utvikling tidligere.

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Summary

Hearing loss is a highly prevalent condition with an estimated 1.4 billion people worldwide and among the five leading causes of years lived with disability. In Scandinavia, the prevalence is estimated to 10 to 13 % among persons of working age. Various studies have indicated that individuals with hearing loss constitute a vulnerable group in the labour market implying decreased participation and increased strain compared to the population at large.

The aim of this thesis was to shed light on work participation for people with hearing loss in Norway and the criteria influencing their work participation. As a whole, the aim was to identify barriers and facilitators to their participation.

The thesis constitutes one cross-sectional study and two interview studies. In the cross-sectional study, 3300 individuals with hearing loss responded to a survey on labour market participation and functioning. The first interview study consisted of 21 interviews with individuals with hearing loss, where they described their labour market experiences, while the second interview study was based on interviews with 10 managers and their experiences with employees with hearing loss.

The first study showed that increased degree of hearing loss might constitute increased degree of fatigue. Women in particular seemed to experience negative impact from the hearing loss. The second study showed that both intrinsic and extrinsic factors influenced the degree of strain over the course of working life. The employees knowledge on and acknowledgement of the impact of the hearing loss on their lives were prerequisites for initiation of important adjustments. The ability of the workplace to meet the needs and contribute to solutions played a role for the perceived degree of strain. Access to extensive services and service providers who contributed to increase the knowledge on hearing loss were important contributions to increase the level of acknowledgement, and thus, the prerequisites for self-efficacy concerning hearing loss issues. The third study showed that the managers had a positive inclination towards accommodation, but lacked prerequisites for contributing to adequate, permanent solutions. They considered hearing loss a limited challenge

and trusted that the employee knew which adequate measures to take. Consequently, support was not requested.

The thesis identifies barriers and facilitators in labour market participation for individuals with hearing loss. Increased attention on the risk for fatigue in a long-term perspective is needed for employees with hearing loss. Transfer of knowledge from service providers to the employees would constitute an important contribution towards improved prerequisites to form ones working conditions. Systematic assessment of negative impact from hearing loss and fatigue as part of the follow-up of individuals with hearing loss in health care could reveal a negative development and be used to initiate permanent workplace accommodations.

List of papers

Paper I

Svinndal, E.V., Solheim, J., Rise, M.B. & Jensen, C. (2018). Hearing loss and work participation: a cross-sectional study in Norway. International Journal of Audiology 57 (9) 646-656.
doi: 10.1080/14992027.2018.1464216

Paper II

Svinndal, E.V., Jensen, C. & Rise, M.B. (2018). Working life trajectories with hearing impairment. Disability and Rehabilitation. doi: 10.1080/09638288.2018.1495273 (Published online)

Paper III

Svinndal, E.V., Jensen, C. & Rise, M.B. (submitted). Leader responsibility for employees with hearing impairment. A qualitative study exploring employers' experiences.

1 Introduction

The subject of this study is labour market participation for people with hearing loss.

1.1 Choice of terms and delimitations

Hearing loss is defined as an abnormal or reduced hearing sensitivity (Tye-Murray, 2015), thus comprising any degree from mild loss to profound deafness. The main scope of this thesis is that of the perceived hearing loss rather than measured levels. For simplicity, the concept of hearing loss has been used to describe the notion of reduced hearing sensitivity even though it may be argued as excluding congenital hearing conditions and other conditions with hearing disorders not measurable with pure-tone audiometry (Stephens & Kramer, 2009). The concepts of impairment and disability are used according to the International Classification of Function (ICF) as will be further elaborated below.

Persons with hearing loss may choose to be part of a Hearing culture using spoken language as means of communication or they may choose a Deaf culture using sign language. This thesis comprises issues pertaining to participation using spoken language as the preferred mode of communication. This choice is due to an anticipated profound difference in the work situation when the communication is in two different languages (i.e. with spoken and signed communication). If both modes of communication were included in the study, these particularities would have been difficult to address with the necessary thoroughness. Hopefully, future research will scrutinise working conditions for people with hearing loss communicating in sign language.

1.2 Hearing loss

Hearing loss is a highly prevalent condition with an estimated 1.4 billion people worldwide and among the five leading causes of years lived with disability (GBD, Global Burden of Diseases, & Injuries, 2017). A prevalence of 13.1 % in men and 9.8 % in women was found among subjects of 20-64 years in Sweden (Pierre, Fridberger, Wikman, & Alexanderson, 2012). The prevalence of hearing loss in Norway was

estimated to 11 % in the age group 45-64 based on a large Norwegian cohort study (the HUNT-study) (Engdahl, 2015).

The aetiology of hearing loss may be hereditary or due to a variety of damages or injuries. Hereditary disorders may cause congenital hearing loss or progressive adult onset hearing loss (Stach, 2010). Infections and toxins may cause auditory damages, as well as trauma and noise exposure (Stach, 2010). However, the main contributor to hearing loss in adults is the decline in hearing due to the aging process (presbyacusis) (Stach, 2010). Adult onset hearing loss may be attributable to both the aging process, a genetic predisposition and various exposures and influences potentially harmful to the auditory system (Stach, 2010).

Auditory damages may be localised to any part of the auditory system, from the outer ear to the cortex. Damages or anomalies in the outer or the middle ear are described as conductive hearing loss, which is characterised by a limited severity (a maximum of 60 dB (Stephens & Kramer, 2009)) with little effect on speech perception when the sound level is of a sufficient magnitude (Stach, 2010). Auditory damages localised to the inner ear and/or cochlear nerve fibres are described as sensorineural hearing loss (Stach, 2010). They tend to be of a higher complexity than conductive losses with a reduction in the sensitivity to sound, the frequency-resolving ability, and the dynamic range, thus frequently resulting in an impact on the speech perception even if the sound is of a sufficient magnitude (Stach, 2010). Sensorineural hearing loss vary from mild to profound and may occur in combination with conductive hearing loss. Lesions of the central auditory nervous system can result in auditory processing disorders, which may be part of the aging process through neural degeneration, and may affect the speech recognition (Stach, 2010).

This is a broad classification of hearing loss, which is commonly used. However, major advances in genetics have improved the understanding of the aetiology of hearing loss (V. Manchaiah & Stephens, 2013), and new classification systems may gain ground.

1.3 Impact of hearing loss

The impact of hearing loss encompasses both listening, comprehension and communication in addition to hearing. Depending on the type of hearing loss, various mechanisms may be affected: the ability to detect different sounds, recognition of speech sounds, localisation of sounds, sound and speech processing, and tolerance and pleasantness of sound (V. Manchaiah & Stephens, 2013). Moreover, speech perception in noise is probably the most common complaint from people with hearing loss (V. Manchaiah & Stephens, 2013). Hearing loss is typically classified in terms of degree, i.e. from mild to profound loss. However, the degree of loss is not necessarily a suitable indicator of communication difficulties, and even unilateral hearing loss frequently affects the communication. As many as 93 % of individuals with permanent unilateral hearing loss reported that their hearing loss had an effect on their communication, and 87 % reported difficulties in noisy environments (Wie, Pripp, & Tvete, 2010).

The person's auditory communicative ability (Stephens & Kramer, 2009) also influences the degree of communicative limitations and restrictions. This ability constitutes three components: the signal-related component involving the capacity of the hearing organ, the central language-processing-related factor involving cognitive capacities, and the expressive speech/language component (Stephens & Kramer, 2009).

Moreover, perceived communication difficulties due to hearing loss may be a result of factors extrinsic to the person. These are environmental factors such as background noise and reverberation. Additionally, social factors such as communication skills and awareness in communication partners will influence the communication situation. Decreased communication abilities may as well affect the communicative self-image, and various psychosocial effects have been observed such as withdrawal and depression (Stephens & Kramer, 2009).

Hearing loss may inflict activity limitations and participation restrictions. Increased levels of activity limitations and participation restrictions have been registered in

experienced hearing aid users compared to inexperienced users (A. S. Helvik, Jacobsen, Wennberg, et al., 2006). Further, psychosocial well-being has been found to be negatively associated with increased levels of activity limitations and participation restrictions (A. S. Helvik, Jacobsen, & Hallberg, 2006). Reduced mental health has been reported in some young and middle-aged individuals with hearing loss provided their hearing loss included a low frequency loss (Tambs, 2004), while increased levels of anxiety and depression have been found in persons with severe or profound hearing loss (Carlsson et al., 2015). However, extensive psychosocial consequences of hearing loss have also been established in persons of working age with mild-moderate hearing loss (Hua, Anderzen-Carlsson, Widen, Moller, & Lyxell, 2015), and decreased well-being and feelings of exclusion have been found in individuals with unilateral hearing loss (Wie et al., 2010). This indicates that the impact of hearing loss on health, activities and participation is found for any degree of hearing loss.

Furthermore, tinnitus is frequently occurring together with hearing loss, and may cause additional distress. Tinnitus is more prevalent in individuals with severe hearing loss, but occurs also in those with milder hearing loss (Kochkin, Tyler, & Born, 2011). In Sweden, 6 % of the working population reported both hearing difficulties and tinnitus (Hasson, Theorell, Wallen, Leineweber, & Canlon, 2011). Highly prevalent consequences of annoying tinnitus are decreased concentration, sleeping difficulties, anxiety and depression (Stephens & Kramer, 2009). In the US, 26 % reported that tinnitus influenced concentration and 20 % reported influence on sleep (Kochkin et al., 2011).

Despite multiple disadvantages, positive experiences due to hearing loss have been reported (V. Manchaiah, Baguley, Pyykko, Kentala, & Levo, 2015). A review identified positive consequences as being e.g. less disturbance from unwanted sounds, self-development, and affinity for or empathy with other people with disabilities/hearing impairments (V. Manchaiah et al., 2015). Moreover, the hearing condition, both hearing loss and tinnitus, could be used for self-advantage (V. Manchaiah et al., 2015).

1.4 Disability paradigms

Activity limitations and participation restrictions due to hearing loss may be perceived as disability. The conception of disability has changed from an individualist understanding towards a spectre of social approaches (Shakespeare, 2014; Tøssebro, 2010). Abandoning the medical model where disabilities were perceived as an intrinsic part of the individual, an environmental turn occurred (Tøssebro, 2010). However, various ways of understanding societal barriers as disabling mechanisms were discussed in different countries and societies. A 'strong' social model, where disability was perceived as a result of societal barriers, had a great impact on the British discourse, while a (Nordic) relational model dominated the discourse in Norway (Shakespeare, 2014; Tøssebro, 2010). The relational understanding of disability adopted in Norway in the 1970's implied a non-corresponding relationship between the abilities of an individual and the demands from society.

The environmental turn also resulted in a change of terminology (Tøssebro, 2010). Words with a strong negative connotation were changed to less stigmatising concepts and the emphasis was moved from the individual to the condition. In similar processes of change in terminology, what became acceptable denotations varied from country to country, even differing between the different English speaking countries (Tøssebro, 2010). Within the World Health Organization, the environmental turn resulted in a new classification system (from International Classification of Impairments, Disability and Handicap (ICIDH) to International Classification of Functioning, Disability and Health (ICF)) based on the biopsychosocial model, which recognises both the biological aspect of the individual and the impact of the environment in which (s)he lives.

1.4.1 The International Classification of Functioning, Disability and Health

The International Classification of Functioning, Disability and Health (ICF) (WHO, 2001) is a framework and serves as a means of classifying human functioning and disability associated with health conditions. Incorporating both environmental and personal factors with health conditions, it provides a multi-perspective approach to function and disability. It is intended for clinical use, but also as a common language with its

building blocks, which can be used according to the field of study and scientific orientation (WHO, 2001).

The ICF consists of two parts with two components each. The first part is 'functioning and disability' with the components 'body functions and structures' and 'activities and participation'. Functioning covers all body functions, activities, and participation. The definition of body functions are 'the physiological functions of body systems (including psychological functions)'. Body structures are defined as 'anatomical parts of the body such as organs, limbs and their components'. Thus, problems in body function or structure, which deviate from generally accepted population standards, are defined as impairments. They can vary in multiple ways, such as severity, stability and duration, and the variations are described in the ICF code system. Further, activity is defined as 'the execution of a task or an action by an individual', while activity limitations are 'difficulties an individual may have in executing activities'. In the same manner, participation is defined as 'involvement in a life situation', and participation restrictions as 'problems an individual may experience in involvement in life situations'.

The second part of the ICF consists of 'contextual factors' with the components 'environmental factors' and 'personal factors'. Environmental factors are 'the physical, social and attitudinal environment in which people live and conduct their lives'. Thus, they constitute the external influence on the performance of an individual, in either a positive or a negative manner functioning as facilitators or barriers. Personal factors represent the background of an individual, features which are not part of the health condition. Apart from age, gender and education, it may include coping strategies, lifestyle and various experiences. Such factors are thus recognised as influential in functioning and disability in the ICF. However, they are not classified due to the large social and cultural variance around the world. Finally, in the ICF, disability is an overarching concept comprising impairments, activity limitations and participation restrictions. It denotes the complex relationship between the individual and the

environment; the health condition of the individual intertwined with personal factors encountering the immediate and peripheral environmental factors.

As hearing loss is a potential disability, a multifactorial perspective is necessary when studying work ability and work participation. Thus, in this thesis, the ICF is used as a framework.

1.4.2 The ICF core set for hearing loss

The ICF is an extensive classification system, and core sets for specific conditions have been developed. The ICF core set for hearing loss, embracing a comprehensive and a brief core set, was developed as a standard measuring instrument to assess effects of hearing loss (Danermark et al, 2010). According to the authors, various definitions have been used to describe functioning and disability in the field of audiology. The ICF core set for hearing loss was developed according to the standards of the World Health Organization (WHO), which include the three phases preparatory, conference, and validation (Danermark et al., 2010). The comprehensive core set consists of 117 categories suitable for comprehensive, multidisciplinary assessments. The brief core set consists of 27 categories including all the components from the ICF as described above, and according to Danermark, Granberg, Kramer, Selb, and Moller (2013) it is most commonly used to give a brief description and assessment of an individual with hearing loss. Danermark et al. (2010) argued that classification systems such as ICF are important to counteract the fragmentation of health care.

1.4.3 Participation restrictions

Despite the environmental turn in understanding disabilities, it has been questioned how far-reaching the changes have been beyond the change in terminology (Tøssebro, 2010). For instance, Tøssebro (2010) pointed to an imbalance in a vast description of bodily dysfunctions compared to the limited description of activity limitations and participation restrictions in ICF, concluding that taking on the ICF point of view results in an emphasis on body functions. Moreover, Shakespeare (2014) pointed to the lack of clear distinctions between activity limitations and participation restrictions in the ICF as well as the distinction between impairment and activity limitations.

Shakespeare (2014) conceptualised disability as an interaction between individual and structural factors where the severity of the impairment is important thus embracing the (Nordic) relational model. The severity of the impairment can be described through a continuum, which allows for different approaches with alternative perspectives to impairments as tragedies or disabilities as purely due to social barriers. Instead, a life course perspective on impairments would allow for their changeable nature. Impairments can improve or worsen, be episodic or fluctuating, to a large extent acquired, and they are mitigated or accentuated by the environment (Shakespeare, 2014). To perceive impairment as a predicament would incorporate its' complexity – it might be trying to the person, but not forcibly a tragedy (Shakespeare, 2014).

In Norway, the concept of disability was important in developing the welfare policies, while there seems to be a change towards regulation policies today (Tøssebro, 2010). Regulation policies are of importance to groups with minor differences on the impairment continuum since they would benefit from structural changes in the environment covered by universal design (Tøssebro, 2010). For instance, individuals with hearing loss would benefit greatly from universally designed hearing environments. However, there is little indication that environments are improved when it comes to universal design for hearing loss, at least in Norway, where for instance the use of open-plan offices tends to increase.

1.4.4 The Convention on the Rights of Persons with Disabilities

Over the years, there has been an increased emphasis on various barriers to participation experienced by people with disabilities leading to e.g. the Convention on the Rights of Persons with Disabilities (UN, 2006) and the World report on disabilities (WHO, 2011). The recommendations for increased participation made by the latter include effective anti-discrimination legislation and promoting awareness among employers of the means available to them to support the employment of people with disabilities.

In 2006, the United Nations' General Assembly adopted The Convention on the Rights of Persons with Disabilities (CRPD) (UN, 2006), which was enforced in 2008. The

convention includes persons with long-term impairments which may hinder effective participation in society. The purpose of the convention is 'to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity' (UN, 2006). The convention constitutes 50 articles within the different aspects and areas of life. Article 8 embraces the obligation to raise awareness in society regarding persons with disabilities, to combat stereotypes, and to promote recognition of skills, abilities and the contributions to the workplace and labour market. Article 26 describes the obligations within rehabilitation. The States Parties are obliged to organize, strengthen and extend comprehensive rehabilitation and programmes, where employment is among the vital areas. Such rehabilitation measures shall begin at the earliest possible stage and be based on multidisciplinary assessments of needs and strengths. The following article concerns the right to work and employment. It contains various subjects, e.g. effective access to vocational guidance programmes, provision of reasonable accommodation, and promotion of vocational and professional rehabilitation.

Norway ratified the convention in 2013 (BLD, 2013). In 2015, three umbrella organisations representing 117 member organisations for people with disabilities published a status report on the work on CRPD in Norway, where multiple shortcomings were reported (FFO & SAFO, 2015). For instance, few governmental initiatives on awareness were identified, and there had been a reduction in media publicity on disabilities (re article 8). Neither the editorial staff nor the journalist education recognised any responsibility on how people with disabilities were presented. Insufficient rehabilitation services were documented in both extent and lack of multidisciplinary and holistic approaches (re article 26). Strategic measures were found appropriate, but scarcely implemented, and vocational follow-up was inefficient (re article 27). The report requested research on employment and discrimination.

1.5 Work participation

Across disciplines and beliefs there is an agreement that work is a trait of the human race (Gini, 2009). Work forms the private lives as well as the collective history, and has a dual function of providing the means of existence and a way to find out whom we are and where we belong (Gini, 2009). Through history, work has evolved from a senseless curse to a meaningful calling (Svendsen, 2011). With the growth of today's individualism, work has become a means to shape our authentic selves (Svendsen, 2011).

There is a common apprehension that work is associated with well-being (Blustein, 2008), and the positive impact of work on physical and mental health and well-being was established in a review (Waddell & Burton, 2006). The positive health effect from work for sick and disabled people was established based on clinical experience and principles of fairness and social justice (Waddell & Burton, 2006). Moreover, unemployment or worklessness was associated with poor health, both general and mental health (Waddell & Burton, 2006). However, the nature and quality of work are important to obtain a positive impact (Waddell & Burton, 2006). Another review on health effects of employment also found positive effects, however limited to general mental health and depression (van der Noordt, H, Droomers, & Proper, 2014).

1.5.1 Work ability, employability and employment

Work ability is a concept embracing an individual capacity expressed as human resources and the external factors at work (Ilmarinen, 2001). Embedded in the human resources are health and functional capacities, education and competence, values and attitudes, and motivation. These human resources form a process with work demands, work community and management, and work environment. Together they constitute an individual's work ability (Ilmarinen, 2001). Work ability denoted as a process emphasises the dynamic quality, which implies change over time.

Another concept relevant to understanding work participation and employment is employability. It serves as a means of describing actions needed to increase employment, and embraces societal factors relevant to employment (Ilmarinen, 2001).

Employability is defined as 'work ability related to society level characteristics, such as employment, education and exit policies, social and health services including occupational health services and rehabilitation, and other preventive measures such as prevention of age discrimination' (Ilmarinen, 2001). The terms work ability, employability and human resources are key terms in employment outcome where they form a continuous process (Ilmarinen, 2001).

1.5.2 The orientation matrix

The complexity of work participation in vulnerable groups might be illustrated through a matrix including the stakeholders in the labour market. Ilmarinen (2001) described the specificities of aging workers in the labour market and addressed the challenges concerning the low employment rate in the senior part of the work force. The author constructed an orientation matrix which describes the relations between the problems, solutions and goals of the three dimensions or parties, namely the individual worker, the enterprise and the society. The key words in the nine fields of the matrix were chosen based on a large set of studies. Arrows between the fields illustrate action at the horizontal level and relationship at the vertical level. The diagonal arrows illustrate a strong connection between the individual worker and the enterprise. Ilmarinen (2001) emphasises that the main intention of the matrix is to give a comprehensive illustration of the complete situation of age and work, and how it can be controlled. The orientation matrix signifies a shared responsibility, and it shows how specifics of the three stakeholders may influence participation. Thus, this matrix might be considered useful in describing work participation in vulnerable groups other than aging workers.

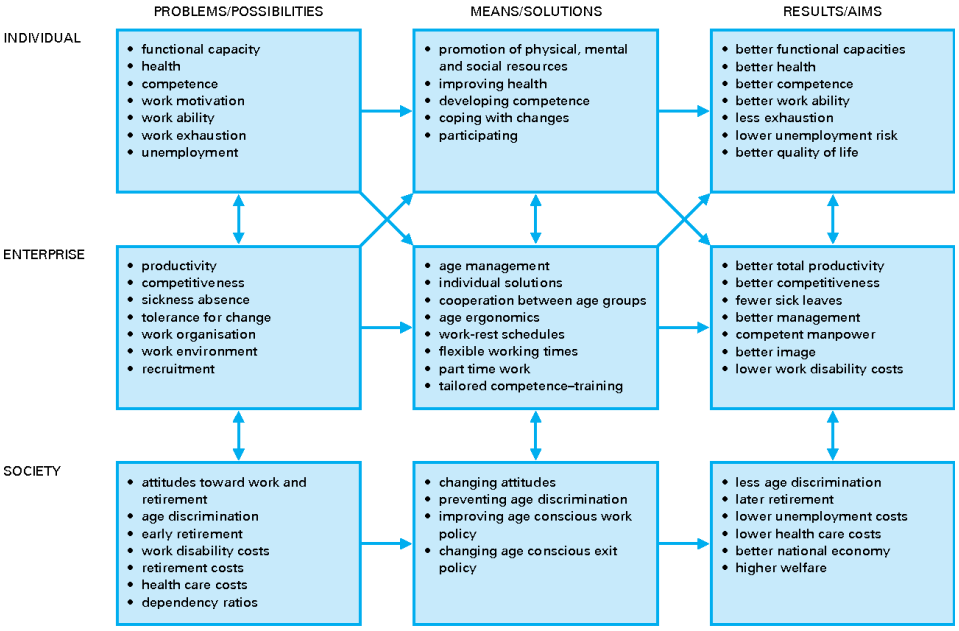

FIGURE 1. 'The orientation matrix'. Reproduced from Aging workers, J.E. Ilmarinen, 58, 546-552, 2001 with permission from BMJ Publishing Group Ltd.

1.6 The Norwegian context

In Norway, there has been a substantial effort to increase participation in the labour market. The present legislation relevant to employment contains the Working Environment Act including an aim of fostering inclusive working conditions, the Equality and Anti-discrimination Act, which prohibits discrimination and applies in all sectors of society, and the National Insurance Act, which provides financial support, including furnishing assistive devices, for improvement of the work ability due to e.g. impairments.

Through the last fifty years, 'the Norwegian model' has influenced the Norwegian labour market. The model is built upon a mutual acceptance of the employers and the unions as legitimate parties and counterparties (Levin, 2012). It is not about agreement in all situations, but an acceptance of the two parties having both common and diverging interests, which potentially could result in conflict in one area while there is

cooperation in others. According to Levin, tolerance in both conflict and cooperation could be a trademark of the Norwegian cooperation model. At the workplace, the model is characterised by a high degree of employee involvement in developing ones daily work and co-determination in decision-making. Legislation and agreements secure co-determination, and employees have access to bodies where the actual decisions are taken through representation in boards and committees. Direct involvement and responsibility provide a substantial potential for innovation and creativity crucial to the goal achievements of the organisation, and it balances the power between the employees and the management (Levin, 2012).

With time, the state became an active stakeholder and formed a tripartite cooperation. The state legitimates the bipartite activities, both in cooperation and in conflict, and prompts specific development measures through the direction of resources. Levin (2012) described democracy and influence together with the bipartite and tripartite cooperation as fundamental traits of the Norwegian labour market.

In 2001, the three parties committed themselves, through an agreement of Inclusive Workplace (the IA-agreement) where the primary goal was to improve work environments, to strengthen presence at work, to prevent and to reduce sickness absence, and prevent expulsion and disconnection from the labour market. The agreement constitutes three subsidiary goals: (1) to reduce sickness absence, (2) increase the participation rate among people with disabilities, and (3) increase work participation among senior workers. Enterprises that sign the agreement get access to certain means, such as accommodation grant schemes and supervision from the welfare system (NAV). While the state gives access to means, employer organisations and unions are committed to promote awareness of the agreement and the means among the employers. The agreement is signed for four years and has been renewed several times. Ose et al. (2013) viewed the IA-agreement as a cooperation in solving the societal challenge concerning lack of work participation due to long-term sick leave, disabilities, or premature retirement. At the end of the 2010-2013 agreement period, 26 % of Norwegian enterprises had signed the agreement. These were typically

large enterprises, and they covered approximately 60 % of all employees (Regjeringen, 2018).

The present agreement (2014-2018) states that sickness absence has been reduced and the age of retirement has increased, while employment for people with disabilities has received increased attention since the first agreement was signed (IA-avtalen, 2014). In an evaluation of the 2010-2013 agreement, Ose et al. (2013) concluded that there was a potential of reaching the primary goal and maybe even reducing sickness absence. However, reaching the goals of including people with disabilities and senior workers were less realistic. The strict demands concerning follow-up of employees on sick leave were believed to have had a negative impact on the willingness to include. These demands were diminished in the subsequent agreement.

Negative attitudes and prejudices against people with disabilities have been considered reasons for labour market disadvantages (WHO, 2011). In Norway, managers in one fourth of the enterprises believed that people with disabilities would increase sickness absence and decrease productivity (Falkum & Solberg, 2015). However, gaining experience with employees with disabilities changed such attitudes (Falkum & Solberg, 2015). The key characteristics of employers open to inclusion of people with disabilities have been identified as a work culture with e.g. an egalitarian attitude valuing diversity, focusing on capabilities and finding a job match, and learn from experiences and using support resources (Gilbride, Stensrud, Vandergoot, & Golden, 2003). Norwegian managers have been identified as being generally concerned about the well-being of their staff and that they were spending much time in communicating with them (Vie, 2012).

1.7 Hearing loss and work participation

Despite efforts to make the labour market inclusive, differences in employment seem to persist, also in Norway (Bø & Håland, 2015). Different employment opportunities have been found for different disabilities in Sweden, where persons with hearing loss were most likely to be employed compared to other disability groups (Boman, Kjellberg, Danermark, & Boman, 2015). However, increased unemployment have been

reported for the US and Australia (Emmett & Francis, 2015; Hogan, O'Loughlin, Davis, & Kendig, 2009; Jung & Bhattacharyya, 2012). Lower income and low educational attainment for persons with hearing loss were also reported (Emmett & Francis, 2015; Jung & Bhattacharyya, 2012). Lower educational attainment compared with normal-hearing individuals was also found in the Netherlands (Stam, Kostense, Festen, & Kramer, 2013). Persons with hearing loss were also less likely to take early retirement than people without hearing loss, but they were more likely to be unfit for work than their normal-hearing counterparts (Stam et al., 2013). This is not in line with the findings in Norway, where an increased risk of early retirement was found in individuals with low-frequency hearing loss (A. S. Helvik, Krokstad, & Tambs, 2013a), and the risk of being granted disability pension increased with degree of hearing loss, though for other reasons than hearing loss (A. S. Helvik, Krokstad, & Tambs, 2013b). An increased risk of receiving unemployment benefit, sickness benefits or disability pension was found in persons with hearing loss in Sweden (Pierre et al., 2012).

A relationship between hearing difficulties (hearing loss and/or tinnitus) and poorer health and long-term illness, has been established (Hasson et al., 2011). Unfavourable conditions have been associated with the increased strain workers with hearing loss often experience (Coniavitis Gellerstedt & Danermark, 2004; Hasson et al., 2011; Nachtegaal, Festen, & Kramer, 2012; Nachtegaal et al., 2009). In a review, Punch (2016) found indications of significant barriers for work participation for employees with hearing loss. Limited awareness of suitable work accommodation and increased levels of fatigue were among the barriers identified (Punch, 2016). Studies from both Sweden and the Netherlands have shown that the impact of background noise was greater in employees with hearing loss than in their normal-hearing colleagues (Hua, Karlsson, Widen, Moller, & Lyxell, 2013; Kramer, Kapteyn, & Houtgast, 2006). Moreover, employees with hearing loss have previously reported lower levels of control over their work situation than employees with normal hearing (Coniavitis Gellerstedt & Danermark, 2004).

Despite unfavourable working conditions as described above, work participation has proven important. Full-time employed workers with severe-profound hearing loss reported better quality of life measures than their part-time or retired counterparts (Grimby & Ringdahl, 2000). Moreover, full-time workers with severe-profound hearing loss did not differ in personal harmony compared to average Swedish workers (Grimby & Ringdahl, 2000). Other studies have also shown that even though hearing loss might have a negative impact on work, there are ways to overcome the difficulties such as through determination and stamina (Tye-Murray, Spry, & Mauze, 2009) and redefining of work and networks (D. C. Baldridge & Kulkarni, 2017). Still, obtaining sustainable working conditions with hearing loss seems to demand considerable individual effort (Shaw, Tetlaff, Jennings, & Southall, 2013), and the satisfaction with the accommodation measures is not always high (Haynes & Linden, 2012). Additionally, a reluctance to disclose the hearing loss at work has been established (Southall, Jennings, & Gagne, 2011) together with an inclination towards withholding accommodation requests depending on the circumstances (D. C. Baldridge & Swift, 2013; David C. Baldridge & Swift, 2016; D. C. Baldridge & Veiga, 2006).

Consequently, work participation is a complex issue influenced by a variety of personal characteristics and mechanisms external to the individual employee. To obtain a truly inclusive labour market, a thorough understanding of work participation in vulnerable groups such as people with hearing loss is needed. Studies have shown various unfavourable factors to work participation. However, participation in a long-term perspective seems to be lacking, and the process towards fatigue or burnout is not fully understood. Moreover, work participation takes place in a relational context. However, the perspectives of stakeholders other than the employee in question have received limited attention. Finally, labour markets differ across countries due to varying organisation and legislation. Challenges found in some countries or communities may not be present in others, and studies of work participation and hearing loss in Norway are very scarce. The lack of knowledge on the characteristics of working life participation of persons with hearing loss in Norway limits our

understanding of possible disparities. Moreover, which barriers and facilitators that these employees face within the Norwegian labour market, have not been studied systematically.

2 Aim

The aim of this thesis is to shed light on work participation for people with hearing loss and the criteria influencing their work participation in Norway. As a whole, the thesis aims to elucidate participation and displacement factors, i.e. barriers and facilitators of work participation for this group in Norway.

The operational aims of the studies in this thesis are:

1. To describe work participation of persons with hearing loss and associations between degree of hearing loss and hearing disabilities, work ability, fatigue and work accommodation.
2. To identify facilitators and barriers to work participation among employees with hearing loss.
3. To explore employers' experiences with having leader responsibility for employees with hearing impairment

3 Material and methods

3.1 Choice of methodology

In this thesis, a combination of a quantitative and a qualitative approach has been applied. Studies combining quantitative and qualitative methods are sometimes called mixed methods studies. The aim of mixed methods is producing converging findings with an explicit and justified strategy where integration of the separate results is considered a key feature (Lingard, Albert, & Levinson, 2008).

The rationale for the choice of methodology in the present thesis has a pragmatic stance as described in Bryman (2006). It is based on a multi-perspective objective rather than setting up a mixed methods study as defined in Lingard et al. (2008). The intention of the quantitative study was to address the lack of data on work participation for individuals with hearing loss in Norway. The results were meant to frame the results from the qualitative studies.

Three different quality criteria in multimethod studies have been described: using the same criteria for both, using separate criteria, and devising new criteria (Bryman, 2006). In studies where either the quantitative or the qualitative part of the study is dominant, the findings are regarded as separate. In this thesis, the qualitative studies were dominant, and separate quality criteria have been applied.

Despite the pragmatic stance in choice of methodology, it is recognised that a research study takes place within an epistemological frame. There is a wide range of kinds of knowledge, and knowledge is constructed based on the epistemological frame we are part of (Chalmers, 1990). This thesis is based on certain assumptions implying that meaning and understanding are based on social interaction. Meaning is constructed within sociocultural processes in time and space. These assumptions correspond to basic assumptions in social constructionism (Lock & Strong, 2014). This is not a relativist stance where anything goes, but a recognition of the great variety of how humans respond to the events of life. Humans shape their institutions and the world

around them, and they are shaped by it themselves (Corbin & Strauss, 2008). The implications of the assumptions for this thesis are twofold. Firstly, the narratives which constitute the qualitative data are constructed within the sociocultural framework of each participant. Secondly, the analyses conducted took part within a specific epistemological frame resulting in potentially different findings than an analysis conducted within another epistemological frame.

3.2 Participants

To map work participation characteristics and to identify barriers and facilitators to participation, the source population for this thesis was individuals with hearing loss of working age in Norway. Since data on hearing loss is not available in registers in Norway and medical examinations of hearing are performed in various outpatient clinics and numerous ENT-doctors in private practise, no single institution can provide a representative sample of the source population. However, the Norwegian Association of the Hearing Impaired (HLF) has a large group of members (approximately 60 000 at the time of the study outset), partly due to a reimbursement arrangement they offer their members if hearing aids are lost. To our knowledge, this is the only feasible way of reaching a large group of individuals with hearing loss with a geographical diversity in Norway. Thus, a collaboration with HLF for recruitment matters was established. HLF communicates with the members on various platforms, i.e. through a journal in print and online, on a web site, by e-mailing and on Facebook, implying an effort to reach a wide range of members.

3.2.1 Sampling paper I

To answer aim number one, to describe work participation of persons with hearing loss and associations between hearing loss and vocational factors, the study population was defined as members of HLF in the age range of 18 to 67 registered with an e-mail address. A selection of the membership list based on these criteria was made anonymously by HLF, and the survey was sent to 10 679 individual e-mail addresses. Women accounted for 48.8 % of this population.

Information on types and degree of hearing loss is registered on a voluntary basis in the HLF membership list. Consequently, the list was incomplete with regard to further descriptions on member characteristics. However, the members of HLF are traditionally individuals with hearing loss who have a spoken language approach to communication. Thus, we anticipate that the participants were users of spoken Norwegian and not sign language, as their first language.

After two reminders to answer the survey, the response rate was 35.6 %. A two-question survey was sent to non-responders to consider possible systematic differences between the groups. Differences were found for employment, but not for degree of hearing loss.

3.2.2 Sampling paper II and III

Sampling for paper II and III was done among the two main stakeholders at the workplace, employers and employees. Inclusion criteria were having had recent experience with employees with hearing loss as a manager (employers) and having a present or recent position, together with being of working age and having a hearing loss as an employee (employees).

Among employees, sampling was done in order to reflect the variety of experiences in the Norwegian labour market. Thus, purposeful sampling was conducted among the 52 individuals who volunteered and were eligible participants. Recruitment of employers through their employees with hearing loss might be categorised as convenience sampling. Written consents to contact employers were given for 17 employers. Purposeful sampling was conducted among these 17 eligible participants with the purpose to represent a variety of enterprises.

Sampling is frequently done in combination with data analysis in qualitative studies in order to decide on saturation or a point of redundancy. A further elaboration on the sampling process is given in the analysis section.

The final samples for paper I, II and III are presented in Table 1.

Table 1. Characteristics of participants in all three papers

	Paper I – persons with hearing loss of working age	**Paper II – employees**	**Paper III – employers**
Number of participants	3330	21	10
Females (%)	1654 (49.7)	13	7
Age mean (range)	54.7 (18-67)	55.7 (32-67)	47 (37-60)
Sector (%)			
Private	1023 (41.4)	10	3
Public	1327 (53.7)	11	7
Self-employed	123 (4.9)	0	0

3.3 Data and analysis

3.3.1 Paper I

A cross-sectional design was chosen using a survey for collecting quantitative data to map work participation characteristics.

In addition to vocational affiliation and sociodemographic variables, variables describing functioning at work were included. Other health symptoms were delimited to measuring fatigue since the association between hearing loss and fatigue/burnout has previously been established.

The questionnaire was based on validated instruments used in previous studies on employees with work disabilities when available. Work ability was assessed with a single-item instrument (Ahlstrom, Grimby-Ekman, Hagberg, & Dellve, 2010).

The Hearing Disability and Handicap Scale, validated by A.-S. Helvik, Thürmer, Jacobsen, Bratt, and Hallberg (2007), was used to measure hearing disability. It consists of four subscales in addition to the total score. Preliminary analyses were performed using the subscales. Gender differences were found in the subscales when

dividing in four categories. However, the scores varied in the same manner as the total score. Thus, further analyses were delimited to using the total score.

Chalder's fatigue scale (Chalder et al., 1993) consists of two subscales, mental and physical fatigue, in addition to the total score. A differentiation was not considered of particular value to the study. Thus, the analysis was delimited to using the total score.

Work Role Functioning Questionnaire, translated into Norwegian (Johansen et al., 2018), also consists of four subscales. In preliminary analyses, only the subscale 'work scheduling and output demands' had a slightly lower score than the other subscales as compared to the total score, and no gender differences were found. Thus, the differences were not considered sufficiently significant for further analysis, and only the total score was used.

Continuous or categorical variables were dichotomised to allow for appropriate logistic models.

Frequencies, means and standard deviations were used for descriptive purposes, while logistic regression analyses were used for analysing associations between hearing status and various work variables. Work participation models analysed associations between work participation and degree and duration of hearing loss, and sick leave variables were analysed for possible associations with fatigue. Vocational functioning was analysed for possible associations with degree of hearing loss, and accommodation was analysed for possible associations with job characteristics and work ability.

The models were adjusted for potential confounders. Sociodemographic variables (age, gender, educational level, geographical region) were included in all multivariate models. Additionally, work participation models were adjusted for fatigue since it was expected to influence participation characteristics. Models on sick leave and fatigue were adjusted for work characteristics because of potential systematic differences between groups. Analysis showed that accommodation increased with degree of

hearing loss, thus, degree of hearing loss was included as a potential confounder in the accommodation models.

3.3.2 Data – Paper II and III

Semi-structured interviews were chosen as method for data collection for both paper II and III. Two interview guides were prepared to secure that the main topics were covered, however not excluding the possibility of introducing new topics by the interviewees. The guides were rather detailed for preparation matters rather than for practical use, and the questions were open-ended. For employer interviews, the questions included subjects which addressed the topics important to employees with hearing loss and the barriers identified in the two previous papers.

All interviews were conducted face to face in a quiet environment of the participants own choice. Most employee interviews were conducted at the work site of the participant, while some were conducted in the interviewer's office. All employer interviews were conducted at the premises of the enterprises.

The employees were asked to tell their story of working life participation as hearing impaired with emphasis on present or most recent position including experiences throughout their total timespan of the hearing loss. Most participants gave thorough accounts of their experiences with hearing loss in working life. In such interviews, questions were only asked for clarifications and further elaborations when needed. Employee data consist of rich narratives in a broad context.

The employers were initially instructed that the aim of the study was to conduct separate analyses and not making a comparison between the employer and their employee. To avoid using their particular employee as an example, a fictitious employee was created for illustration purposes when necessary. Moreover, simulation questions were constructed to address issues either not experienced or to avoid a direct relationship with a respective employee. Probes were frequently used for elaborations and enriching the descriptions. On the other hand, probes were avoided for ethical purposes if necessary.

3.3.3 Analysis – Paper II

3.3.3.1 Rationale

A grounded theory approach was chosen as method of analysis of the employee data. Grounded theory was originally developed by Barney Glaser and Anselm Strauss as a method to generate theory from data as opposed to a logico-deductive way of theorising (Glaser & Strauss, 1999 [1967]). Epistemologically, grounded theory has its origin in both positivism and pragmatism, but was further developed in different directions by its founders (Charmaz, 2014). Today, grounded theory is widely used across epistemological boundaries where the methods provide guidelines independent of the researchers' epistemological stance (Charmaz, 2014).

Theory in this context pertains to a logical, systematic explanatory scheme developed from the concepts found in the raw data (Corbin & Strauss, 2008). There are different levels of theory depending on the level of abstraction (Corbin & Strauss, 2008; Glaser & Strauss, 1999 [1967]). Middle-range theories are either formal, which pertains to a formal or conceptual area less specific to a group, or substantive, which pertains to an empirical area such as a specific group (Corbin & Strauss, 2008; Glaser & Strauss, 1999 [1967]).

The rationale for building theory from experiences of work participation for persons with hearing loss arose from the aim of identifying barriers and facilitators for work participation. Barriers and facilitators might constitute factors on various levels and arenas, conscious or unconscious to the employees themselves. Thus, in addition to descriptions, some degree of abstraction was considered necessary to embrace a sufficiently wide perspective. As to the level of abstraction, the data material was collected from a specific group (employees with hearing impairment) in a specific context (work). Thus, the appropriate level for building theory would be as substantive.

3.3.3.2 The process of analysis

Grounded theory is an extensive method of qualitative data analysis. Nevertheless, the flexible nature of the analytic process has been highlighted (Charmaz, 2014; Corbin &

Strauss, 2008). Being both systematic and flexible makes it appropriate to neophyte analysists. Different guidelines to grounded theory studies have been published to support new researchers, and in this study, the procedure of Corbin and Strauss (2008) has been applied.

In the procedure of Corbin and Strauss (2008), data analysis starts directly after the first interview with the intention that the initial analysis should instruct further data collection, pursuing and developing concepts in an iterative process. The guidelines contain various tools to enable in depth analysis and theory construction. Development of concepts and categories is done through coding and comparisons. Writing memos and drawing diagrams are other important tools to enable a creative analysis process, and they are used throughout the entire process. Moreover, context is a basic concept within this procedure and consists of the conditions which form individuals' responses to problems or circumstances. The paradigm and the matrix are two available tools to explore the context. The paradigm is a perspective based on an understanding that events happen due to a set of conditions, that responses are made to events, and that there are outcomes or consequences of the events. Further, events occur in various conditions, and the matrix is a tool used to locate these conditions. It means that various levels from micro to macro influence an event or a situation, i.e. from an individual to an international level. Finally, categories need to be linked through a process of integration, where a central or core category constitutes the main theme of the study.

The employee interviews of the present study constituted in depth narratives of hearing loss experiences in a vocational setting, thus, appropriate for theory building. A thorough analysis of the first interview was conducted with writing memos and coding. Two researchers were involved in the process discussing content and labels. Drawing diagrams was used throughout the analysis in order to explore the relationship between the concepts and to search for contexts. Then, the next interview was analysed using the same method of writing an initial memo, coding within the existing codes, creating new ones, and renaming existing codes when appropriate. This

process was repeated for each interview. Previous interviews were revisited when new codes or concepts were developed.

In exploring the data for context, nine contextual factors were identified within three different areas (described in Figure 1 in Paper II). The contextual factors described circumstances on various levels within a matrix from micro to macro, e.g. from in-house organisation to legislative limitations. However, the data were not excessive enough to explore contextual factors on macro level and the results reflect factors on a micro level only. The paradigm in the present analysis is reflected by the three contexts that were identified, by the process in three phases of acknowledgement which progressed according to the contextual factors, and by the possible outcomes of the processes.

Theoretical comparison, a core strategy in the procedure of Corbin and Strauss (2008), was another tool employed in the development of concepts. For instance, in deriving at the concept of 'acknowledgement' it was compared with the concept of 'acceptance', which has been used in earlier research on attitudes of hearing loss (Wänström et al., 2014). Their properties and dimensions were compared, and differences were found. Another theoretical comparison was made with the integrated life course perspective by Amick, McLeod, and Bultmann (2016). Their model on working life courses in a social context had the shape of trajectories and included an understanding that experiences and exposures, both past and present, happen within a context which will influence future health and labour market outcomes. Similarities were found between the integrated life course perspective and the concepts and process developed in the present analysis. Thus, the narratives and the concepts already developed were explored through this life course perspective. However, differences were also found, such as the concepts of experiences and transitions in the model of Amick et al. (2016), which were not found to be applicable. These concepts were left out of further analyses.

The integration process resulted in a central category labelled 'participation characteristics modifiable by support and knowledge' encompassing the dynamics of the trajectories.

The interviewing was a continuous process alternating with analysis. However, the analysis process was time consuming, and interviewing had to proceed ahead of the single analysis. Nevertheless, the ongoing analysis instructed the interviewing and the development of concepts in the alternating process crucial to grounded theory. Theoretical sampling as method of data collection in the present study was conducted within the frame of the available sample as described above. During the initial data collection a variety in experiences were sought, while sampling towards exploration of specific concepts were sought towards the end of the data collection. Thus, theoretical sampling was achieved within the scope of eligible participants.

3.3.4 Analysis – Paper III

3.3.4.1 Rationale

For the employer interviews, Systematic text condensation (STC) was chosen as method of analysis (Malterud, 2012). STC was elaborated from Giorgi's psychological phenomenological analysis as a descriptive and pragmatic approach to the data. A phenomenological analysis describes the experiences of the participants as they express them, and STC is a feasible and transparent approach in doing so with little philosophical commitment (Malterud, 2012).

The employer interviews were less detailed in content compared to the employee interviews. Moreover, an incorporation of employee perspectives in the analysis was considered important. Thus, a descriptive method rather than building theory was considered appropriate to analyse employer data. STC was chosen due to its systematic and well described guidelines fitting the aim of the third study.

3.3.4.2 The process of analysis

In STC, it is recognised that a truly objective position as a researcher is not feasible, and being explicit about the preconceptions and theoretical framework is a way to confront this potential bias. This is part of securing the intersubjectivity (Malterud, 2011, 2012). The preconceptions are put in brackets as far as possible to allow for alternative interpretations. In this study, this implied writing down the preconceptions, e.g. expectancies based on professional experiences, and keep them in brackets during the analysis.

Although qualitative analysis involves a bottom-up process, a combination of inductive and deductive elements is common (Malterud, 2011). In this study, employer perspectives were explored within the frame of employee perspectives of working life experiences. This framework influenced the analysis process resulting in a position between inductive and deductive, i.e. inductive by exploring employer perspectives, but deductive by baring on the employee perspectives on engaging at work with hearing loss.

In the stepwise analysis, the employers' main interests within the frame of the aim were established in step 1 disregarding the framework mentioned above. In step 2 the identification of relevant text was influenced by the framework searching for text which could elucidate this conception. However, the coding and labelling following and the rest of the analysis process were highly inductive in nature where the life world of the employers directed the analysis.

The four steps of the analysis in STC was conducted as follows: In the first step, four preliminary themes were found: company culture and leadership, hearing loss in the company, room for manoeuvre, and employer and employee relations. The coding in the second step encompassed coding of meaning units identified as relevant to the aim of the study. It was further elaborated, grouped and regrouped, resulting in five different code groups. An example of a code group is 'reflections and knowledge' and an example of an associated meaning unit follows:

> "I think that it's quite good for a hearing impaired to enter and function in such a classroom – I expect – even though I don't know much about it. For example, where [the employee with hearing loss] works, there ought to be such a system maybe. That's the kind of thing we see if you are supposed to think about technical solutions that can work for her in the classrooms where she is, and – and elsewhere"

During condensation in the third step, sub-groups were created under each group and condensates for all groups were constructed. An example of such an artificial quote from the subgroup 'the function of dialogue' is given below:

> It is through dialogue that we find the measures. Dialogue will facilitate being ahead of problems. Without dialogue, I'm side-lined. We talk all the time to find out how to do things in the best way, and when the situation got worse, we had to talk even more. Our wish is to keep people at work, and then dialogue is my tool in contributing to that, whatever impairment it is about…

The synthesising of the fourth step involved a regrouping of condensates where a coherent story was not obtainable. Category headings were named and renamed in a continuous process. The final category names and thus, the results were as follows:

- The observant facilitator
- Bypassing non-manifested challenges
- The imperative of information
- Tailoring positions for temporary needs
- Unaccommodated meetings despite benevolence
- Self-sufficient accommodation processes for hearing loss issues

The process of analysis involved the first (EVS) and last (MBR) author of the paper. In the first and second step, themes and codes were identified separately and discussed afterwards, while the condensates in step three were read by the last author and discussed in combination with the synthesising process in step four.

3.4 Ethical considerations

The mandatory ethical practises were followed by applying to The Norwegian Centre for Research Data, NSD, where the studies were approved (ref. no. 45289 and 47760). A remit assessment was forwarded to The Regional Committees for Medical and Health Research Ethics (document-id 610168), where the study was regarded as not being within the scope of the health research legislation (ref.no. 2015/1122 C).

In the cross-sectional study, information on anonymity and information handling was given in the e-mail in which the survey-link was included, and an e-mail address was forwarded for questions about the survey. In the two interview studies, an information sheet was forwarded in advance. The content was explained at the interview appointment, and a written consent was given before the interview was conducted.

Brinkmann and Kvale (2005) described the importance of thick ethical descriptions for qualitative researchers to be ethically proficient. Ethical proficiency involves confronting the ethical reality such as the power relations in interviews. Thick descriptions, both scientifically and ethically, signifies the ethically competent qualitative researcher (Brinkmann & Kvale, 2005). Describing the events in which the interviews occur is one way of thickening the ethical description (Brinkmann & Kvale, 2005). In this thesis, the employees interviewed were considered the most vulnerable group of informants due to both power relations and their communication impairment. Thus, all interviews were conducted at the premises of the choice of the respective employee to secure a quiet setting with the privacy necessary for her/him. The communication setting was thematised and clarified before the recording started. An assistive listening device was available if needed, and one employee chose to use it. The employers had the same choice of premises.

An additional contextual issue of importance was the background of the interviewer. All participants were informed of the interviewer being a trained educational audiologist and the background and the aim of the study. Being open to other people is part of being ethical according to Brinkmann and Kvale (2005). Furthermore, the

interviews were performed in a Rogerian manner of unconditional positive regard (Brinkmann & Kvale, 2005) in acceptance of the participants' narratives.

Ethical implications of these choices are included in the methods discussion section.

4 Summary of results

Investigating and identifying facilitators and barriers in work participation for employees with hearing loss was the main objective of this thesis. The subject was studied from three different perspectives: a mapping of the overall situation for individuals with hearing impairment of working age as a group in Norway, investigation of the employee perspective on facilitators and barriers, and investigation of the employer perspective of having leader responsibility for employees with hearing impairment.

4.1 Paper I

Hearing loss and work participation: a cross-sectional study in Norway

The aim of this study was to describe work participation of persons with hearing loss, and associations with hearing disabilities, self-reported work ability, fatigue, and work accommodation.

The study population had mainly a bilateral mild or moderate hearing loss of long duration. They were mainly hearing aid users, and frequently troubled by tinnitus. Furthermore, there was a high employment rate (76.6%), a high proportion of senior workers (mean age 54.7 years) with high seniority in their present position, and they were highly educated.

The results showed an apparently high mean score of hearing disability (43.5) and fatigue (15.4) despite the large number of responders with mild and moderate hearing loss. Fatigue was positively associated with an increase in the degree of hearing loss and it was highly associated with an increase in sick leave. Moreover, the degree of hearing loss was negatively associated with work ability and work role functioning, and the strongest association was from mild to moderate hearing loss.

Having workplace accommodation was more likely with increased hearing loss, high seniority, and having part-time position. However, being in need of accommodation

without receiving it was reported by 30.7% and was also associated with increased hearing loss. Workplace accommodation was more common among employees with additional conditions (hyperacusis, Ménière's disease or a visual impairment) reported by 34.4% vs. 21.6% among those with hearing loss only. However, the need of accommodation without receiving it was larger as well (40.9% vs. 27.1%). Having an additional condition was associated with a lower employment rate, a higher prevalence of long-term sick leave as well as a decreased work ability score and increased fatigue score.

Women reported lower work ability scores, higher fatigue scores and higher hearing disability scores than men, and increased severity of hearing loss was associated with a decreased employment rate and increased part-time work in women only.

In conclusion, this study found a high degree of fatigue among individuals with hearing loss. Moreover, moderate hearing loss might have a negative impact on function, and negative consequences of hearing loss seem to have a greater impact on women than men. Accommodation seems to be more frequent among the employees most vulnerable to a labour market disconnection.

4.2 Paper II

Working Life Trajectories with Hearing Impairment

The aim of this study was to identify and explore factors which facilitate or hinder work participation, as described by employees with hearing impairment.

The analysis resulted in a conceptual framework of working life trajectories towards sustainable participation or disconnection. The trajectories proceeded through phases of acknowledgement of the impact of hearing loss where the pre-acknowledgement phase implied limited adjustments to the hearing loss. The acknowledgement phase implied a transition towards initiation of accommodation processes, and the post-acknowledgement phase implied a long-term maintenance of accommodation and participation. The phases were influenced by the qualities of three main contexts (the personal context, the workplace context, and the service provider context). Important

contextual factors for work participation outcome were the level of knowledge about hearing loss impact, involvement or accommodation by co-workers and employer, and access to service providers.

Sustainable trajectories were characterised by a high level of knowledge about hearing loss impact, which contributed to an acknowledging attitude towards the hearing condition. Such attitude tended to increase the likelihood of co-worker and manager involvement in solving challenging situations. When appropriate service provision was accessible in addition to this, a predictable working situation was established. Spending a long time in a pre-acknowledgment phase seemed to be a risk factor for disconnecting trajectories, and limited access to service providers tended to prolong the time spent in this phase. A lack of knowledge about hearing loss impact tended to give few tools for accommodation, and unsupportive employers and co-workers would add to the strenuous working situation.

In conclusion, contextual factors seemed to contribute to hearing related working conditions for employees with hearing impairment. The results from this study indicate that the presence of the following factors may constitute barriers to work participation: lack of knowledge on the impact of hearing loss, solitary responsibility in accommodation processes, and limited access to appropriate service provision.

4.3 Paper III

Leader Responsibility for Employees with Hearing Impairment.
A Qualitative Study Exploring Employers' Experiences

The aim of this study was to explore managers' experiences with having leader responsibility for employees with hearing impairments.

The managers' way of thinking about vocational participation in general and their experiences with employees with hearing loss evolved around six main categories: 'the

observant facilitator', 'bypassing non-manifested challenges', 'the imperative of information', 'tailoring positions for temporary needs', 'unaccommodated meetings despite benevolence', and 'self-sufficient accommodation processes for hearing loss issues'.

The analysis showed that the managers saw themselves as facilitators for their employees to succeed in their positions, but they were dependent on information in order to do so. They showed flexibility in accommodating for temporary needs, while permanent needs tended to be more difficult to accommodate. Hearing related challenges were easily bypassed since the consequences were not observable in everyday situations, and meetings were often not accommodated even if they were acknowledged as difficult situations for employees with hearing impairment. Additionally, managers did not request support in accommodation processes involving hearing loss even when they requested support involving other issues.

In conclusion, this study suggests that there are barriers to develop less strenuous working conditions for employees with hearing impairments, even when the managers have a positive inclination towards accommodation and inclusion. The implications of hearing loss are not recognised as risk factors for fatigue and treated accordingly. Thus, this situation indicates a lack of prerequisites for exploiting the room for manoeuvre in the accommodation process. Not requesting support might be considered an additional barrier to improve the situation.

4.4 Synthesis of results

The topic of exploring work participation among persons with hearing loss in Norway and to identifying barriers and facilitators to their participation has been elucidated through three different perspectives. The first study gives a backdrop describing participation characteristics, while the two subsequent studies explore barriers and facilitators from the two main stakeholders in a work situation, namely the employees and their managers.

All three studies show that hearing loss constitutes a potential challenge in work participation. In the first study, it is indicated that moderate and severe hearing loss are associated with fatigue and reduced work ability. The way in which participation is challenged, is described in the second study showing that both intrinsic and extrinsic factors together played a crucial role in how strenuous employees with hearing loss experienced their work situation. The employees often found it lonely and tiresome to be the sole responsible for adjusting to their communication needs. In the third study, the managers confirmed that hearing loss challenges are easily forgotten when there are few signs of them in daily life. They described an awareness of these issues, but showed little initiative in the execution of possible steps.

The presence of fatigue registered in the first study was associated with increased severity of hearing loss, particularly going from mild to moderate hearing loss. However, the employees with hearing loss described contextual factors such as oral-aural demands at work and the access to service providers as important to their experience of strain and toil rather than the severity of their hearing loss. Flexibility, oral-aural demands, and accommodation by co-workers and employer were identified as the contextual factors influencing the degree of strain at the workplace. At the same time, the employers described a benevolent attitude towards hearing loss, which they often considered a minor challenge. Their concern tended to evolve around job satisfaction and sickness absence. The two interview studies indicate that hearing loss issues seem to get little attention among both employers and their employees, where the latter tend to avoid attention to their impairment.

Accommodation might influence participation indirectly, and accommodation related issues were central to the participants in both interview studies. The survey revealed that hearing related accommodation increased in prevalence with increased degree of hearing loss. Still, a large proportion of those with moderate and severe/profound hearing loss did not receive such accommodation. Moreover, a low use of assistive listening devices was reported. The employee study showed a reluctance towards requesting accommodation that involved communication partners, particularly using

assistive listening devices which involved active participation from them. Even assistive listening devices with a single microphone on the table could provoke uneasiness due to the visibility. Thus, this reluctance might be understood as a barrier to the initiation of accommodation processes which could be important to fatigue prevention and thus, sustainable participation.

The employer study found a benevolent attitude towards accommodation. However, temporary measures were more accessible than permanent ones, and the employers depended on information from the employee to know what to do. Moreover, they confirmed the impression from the employees that hearing loss issues are easily forgotten. This picture indicates a situation which lacks initiation, and accommodation was delimited to small-scale measures rather than prevention of future fatigue. At the same time, there were prerequisites present for adequate processes, but they did not seem to have the necessary catalyst to get started. Potentially, service providers could function as catalysts, but they were not requested by the employers, while the employees reported limited access to service providers.

5 Discussion of methods

This thesis constitutes a multimethod approach using separate quality criteria for the respective studies (Bryman, 2006). The multimethod approach is considered a strength of the study since it enlightens the research question from various perspectives.

5.1 Quantitative study

A cross-sectional design was chosen to map various variables regarding the target population. Drawing a representative sample would be the optimal procedure, but in a Norwegian setting, this procedure would have been expensive and time consuming due to the absence of register data. Recruitment through a special interest organisation might constitute a bias to the generalisability of the results, and thus, constituting a limitation of the study. For instance, the members might be individuals perceiving a greater burden than the general population of adults with hearing loss. Additionally, they might be better informed on hearing loss issues than non-members. However, there are reasons to believe that HLF is an organisation with a wide range of members with hearing loss partly due to their compensation arrangements if hearing aids are lost. This assumption is supported by the large proportion of participants using hearing aids and the large proportion of mild hearing loss in the survey. A strength of the study though is the high number of participants, i.e. exceeding 3000 participants.

By choosing an electronically conveyed questionnaire, a possibility to include everyone on the membership list registered with an e-mail address was available. This constitutes a strength of the study when recruiting through a special interest organisation. However, the low response rate could be a bias to the generalisability. The high work participation rate among the responders indicates the possibility of an underrepresentation of individuals disconnected from the labour market. Thus, the generalisability of the survey results could be biased towards senior workers rather than to the entire adult population with hearing loss of working age.

The use of validated instruments is a strength of the study. The instruments applied were the Hearing Disability and Handicap Scale (A.-S. Helvik et al., 2007; Hétu et al.,

1994), Chalder's fatigue scale (Chalder et al., 1993), a single-item question on work ability (Ahlstrom et al., 2010), and Work Role Functioning Questionnaire (Abma, van der Klink, & Bultmann, 2013; Johansen et al., 2018). Other questions were retrieved from previously established operationalised variables when available, i.e. the degree of hearing loss retrieved from the WHO classification and type of work tasks retrieved from the HUNT-study (a large Norwegian cohort study).

To measure the impact of hearing loss, the Hearing Disability and Handicap Scale (HDHS) was chosen. This was to our knowledge the only instrument validated in Norwegian. HDHS was developed to measure the most important consequences of hearing loss (Hétu et al., 1994). However, the scale might be considered limited missing some important factors important to employees with hearing loss, such as hearing rapid or quiet speech and hearing in meetings (Stephens, Jones, & Gianopoulos, 2000). Still, the scale has been found to identify important consequences of hearing loss not identified by individuals in patient-generated reports (Stephens et al., 2000). Thus, together with its brevity it was considered appropriate for the purpose of the study. Moreover, the HDHS is originally instructing responders to answer as without wearing hearing aids (A.-S. Helvik et al., 2007; Hétu et al., 1994), while we chose to instruct respondents to answer as wearing hearing aids. The rationale for this decision was to measure the impact of hearing loss as it is perceived by the respondents in real-life activities.

The Work Role Functioning Questionnaire (WRFQ) had recently been translated into Norwegian and a preliminary validation was available (Johansen et al., 2018). The WRFQ is extensive measuring various aspects of functioning, which is a strength of the instrument. However, the instrument might not sufficiently address challenges specific to individuals with hearing loss. Other health issues than fatigue was excluded from the questionnaire and might be considered a limitation. However, exhaustion/fatigue has been identified as a significant variable in groups with hearing impairments, and might be considered the most prominent threat to their health condition. Fatigue was chosen over burnout since there was an instrument available in Norwegian, which also

had been used in a population-based study in Norway. Moreover, sick leave measures were self-constructed and thus, a bias to the validity might be present. Sick leave measures differ from different countries due to different allowance systems and questions suitable across boarders are not feasible. For a Norwegian setting, no standard questions for sick leave measures were found.

5.2 Qualitative studies

Quality in qualitative studies is assessed through thick descriptions of the research process (Patton, 2002) rather than following predefined validation rules. Instead of considering its validity, trustworthiness and credibility are preferred concepts for quality assessment in a qualitative study. To achieve some agreement on quality criteria, consensus criteria have been developed (Kuper, Reeves, & Levinson, 2008; Tong, Sainsbury, & Craig, 2007). Consolidated criteria for reporting qualitative research (COREQ) based on extensive literature search has been established (Tong et al., 2007). The criteria consist of three domains, reflexivity, study design and analysis and findings, which need to be addressed in interview studies to ensure credibility. These three domains are discussed for both studies below.

5.2.1 Reflexivity

Reflexivity concerns how the researcher influences the research process and the examination of this influence (Corbin & Strauss, 2008). The researcher needs to acknowledge and consider one's personal stance (Malterud, 2011). The relationship to the participants is also a part of the reflexivity (Charmaz, 2014).

A reflexive attitude was attempted in both interview studies throughout the process. Preconceptions were written down in advance of both studies allowing for bracketing. Particularly the professional role as an educational audiologist was put in brackets. Logs on the analysis process were written, which was used to keep track of potential influence from the preconceptions. Disclosure of the professional stance was done towards the participants to ensure openness in an ethical perspective (Brinkmann & Kvale, 2005). A trained educational audiologist proposed a position of an informed outsider to both groups of participants. Openness on both educational background and

explicitly describing the aim of the study prevented a hidden agenda. Moreover, the professional background could ensure the employees that the interviewer was familiar with hearing impairments and its' challenges. Towards the employers, this disclosure could potentially have an adverse effect on the confidence between the interviewer and the interviewee since the interviewer could be regarded as an advocate for the employees. An explicitly neutral and open-minded attitude was attempted during the interview to prevent such a situation.

5.2.2 Study design

Purposeful sampling with maximum variation was the intention in the interview studies. The strength of the employee sample is that it encompasses both participants with pre-lingual and acquired hearing loss and a variation in the degree of loss. There was also a variation in attitudes towards and experiences with hearing loss. However, the variation was delimited to the eligible participants described in the methods section. Thus, the variation was restricted in terms of occupational categories with areas such as craft industry not being represented. Thus, this might imply a limitation to the transferability to such groups.

The convenience sampling of employers might be considered a limitation. However, purposeful sampling was done among the eligible participants even though the variation was limited. Nevertheless, the strength consists of the participants' recent and close experiences with hearing loss conveying data describing real-life experiences rather than attitudes expressed through hypothetical situations. Mainly, employer experiences might be transferable to employers with a positive inclination towards inclusion and accommodation issues. Further, most of the enterprises represented were enterprises with an Inclusive Workplace-agreement. Approximately 60% of Norwegian employees work in an enterprise with such an agreement, and these enterprises constitute 26% of Norwegian enterprises (Regjeringen, 2018). This implies that the findings pertain to the situation of a large proportion of Norwegian employees. Whether small enterprises, which typically do not have an Inclusive

Workplace-agreement, differ from large enterprises in handling disabilities, is not known.

Power characteristics often embedded in interview situations comprise interviews as asymmetrical, instrumental, one-way dialogues with a potentially hidden agenda where the interviewer decides on the interpretation (Brinkmann & Kvale, 2005). However, opposite effects were expressed during some interviews when participants explicitly expressed how they perceived the importance of generating new knowledge on the study topic, and that they appreciated the participation. Some participants used the interview situation as a possibility to reflect on their situation as hearing impaired and experienced the talk as bringing them further in their understanding. Additionally, some participants had questions on how to solve specific difficulties, and such questions were discussed after the interview. In this respect, the interview situation was less instrumental and not serving as a one-way dialogue. Moreover, probing was used to deepen the understanding for interpretation purposes to diminish misunderstandings.

The employers also expressed sympathy with the aim of the study. A positive attitude towards the opportunity to reflect on the subjects and pose questions afterwards were present in some participants. Moreover, these interviews were less personal than the employee interviews since the employers were in the role of professionals. Thus, these data consist of somewhat less detailed accounts of working life perspectives compared to the employee data. Further, the power characteristics were considered less prominent in the employer interviews, thus being less ethically challenging considering the descriptions by Brinkmann and Kvale (2005) above.

5.2.3 Analysis and findings

The use of well-described guidelines within the methods chosen, as described in the methods section, is considered a strength of the interview studies.

A grounded theory approach as method of analysis of employee data is considered a strength due to its appropriateness in dealing with a vast material and the aim of

proceeding past descriptions. The guidelines of Corbin and Strauss (2008) were followed as far as feasible. Nevertheless, the method is flexible towards the necessity of pragmatic choices of reality (Corbin & Strauss, 2008). Their procedure does not deviate in any significant way from the strategies necessary to claim a grounded theory approach as described by Charmaz (2014), such as conducting a simultaneously and iterative process of data collection and analysis, using comparative methods, aiming at theory construction rather than description, and engaging in theoretical sampling.

In this study, the simultaneous and iterative process of data collection and analysis was applied. However, interviewing was evolving ahead of the analysis process, and the iterative process was accomplished in a somewhat adjusted manner. Theoretical sampling is another characteristic of grounded theory, which implies that data collection is pursued until theoretical saturation for the developed concepts has been achieved (Charmaz, 2014; Corbin & Strauss, 2008). The concepts derived from the analysis were sought contested through variation in experiences, thus, doing purposeful sampling with maximum variation, and by such reaching theoretical saturation. However, sampling was limited to the eligible participants, and theoretical saturation could have been improved with more variation among the eligible participants.

The method of systematic text condensation is appropriate when analysing less extensive data material (Malterud, 2012). Less extensive material is considered an advantage in STC since it comprises a manageable amount of text. However, the steps of the analysis process need to be followed. This was consistently done in the analysis of the employer data. STC as a phenomenological approach aims at conveying the participants' experiences (Malterud, 2012). To achieve taking employer perspectives it was important to put employee perspectives in brackets. Employee perspectives were incorporated in the topics of the interview guide, but put in brackets during the analysis to allow for the employer perspectives to emerge.

Saturation as a concept describes the point where new data does not add something new compared to the previous data (Malterud, 2012). Whether it is possible to

establish such a point is questionable, and an adequate sample rich on information is more pertinent (Malterud, 2012). With the aim of developing new knowledge within a scarcely described area, the employer interviews provide a coherent story within the sample they represent. The categories developed in the analysis reached saturation in terms of this sample. New aspects could be provided with participants from other branches, however not eligible for this study.

6 Discussion of results

This thesis presents new insight on work participation in individuals with hearing loss in a Norwegian setting, thus contributing to an elucidation of participation possibilities for this group of employees. The results depict both participation characteristics and working life trajectories for persons with hearing loss. A broad perspective has been applied allowing factors external to the individual to be incorporated. Moreover, identifying barriers and facilitators was an overarching aim, and these barriers and facilitators are discussed in the following within the frame of the phases identified.

Despite a high participation rate, the results in paper I showed that part-time work was common for health reasons and/or that a full time position would be too strenuous for employees with hearing loss. The fairly high fatigue score implied a strenuous life situation. Considering the proportion of employees in need of accommodation without receiving it, the amount of fatigue might be considered unnecessarily high. Moreover, gender differences were found where women seemed to experience higher impact from their hearing loss than men.

Paper II showed that the time spent in a pre-acknowledgement phase together with a lack of knowledge of hearing loss issues influenced the degree of strain. The risk of fatigue appeared to increase with an excessive period of time before reaching a point of acknowledgment of restrictions and limitations from the hearing loss. A transition towards the point of acknowledgement was frequently a result from knowledge transfer. Further, the degree of toil was influenced by environmental factors at the work place. Involvement from co-workers and the employer in the execution of accommodation measures was an important environmental factor to the level of strain. Environmental factors constituted favourable or unfavourable long-term working conditions forming sustainable or disconnecting trajectories.

The results of paper III showed that the employers had a benevolent attitude towards participating in accommodation, but showed limited long-term perspective on prevention of fatigue and disconnection. Available services were not utilised by either

stakeholders – the employees due to limited access while the employers did not request support.

6.1 Hearing loss as a relational condition

A main finding in this thesis was the significance of the contextual factors on the degree of strain perceived by the employees with hearing loss (Paper II). Within this frame, hearing loss may be perceived as a risk factor for labour market disconnection depending on the characteristics of the contexts. This perception has similarities with the orientation matrix of aging and work by Ilmarinen (2001) where the individual, the enterprise, and society were considered stakeholders for work participation in aging employees. The vertical level of the matrix depicted the relationship between the stakeholders and a potential sharing of responsibility to secure work participation, and a strong connection between the enterprise and the individual was emphasised. A corresponding connection between the employee with hearing loss and the work place was established in this thesis. Flexibility, low oral-aural demands and accommodation by employer/colleagues were identified as facilitators for reduced strain (Paper II), while the manager took responsibility through facilitation of dialogue and being attentive to needs (Paper III). This relationship between the employee and the employer comprised both columns of problems/possibilities and means/solutions in the orientation matrix. Additionally, both stakeholders expressed the same aim of sustainable participation, representing the third column in the matrix.

Society as stakeholder in the orientation matrix was present in this thesis through the service providers as experienced by the employees with hearing loss (Paper II) and through arrangements such as the Inclusive Workplace-agreement and occupational health services in employer perspectives (Paper III). However, examples of the various costs listed in the orientation matrix for this stakeholder were not present in this study. Nevertheless, economic issues may explain perceived shortcomings in service provision, and thus indirectly be present.

Employing the orientation matrix of aging and work on hearing loss seems to be an adequate framework. A strength of the matrix is the emphasis on action in finding

means for sustainable work participation. However, its limitation constitutes the absence of time as a significant factor, which was identified in the working life trajectories with hearing loss.

6.2 Hearing loss at work as trajectories

The significance of time as a factor in labour market affiliations, as mentioned above, is another main finding in this thesis (Paper II). More specifically, a long duration of non-accommodated working situations implied an accumulation of strain. Time is also an important aspect of labour market affiliation in the life course perspective described in Amick et al. (2016). The intention of the life course perspective was to develop a dynamic model, which included time as well as the influence from external factors on the individual and its work participation and health. Their model encompassed a life course shaped by experiences and transitions, and influenced by contexts. Their perspective identified four contextual levels: the workplace, the labour market, societal, and supranational contexts. The levels above the workplace were not present in this thesis, apart from the potential indirect influence from a societal level as indicated above. The contextual levels not represented in this thesis are expected to have the same kind of influence on the trajectories as in those described by Amick et al. (2016), however not directly perceivable by the employees themselves.

The trajectories of labour market and health described by Amick et al. (2016) encompassed an interplay between labour market experiences and transitions in life course, health status and labour market affiliation. Such transitions could potentially influence the labour market outcome. A trajectory may include critical and sensitive periods, which are concepts pertaining to periods with potentially high positive or negative impact on the course. To perceive the working life experiences with hearing loss as trajectories seems an adequate way of incorporating the importance of time on the working situation of these employees. The most obvious health transition described in paper II constituted the onset of hearing loss or the time of diagnosis. Other health transitions related to hearing loss were exhaustion leading to sick leave episodes. Various experiences and transitions were present in the individual

narratives, but they were not easily fitted into a theoretical model as concepts of general significance. Moreover, critical and sensitive periods did not have a pronounced manifestation in the trajectories. The acknowledgement phase could, however be perceived as a critical period. It started by a transition, and the time following constituted initiation of measures for adjustments and accommodation. The experiences made within the different contexts had a potentially adverse or protective effect, thus resembling a critical period.

In the life course perspective, an accumulation of risks was described as different exposures and transitions occurring together influencing the health outcome (Amick et al., 2016). Moreover, exposures and transitions could occur with a link between the events, thus constituting a chain of risk. An accumulation of risk factors was identified in certain individual trajectories with hearing loss (Paper II) while an accumulation of protective factors was identified in others. A link between the factors, both facilitating and risk factors, could in some trajectories be identified and perceived as forming chains of risks or protective chains. However, these links were only tendencies and thus interpreted as accumulations rather than chains. Further analysis of a potential presence of such chains could be of interest for future research.

Consequently, an integration of the life course perspective with the orientation matrix in addressing hearing loss issues in the labour market seems adequate with respect to the multidimensional frame provided when aiming for sustainable work participation.

6.3 Barriers and facilitators in hearing loss trajectories

An important concept within the trajectories shown in paper II was their development through phases of acknowledgement. Acknowledgement of the impact of the hearing condition appeared to be a precondition for change towards sustainable trajectories. Barriers and facilitators are discussed below for the three phases of pre-acknowledgement, acknowledgement, and post-acknowledgement.

6.3.1 The pre-acknowledgement phase

Previously, several studies have described a reluctance towards acceptance or recognition of the hearing loss before and after the time of diagnosis (Engelund, 2006; A. Hindhede, 2010; Wänström et al., 2014). The process towards acceptance has been described as slow and gradual (Wänström et al., 2014), often initiated through social pressures (A. Hindhede, 2010), and a four-step recognition process towards help seeking has been identified (Engelund, 2006). Acceptance of the hearing loss seems to be a prerequisite for hearing correction and successful hearing aid use. However, acceptance seems to be insufficient for initiation of further measures for fatigue prevention according to the findings of paper II. Thus, the pre-acknowledgement phase identified in this thesis extended past the point of acceptance until an acknowledgement of the impact of the hearing loss on the individual's life was reached. Such an acknowledgement was dependent on knowledge of the potential impact of hearing loss, and this knowledge was scarce in the pre-acknowledgement phase. Additionally, gaining experience did not result in knowledge in itself. Spending long time in this phase seemed to constitute a risk for excessive strain, and this risk seemed to be associated with a lack of knowledge transfer from service providers. Moreover, with few prerequisites for initiating measures, the employer played a minor role. The study described in paper III showed how the employer depended on employee initiatives. Acknowledgement was an important aspect in a study of successful careers with acquired hearing loss (D. C. Baldridge & Kulkarni, 2017). Employees with hearing loss had experience with denial and concealment of the impairment. The subsequent acknowledgement lead to a change in identity and a need to change position or career.

Efforts in abbreviating the time spent in a pre-acknowledgement phase seem to be important to reduce the long-term wear and tear. In Norway, the entry into the sphere of hearing impairment services and rehabilitation is typically through a medical examination and subsequent hearing aid fitting. A study of the audiological encounter between the patient and the technical audiologist in hearing aid fitting in Denmark

found the encounter to be a standardised speech about medical/technical topics of hearing aid use (A. L. Hindhede, 2010). The audiologists controlled the encounter, and the patients' everyday life and concerns were not on the agenda. A high prevalence of hearing aid use was found in the present thesis (Paper I) indicating access to hearing assessment. A lack of knowledge transfer from professionals to the persons with hearing loss was expressed, together with a restricted access to other service providers (Paper II), which bear similarities with the study of A. L. Hindhede (2010). To reach acknowledgement and incorporating the hearing loss as a part of one's identity, topics other than medical/technical concerns need to be addressed, and the hearing aid fitting process is the first, and for some the only possibility where there are preconditions for initiating the process.

Seven main phases of patient journeys during hearing assessments and rehabilitation have previously been identified comparing descriptions from adults with acquired hearing loss with the perspective of professionals (V. K. C. Manchaiah, Stephens, & Meredith, 2011). The journey included a self-evaluation phase where the patients reflected on their experiences and evaluated the services they had received. This phase was not identified by the professionals, and according to the authors, it highlights the fact that the journeys of individuals with acquired hearing loss are not fully understood even by experienced hearing healthcare professionals. Further, they argued that counselling and service delivery might be improved by exploring such subjects, and using a patient journey template could be adequate due to the limited time during consultations. The limited use of assistive listening devices reported in both paper I and II might result from causes both intrinsic and extrinsic to the person with hearing loss and the situation suggests an underconsumption compared to what could be appropriate for improving listening conditions. Thus, an improved systematic approach during audiological assessment could potentially capture such needs earlier.

Assessment beyond hearing sensitivity levels could encompass activity limitations and participation restrictions. The Hearing Disability and Handicap Scale is available in Norwegian and previously found suitable for the purpose (A. S. Helvik, Jacobsen, &

Hallberg, 2006). The brief ICF core set for hearing loss is an additional tool possibly adequate for the same purpose (Danermark et al., 2013). Such tools might be helpful to the service provider in contributing to adequate accommodation measures and to the person with hearing loss in a process towards acknowledgement.

6.3.2 The acknowledgement phase

The transition into acknowledging the impact of the hearing loss was initiated by knowledge acquisition (Paper II). However, when the knowledge transfer was limited, it tended to result in limited measures. A benevolent employer attitude was a process facilitator. However, employers expected the employee to know what measures would be adequate (Paper III). Thus, there seemed to be a limitation in initiating excessive approaches to accommodation.

Perceived satisfaction with workplace accommodation has previously been found to be low and effective communication in groups and lack of co-worker support were the needs most commonly unmet (Haynes & Linden, 2012). A study from Canada identified four categories of challenges to employees with hearing loss: lack of hearing friendly workspaces, problems with technologies, communication with others, and lack of access to professional assessment at work (Shaw, Tetlaff, et al., 2013). Furthermore, managing the disparities at work included self-accommodation, self-advocacy, lobbying, and self-management. Such findings indicate that the challenges have potentially vast consequences for work performance where finding solutions implies a high degree of solitary personal efforts.

Involvement from others through accommodation from manager and co-workers was identified as a facilitator in the present thesis (Paper II). The benevolent attitude and the great social responsibility conveyed by the employers (Paper III) indicated that this is a feasible scenario in many workplaces. However, the characteristics of hearing impairments need to be identified in the process to sufficiently address the challenges so that accommodation measures proceed beyond task adjustments. A barrier to this identification was the employers tendency to view hearing loss as a minor challenge.

6.3.3 The post-acknowledgement phase

Managing working life with hearing loss involves a long-term perspective. The prevalence of accommodation found in the present thesis was limited, and accommodation was more prevalent in vulnerable groups, e.g. participants with recent long-term sick leave and low work ability (Paper I). Thus, accommodation was in all likelihood not conducted as a measure to prevent fatigue, and it is questionable whether the measures taken were sufficient to do so.

As mentioned above, co-worker support was appreciated but it was also scarce (Paper II). Such support has been identified as an unmet need among employees with hearing impairments elsewhere as well (Haynes & Linden, 2012). Increased participation from manager and co-workers could contribute in fatigue prevention. However, studies have shown that accommodation imposing action on others, particularly when they are recurring, has an increased risk of being withheld (D. C. Baldridge & Swift, 2013; D. C. Baldridge & Veiga, 2006). Moreover, employer perspectives revealed a tendency on their behalf to concentrate on temporary measures (Paper III), while managing hearing loss presupposes permanent ones. Support from service providers such as occupational health services could contribute to a purposeful process. However, employers failing to request support (Paper III) together with reluctance in employees (Paper II) could be considered as barriers to involvement from service providers. Furthermore, limited access to service providers was another barrier to such involvement.

The aims to facilitate work participation and prevent disconnection in the Norwegian Inclusive Workplace-agreement consist of three intermediate aims as mentioned earlier. The three aims are sick leave prevention, participation of persons with reduced work ability, and delayed retirement. Based on the results from this thesis, individuals with hearing impairment constitute a target population within all three areas. A risk for developing fatigue has been found in previous studies (Hasson, Theorell, Westerlund, & Canlon, 2010; Nachtegaal et al., 2009) as well as in this thesis (Paper I and II), which might constitute an increased risk of both sickness absence and early retirement in

these employees. Thus, to decrease the risk of sick leave, secure sustainable trajectories and postpone retirement, a closer attention on fatigue prevention would be necessary. That accommodation was found to be more prevalent in vulnerable groups (Paper I), indicates a late onset of accommodation measures. The high proportion of employees without accommodation when being in need of it, as described in Paper I, supports this interpretation. When the reason for part-time work frequently was due to health issues and/or a full-time position being a too heavy burden, there are indications of disconnecting processes. However, working part-time might as well be an adequate measure for sustainable work participation. Nevertheless, more attention to prevention could possibly make part-time work unnecessary in a long-term perspective.

6.4 Vocational support issues for hearing loss

Studies on the impact of hearing loss on working life have increased over the years, and several studies have requested improved follow-up of these employees (Haynes & Linden, 2012; Hua et al., 2015; Shaw, Jennings, & Kramer, 2013; Tye-Murray et al., 2009). Haynes and Linden (2012) recommended further emphasis on universal design. Hua et al. (2015) viewed hearing aid fitting for individuals with mild-moderate hearing loss as insufficient and called for extensive services post fitting. Shaw, Jennings, et al. (2013) demanded new efforts in disability prevention of employees with hearing loss. They offered suggestions to how professionals can contribute to improved hearing at work. Tye-Murray et al. (2009) also pointed to a lack of follow-up additional to providing a listening device. They recommended designing aural rehabilitation intervention plans embracing multiple topics including psychosocial support if necessary.

Lack of a standard approach to work related difficulties in audiological practices has been described (Kramer, 2008). However, efforts have been made to improve on the issue, and specific guidelines and programs have received attention (A. H. Gussenhoven et al., 2013). A systematic review assessed nine vocational rehabilitation services and found that they varied in content, extent, and procedures (A. H.

Gussenhoven et al., 2013). All rehabilitation programs in the review included information provision, while topics like communication training, coping and accommodation matters varied. Five programs took a multidisciplinary approach, and three took an integrated approach, where professionals were in close contact with stakeholders to increase the likelihood of implementation. The remaining programs involved the employee with hearing loss only.

Statistical evidence of the effectiveness of the programs was scarce, and the programs with evaluation used different outcome measures (A. H. Gussenhoven et al., 2013). However, an improvement in general health, communication strategies, and work readiness were reported (A. H. Gussenhoven et al., 2013). Recently, a randomized controlled trial measuring the effectiveness of a vocational enablement protocol (VEP) for employees with hearing difficulties found no differences between the groups using need for recovery after work as outcome measure (A. H. M. Gussenhoven, Anema, Witte, Goverts, & Kramer, 2017). However, a significant but small improvement in self-acceptance was found in the intervention group. A possible explanation to the lack of effect was suggested to be a low score on the need for recovery scale at baseline. Another suggestion was a modest implementation rate of the measures provided in the program. The VEP as described in Kramer (2008) was a multidisciplinary approach performed in a clinic. The workplace was examined if indicated, and no particular professional had a co-ordinating responsibility to secure the process (Kramer, 2008). Moreover, 20 % of the participants had an employer who was negative towards implementing the suggested measures. Introducing a case manager and closer contact with relevant stakeholders were suggested as measures to improve compliance with the recommendations (A. H. M. Gussenhoven et al., 2017).

In Norway, individuals of working age who suspect a hearing loss are offered medical tests and fitting of hearing aids if adequate within the specialist health care system. Other technical assistive devices are available from the Norwegian welfare system together with a newly introduced vocational counselling service. Other rehabilitative services, such as enablement courses, are available but scarce, and the path to attend

these courses were found to be coincidental (Paper II). Moreover, the service provision for hearing loss issues has been characterised as fragmented and criticised for not incorporating psychosocial factors (Helsedepartementet, 2000). Thus, the recommendations expressed in previous research seem to be appropriate in a Norwegian setting as well. Needs for closer follow-up to prevent fatigue was found in the present thesis, and no rehabilitation protocol seemed to exist.

A future enablement approach needs to be an integrated one. Involvement of stakeholders are important to increase the likelihood of implementation of measures as suggested in the above-mentioned studies. In this thesis, accommodation and assistance by co-workers and managers were identified as important (Paper II) while managers did not report a need for support (Paper III). Thus, an integrated approach could contribute to increased self-efficacy in both employer and employee. Additionally, a multidisciplinary approach would broaden the scope and ultimately the room for manoeuvre. A co-ordinator would increase the possibility for a goal-oriented process as suggested earlier. The ICF core set for hearing loss could provide a template for setting up an enablement program.

This thesis also found gender differences where hearing loss seemed to have a greater impact on women than men (Paper I). Such gender differences have been found in other areas of working life as well. The reasons for these differences are not fully understood. However, such differences call for increased awareness among service providers to possible gender specific issues particularly when it comes to prevention matters. Within a relational or a biopsychosocial model, a broad assessment would be necessary to prevent disconnecting trajectories. Using a biopsychosocial model in rehabilitation towards individuals with hearing impairments has been urged elsewhere. Kooser (2013) argued that such an intervention model would improve the hearing aid adoption rate. She also urged hearing professionals to engage in various disciplines to enlarge their understanding of human behaviour to improve their counselling interventions. Moreover, other professionals would be in need of an improved understanding of the biopsychosocial impact of hearing loss (Kooser, 2013).

In a Norwegian setting, the latter would probably improve the possibilities for employees with hearing loss to be supported earlier in their trajectories.

7 Conclusion

The findings of this thesis is in line with previous studies indicating that people with hearing loss constitute a vulnerable group in the labour market. The risk of developing fatigue seems to be a major concern for sustainable work participation, and the experiences over time seem to play a crucial part in a long-term working life perspective. Previous research and today's service provision tend to focus on an individual-oriented approach to hearing loss and work. However, work participation occurs within a relational context influenced by various factors internal and external to the employee. Thus, the approach to hearing loss at work needs to apply a relational approach where the respective stakeholders are included in processes facilitating participation, and where the approach is adapted to the acknowledgement phase in which the employee currently is. Additionally, individuals with hearing loss need support in developing an adequate self-advocacy approach to bring along to the workplace. In today's service provision in Norway, only service providers with audiological competency have the preconditions to initiate a change which implies a knowledge transfer necessary to the individuals' enablement. Moreover, the employers need support to detect the specificities of hearing related challenges at work. Thus, an integrated approach including the stakeholders implies that support should be provided at the workplace.

8 Implications for practice

To facilitate sustainable work participation for individuals with hearing loss, new measures and initiatives are necessary. Support additional to medical examination and hearing aid fitting has been requested previously, and this thesis adds to the argumentation in favour of such support. Thus, suggestions to the topics that need to be addressed are as follows:

- Increased emphasis on fatigue prevention is necessary to secure sustainable participation. Hearing loss as a risk factor for labour market disconnection needs to be addressed by occupational health services and general practitioners.
- Implementation of hearing disability and fatigue assessments in the clinics is necessary to consider potential negative effects of the hearing loss.
- Individuals newly diagnosed with hearing loss need assistance in audiological enablement. Improved access to knowledge on potential impact of hearing loss in an early stage of hearing loss trajectories could facilitate an early recognition, and by such contribute to fatigue prevention.
- A broad perspective on workplace accommodation is needed. Efficient vocational enablement measures include not only the employee with hearing loss, but also the employer to improve implementation likelihood.
- Implementation of a systematic follow-up after hearing aid fitting towards individuals with moderate and severe/profound hearing loss is needed.
- A vocational enablement program needs a biopsychosocial and multidisciplinary approach towards sustainable work participation as hearing loss tends to have consequences on various domains in life potentially affecting work participation.

9 Implications for research

This thesis is a first step in mapping issues related to work participation for individuals with hearing loss in Norway. Further research is needed to better understand their conditions for participation. Topics that would elaborate this picture are indicated below.

- The development of a vocational enablement program for hearing loss is needed, and the effect of the program needs to be tested.
- Assessment tools for work role functioning which address hearing loss issues need to be developed.
- More research is needed to describe the perspectives of employers who are less prone to workplace accommodations. Their perspectives could provide important knowledge on how to construct vocational enablement programs and how to implement them.
- More research on gender differences in work and health is needed to understand how rehabilitation and enablement initiatives can address gender specificities to prevent disconnection.
- Conducting a study drawing a more representative sample of the target group could provide a complementary picture of the participation characteristics. A particular emphasis on accommodation matters could be of great value in such a study.

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11 Appendix

11.1 Appendix A

Questionnaire Paper I

Transformed from electronic version to word for administration purposes only

1. Takk for at du vil delta! Svarene dine blir behandlet anonymt og kan ikke spores tilbake til deg.

2. Bakgrunnsinformasjon

Kjønn

(Angiv kun ét svar)

Kvinne	Mann
❑	❑

3. Hvor gammel er du?

(Angiv kun ét svar)

1 1 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5 6 6 6 6 6 6 6 6
8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7

4. Hvilket fylke bor du i?

(Angiv kun ét svar)

Akershus	Aust-Agder	Buskerud	Finnmark	Hedmark	Hordaland	Møre og Romsdal	Nord-Trøndelag	Nordland	Oppland	Oslo	Rogaland	Sogn og Fjordane	Sør-Trøndelag	Telemark	Troms	Vest-Agder	Vestfold	Østfold
❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑

5. Har du nedsatt hørsel?

(Angiv kun ét svar)

- ❑ Ja, på begge ører
- ❑ Ja, på ett øre
- ❑ Nei - Gå til 9

6. Hvordan vurderer du din hørsel?

Vurder ut fra det øret du hører best på og uten bruk av høreapparat eller annen forsterkning

(Angiv kun ét svar)

- ❑ Lett hørselstap – kan høre og gjenta ord sagt med vanlig stemme på én meters avstand
- ❑ Moderat hørselstap – kan høre og gjenta ord sagt med hevet stemme på én meters avstand
- ❑ Stort hørselstap – kan høre noen ord ved roping inn i det beste øret
- ❑ Svært stort/døv – kan ikke høre eller forstå selv ved roping

7. Hvor lenge har du hatt hørselstap?

(Angiv kun ét svar)

Inntil 2 år	2 - 5 år	6 - 10 år	Mer enn 10 år	Hele livet / så lenge jeg kan huske

❑ ❑ ❑ ❑ ❑

8. Hva slags hørselsteknisk utstyr bruker du?

Flere svar mulig

(Angiv gerne flere svar)

❑ Høreapparat

❑ Cochleaimplantat (CI)

❑ Teleslynge/FM-anlegg eller annet kommunikasjonsutstyr

❑ Bruker ikke hørselsteknisk utstyr

Annet, spesifiser

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9. Er du plaget av tinnitus (øresus)?

(Angiv kun ét svar)

❑ Ja, ofte

❑ Ja, av og til

❑ Sjelden

❑ Aldri

10. Har du fått påvist hyperacusis (overfølsomhet for lyd)?

(Angiv kun ét svar)

Ja	Nei
❑	❑

11. Har du fått påvist sykdommen Menière (kombinasjon av svimmelhetsanfall, tinnitus og nedsatt hørsel)?

(Angiv kun ét svar)

Ja	Nei
❑	❑

12. Har du synsvansker som ikke kan korrigeres med briller?

(Angiv kun ét svar)

Ja	Nei
❑	❑

13. Vennligst svar på spørsmålene under.

Hvis du bruker høreapparat eller cochleaimplantat, svarer du utfra din funksjon med høreapparatene/implantatet på.

(Angiv kun et svar pr. spørgsmål)

	Aldri	Av og til	Ofte	Alltid
Er det vanskelig for deg å følge	❑	❑	❑	❑

med i en samtale i noen av de følgende situasjonene: På jobb, på bussen, i bilen eller i butikken?				
Kan du høre lyden av en dør som åpnes når du er inne i rommet?	❑	❑	❑	❑
Bekymrer det deg at andre skal få vite at du hører dårlig?	❑	❑	❑	❑
Synes du det er vanskelig å be andre gjenta hva de sa?	❑	❑	❑	❑

14. Vennligst svar på spørsmålene under.

Hvis du bruker høreapparat eller cochleaimplantat, svarer du utfra din funksjon med høreapparatene/implantatet på.

(Angiv kun et svar pr. spørgsmål)

	Aldri	Av og til	Ofte	Alltid
Er det vanskelig for deg å høre hva som sies på TV'n om noen andre justerer lydstyrken?	❑	❑	❑	❑
Kan du høre om vannet koker når du	❑	❑	❑	❑

befinner deg på kjøkkenet?				
Blir du oppbrakt om du svarer feil eller for at du har misoppfattet noe?	❑	❑	❑	❑
Fører hørselstapet til begrensinger i ditt sosiale eller private liv?	❑	❑	❑	❑

15. Vennligst svar på spørsmålene under.

Hvis du bruker høreapparat eller cochleaimplantat, svarer du utfra din funksjon med høreapparatene/implantatet på.

(Angiv kun et svar pr. spørgsmål)

	Aldri	Av og til	Ofte	Alltid
Er det vanskelig for deg å høre hva som sies på radioen når noen andre justerer lydstyrken?	❑	❑	❑	❑
Kan du høre fottrinn hvis noen kommer inn i rommet uten at du ser personen?	❑	❑	❑	❑
Blir du irritert eller lei deg dersom du ikke	❑	❑	❑	❑

kan delta i en samtale?				
Blir du anspent eller trøtt pga. hørselsproblem et ditt?	❑	❑	❑	❑

16. Vennligst svar på spørsmålene under.

Hvis du bruker høreapparat eller cochleaimplantat, svarer du utfra din funksjon med høreapparatene/implantatet på.

(Angiv kun et svar pr. spørgsmål)

	Aldri	Av og til	Ofte	Alltid
Har du vanskelig for å oppfatte når flere snakker sammen?	❑	❑	❑	❑
Hører du om noen ringer eller banker på døren?	❑	❑	❑	❑
Unngår folk deg på grunn av hørselsproblem et ditt?	❑	❑	❑	❑
Vil du si at du i dag mangler selvtillit på grunn av ditt hørselstap?	❑	❑	❑	❑

17. Vennligst svar på spørsmålene under.

Hvis du bruker høreapparat eller cochleaimplantat, svarer du utfra din funksjon med høreapparatene/implantatet på.

(Angiv kun et svar pr. spørgsmål)

	Aldri	Av og til	Ofte	Alltid
Opplever du at du kan høre andre snakke, men ikke oppfatte hva de sier?	❑	❑	❑	❑
Kan du høre når telefonen ringer fra et annet rom?	❑	❑	❑	❑
Får du noen ganger følelsen av å være stengt ute fra enkelte ting på grunn av din hørsel?	❑	❑	❑	❑
Opplever du at din nedsatte hørsel påvirker forholdet til din ektefelle/samboer eller annen nærstående person?	❑	❑	❑	❑

18. Det er en del spørsmål igjen, men du er godt i gang. Klikk "neste" når du er klar for spørsmål om utdanning og arbeid.

19. Hva er den høyeste utdannelsen du har fullført?

(Angiv kun ét svar)

- ❑ Ikke fullført 9/10-årig grunnskole
- ❑ 9/10-årig grunnskole
- ❑ Videregående skole
- ❑ Høyskole eller universitet - bachelorgrad/profesjonsutdanning (1-4 år)
- ❑ Høyskole eller universitet - hovedfags-/masternivå eller høyere (mer enn 4 år)

20. Hvor lenge har du vært i arbeidslivet totalt?

(Angiv kun ét svar)

- ❑ Har ikke arbeidserfaring
- ❑ Inntil 5 år
- ❑ 6 - 10 år
- ❑ 11 - 20 år
- ❑ Lenger enn 20 år

21. Har du for tiden et arbeidsforhold?

(Angiv kun ét svar)

Ja	Nei - Gå til 37
❑	❑

22. Har du fast eller midlertidig stilling?

(Angiv kun ét svar)

Fast	Midlertidig
❑	❑

23. Har du heltids- eller deltidsstilling?

(Angiv kun ét svar)

Heltid - Gå til 26	Deltid
❑	❑

24. Hvor stor stillingsprosent jobber du i?

Hvis du har flere arbeidsforhold, kryss av for samlet andel.

Ikke ta hensyn til om du er sykemeldt.

(Angiv kun ét svar)

Under 50 %	Omtrent 50 %	Over 50 %
❑	❑	❑

25. Hva er årsaken til at du jobber deltid?

Flere svar mulig

(Angiv gerne flere svar)

- ❑ Eget ønske
- ❑ Student/skoleelev
- ❑ For stor arbeidsbyrde ved full stilling
- ❑ Omsorgsoppgaver
- ❑ Helsemessige årsaker
- ❑ Kombinasjon med uføretrygd
- ❑ Ikke fått større stilling
- ❑ Annet

26. Hvor mye jobber du for tiden?

(Angiv kun ét svar)

- ❑ Jeg jobber fullt i den stillingen jeg har
- ❑ Jeg jobber delvis i den stillingen jeg har
- ❑ Jeg jobber ikke for tiden

27. Hvor mange ansatte er det i din virksomhet?

(Angiv kun ét svar)

- ❑ 1-9
- ❑ 10-19
- ❑ 20-49
- ❑ 50-99
- ❑ 100-249
- ❑ 250 eller flere

28. Hvilken type virksomhet er du ansatt i?

Flere svar mulig

(Angiv gerne flere svar)

- ❑ Privat sektor
- ❑ Offentlig sektor
- ❑ Er selvstendig næringsdrivende

29. Hvordan vil du beskrive arbeidet ditt?

Har du flere arbeidsforhold, svarer du utfra den stillingen du jobber mest i.

(Angiv kun ét svar)

- ❑ For det meste stillesittende arbeid (f.eks. skrivebordsarbeid, montering)
- ❑ Arbeid som krever at du går mye (f.eks. ekspeditørarbeid, lett industriarbeid, undervisning)
- ❑ Arbeid hvor du går og løfter mye (f.eks. postbud, pleier, bygningsarbeid)
- ❑ Tungt kroppsarbeid (f.eks. skogsarbeid, tungt jordbruksarbeid, tungt bygningsarbeid)

30. Hvor lenge har du vært ansatt hos nåværende arbeidsgiver?

(Angiv kun ét svar)

- ❑ Inntil 1 år
- ❑ 1 - 3 år
- ❑ 4 - 8 år
- ❑ Lenger enn 8 år

31. Har arbeidsgiver tilpasset arbeidssituasjonen din til dine hørselsvansker, for eksempel i form av endringer i arbeidsoppgaver, arbeidstid, anskaffelse av hjelpemidler/utstyr?

(Angiv kun ét svar)

Ja - Gå til 33	Nei
❑	❑

32. Har du behov for tilpassing av arbeidssituasjonen til dine hørselsvansker?

(Angiv kun ét svar)

Ja	Nei
❑	❑

33. Er du for tiden sykemeldt?

(Angiv kun ét svar)

Ja, jeg er helt sykemeldt	Ja, jeg er delvis sykemeldt	Nei
❑	❑	❑

34. Hvor lenge har du vært sykemeldt siste år?

(Angiv kun ét svar)

- ❑ Har ikke vært sykemeldt
- ❑ under 1 uke
- ❑ 1-2 uker
- ❑ 3-4 uker
- ❑ 5-7 uker
- ❑ 8 uker eller mer

35. Mottar du noen av disse ytelsene?

Flere svar mulig

(Angiv gerne flere svar)

- ❑ Arbeidsavklaringspenger
- ❑ Uførestønad
- ❑ Arbeidsledighetstrygd

- ❑ Tidsubegrenset lønnstilskudd (TULT)
- ❑ Andre ytelser
- ❑ Jeg mottar ingen ytelser

36. Er du bekymret for å miste jobben din?

(Angiv kun ét svar)

- ❑ Jeg er ikke bekymret i det hele tatt
- ❑ Jeg er litt bekymret
- ❑ Jeg er veldig bekymret
- ❑ Vet ikke

37. Hvordan vurderer du din nåværende arbeidsevne sammenlignet med når den var på sitt beste?

(Angiv kun ét svar)

- ❑ 0 dårligst
- ❑ 1
- ❑ 2
- ❑ 3
- ❑ 4
- ❑ 5
- ❑ 6
- ❑ 7
- ❑ 8
- ❑ 9

- [ ] 10 best

38. Hvilke av disse tjenesteyterne kjenner du til med tanke på hørselsvansker?

Flere svar mulig

(Angiv gerne flere svar)

- [ ] Hørselssentral
- [ ] Privat øre-nese-halslege (avtalespesialist)
- [ ] NAV
- [ ] Hjelpemiddelsentral
- [ ] Kommunale tjenester
- [ ] Ingen av dem

Annet, spesifiser

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39. Hvilke av disse tjenesteyterne har du brukt med tanke på dine hørselsvansker?

Flere svar mulig

(Angiv gerne flere svar)

- ❑ Hørselssentral
- ❑ Privat øre-nese-halslege (avtalespesialist)
- ❑ NAV
- ❑ Hjelpemiddelsentral
- ❑ Kommunale tjenester
- ❑ Ingen av dem

Annet, spesifiser

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40. I løpet av de siste 4 ukene, hvor mye av din arbeidstid har du hatt vansker med å gjøre følgende på grunn av din fysiske og psykiske helse:

(Angiv kun et svar pr. spørgsmål)

	Hele tiden	Det meste av tiden	Halvparten av tiden	Noe av tiden	Aldri	Ikke relevant i min jobb
Komme i gang på starten av arbeidsdagen?	❑	❑	❑	❑	❑	❑

Begynne på oppgavene med en gang du kommer på arbeid?	❑	❑	❑	❑	❑	❑
Gjøre arbeidet ditt uten å ta ekstra pauser eller hvile?	❑	❑	❑	❑	❑	❑
Holde deg til rutiner eller tidsplaner?	❑	❑	❑	❑	❑	❑
Arbeide raskt nok?	❑	❑	❑	❑	❑	❑

41. I løpet av de siste 4 ukene, hvor mye av din arbeidstid har du hatt vansker med å gjøre følgende på grunn av din fysiske og psykiske helse:

(Angiv kun et svar pr. spørgsmål)

	Hele tiden	Det meste av tiden	Halvparten av tiden	Noe av tiden	Aldri	Ikke relevant i min jobb
Fullføre arbeidet i tide?	❑	❑	❑	❑	❑	❑
Gjøre arbeidet ditt uten feil?	❑	❑	❑	❑	❑	❑
Tilfredsstille de som vurderer	❑	❑	❑	❑	❑	❑

arbeidet ditt?						
Føle at du utretter noe i arbeidet ditt?	❑	❑	❑	❑	❑	❑
Føle at du har gjort hva du er i stand til?	❑	❑	❑	❑	❑	❑

42. I løpet av de siste 4 ukene, hvor mye av din arbeidstid har du hatt vansker med å gjøre følgende på grunn av din fysiske og psykiske helse:

(Angiv kun et svar pr. spørgsmål)

	Hele tiden	Det meste av tiden	Halvparten av tiden	Noe av tiden	Aldri	Ikke relevant i min jobb
Løfte, bære eller flytte gjenstander som veier mer enn 5 kilo?	❑	❑	❑	❑	❑	❑
Sitte, stå eller være i samme stilling mer enn 15 minutter mens du arbeider?	❑	❑	❑	❑	❑	❑
Gjenta de samme bevegelsene om og om igjen	❑	❑	❑	❑	❑	❑

mens du arbeider?						
Bøye eller vri deg mens du arbeider?	❑	❑	❑	❑	❑	❑
Bruke håndholdt verktøy eller utstyr (f.eks. telefon, penn, tastatur, data-mus, drill, hårtørrer, slipemaskin)?	❑	❑	❑	❑	❑	❑

43. I løpet av de siste 4 ukene, hvor mye av din arbeidstid har du hatt vansker med å gjøre følgende på grunn av din fysiske og psykiske helse:

(Angiv kun et svar pr. spørgsmål)

	Hele tiden	Det meste av tiden	Halvparten av tiden	Noe av tiden	Aldri	Ikke relevant i min jobb
Holde oppmerksomheten på arbeidet ditt?	❑	❑	❑	❑	❑	❑
Gjøre arbeidet grundig?	❑	❑	❑	❑	❑	❑
Konsentrere deg om arbeidet ditt?	❑	❑	❑	❑	❑	❑

Arbeide uten «å miste tråden» i det du holder på med?	❑	❑	❑	❑	❑	❑
Lese eller bruke øynene mens du arbeider?	❑	❑	❑	❑	❑	❑
Snakke direkte med andre, på møter eller på telefon?	❑	❑	❑	❑	❑	❑

44. I løpet av de siste 4 ukene, hvor mye av din arbeidstid har du hatt vansker med å gjøre følgende på grunn av din fysiske og psykiske helse:

(Angiv kun et svar pr. spørgsmål)

	Hele tiden	Det meste av tiden	Halvparten av tiden	Noe av tiden	Aldri	Ikke relevant i min jobb
Styre temperamentet ditt blant andre mens du er på jobb?	❑	❑	❑	❑	❑	❑
Prioritere arbeidsoppgavene dine?	❑	❑	❑	❑	❑	❑
Håndtere endringer	❑	❑	❑	❑	❑	❑

i arbeidet ditt?						
Behandle innkommende informasjon i tide, som for eksempel e-post?	❑	❑	❑	❑	❑	❑
Utføre flere oppgaver samtidig?	❑	❑	❑	❑	❑	❑
Være proaktiv og vise initiativ på jobb?	❑	❑	❑	❑	❑	❑

45. Nå som du nærmer deg slutten av skjemaet, passer det kanskje å svare på spørsmål om tretthet?

Jeg vil gjerne vite om du har følt deg sliten, svak eller i mangel av overskudd den siste måneden. Jeg spør om hvordan du har følt deg i det siste og ikke om hvordan du følte deg for lenge siden.

Hvis du har følt deg sliten lenge, sammenligner du deg med hvordan du følte deg sist du var bra.

46. Har du problemer med at du føler deg sliten?

(Angiv kun ét svar)

Mindre enn vanlig	Ikke mer enn vanlig	Mer enn vanlig	Mye mer enn vanlig
❑	❑	❑	❑

47. Trenger du mer hvile?

(Angiv kun ét svar)

Nei, mindre enn vanlig	Ikke mer enn vanlig	Mer enn vanlig	Mye mer enn vanlig
❑	❑	❑	❑

48. Føler du deg søvnig eller døsig?

(Angiv kun ét svar)

Mindre enn vanlig	Ikke mer enn vanlig	Mer enn vanlig	Mye mer enn vanlig
❑	❑	❑	❑

49. Har du problemer med å komme i gang med ting?

(Angiv kun ét svar)

Mindre enn vanlig	Ikke mer enn vanlig	Mer enn vanlig	Mye mer enn vanlig
❑	❑	❑	❑

50. Mangler du overskudd?

(Angiv kun ét svar)

Ikke i det hele tatt	Ikke mer enn vanlig	Mer enn vanlig	Mye mer enn vanlig
❑	❑	❑	❑

51. Har du redusert styrke i musklene dine?

(Angiv kun ét svar)

Ikke i det hele tatt	Ikke mer enn vanlig	Mer enn vanlig	Mye mer enn vanlig
❑	❑	❑	❑

52. Føler du deg svak?

(Angiv kun ét svar)

Mindre enn vanlig	Som vanlig	Mer enn vanlig	Mye mer enn vanlig
❑	❑	❑	❑

53. Har du vansker med å konsentrere deg?

(Angiv kun ét svar)

Mindre enn vanlig	Som vanlig	Mer enn vanlig	Mye mer enn vanlig
❑	❑	❑	❑

54. Forsnakker du deg i samtaler?

(Angiv kun ét svar)

Mindre enn vanlig	Ikke mer enn vanlig	Mer enn vanlig	Mye mer enn vanlig
❑	❑	❑	❑

55. Er det vanskeligere å finne det rette ordet?

(Angiv kun ét svar)

Mindre enn vanlig	Ikke mer enn vanlig	Mer enn vanlig	Mye mer enn vanlig
❑	❑	❑	❑

56. Hvordan er hukommelsen din?

(Angiv kun ét svar)

Bedre enn vanlig	Ikke verre enn vanlig	Verre enn vanlig	Mye verre enn vanlig
❑	❑	❑	❑

57. Hvis du føler deg sliten for tiden, omtrent hvor lenge har det vart?

(Angiv kun ét svar)

- ❑ Føler meg ikke sliten
- ❑ Mindre enn en uke
- ❑ Mindre enn tre måneder
- ❑ Mellom tre og seks måneder
- ❑ Seks måneder eller mer

58. Hvis du føler deg sliten for tiden, omtrent hvor mye av tiden kjenner du det?

(Angiv kun ét svar)

- ❑ Føler meg ikke sliten
- ❑ 25 % av tiden
- ❑ 50 % av tiden
- ❑ 75 % av tiden
- ❑ Hele tiden

59. Tusen takk! Det betyr mye at at du tok deg tid til å svare på spørsmålene.

11.2 Appendix B

Information sheet – Paper II

Forespørsel om deltakelse i forskningsprosjektet «Hørselstap og arbeidsliv»

Hensikten med studien
Dette er en forespørsel om å delta i et forskningsprosjekt som undersøker vilkårene for at mennesker med nedsatt hørsel kan delta i arbeidslivet. Studier fra andre land viser at personer med nedsatt hørsel har økt risiko for enkelte helseplager på grunn av utfordringer med kommunikasjon. Slike sammenhenger er lite beskrevet i Norge. Vi ønsker derfor å utforske vilkårene for yrkesdeltakelse for personer med nedsatt hørsel. Målet er å få kunnskap om temaet som kan gjøre det lettere for personer med hørselshemming å kunne delta i arbeidslivet.

Hva innebærer det å delta?
Vi ønsker å intervjue personer i yrkesaktiv alder som har hørselshemming. Hensikten med intervjuene er å utforske barrierer og suksesskriterier for at personer med nedsatt hørsel kan kunne delta i arbeidslivet. Viktige spørsmål vil være hvordan du opplever din arbeidssituasjon, om arbeidsplassen er tilrettelagt, hva slags dialog du har med arbeidsgiver og kolleger om hørselshemming og eventuelle utfordringer hørselshemmingen gir i arbeidssituasjonen. Intervjuet forventes å ta mellom en og to timer. Intervjuet vil bli tatt opp på bånd. Lydopptakene blir slettet etter at studien er avsluttet.

Hva skjer med informasjonen om deg?
Alle opplysninger vil bli behandlet konfidensielt. Det vil kun være stipendiat Elisabeth Svinndal og hennes veiledere som har tilgang til lydopptakene og informasjonen om deg. Informasjon fra intervjuene vil bli anonymisert, og det vil ikke være mulig å kjenne igjen enkeltpersoner når resultatene fra prosjektet presenteres.

Frivillig deltakelse Det er frivillig å delta i studien, og du kan når som helst, og uten å oppgi noen grunn, trekke deg fra studien. Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS. Studien er en del av et doktorgradsprosjekt ved Institutt for samfunnsmedisin ved NTNU og Nasjonalt kompetansesenter for arbeidsretta rehabilitering (NK-ARR). Arbeidet finansieres av ExtraStiftelsen. Hørselshemmedes Landsforbund (HLF) er samarbeidspartner.

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Jeg har mottatt informasjon om studien, og er villig til å delta.

(Dato, signert av prosjektdeltaker)

11.3 Appendix C

Interview guide – Paper II

Intervjuguide arbeidstakere – hørselstap og arbeidsliv

Introduksjon

Denne studien er en del av mitt doktorgradsarbeid og handler om hørselstap og arbeidsliv. Hensikten med studien er å få mer kunnskap om hvordan det er å være i jobb med nedsatt hørsel. Det er gjort få studier i Norge på dette temaet, og jeg ønsker med denne studien å bidra til at hørselshemmede selv, arbeidsgivere og tjenesteapparatet får bedre innsikt i hva som hemmer og fremmer deltakelse for dere med nedsatt hørsel. Målet er at hørselshemmede skal få arbeidsvilkår som gjør at de kan stå i jobb fram til pensjonsalder.

Jeg har forberedt en del spørsmål innenfor temaer jeg tenker er sentrale, men det viktigste for meg under intervjuet er at du forteller med dine ord hvordan du opplever din arbeidshverdag og tar opp de temaene som du synes har størst betydning. Så kommer jeg til å stille noen spørsmål innimellom for å være sikker på at jeg forstår deg rett.

Alt du forteller meg vil bare være tilgjengelig for meg. Mine veiledere vil også ha tilgang til intervjuene, men de vil da være anonymisert slik at ditt navn eller annen personlig informasjon som kan identifisere deg, vil være fjernet. Når resultatene skal publiseres, vil det ikke på noen måte være mulig å gjenkjenne enkeltpersoner.

For å være sikker på at jeg får med meg alt, ønsker jeg å ta opp samtalen vår. Jeg håper at det er greit. Når prosjektet er ferdig, vil opptaket bli slettet.

Jeg har et samtykkeskjema som jeg ønsker at du undertegner hvis du fortsatt ønsker å delta.

Intervju

Bakgrunnsinformasjon: alder, familiesituasjon, bosted

Hovedtemaer: *Hørselstapets betydning, åpenhet, strategier (spørsmålene er uthevet)*

1. **Kan du begynne med å beskrive din arbeidshverdag?**
2. **Du har allerede sagt litt om hvordan hørselen påvirker deg i jobb. Kan du utdype det noe mer?**
3. **Støy er et utbredt problem for de med nedsatt hørsel. Påvirker støy deg i din hverdag?**
   I Så fall: På hvilken måte?
4. **Du har allerede fortalt om hvordan hørselstapet påvirker deg i jobben din. Jeg skulle gjerne vite mer om hva du gjør dersom du opplever at situasjonen blir for slitsom. Kan du si noe mer om hva du gjør i slike perioder for å ta vare på deg selv?**

5. **De fleste kan nok fra tid til annen kjenne på at det rett og slett blir for mye på jobb, og kanskje i livet totalt sett, og ikke klarer å gå på jobb som normalt. Hender det med deg?**
6. **Mange med nedsatt hørsel opplever samtaler med flere mennesker til stede som utfordrende. Du har allerede sagt noe om kommunikasjon på din arbeidsplass, men jeg vil gjerne høre litt mer om hva som gjøres på din arbeidsplass i sånne situasjoner.**
7. Hva tenker du om den situasjonen?
8. **Når du snakker med din leder om din arbeidssituasjon, f.eks. i medarbeidersamtale, er din hørselssituasjon et tema? I så fall: På hvilken måte?**
9. **Dine kolleger vet (ikke?) at du har nedsatt hørsel. Når de fikk informasjon om det, hva var det de fikk vite? (Alternativt hvis de ikke vet: Du har ikke fortalt om din nedsatte hørsel til dine kolleger. Kan du fortelle litt mer om hvorfor ikke det?)**
10. Hvis du prøver å se for deg den ideelle arbeidssituasjonen i den jobben du har i dag, hvordan ville den se ut?
11. Hvis du kunne hente inn hjelp og kompetanse som du selv ønsker for å skape en god arbeidssituasjon, hvordan skulle den hjelpen ha sett ut da?
12. Hvilken rolle tenker du at arbeidsgiver bør ha i et slikt arbeid?
13. På mange arbeidsplasser har de folk som jobber med arbeidsmiljø og arbeidsforhold, f.eks. verneombud og tillitsvalgte. Har du samarbeidet med noen hos dere om tilrettelegging eller andre temaer knyttet til din arbeidssituasjon?
14. **Hvor viktig er det for deg å være i jobb?**
15. Nå har vi vært gjennom mange forskjellige temaer. Er det andre ting som du tenker er viktige som vi ikke har vært innom?

11.4 Appendix D

Information sheet – Paper III

Forespørsel om deltakelse i forskningsprosjektet «Hørselstap og arbeidsliv»

Hensikten med studien
Dette er en forespørsel om å delta i et forskningsprosjekt som undersøker vilkårene for at mennesker med nedsatt hørsel kan delta i arbeidslivet. Studier fra andre land viser at personer med nedsatt hørsel har økt risiko for enkelte helseplager på grunn av utfordringer med kommunikasjon. Slike sammenhenger er lite beskrevet i Norge. Vi ønsker derfor å utforske vilkårene for yrkesdeltakelse for personer med nedsatt hørsel. Målet er å få kunnskap om temaet som kan gjøre det lettere for personer med hørselshemming å kunne delta i arbeidslivet.

Hva innebærer det å delta?
Vi ønsker å intervjue ledere i virksomheter som har erfaring med arbeidstakere med nedsatt hørsel. Hensikten med intervjuene er å utforske arbeidsgiveres tanker om det å ha ansatte med nedsatt hørsel. Viktige spørsmål vil være hvilke behov din virksomhet har, hvilke tiltak dere har vurdert, hva slags dialog du har med arbeidstaker og eventuelle utfordringer hørselshemming gir i arbeidssituasjonen. Intervjuet forventes å ta cirka en time. Intervjuet vil bli tatt opp på bånd. Lydopptakene blir slettet etter at studien er avsluttet.
Hva skjer med informasjonen om deg?

Alle opplysninger vil bli behandlet konfidensielt. Det vil kun være stipendiat Elisabeth Svinndal og hennes veiledere som har tilgang til lydopptakene og informasjonen du har gitt. Informasjon fra intervjuene vil bli anonymisert og det vil ikke være mulig å kjenne igjen enkeltpersoner eller virksomheter når resultatene fra prosjektet presenteres.

Frivillig deltakelse Det er frivillig å delta i studien, og du kan når som helst, og uten å oppgi noen grunn, trekke deg fra studien. Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS. Studien er en del av et doktorgradsprosjekt ved Institutt for samfunnsmedisin ved NTNU og Nasjonalt kompetansesenter for arbeidsretta rehabilitering (NK-ARR). Arbeidet finansieres av ExtraStiftelsen. Hørselshemmedes Landsforbund (HLF) er samarbeidspartner.

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Jeg har mottatt informasjon om studien, og er villig til å delta.

(Dato, signert av prosjektdeltaker)

11.5 Appendix E

Interview guide – Paper III

Intervjuguide arbeidsgivere

Introduksjon

Denne studien er en del av mitt doktorgradsarbeid og handler om hørselstap og arbeidsliv. Hensikten med studien er å få mer kunnskap om hvordan det er å være i jobb med nedsatt hørsel. Det er gjort få studier i Norge på dette temaet, og jeg ønsker med denne studien å bidra til at hørselshemmede selv, arbeidsgivere og tjenesteapparatet får bedre innsikt i hva som hemmer og fremmer deltakelse for de med nedsatt hørsel. Målet er å bedre mulighetene til deltakelse i arbeidslivet for hørselshemmede fram til pensjonsalder. I den anledning tenker jeg det er viktig å få fram arbeidsgivers synspunkter og erfaringer med å ha hørselshemmede arbeidstakere.

Jeg har forberedt en del spørsmål innenfor temaer jeg tenker er sentrale, men det viktigste for meg under intervjuet er at du forteller med dine ord hvordan du opplever situasjonen på denne arbeidsplassen og tar opp de temaene som du synes har størst betydning. Så kommer jeg til å stille noen spørsmål innimellom for å være sikker på at jeg forstår deg rett.

Alt du forteller meg vil bare være tilgjengelig for meg. Mine veiledere vil også ha tilgang til intervjuene, men de vil da være anonymisert slik at ditt navn eller annen personlig informasjon som kan identifisere deg og din bedrift, vil være fjernet. Når resultatene skal publiseres, vil det ikke på noen måte være mulig å gjenkjenne enkeltpersoner eller virksomheten.

For å være sikker på at jeg får med meg alt, ønsker jeg å ta opp samtalen vår. Jeg håper at det er greit. Når prosjektet er ferdig, vil opptaket bli slettet.

Jeg har et samtykkeskjema som jeg ønsker at du undertegner hvis du fortsatt ønsker å delta.

Intervju

Bakgrunnsinformasjon: alder, utdanning, fartstid i bedriften, bedriftens beliggenhet

Når jeg spør om dine erfaringer med hørselshemmede som arbeidstakere, tenker jeg på erfaringer mer generelt og ikke personlig informasjon om din konkrete medarbeider.

Hovedtemaer: *kunnskap, holdninger, behov (spørsmålene er uthevet)*

1. Kanskje du kan begynne med å fortelle litt om bedriften/virksomheten deres.

2. Hva er den viktigste kompetansen eller ferdighetene ansatte hos dere bør ha?

3. Jeg vil gjerne høre litt om de erfaringene du har med å ha ansatte med nedsatt hørsel. Kan du fortelle litt om hvilke generelle erfaringer du har gjort deg? Jeg tenker da altså ikke på det personlige plan.

4. Med de kravene deres virksomhet har til sine ansatte, hvordan tenker du at nedsatt hørsel passer inn hos dere?

5. Hadde du kjennskap til det å ha nedsatt hørsel før du fikk en arbeidstaker her?

6. Har du erfaring med ansatte med andre funksjonsvansker også?

7. Hvordan opplever du å være leder/arbeidsgiver i en virksomhet som også har ansatte med hørselstap?

8. Når du fikk vite at en ansatt hadde nedsatt hørsel, hva fikk du av informasjon?

9. Opplever du at den informasjonen du har hatt tilgang til har vært tilstrekkelig for å kunne fungere som leder i denne situasjonen?

10. Har du og den ansatte snakket om tilpassinger eller tilrettelegging av noe slag med tanke på vedkommendes nedsatte hørsel?

11. Hva slags samarbeid har du og din ansatt om tilrettelegging i hverdagen?

12. Hvordan fungerer slik tilrettelegging i praksis – i hverdagen?

13. Det finnes ulike tjenester og virkemidler. Har du fått hjelp fra eksterne aktører med tanke på å få hverdagen til å fungere?

14. Hvis du kunne bestemme selv hva slags hjelp eller tiltak du kunne hente inn for gjøre situasjonen enklere, hvordan skulle den hjelpen sett ut da?

15. Hvis du hadde utlyst en stilling, og en person med nedsatt hørsel ville søke, hvordan tenker du at den informasjonen bør komme fram?

16. Har du noen tanker om det å inkludere personer med nedsatt funksjonsevne i arbeidslivet? Hva tenker du er den enkelte bedrifts rolle eller ansvar for slik inkludering?

PAPER I

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Hearing loss and work participation: a cross-sectional study in Norway

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ORIGINAL ARTICLE

Hearing loss and work participation: a cross-sectional study in Norway

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ABSTRACT

Objective: To study work participation of persons with hearing loss, and associations with hearing disabilities, self-reported workability, fatigue and work accommodation.

Design: Cross-sectional internet-based survey.

Study sample: A total of 10,679 persons with hearing loss within working-age were invited to answer the survey, where 3330 answered (35.6%).

Results: Degree of hearing loss was associated with low workability, fatigue and work place accommodation, while sick leave was associated with fatigue. Degree of hearing loss was positively associated with being unemployed ($p < .001$) and having part-time work ($p < .01$) (often combined with disability benefits) for women. Work place accommodation was more frequently provided among respondents working with sedentary postures, high seniority, long-term sick leave or low workability. Additional unfavourable sensory conditions were associated with decreased employment ($p < .001$) and workability, and an increase in sick leave ($p < .01$) and fatigue ($p < .001$).

Conclusions: Hearing loss seemed to influence work participation factors negatively; particularly, for moderate hearing loss and for women, even though the degree of employment was high. A lack of work place accommodation when there was a need for such was found. This implies increased attentiveness towards individual needs concerning the experienced disability a hearing loss may produce. A more frequent use of hearing disability assessment is suggested.

Abbreviations: WHO: World Health Organization; HLF: The Norwegian Association of the Hearing Impaired; NSD: The Norwegian Centre for Research Data; HDHS: Hearing Disability and Handicap scale; WRF: Work Role Functioning; WRFQ: Work Role Functioning Questionnaire; CI: Confidence interval; SD: Standard deviation; OR: Odds ratio; HL: hearing loss

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Hearing loss; work; participation; disability; accommodation; hearing impairment

Introduction

Participation in working life is a major concern for the individual and for the society as a whole, and a working life accessible to everybody is a major aim. However, individuals with disabilities are associated with a lower degree of working life participation than the population at large (WHO 2011). Hearing loss is associated with unfavourable conditions, such as low educational attainment (Emmett and Francis 2015), increased unemployment/underemployment rate (Emmett and Francis 2015; Hogan et al. 2009; Jung and Bhattacharyya 2012) and higher odds of low income (Jung and Bhattacharyya 2012; Emmett and Francis 2015). At the same time, hearing loss is a highly prevalent chronic condition. According to WHO (2017), more than 5% (360 million) of the world population has disabling hearing loss, of which 328 million are adults. In the United States, an estimated prevalence in 40–49-year olds is 12.9%, and 28.5% in the age group 50–59 (Lin, Niparko, and Ferrucci 2011), while the prevalence of hearing loss in Norway is approximately 11% in the age group 45–64 years (Engdahl 2015).

Studies have found a high degree of exhaustion or need for recovery after work among employees with hearing loss (Nachtegaal et al. 2009; Kramer, Kapteyn, and Houtgast 2006), increased risk of sick leave (Kramer, Kapteyn, and Houtgast 2006) and an increased risk of early retirement (Helvik, Krokstad, and Tambs 2013a, 2013b). Other unfavourable conditions are less job control (Kramer, Kapteyn, and Houtgast 2006) and reduced quality of life (Ringdahl and Grimby 2000; Carlsson et al. 2015). Such unfavourable conditions may influence the work capacity and increase the risk of work disability. At the same time, Grimby and Ringdahl (2000) found that individuals with severe-profound hearing loss who worked fulltime had less energy than their hearing counterparts, but they scored better on health-related quality of life than hearing-impaired individuals working part time or those who were retired. This might be an indication of the potential positive impact on mental health that employment may have (Blustein 2008).

A major consequence of hearing loss is oral communication challenges, which may influence the access to education and oral communication demanding work. Progress in technology has improved the hearing compensation possibilities through improved hearing aids, cochlear implants and assistive listening devices. Still, such compensative measures cannot fully recover the hearing capacity. For instance, Bjarnason (2011) described how assistive listening devices were valuable but not sufficient in workplace accommodation among Swedish employees with

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hearing loss. Moreover, technical advancements are followed by increased demands in the labour market. In addition to a reduction in the number of jobs in high-income countries, communication skills are, according to Ruben (2000), more important in working life than ever. In this case, people with hearing loss are vulnerable employees.

There has not been, to our knowledge, any large-scale studies in Norway on working life participation among people with hearing loss and to what extent the above-mentioned challenges are present. In addition, the Norwegian labour market has been influenced by what is called "The Norwegian Employment Model", which builds upon a democratic foundation and an extensive employee engagement (Levin 2012). The model is characterised by a high degree of employee involvement and co-determination both in decision-making and in daily work. Thus, studies from other countries with different employment cultures may not be directly generalisable to the situation in the Norwegian labour market. A large-scale study would provide knowledge on the level and characteristics of working life participation among employees with hearing loss, and elucidate potential barriers for participation. Such data would also provide information on the risk of work disability for hearing-impaired employees in Norway. Thus, the aim was to study work participation of persons with hearing loss in Norway, and associations between degree of hearing loss and hearing disabilities, self-reported workability, fatigue and work accommodation. Hearing disability is understood as "any restrictions or lack of ability to perform an activity in the manner or within the range considered normal for a human being in terms of hearing and communication" (Manchaiah and Stephens 2013; p. 8).

Methods

Design

The study used a cross-sectional design and it was collected through an internet-based survey.

Participants

The target population was people with hearing loss of working-age (18 to 67 years of age). Data on degree of hearing loss and work participation of people with hearing loss in working-age are not available in registers in Norway. Thus, the survey was launched through the Norwegian Association of the Hearing Impaired (HLF), which has 60,000 members and is, according to the association, the world's largest association for people with hearing loss. Traditionally, the members of HLF are individuals with hearing loss who have a spoken language approach to communication. Thus, we anticipate that the participants were users of spoken Norwegian and not sign language, as their first language. The study was approved by The Norwegian Centre for Research Data, NSD.

Data collection

Using the HLF membership list, an e-mail that included a link to questionnaires was sent to the 10,679 respondents aged between 18 and 67 registered with an e-mail address (out of 20,000 members in this age range). Women accounted for 48.8% of members while 1.1% had not registered their gender.

Two reminders to answer the survey were sent, after four and eight weeks. A total number of 3330 questionnaires were completed, while 824 declined participation. Reports on not delivered e-mails equaled 1336, decreasing the study population to 9343. Thus, the response rate was 35.6%.

Those who did not respond to the survey after two reminders (non-responders) received a survey with two questions on hearing status and vocational affiliation in order to consider possible systematic differences between the groups. The two-question-survey was sent to those who had not answered the first questionnaire and who had not declined participation. Mail addresses which returned mails undelivered were not excluded in the non-responder survey. A total of 6525 mails were sent to non-responders, and 1644 answered the survey, while 1168 were returned undelivered, corresponding to a response rate of 30.7%.

Survey

The survey was mainly based on validated instruments used in previous studies on employees with work disability, while basic questions, such as background, duration of present position and reasons for part time position were developed for this survey.

Information on background and participation

In addition to gender, age and geographical region, the survey consisted of questions on education level (primary, secondary or higher education) and working life factors. The latter included the following items: employed (yes/no), temporary or fixed employment, vocational experience in total and in present position, and full time or part time employment. The part time workers were asked about the degree of and reasons for working part time (own choice, health condition, too strenuous workload, not being offered a greater percentage of employment, private caregiver tasks). Multiple answers were possible. Questions concerning the work place comprised size, public or private sector, and type of tasks. The latter was retrieved from a large Norwegian cohort study, the HUNT study (www.ntnu.no/hunt/). Two questions on adaptation of work situation to accommodate hearing loss and the need of such were included together with items on doctor certified sick leave at present and the extent of sick leave during the last 12 months. Items with degree of concern of losing one's position ("not concerned", "a little concerned", "very concerned" and "no opinion") .

Hearing loss, its impact and additional conditions

Questions on the presence and duration of hearing loss, and the kind of listening devices in use were developed for this survey, while the degree of hearing loss was established using the WHO classification (none, mild, moderate, severe, profound) assessed through the better ear without use of amplification. The explanatory descriptions of the different levels were included in the question, such as "slight impairment – able to hear and repeat words spoken in normal voice at one metre" and "severe impairment – able to hear some words when shouted into better ear". Suffering from tinnitus was determined by self-reporting "are you bothered by tinnitus" with the options being "yes, often", "yes, occasionally", "seldom" and "never". Hyperacusis and Ménière's disease were established through "'have you been diagnosed with". To measure hearing disability, the Hearing Disability and Handicap scale (HDHS) was used, which is an instrument developed to assess the most important consequences

of hearing loss, including auditory incapacities and psychosocial disadvantages (Hétu et al. 1994). HDHS has been adapted to Norwegian and psychometrically evaluated by Helvik et al. (2007). It consists of 20 questions and can be divided into four subscales (speech perception, non-speech perception, participation restrictions, activity limitations). This study, however, has used the total scale based on all items only. The participants were instructed to answer the questions as experienced using hearing aids. Two examples of questions asked are "Do you have difficulty following a conversation normally in any of the following situations: at work, in a bus or a car, or when shopping?" and "Do you have a difficulty hearing in group conversation?" The answers were given on a four-point ordinal scale [never (1), sometimes (2), often (3), always (4)] within a range of 20–80. A high score indicates a high degree of hearing disability. The reported Cronbach's alpha for the entire scale was 0.89 (Helvik et al. 2007). Visual function was included delimited to visual impairment that cannot be corrected with glasses ("do you have visual difficulties which cannot be corrected with glasses"). Other conditions could also affect fatigue and workability, but we considered visual function as the most important condition affecting communication abilities.

Fatigue, workability and work role functioning

We measured the degree of fatigue by the means of Chalder's fatigue scale (Chalder et al. 1993), which has been adapted to Norwegian and used in a study on the general Norwegian population (Loge, Ekeberg, and Kaasa 1998). Two examples of questions in the eleven-item questionnaire are "Do you need to rest more?" and "Do you have difficulty concentrating?" The responses were given on a four-point Likert scale [better than usual (0), no more than usual (1), worse than usual (2), much worse than usual (3) within a range of 0–30]. A high score indicates a high degree of fatigue. The reported Cronbach's alpha was 0.89 (Chalder et al. 1993).

Assessment of workability were included using a single-item question (scale 0–10) (Ahlstrom et al. 2010). Work Role Functioning Questionnaire 2.0 (WRFQ) was used to measure difficulties with performing work. It consists of 27 items divided in four subscales (work scheduling and output demands, physical demands, mental and social demands, flexibility demands) (Abma, van der Klink, and Bultmann 2013), while a total scale based on all items were applied in this study. WRFQ has been translated to Norwegian by Johansen et al. (2018). Two examples of questions asked are "the last four weeks, to what extent have you had problems working fast enough due to your physical or mental health" and "the last four weeks, to what extent have you had problems speaking with people in-person, in meetings or on the phone due to your physical or mental health". The answers were given on a five-point Likert scale (0–4) measuring the amount of time the employee perceived as difficult meeting work demands. Each scale is scored from 0 to 100, and the sums are multiplied by 25 to obtain percentages between 0 and 100. A high score indicates a good work functioning. Psychometric testing is ongoing in Norway (Johansen et al. 2018).

Statistical analyses

The data were analysed by means of Stata IC 14.0 (StataCorp, College Station, TX). Descriptive statistics (frequencies, means and standard deviations) were used to describe respondent characteristics, hearing status, working life participation and functioning. Severe and profound hearing loss were merged into one group due to a limited number of participants. The vocational analyses were done for women and men separately for those variables where there are known systematic gender differences in the general population. Other possible gender differences were explored where appropriate. Duration of sick leave in the last 12 months was collapsed into a binary variable of 0–7 weeks and 8 weeks or more since case managers in the Norwegian welfare system at this point assess if sick leave benefits still can be granted. Chi-square tests were performed to compare groups on categorical variables, and Fischer's exact test when there were few observations in some categories reporting Chi-square when the results were not contradictory. The *t*-test was run to compare the means of two groups, while test for trend across ordered groups was used instead of one-way ANOVA to compare group means when Bartlett's test showed that the assumptions for ANOVA were not met.

Logistic regression analyses were performed to explore possible associations between the different vocational variables and the variables describing hearing loss and its impact. Demographic and socio-economic variables may influence the vocational functioning, and the analyses were adjusted for the potential confounders: age, gender, education and geographical regions. The latter relates to potential differences in the Norwegian labour market between the regions. Regarding workplace accommodation, "degree of hearing loss" was considered as a potential confounder, and added as a potential confounding variable. For the association between sick leave and fatigue, the variables "degree of hearing loss", "part-time work", "job characteristics" and "workplace accommodation" were examined for confounding effects in addition to the demographic and socio-economic variables. Continuous or categorical variables were dichotomised according to the respective median, and the scores of the Hearing Disability and Handicap scale were divided in four categories with 25% in each category. The significance level was $p < .05$.

Additional medical conditions were explored through three strata: (1) Hearing loss together with hyperacusis, Ménière's disease or visual impairment, (2) Hearing loss and tinnitus (frequently troubled), (3) Hearing loss only.

Results

A total number of 3330 participants completed the survey. The average age in the sample was 54.7 years (SD = 10.7). The proportion of responders between 50 and 67 years of age was 74.3%. Nearly 60% had completed education after secondary school and 76.6% were employed (Table 1). Among the non-responders ($n = 1644$), 39.3% worked full-time while 13.4% worked part time. Furthermore, 43.4% assessed their hearing loss as mild, 32.2% as moderate, 3.8% as severe and 1.1% as profound. Another 4.5% reported no hearing loss and 14.9% did not answer the question. This was not statistically significantly different from the hearing loss reported by the responders ($p > .05$).

Hearing status

The responders mainly reported a bilateral, mild or moderate hearing loss (77.9%, $n = 2506$, Table 2). In addition to the 3216 responders with a hearing loss, 93 individuals (2.8%) reported having no hearing loss, and were not included in the analysis. Tinnitus was frequent as 45.0% were frequently troubled, while 17.6% were troubled occasionally. Among those without hearing

loss, 76 individuals reported being frequently troubled by tinnitus.

There was a long-term experience of hearing loss among the responders as 54.5% had suffered from hearing loss for more than 10 years, either acquired or pre-lingual. Hearing aids were used by 92.4% of the participants, and 39 responders used a combination of hearing aid and cochlear implant. The proportion of responders using an assistive listening device was 18.9%, while 5.3% used no amplification.

Work participation

Degree of hearing loss was associated with being without employment for women, but not for men (Table 3). The association was also statistically significant in a logistic regression analysis adjusted for age, education, geographical region and fatigue [odds ratios compared to mild hearing loss for women were 1.32 (CI 1.01–1.74) for moderate hearing loss and 2.14 (1.45–3.17) for severe hearing loss, and the corresponding odds ratios for men were 1.01 (CI 0.78–1.30) and 1.18 (CI 0.71–1.97)]. Explained variance (R^2) was 0.08 and 0.09 for women and men, respectively. Duration of hearing loss was statistically significantly associated with being without employment only for hearing loss exceeding 10 years of duration as compared to less than two years in a logistic regression analysis adjusted for age, gender, fatigue, education and geographical region [odds ratio 1.85 (CI 1.01–3.39) for acquired hearing loss and 2.19 (CI 1.16–4.11) for early onset hearing loss, R^2=0.11].

Among the employed responders ($n = 2475$), a vast majority (94.5%) had a permanent job position, and there were no statistically significant gender differences. Men worked more frequently in the private sector than women (58.8% vs. 27.8%, $p < .001$). More women (33.8%) than men (14.2%) worked part time ($p < .001$), and the degree of hearing loss was statistically significantly associated with degree of job position for women ($p = .006$) but not for men ($p = .072$). The part time workers did so by their own choice in 28.3% of the cases ($n = 169$), 39.5% ($n = 236$) did so because of their health condition, while 20.9% ($n = 125$) reported that the workload was too strenuous in a full time position. Not being offered a greater percentage of employment applied for 11.2% ($n = 67$), while 4.2% ($n = 25$) had private caregiver tasks as reason for their part-time position. The possibility to combine work with disability pension was used by 37.0% ($n = 221$) with no statistically significant gender differences.

Vocational functioning

There were statistically significantly negative associations between an increase in degree of hearing loss and workability and work role functioning, especially when comparing mild to moderate hearing loss (Table 4). The negative association was statistically significant in a logistic regression analysis for workability, but not for work role functioning for severe/profound hearing loss (Table 5).

The mean fatigue score was 15.4 (SD 5.4), while the corresponding hearing disability score was 43.5 (SD 9.2). Logistic regression analyses showed a statistically significantly increased likelihood of obtaining a high score in fatigue (>13) and hearing disability (>42) with increased degree of hearing loss (Table 5).

Table 1. Respondent characteristics.

	n (%)
Age groups ($n = 3326$)	
18–29	129 (3.9)
30–39	219 (6.6)
40–49	507 (15.2)
50–59	1031 (31)
60–67	1440 (43.3)
Gender ($n = 3326$)	
Female	1654 (49.7)
Male	1672 (50.3)
Education ($n = 3234$)	
Not completed elementary school	29 (0.9)
Elementary school	229 (7.1)
Upper secondary school	1033 (31.9)
Higher education 1–4 years	1288 (39.8)
Higher education >4 years	655 (20.3)
Geographical region ($n = 3322$)	
South	696 (21.0)
East	1171 (35.3)
West	640 (19.3)
Mid-Norway	391 (11.8)
North	424 (12.8)
Employment ($n = 3234$)	
Employed	2477 (76.6)
Not employed	757 (23.4)

Table 2. Hearing status and use of amplification devices.

		Degree of hearing loss			
	Total *n*	Mild *n* (%)	Moderate *n* (%)	Severe *n* (%)	Profound *n* (%)
Hearing loss	3216	1513 (47.1)	1396 (43.4)	220 (6.8)	87 (2.7)
Bilateral	2790	1233 (44.2)	1273 (45.6)	206 (7.4)	78 (2.8)
Unilateral	426	280 (65.7)	123 (28.9)	14 (3.3)	9 (2.1)
Tinnitus	3213				
Often	1410	673 (47.7)	613 (43.5)	94 (6.7)	30 (2.1)
Occasionally	578	253 (43.8)	264 (45.7)	44 (7.6)	17 (2.9)
Seldom	499	226 (45.3)	218 (43.7)	41 (8.2)	14 (2.8)
Never	726	361 (49.7)	299 (41.2)	40 (5.5)	26 (3.6)
Duration of hearing loss	3214				
0–5 years	686	471 (68.7)	197 (28.7)	13 (1.9)	5 (0.7)
6–10 years	775	403 (52.0)	343 (44.3)	23 (3.0)	6 (0.8)
>10 years	1180	471 (39.9)	579 (49.1)	91 (7.7)	39 (3.3)
All my life	573	168 (29.3)	275 (48.0)	93 (16.2)	37 (6.5)
Use of amplification devices	3214				
Hearing aids	2971	1386 (46.7)	1341 (45.1)	205 (6.9)	39 (1.3)
Cochlear implant	92	1 (1.1)	5 (5.4)	24 (26.1)	62 (67.4)
Assistive listening device	606	129 (21.3)	329 (54.3)	107 (17.7)	41 (6.8)
None	169	111 (65.7)	49 (29)	6 (3.6)	3 (1.8)

Women reported slightly higher mean scores of hearing disability and fatigue than men ($p < .001$). The mean scores of HDHS and fatigue for women were 44.6 (SD = 9.2, $n = 1613$) and 16 (SD = 5.6, $n = 1560$) and for men 42.4 (SD = 9.1, $n = 1631$) and 14.8 (SD = 5.1, $n = 1577$). There were only small gender differences in workability [mean score 6.3 (SD 2.6) for women and 6.6 (SD 2.5, $p = .003$) for men and work role functioning (mean score 81.5 (SD 19) for women and 83 (SD 19.1) for men, $p = .238$].

Sick leave according to the degree of hearing loss is presented in Table 4. The prevalence of long-term sick leave (8 weeks or more during the last 12 months) was 17.0% ($n = 212$) for women and 11.8% ($n = 144$) for men. Women had a prevalence of part time or full time sick leave at present of 12.5% ($n = 156$), while the corresponding results for men were 7.9% ($n = 96$). Regression analyses revealed no statistically significantly increased likelihood of being at sick leave at present or for more than eight weeks during the last 12 months, neither for women nor for men, according to the degree of hearing loss.

Fatigue was strongly associated with sick leave, both at present and for long-term sick leave during the last 12 months. Logistic regression analysis, adjusted for age, gender, level of education,

Table 3. Work participation and degree of hearing loss stratified according to gender.

	Women Degree of hearing loss				Men Degree of hearing loss			
	Mild *n* (%)	Moderate *n* (%)	Severe to pro-found *n* (%)	Chi-square	Mild *n* (%)	Moderate *n* (%)	Severe to pro-found *n* (%)	Chi-square
Employment								
Yes	559 (81.8)	530 (72.3)	132 (68.4)	17.3***	611 (76.6)	504 (74.1)	76 (72.4)	1.7
No	124 (18.2)	165 (23.7)	61 (31.6)		187 (23.4)	176 (25.9)	29 (27.6)	
Sector								
Private	143 (25.6)	137 (25.9)	37 (28)	1.3	340 (55.8)	297 (59.1)	40 (52.6)	5.4
Public	397 (71.2)	370 (69.8)	90 (68.2)		236 (38.8)	172 (34.2)	28 (36.8)	
Self-employed	18 (3.2)	23 (4.3)	5 (3.8)		33 (5.4)	34 (6.8)	8 (10.5)	
Size of workplace								
1–19 employees	162 (29)	167 (31.5)	34 (25.8)	2.2	153 (25.1)	135 (26.8)	26 (34.2)	8.6
20–99 Employees	212 (38)	197 (37.2)	55 (41.7)		137 (22.5)	132 (26.2)	22 (29)	
>100 employees	184 (33)	166 (31.3)	43 (32.6)		319 (52.4)	236 (46.9)	28 (36.8)	
Duration of present position								
0–3 years	87 (15.6)	88 (16.6)	25 (18.9)	1.9	81 (13.3)	79 (15.7)	11 (14.5)	1.5
4–8 years	93 (16.7)	96 (18.2)	25 (18.9)		106 (17.4)	90 (17.9)	13 (17.1)	
>8 years	378 (67.7)	345 (65.2)	82 (62.1)		421 (69.2)	333 (66.3)	52 (68.4)	
Degree of position								
Full time	397 (71)	333 (62.8)	80 (60.6)	10.4**	535 (87.7)	417 (82.9)	66 (86.8)	5.3
Part time	162 (29)	197 (37.2)	52 (39.4)		75 (12.3)	86 (17.1)	10 (13.2)	
Task characteristics								
Sedentary	300 (53.8)	253 (47.8)	73 (55.3)	8.3[a]	413 (67.9)	290 (57.7)	48 (63.2)	15.2[a]
Walk demanding	167 (29.9)	172 (32.5)	31 (23.5)		116 (19.1)	129 (25.7)	15 (19.7)	
Walk and lift demanding	90 (16.1)	102 (19.3)	28 (21.2)		67 (11)	67 (13.3)	9 (11.8)	
Heavy manual labour	1 (0.2)	2 (0.4)	0 (0)		12 (2)	17 (3.4)	4 (5.3)	

Chi-square tests were used to test for statistical differences related to degree of hearing loss.
[a]Fischer's exact test.
**$p < .01$; ***$p < .001$.

Table 4. Degree of functioning according to degree of hearing loss.

		Mild	Moderate	Severe – profound	Chi-square or *z* (test for trend)
Work ability Mean (SD)	Scale 0–10 $n = 3139$	6.9 (2.4)	6.1 (2.6)	6.1 (2.8)	8.7**,[a]
Work role functioning Mean (SD)	Scale 0–100 $n = 2093$	85.4 (17.5)	79.2 (19.7)	81.2 (21.0)	6.4***,[a]
Hearing disability Mean (SD)	Scale 20–80 $n = 3164$	39.6 (7.7)	46.6 (8.4)	51.2 (8.9)	24.8***,[a]
Sense of fatigue Mean (SD)	Scale 0–44 $n = 3059$	14.7 (5.1)	15.9 (5.4)	16.3 (6.1)	6.2***,[a]
Sick leave at present *n* (%)	Yes, full time	40 (3.4)	44 (4.3)	9 (4.3)	8.5b
	Yes, partly	56 (4.8)	67 (6.5)	19 (9.1)	
	No	1069 (91.8)	919 (89.2)	180 (86.5)	
Sick leave last 12 months *n* (%)	0–7 weeks	1018 (87.5)	871 (84.7)	175 (84.5)	4.2b
	8 weeks or more	145 (12.5)	158 (15.4)	32 (15.4)	
Concerned about losing job *n* (%)	Not concerned	870 (74.8)	663 (64.4)	131 (63.3)	33.0***,[b]
	Some concern	216 (18.6)	267 (26.0)	53 (25.6)	
	Very concerned	44 (3.8)	52 (5.1)	14 (6.8)	
	No opinion	33 (2.8)	47 (4.6)	9 (4.4)	
Workplace accommodation *n* (%)	Yes	197 (16.9)	260 (25.2)	109 (52.4)	126.5***,[b]
	No	969 (83.1)	771 (74.8)	99 (47.6)	

Test for trend across ordered groups and Chi-square tests were used to test for statistical differences related to degree of hearing loss.
[a]Test for trend across ordered groups.
[b]Chi^2-test.
**$p < .01$; ***$p < .001$.

Table 5. Degree of hearing loss and vocational functioning. Logistic regression analyses showing odds ratios (OR) and 95% confidence intervals (95% CI) adjusted for gender, age, education and geographical region.

	Low work ability score		Low WRF[a] score		High fatigue score		High HDHSb score		Received work place accommodation	
	OR (95% CI)	R^{2c}	OR (95% CI)	R^{2c}	OR (95% CI)	R^{2c}	OR (95% CI)	R^{2c}	OR (95% CI)	R^{2c}
Mild hearing loss	1.0	0.04	1.0	0.02	1.0	0.03	1.0	0.11	1.0	0.05
Moderate HL	2.01 (1.72–2.35)***		1.47 (1.25–1.72)***		1.42 (1.22–1.66)***		3.95 (3.37–4.62)***		1.64 (1.33–2.02)***	
Severe HL	2.11 (1.63–2.74)***		0.99 (0.75–1.31)		1.29 (0.99–1.67)		7.58 (5.51–10.41)***		5.00 (3.63–6.87)***	

[a]Work Role Functioning.
[b]Hearing Disability and Handicap Scale.
[c]Pseudo R^2.
***$p < .001$.

Table 6. Workplace accommodation varies according to job characteristics and functioning. Logistic regression analyses adjusted for age, gender, education, geographical region and degree of hearing loss.

		Received workplace accommodation Odds ratio (95% CI)	Pseudo *R*-squared
Sector	Private	1.0	0.06
	Public	1.29 (1.03–1.61)*	
Working hours	Full time	1.0	0.05
	Part time	1.50 (1.19–1.87)***	
Seniority	<1 year	1.0	0.06
	1–3 years	1.54 (0.86–2.76)	
	4–8 years	1.68 (0.97–2.92)	
	>8 years	2.29 (1.35–3.87)**	
Working postures	Sedentary	1.0	0.05
	Walking	0.76 (0.60–0.96)*	
	Walking and lifting	0.61 (0.45–0.84)**	
Doctor certified sick leave last 12 months	Sick leave <8 weeks	1.0	0.05
	Sick leave >8 weeks	1.71 (1.32–2.22)***	
Work ability	High score	1.0	0.06
	Low score	1.66 (1.36–2.04)***	

*$p < .05$, **$p < .01$, ***$p < .001$.

degree of hearing loss, part-time work, job characteristics and accommodation of work place, showed odds ratios of 1.17 (CI 1.14–1.20) for sick leave at present and 1.14 (CI 1.11–1.16) for long-term sick leave for each unit of increase on the fatigue scale.

There was an increased percentage of responders reporting concern for losing their job with increased hearing loss (Table 4).

Workplace accommodation

The association between degree of hearing loss and having a workplace, which was adapted to accommodate the hearing loss, was statistically significant (Table 4). The likelihood of having workplace accommodation was increased with increasing degree of hearing loss, especially for severe/profound hearing loss compared to mild (Table 5).

Work place accommodation was more frequent in the public sector than in the private sector, among part time workers, and workers with more than eight years of seniority (Table 6). Additionally, men were less likely to have workplace accommodation compared to women (odds ratio 0.78 (CI 0.64–0.95)). There was a decreased likelihood of work place accommodation in walk demanding positions compared to positions where sedentary postures were dominant. Doctor certified sick leave for eight weeks or more was associated with an increased likelihood of having an adapted work place, and so was a low workability score.

Furthermore, 30.7% ($n = 579$) of the respondents reported to be in need of work place accommodation without receiving it. Among respondents without accommodation ($n = 893$), the need of such according to degree of hearing loss was reported by 29.7% (mild), 45.1% (moderate) and 60.7% (severe-profound) of the women ($p < .001$), while for men ($n = 944$) the corresponding figures were 16.6, 31.1 and 52.6%, respectively ($p < .001$).

Additional sensory conditions

Sensory conditions additional to hearing loss had a prevalence of 21.1% ($n = 632$). In addition to the 1410 participants with hearing loss who were frequently troubled by tinnitus (43.9%), hyperacusis was present in 9.3% ($n = 308$) of the participants, 6.8% ($n = 223$) suffered from Ménière's disease and 7.7% ($n = 255$) had an additional visual impairment which could not be corrected with glasses. Statistically significant differences in vocational characteristics were observed among participants with hearing loss only and those with severe tinnitus and those with other additional sensory conditions (Table 7). There were decreased employment rates, an elevated rate of doctor certified long-term sick leave, a decreased workability and an increased fatigue score for these groups. The difference was strongest for those with other additional sensory conditions than tinnitus in addition to hearing loss. A larger proportion of the participants had workplace accommodation according to their hearing loss when they had additional conditions. However, the reported need of accommodation when it was not arranged for was also higher than for those without additional conditions.

Table 7. Additional sensory conditions and vocational functioning.

		Hearing loss	Hearing loss and frequent tinnitus without other conditions	Hearing loss and hyperacusis/Meniere's disease/visual impairmenta	Chi-square or *z* (test for trend)
Employment rate *n* (%)	*n* = 3234	1308 (79.8)	741 (76.0)	428 (69.0)	29.4***,b
Sick leave >7 weeks last 12 months *n* (%)	*n* = 2464	167 (12.8)	105 (14.3)	84 (19.8)	12.5**,b
Work ability Mean (SD)	Scale 0–10	6.9 (2.4) *n* = 1632	6.3 (2.6) *n* = 971	5.5 (2.8) *n* = 616	11.4***,c
Sense of fatigue Mean (SD)	Scale 0–44	14.5 (5.0) *n* = 1593	15.6 (5.3) *n* = 944	17.5 (6.0) *n* = 600	10.0***,c
Workplace accommodation *n* (%)	*n* = 2470	281 (21.6)	153 (20.7)	147 (34.4)	34.3***,b
In need of accommodation when not arranged for	*n* = 1887	277 (27.1)	188 (32.1)	114 (40.9)	20.3***,b

Test for trend across ordered groups and Chi-square test were used to test for statistical differences related to additional sensory conditions.
[a]Prevalence: Hyperacusis, *n* = 308 (9.3%), Meniere's disease, *n* = 223 (6.8%), visual impairment, *n* = 255 (7.7%).
[b]Chi-square test.
[c]Test for trend across ordered groups.
**$p < .01$; ***$p < .001$.

Discussion

The participants had mainly a bilateral mild or moderate hearing loss of long duration. They were mainly hearing aid users, and they were frequently troubled by tinnitus. Furthermore, most participants were senior workers (74.3% in the range of 50–67 years) with high seniority in their present position. They were highly educated compared to the population at large according to numbers from Statistics Norway (2015) (39.8% vs. 30.1% for university education of 1–4 years and 20.3% vs. 10.0% for university education exceeding 4 years).

The employment rate was high [76.6% versus 74.3% in the population at large (Statistics Norway 2015)], and we found a part-time job rate consistent with the rate in the general population (13.3% for men and 35.5% for women) (Statistics Norway 2015). The reason for working part-time was to a large extent due to the health condition (39.5%) and/or a full time position being too strenuous (20.9%). Among the part-time workers, 37.0% combined the part-time work with disability pension. Helvik, Krokstad, and Tambs (2013b) found that hearing loss was seldom the main cause for disability pension in Norway, but the risk of being granted disability pension due to other diagnoses than hearing loss increased with degree of hearing loss. Additional strain and an unfavourable working situation among hearing-impaired employees have been found in other studies (Danermark and Gellerstedt 2004; Kramer, Kapteyn, and Houtgast 2006; Nachtegaal et al. 2009) implying that working full time may be too strenuous. McDonough and Amick (2001) found an increased risk of job exit among part-time workers in the general population in the US. However, reducing working hours may be a protective measure against developing fatigue for people with hearing loss. Thus, an increased use of a combination of work and disability pension in the senior working population with long-term experience of hearing loss may contribute to securing labour market participation.

Participation characteristics

We found a high mean score of fatigue (15.4), and it was positively associated with an increase in the degree of hearing loss. In a study of fatigue in the general Norwegian population, Loge, Ekeberg, and Kaasa (1998) found a mean fatigue score of 12.2, while participants with health problems had a mean score of 14.2, and in the age group 60–80 years the score was 15.1. Working life conditions may have changed since the 1990s, but our findings indicate a considerable presence of fatigue among employees with hearing loss. Thus, our study confirms previous studies regarding fatigue among people with hearing loss such as Nachtegaal et al. (2009) and Kramer, Kapteyn, and Houtgast (2006).

Kramer, Kapteyn, and Houtgast (2006) found that employees with hearing loss perceived the background noise as louder than their normal-hearing colleagues did. This is in line with the study of Hua et al. (2013), who found that people with mild–to- moderate hearing loss used more effort in noise typical to open plan offices than normal-hearing peers. The high mean score of hearing disability (43.5) in this study despite the large number of responders with mild and moderate hearing loss indicates that even moderate hearing loss might have a negative impact on function. Earlier studies such as Chang, Ho, and Chou (2009) and Kim et al. (2017) have also found a moderate correlation between measured hearing loss and perceived hearing disability. Due to this lack of correspondence between the degree of hearing loss and the perceived difficulties, the loss may inflict an increased attentiveness to hearing disability assessment in audiological follow-up.

Furthermore, we found that the degree of hearing loss was negatively associated with workability and work role functioning, and the strongest association was from mild to moderate hearing loss. Additionally, degree of hearing loss was associated with work task characteristics for men only ($p < .05$). That is, men with moderate hearing loss tended to have a larger proportion in walk demanding positions than in sedentary postures compared to those with mild or severe to profound hearing loss. Acquired hearing loss tends to develop and augment over the years, and it takes time to discover and to become familiar with the change in condition. Going from mild to moderate hearing loss might imply a transition period where it takes time to discover and familiarise oneself with new communication needs. In this process, people with moderate hearing loss might be more inclined to endure a job situation based on their remaining auditory function and by such risking a strenuous daily life. People with severe and profound hearing loss may need more time to adapt and will not have prerequisites to do their job without any accommodation. The differences in task characteristics could also explain some of the reduced workability and work role functioning since

walk demanding positions would typically be teaching, health care, social work and service trades, which would be communication-demanding occupations. Participants with mild hearing loss and severe to profound loss had a larger proportion of jobs with sedentary postures, which would typically be clerical work, which potentially requires less verbal communication. However, the weaker association among the employees with severe/profound hearing loss may be caused by a healthy worker effect, where employees still working were those with the healthiest constitutions or most suitable jobs for hearing-impaired employees.

We found a prevalence of 12.5% doctor certified sick leave at present for women and 7.9% for men as compared to 6.9% for women and 4.0% for men in the general population (fourth quarter 2015, Statistics Norway). There was no statistically significant associations between sick leave and degree of hearing loss, but it was highly associated with fatigue. Kramer, Kapteyn, and Houtgast (2006) found a significant difference in sick leave among employees with hearing loss compared to normal hearing employees. Sick leave due to distress occurred significantly more often among workers with hearing loss. Hearing loss, job demands and requirement to recognise/distinguish between sounds were the strongest risk factors for stress-related sick leave. In addition to the extra effort used in noise by employees with mild-to-moderate hearing loss, Hua et al. (2013) also found that their general health was lower than their normal-hearing controls. With the argumentation of Ruben (2000) that communication skills are more important in work-related tasks than ever, we can assume that employees with hearing loss are more vulnerable than normal hearing employees. We do not know the reason for sick leave in this study, but the strong association with fatigue together with the strong association between fatigue and severity of hearing loss indicates that it should be further examined whether hearing loss is a factor contributing to sick leave. The perceived reason for sick leave may be fatigue, but hearing loss may be the main contributing factor to fatigue.

Work place accommodation

The degree of hearing loss was positively associated with both having workplace accommodations according to the hearing loss and being in need of such when no accommodation measures were taken. Hearing loss is often described as an invisible disability and might provide an explanation for the apparently insufficient prevalence of accommodation measures in this group. Hearing aids are small and almost invisible and only 18.9% of the participants reported use of assistive listening devices, which could have provided visible cues. Service provision towards hearing loss in Norway has been described as fragmentary and limited in terms of extent and content (Helsedepartementet & Sosialdepartementet 2002) and might provide an additional explanation in lack of accommodation measures.

We do not know if the participants in our study had requested accommodation or not. Baldridge and Swift (2016) found a reluctance to request accommodation, especially in for-profit organisations and this reluctance increased with age. The lack of accommodation when being in need of such in this study might be due to such a tendency, with our study population being the older part of the workforce and accommodation was found to be more frequent in public sector.

We also found that accommodation was less frequent in walk demanding work compared to work mainly involving sedentary postures, and that seniority exceeding eight years was associated with an increased accommodation rate. The difference in accommodation measures according to types of position/task characteristics may be due to differences in measures needed and how these are perceived by co-workers and managers. Walk demanding positions are typically teaching, various health care positions, and manual labour while sedentary postures are typically clerical work. Baldridge and Swift (2016) argued that employees with disabilities are less likely to request accommodation if they believe that co-workers would not approve of it. Necessary accommodation measures in walk demanding positions, like reduced amount of teaching, smaller classes or less shift-work might be perceived as expensive and inappropriate special treatment, which would feel awkward to request. Requesting accommodation may be easier when requiring commonplace measures and individual actions with little effect on co-workers, which might be the case in typical office-work.

We found that accommodation was more frequent among the part-time workers, which is contrary to the findings of Dong and Guerette (2013). They argued that less accommodation among part-time workers might be due to lower access to organisational resources and people with disabilities being more likely to be placed in part-time positions. With only 11.2% reporting not being offered more working hours together with the high proportion of health-related reasons for part-time work, this is not the case in this study. Furthermore, reduced workability and having been on long-term sick leave in our study increased the likelihood of having an accommodated work situation. These results indicated an accordance between needs and accommodation, and that vulnerable employees to a larger extent tend to get their workplace adjusted to their needs. Carlsson et al. (2015) found comparable results in Sweden, where patients on sick leave received extended audiological rehabilitation significantly more often, which indicated that those with the highest needs received the rehabilitation offer. In Norway, there is a follow-up plan of people on sick leave, which should be effectuated when an employee has been on sick leave for 4–8 weeks. Measures should also be considered in co-operation with the employer, the general practitioner and the social insurance system in order to prevent long-term sick leave, and in this process accommodation needs could be revealed and measures taken.

The high number of employees without accommodation measures when reporting needing it, together with the high fatigue score and the number of employees finding full-time positions too strenuous, emphasise the importance of having the working situation assessed and accommodated according to individual needs to support labour market participation. Both employees with moderate and severe/profound hearing loss seem to be vulnerable.

Gender differences

In the present study, women reported lower workability scores, higher fatigue scores and higher hearing disability scores than men, and the severity of hearing loss was statistically significantly associated with the employment rate and the extent of part-time work in women only. Additionally, men were more concerned of losing their position and were less likely to have workplace accommodation, while women had a larger proportion with need for such accommodation without receiving it. Still, women worked more frequently in the public sector, where accommodation was more usual. On this basis, it seems that the hearing loss and factors associated with hearing loss have a greater impact on women than men. In addition, they seem to be disconnected from the labour market to a larger extent even though they do

not feel insecure in their position. Gender differences in the labour market are known from the general population, both in employment, part-time work and the degree of sick leave. Differences in work and working conditions have been used as an explanation for these gender differences (Mastekaasa 2016). For employees with hearing loss it may be particularly relevant that some of the female-dominated jobs, in health care and social work, may require more communication skills and are more emotionally demanding than other jobs. Mastekaasa (2016) argued that women choose absence instead of presence when they are confronted with health problems to a larger degree than men. If this line of argument is plausible, it is likely that the gender differences found among employees with hearing loss, in the present study, could be attributed to the same mechanisms implying that women with hearing loss experience their health condition as more severe and that they choose to stop working earlier than their male counterparts. Furthermore, it is well known that social circumstances also contribute negatively to health and work participation in women. Voss et al. (2008) reported that family conflicts and living alone with children increased the risk of sickness absence in municipal female workers. In a study by Vaananen et al. (2004), the double burden of domestic and paid work was associated with distress and poor health in women. For people with disabilities who participated in vocational rehabilitation in the US, women were less likely to be employed than men and earnings were lower (Mwachofi 2009). Gender differences were also present after vocational rehabilitation. Lower work participation among women after occupational rehabilitation in a Norwegian setting has also been reported (Øyeflaten et al. 2014). Thus, the gender differences observed in the present study were in line with previous studies and may be the result of unfavourable conditions for women with hearing loss both at work and in private life. Psychological factors may also be important as gender differences have been reported in the sense of coherence response after participation in a rehabilitation programme, where women with chronic pain showed poorer sense of coherence than men (Lillefjell 2006). Thus, the reasons for gender differences in work participation are not fully understood. If possible, a complex biopsychosocial framework should be used to understand these reasons.

Additional sensory conditions

We found a high prevalence of additional sensory conditions, especially participants frequently troubled by tinnitus (43.9%). High co-morbidity has been found between hearing loss and tinnitus, hearing loss and hyperacusis, and tinnitus and hyperacusis (Hasson et al. 2010; Shargorodsky, Curhan, and Farwell 2010; Andersson et al. 2002). Carlsson et al. (2015) found in a study of patients with severe to profound hearing loss in Sweden that all quality of life parameters were negatively correlated with tinnitus affecting daily life often or always, and the proportion of sick leave was higher than those never or sometimes bothered. Stephens et al. (2010) found that 39% in their study population of people with Ménière's disease experienced activity limitations and 47% experienced participation restrictions, of which one main area was concerning work and employment. In the study of Juris et al. (2013), patients with hyperacusis had a high prevalence of symptoms of depression.

In this study, having an additional audiological condition such as tinnitus, hyperacusis or Ménière's disease or a visual impairment was associated with a lower employment rate, a higher prevalence of long-term sick leave as well as a decreased workability score and increased fatigue score. The proportion of employees with workplace accommodation was larger among employees with additional conditions, but so was the proportion of employees in need of accommodation without receiving it as well. Our results together with earlier studies imply a cumulative effect of an additional sensory condition on the vocational participation parameters. Consequently, a lack of accommodation measures will potentially have an even greater impact on this group than on the group of hearing loss only. Further studies on the impact of additional conditions on the participation factors are needed. Additionally, particular attention should be given to this group within audiological rehabilitation.

Strengths and limitations

Cross-sectional studies are limited in terms of indicating causality. Thus, in this study, we can merely observe associations between the various variables of vocational affiliation. However, a cross-sectional study is well suited to describe vocational characteristics of participants with varying degrees of hearing loss.

Recruiting through a special interest organisation might not produce a study population representative of the target population. One aim of this study was to recruit a large number of participants, as register data are not available on hearing loss in Norway. The HLF has a large number of members, which might be partly due to the compensation arrangement for loss of hearing aids, which they offer members. Newly fitted hearing aid users are routinely informed about this benefit. The high rate of hearing aid use and the high prevalence of mild hearing loss among the participants support the assumption that the HLF organises a wide spectre of citizens with hearing loss.

The low response rate seemed to produce a bias towards employed responders. The non-responders in the survey had a considerably lower degree of working life participation (52.7% in part-time or full-time work), which implies that our responders were not representative for the entire population of people with hearing loss in Norway. Therefore, the results mainly describe the working life characteristics of people with a long-term experience of hearing loss and the extent of problems they may face in working life. Additionally, the results mainly describe the oldest population of employees with hearing loss with a mean age of 54.7 years. Thus, the characteristics of individuals with hearing loss with children at home are less described in this study.

The high employment rate and the low number of participants with severe and profound hearing loss might be due to a healthy worker effect, common in cross-sectional studies, indicating that the responders are those still employed. A healthy worker effect could explain the lack of statistically significantly higher fatigue score for severe and profound hearing loss.

Conclusions

This study found a high degree of employment among individuals with hearing loss. However, the degree of strain was high, and there was a negative association between the degree of hearing loss and workability and work role functioning, particularly for moderate hearing loss. Hearing loss also seemed to have stronger negative implications for women compared to men. Further, there was a lack of work place accommodation when there was a need of such, both for employees with hearing loss only and for employees with additional sensory conditions. These results imply a need for an increased attentiveness to the individual needs concerning the experienced disability a hearing loss

may produce. The attentiveness should produce a more frequent use of hearing disability assessment related to working conditions by audiology professionals, and an increased use of work place accommodation.

Disclosure statement

No potential conflict of interest was reported by the authors.

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PAPER II

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Working life trajectories with hearing impairment

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Working life trajectories with hearing impairment

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ABSTRACT

Purpose: The aim was to identify and explore factors, which facilitate or hinder work participation for people with hearing impairment.

Materials and methods: In-depth interviews with 21 hearing impaired individuals of 32–67 years of age with a present or recent vocational affiliation were conducted. The analysis was conducted using a grounded theory approach.

Results: The analysis resulted in a conceptual framework of working life trajectories evolving through three phases of acknowledgement of hearing loss impact: the pre-acknowledgement, acknowledgement, and post-acknowledgement phase. The phases were influenced by the qualities of three contexts: the personal, the workplace, and the service provider. The qualities of the contexts, together with the amount of time spent in a pre-acknowledgement phase, formed the trajectories towards continuation of work participation or towards a disconnection. Accumulated risk factors constituted increased likelihood of disconnecting trajectories, while accumulated facilitating factors supported sustainable trajectories.

Conclusions: The results revealed a need for extended support at the workplaces, which includes the manager, colleagues, and professionals in the aim of preventing exhaustion and facilitate work participation among employees with hearing impairments. Joint action in facilitating communicative participation would share the responsibility for accommodation measures and broaden the room for manoeuver at the workplace.

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➤ IMPLICATIONS FOR REHABILITATION

- Fatigue prevention in employees with hearing loss needs to be addressed in occupational rehabilitation.
- Knowledge transfer on hearing loss implications needs to be included in aural rehabilitation.
- Occupational rehabilitation professionals and professionals targeting hearing impairments should enter into systematic, multidisciplinary follow-up at the worksite.

Introduction

Work participation is crucial to economic independency, professional and social fulfillment, and an important element of the personal identity. However, barriers to work participation might occur in individuals with impairments [1]. Hearing impairments imply reduced access to oral communication which might result in such barriers and cause adverse effects on work participation. For instance, hearing impairment has been associated with a reduced degree of vocational participation, such as unemployment/underemployment [2,3], increased risk of disability pension [4], and increased risk of stress-related sick leave [5]. Moreover, increased levels of anxiety and depression in patients with severe and profound hearing loss compared to the population at large were found in a retrospective study [6]. Participants with hearing impairments who were of working age were less likely to have high education and income, compared to normal hearing peers according to a cross-sectional study from the Netherlands [7]. Additionally, persons with hearing impairments were less likely to have paid work exceeding 12 h and more likely to look for work or to be unfit for work [7]. Higher odds for low-educational attainment and low income among people with hearing impairments were also found in the United States of America [2]. Diverging results have been found for the risk of early retirement. Decreased likelihood was found among subjects with hearing impairment in a Dutch cross-sectional study [7], while an increased risk was found with an increase in low-frequency hearing loss in a cohort study from Norway [8].

Hearing loss is a highly prevalent chronic condition with an estimated 328 million adults worldwide [9]. It is also prevalent in the working age population. The prevalence in the United States of America was estimated to 12.9% in 40– 49-year-olds and 28.5% in the age group 50–59 [10]. In Norway, the estimated prevalence was approximately 11% in 45–64-year-olds [11]. A Swedish study included tinnitus and found that 31% of the working population reported hearing loss, tinnitus or both and 36% did so in the non-working population [12].

Many employees with hearing loss experience a high degree of strain or tiredness related to work. Thus, there is a need to

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Supplemental data for this article can be accessed here.

Table 1. Characteristics of participants.

Variables		Total sample
Number of participants		21
Gender	Females	13
Age (mean (range))		55.7 (32–67)
Auditory status*	Pre-lingual/childhood onset	6
	Severe/profound hearing loss (cochlear implants)	9 (4)
	Moderate hearing loss	10
	Mild hearing loss	2
	Tinnitus (severe)	9 (6)
	Ménière's disease	1
	Dual sensory loss	1
	Hearing aid users (combination with cochlear implant)	18 (1)
Education	Higher education – university	16
	Vocational training – college	4
	Primary education	1
Employment	Full-time position (37.5 h per week)	10
	Part-time position	7
	No position or in disability assessment	4
Manager responsibility	Yes	2
Most recent work	Office and communication work sector	12
	Education sector	4
	Health and care sector	3
	Practical work/support sector	2

*Inclusion in multiple categories possible.

consider hearing loss as a risk factor for fatigue [5]. An increased need for recovery with increased hearing loss was found in a cohort study [13], and a higher prevalence of hearing problems (hearing loss and/or tinnitus) was found among those with higher burnout scores [12]. Moreover, an elevated fatigue score among people with hearing loss of working age was found in a cross-sectional study [14]. The high levels of fatigue/exhaustion have been associated with the concentration and the hypervigilance, which employees with hearing impairments need in work settings [15]. The task of compensating for the hearing loss together with the need to be prepared to initiate such compensation has been described as a double or triple workload [16].

Employees with hearing impairments still face considerable barriers at work, such as restrictions in group interactions and suitable workplace accommodation awareness [15]. However, how employees with hearing impairments perceive barriers and how the barriers contribute to fatigue are less understood. Furthermore, we know little about what employees with hearing impairments perceive as factors that facilitate work participation. Such knowledge is needed to develop appropriate measures to increase the likelihood of sustainable participation. Thus, the aim of this study was to identify and explore factors which facilitate or hinder work participation, as described by employees with hearing impairments. An ecologic perspective, which includes various contextual factors, was adopted since a variety of persons and mechanisms within and outside the workplace influence work participation.

Methods

An inductive approach was necessary to explore experiences with hearing loss at work. Thus, a qualitative approach based on individual interviews with persons with hearing impairment was chosen. An objective in this study was to reflect the variety of working life. Thus, we wanted to recruit participants from a wide spectre of professions, on different managerial levels and with various educational backgrounds.

Participants

Participants were recruited through an article in the journal of the Norwegian Association of the Hearing Impaired (December 2015) where the study was described and readers invited to participate. Inclusion criteria were: (1) having a hearing loss, (2) being of working age (18–67), and (3) having a recent vocational affiliation. We had no exclusion criteria.

Fifty-two individuals responded to the article. Potential participants who matched the inclusion criteria were contacted successively for interview arrangements, four of whom did not respond. Another one did not have a recent vocational affiliation. Purposeful sampling [17] aiming for variation within working life experiences was performed based on the list of the potential participants. Further, sampling towards exploration of specific concepts was sought towards the end of the data collection representing theoretical sampling. Theoretical sampling implies that data collection is pursued until the developed concepts have been sufficiently explored [18].

A total of 21 individuals were interviewed, where the age range was 32–67 and 13 were women (Table 1). All the participants had spoken language as their first language, and they had long-term experience of hearing loss. Of the 17 participants who did not have cochlear implants, audiograms were provided by 14 participants.

The severity of hearing loss was assessed by the first author (who is an educational audiologist) based on the available audiograms and grouped according to the WHO classification (no impairment: 25 dB or better, mild impairment: 26–40 dB, moderate impairment 41–60, severe impairment: 61–80, profound impairment: 81 dB or greater (http://www.who.int/deafness/hearing_impairment_grades/en/)). Participants with cochlear implants were assessed as having severe/profound hearing loss, while other participants without audiograms were classified based on self-assessment.

Ethics

The study was approved by The Norwegian Centre for Research Data, NSD (ref. no. 47760). All participants received information about the project in advance of the appointment and signed an informed consent before the interview was conducted.

Data collection and analysis

An interview guide with open-ended questions (attached as supplementary material) was developed based on these professional experiences and previous research. The purpose of the interview

guide was to ensure that the interviews included the following subjects: the nature of the hearing loss, working conditions, accommodation matters, leadership and cooperation, social belonging and participation. Questions were only asked if the participants did not launch the subjects themselves, or if elaboration was needed.

All interviews were conducted face to face in a quiet environment of the participants own choice. The participants were asked to tell their story of working life participation as hearing impaired with emphasis on present or most recent position including experiences throughout their total timespan of the hearing loss.

The interviews lasted from 55 min to 2 h, and were recorded and transcribed verbatim.

The first author is trained in the audiological field and has long-term experience in working with people with hearing impairments. The second author has experience with mixed methods studies, while the third author has extensive experience with qualitative research, both interview studies and grounded theory. None of the authors had any pre-existing relationship with any of the participants.

A grounded theory approach was chosen as method of analysis building on the procedure described in Corbin and Strauss [18]. This method is particularly appropriate for areas scarcely described with an aim to develop an explanatory theory. In grounded theory, analysis and data collection are conducted successively until the concepts developed through the data analysis are defined, i.e., theoretical saturation is obtained. Data collection was performed as long as new interviews added to the concepts developed in the ongoing analysis. When new interviews no longer added to the variety of the concepts within the frame of the sample available, theoretical saturation was perceived as obtained.

The analysis started directly after the first interview with the first author (EVS) reading through and writing a memo (written records of analysis) [18] on the entire text describing the first impression of the story told. NVivo version 11 (QSR International, Melbourne, Australia) was used as a tool during the process of analysis.

In the next step, the text was decomposed into sections according to the theme in question, and memos on each section were written. The memos were labelled according to the main content. The last author (MBR) read the transcript of the interview and the memos, and the labels were discussed and renamed when necessary. The labels constituted an initial code list. Further exploration of the memos was conducted searching for concepts, and then for properties and dimensions. The next interview was analysed in the same manner with memos and coding at the existing codes. When new codes were added, the previous interview was revisited searching for similar text elements. Some codes needed relabelling during the process, while others needed elaboration into lower-level concepts. For example, a high-level code such as "workplace relations" had lower-level concepts such as "workplace culture," "management involvement," and "interactions." The subsequent interviews were analysed in the same manner with memos and coding. The first (EVS) and last (MBR) authors discussed the further elaborated memos and code lists.

The aim of grounded theory is to build theory from data, where theoretical integration evolves through a central or core category [18]. The central category could be a conceptual idea and should comprise all other categories. In this analysis process, the central category developed was "participation characteristics modifiable by support and knowledge."

Another important step in grounded theory approach as presented in Corbin and Strauss [18] is searching for process in the data. Throughout the analysis, the importance of time and the contexts in which the participants were engaged appeared fundamental. Amick et al. [19] described a model on working life courses in a social context by the shape of trajectories. Their theoretical framework had constructive concepts, which appeared relevant to the understanding of this data material. Hence, the concepts of contexts and trajectories, as described in their article, were explored as a framework during the further course of analysis. The life course perspective in this study was limited to the hearing loss experiences. The contexts were elaborated and/or narrowed according to the quality of the data, i.e., the social context was limited to service providers, the labour market context was omitted, and a personal context was added. Furthermore, we have concentrated on transitions concerning hearing-related health aspects and work participation and elaborated on the influence of such transitions into trajectory phases.

In the analysis process, the procedure of Corbin and Strauss [18] was followed as far as practically feasible. However, it was necessary to conduct interviews continuously. Consequently, the procedure of alternating between interviews and analysis was followed in the sense that interviews were analysed one at a time and that the continuous analysis brought new aspects to subsequent interviews. The final memo in the analysis constituted an analytic story, which told the main outline of participants' stories. The theoretical framework of working life trajectories was outlined based on this analytic story.

Results

The participants' stories of work participation as hearing impaired constituted working life trajectories, either towards sustainable working life participation or towards a disconnection from working life. The trajectories consisted of phases, which the participants underwent over the course of time, and contexts in which their working life experiences evolved. In the following, the contexts and the phases that constitute the trajectories are described and illustrated by citations. The term "key person" pertains to individuals, within or outside the enterprise, significant for the participants' work performance.

The importance of context

The participants spoke of three main contexts, which played an important role in their work situation: their personal context, their workplace context, and their service provider context. During the working life course, the contexts influenced the resilience of the participants' participation in working life. The degree of strain within the three contexts and the possible relationship between them are described in Figure 1.

The personal context

The personal context comprised the individual situation of the participants including their individual perception of the hearing loss. Three concepts within the personal context were important to regulate the degree of strain: Knowledge of the impact of hearing loss, strategies used in dealing with the challenges, and the participant's attitude towards the hearing loss itself.

Knowledge: At the time of onset of the hearing loss or at the time of diagnosis, the participants' level of knowledge about possible consequences and impact of hearing loss was low. The lack of knowledge led to a low level of workplace accommodation and few adjustments, and the participants did not see the relationship between the signals of strain and the hearing impairment

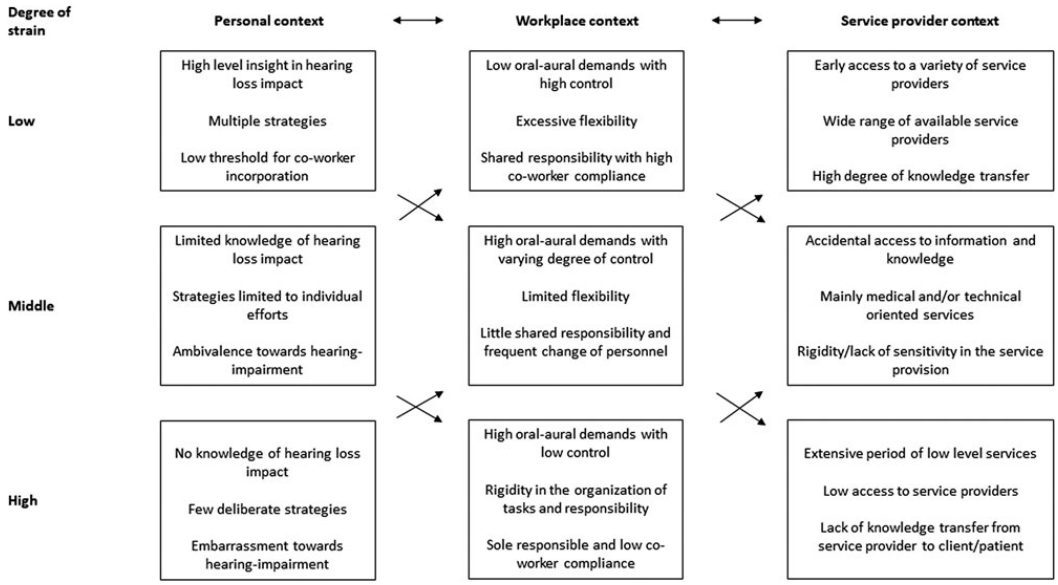

Figure 1. Factors influencing the degree of strain according to the contexts. Arrows indicating possible relationships between the levels of the contexts.

when such signals occurred. However, when knowledge was gained, the needs for accommodation and adjustments became clearer.

> [Attending the course] first and foremost made me aware of the hearing loss. Being able to raise my voice to say: 'I have a problem with this'. That was the primary thing. And meeting others with hearing difficulties, since I hadn't met anyone else […] It was good to become aware, and gain the courage to talk about it at work– to tell the others what it entailed. [Attending the course] influenced my thoughts about myself, which I hadn't really thought about before. *(No. 1, female, 56–67, moderate hearing loss, two half-time positions education sector and health and care sector)*

Strategies: The participants applied strategies to manage the consequences of their hearing condition depending on the perceived severity of the hearing loss and other individual needs. Visual support and strategic physical positioning were frequently used. To cope with speech perception challenges, some had adopted a highly complex analytic process of using fragments of words, sentences, and intonation, together with context, to make a puzzle of meaning. Others mainly used lip-reading, while others had few explicit strategies. The auditory capacity varied with the day-to-day health condition, where a day with less energy gave poorer hearing. Limiting strain was important, and for some, the goal of all adjustments. Severe tinnitus aggravated the circumstances of life, especially regarding the level of energy. Some perceived severe tinnitus as a bigger challenge than their hearing loss. However, tinnitus could function as an "alert lamp," where the participants used an increase in the tinnitus as an indication of too much stress or workload.

> Not only do I organise my day. I organise my time by keeping a weekly plan. I am very dependent on seeing the week as a whole. I plan the distribution of my work – so that I know when to expect the peaks. *(No. 3, female, 46–55, moderate to severe hearing loss, full-time employment office and communication work sector)*

Attitude: Among the participants, personal attitudes towards hearing loss varied from assertiveness, to ambivalence to embarrassment. Participants who had an assertive attitude towards the impact of the hearing loss were specific about their needs towards key persons during working hours, while ambivalent participants were selective in which occasions they would include others in solving their communication challenges. Ambivalence or a negative attitude towards ones' own hearing loss evoked uneasiness when the hearing loss became visible, because visibility could imply unwanted attention to ones' differentness. Assistive listening devices in particular evoked such uneasiness, together with the needs for communication measures which involved partaking of others, e.g., meeting participants having to pick up a microphone or enforcing a tight communication structure. Hence, the participants rarely used assistive listening devices, especially when communication partners had to take an active part to use such devices.

> It has taken a lot of practice to dare … and to trust that I have something to offer. That I am as important as others are. That I have something to say as well. I have a right to hear. That entails placing demands upon others … it is not just my responsibility to hear what people say. It is actually the responsibility of others too. To demand from others that measures are taken and that they show consideration. Standing up and speaking up have been quite difficult. Firstly, you want to be kind of invisible, especially with such a hearing loss, and you quickly become invisible. But ironically, with my kind of disability it is very important to make yourself visible. That has been the most difficult part, to stand up for your rights and for who you are. *(No. 16, female, 30–45, severe hearing loss, part-time employment education sector)*

Knowledge, strategies, and attitudes were closely connected. In-depth knowledge of hearing loss and its impact on one's life tended to advance an assertive attitude towards hearing impairment, which seemed to facilitate the development of relevant strategies, particularly the inclusion of key persons at work in the execution of accommodation measures.

The workplace context

The workplace context consisted of three main concepts, which influenced the degree of strain: oral-aural demands, flexibility, and accommodation by manager and coworkers.

Oral-aural demands: The participants described workplaces with oral communication demands challenging their speech perception abilities. A high amount of oral communication situations

with a low level of structure had a negative impact. This could be a working situation with a large number of meetings with unstructured dialogues and scarce access to minutes. On the other hand, highly structured oral communication and a high degree of information given in writing had a positive impact. Having the opportunity to control the oral communication situations was also beneficial. Acting as the moderator of a meeting, using amplification devices and limiting the number of meetings were types of control that decreased demands.

> I am good at writing, and my bad hearing does not restrict it. The difficult parts are projects or work tasks that entail a lot of coordination between departments and locations and video meetings. It does not work well [laughing]. […] What follows is a lot of guessing … I have to do many things off the cuff. You get good at that after a while [laughing]. I have been in all kinds of setting with hearing impairment, and have felt and thought that I do not want to experience them again. *(No. 9, male, 30–45, severe hearing loss, full-time employment office and communication work sector)*

The acoustic environment, such as the level of noise at the workplace and the acoustic qualities of the premises, influenced the speech perception. Noise reduction options were important to control such aural demands, i.e., being able to withdraw from noisy situations, and join meetings and lunch in adequate acoustic environments.

The oral-aural demands as described above were associated with performance and participation limitations.

Flexibility: Workplaces which facilitated a flexible way of organising the workday and the tasks, contributed to less strain among the participants. Types of flexibility were regulating working hours including taking breaks when needed, variation in the daily agenda related to oral-aural demands, and home office possibilities. Rigidity in workplace organisation gave few possibilities of recuperation during the day, and signalled a lack of recognition of one's individual needs.

> I have a good capacity for work. I really do. But I felt that I received more and more tasks, and that I stretched too far. I asked my manager if I could reduce the amount of tasks a bit. I felt that I could still work but that it was necessary to do some restructuring in the department. The manager was not willing to do that. The consequence was that I became sick-listed due to burnout because I stretched too far. It does not feel good, since I have tried to focus on solutions, and I know my work place for better and worse. I know that many tasks and routines are not taken care of, and I suggested taking on such work, to help where staff was short […]. However, the manager did not want that. It has been difficult. On some occasions, I have been invited to take part in some projects, and it has worked out well. Unfortunately, those projects have been short-term and didn't offer a permanent solution. I have always wanted a permanent solution. *(No. 10, female, 56–67, severe hearing loss, full-time employment office and communication work sector)*

Accommodation by manager and coworkers: The participants were frequently alone with the responsibility of making oral communication audible. They frequently saw this responsibility as reasonable, but it became tiresome and lonely over time. Hence, managers and coworkers who engaged in finding and executing adequate measures relieved the participants of strain. Some coworkers made sure microphones were used, took notes on behalf of their coworker with hearing impairment, or in other ways made oral information more accessible. Such initiatives were warmly welcomed by most participants, and took pressure away. A manager with a positive inclination towards accommodating the work situation provided important support and signalled an acceptance of ones qualifications independent of the impairment. However, managers' lack of knowledge about hearing impairment limited their degree of taking responsibility and initiative in the accommodation process. Most participants thought that their coworkers and manager needed information on hearing impairments. Some workplaces had frequent change of personnel, and keeping colleagues and managers updated and informed at all times was demanding and tiresome. Additionally, normal-hearing coworkers tended to quickly forget the specific needs, and the participants had to repeat this information regularly.

> The IT department has really helped me and it still does. They have assistive listening devices and video magnifiers. Every time that there were large lectures the IT-department handled the presentations and microphones and so on. In addition, they always reserved a seat in the front for me, so that I could both hear and see. They did that in such a laid-back way. I never had to ask for it. They still do it, after all these years. That is admirable of them, very gratifying. *(No. 7, female, 46–55, moderate hearing loss, tinnitus, full-time employment office and communication work sector)*

Consequently, the participation possibilities were formed by the degree of oral-aural demands. However, the degree of demands was reduced with accommodation offered by manager and coworkers and with the degree of flexibility in the work situation. High degree of accommodation by manager and coworkers and flexibility reduced the oral-aural demands and thus, limited the strain.

The service provider context

The service provider context constituted of three main concepts, which played an important role in the participants' encounter for the services to be perceived as adequate and contribute to reduce strain: access to services, extent of services, and proficiency in the execution. This context included general and specialised health services, as well as welfare services.

Access: Access to service provision was associated with information about the existence of a specific service provider. At the early stage of the adult-onset hearing loss, the participants reported mainly access to medical follow-up and hearing aid fitting. Frequently, a long period of time had elapsed without further service provision. Typically, different needs, in or outside work, would surface during the course of time, but the participants had rarely enough knowledge about existing providers to request support or to see the connection between the needs and the hearing loss. For many, the discovery of service providers was a coincidence, for instance from a peer or a coworker who randomly shared useful information about accommodation possibilities and relevant service providers.

> I think it was that nurse [at a rehabilitation course] who told me about it. […]She had hearing difficulties herself and thus paid attention to the issue for her clients. […] Without her, I think I would not have had assistance with a hearing aid in quite a few years. I had come to terms with the fact that tinnitus was something you got and that you just carried on. There is nothing to be done. […] So, I was actually very lucky. *(No. 11, female, 56–67, slight hearing loss, tinnitus, full-time employment office and communication work sector)*

Extent: Participants talked about the usefulness of having access to a variety of professionals, both audiologically trained and other professionals such as physiotherapists and psychologists, in order to develop a sustainable work situation. Different professional approaches, when the information was both abundant and specific, gave broader perspectives and knowledge that was more thorough. It tended to result in an extensive selection of tools, such as measures for noise and strain protection. The participants used these tools to find efficient and individually suitable measures in coping with their working life challenges as hearing impaired. Especially, participants with severe tinnitus benefitted from extensive training in dealing with the unwanted sound in general. Moreover, the participants found access to

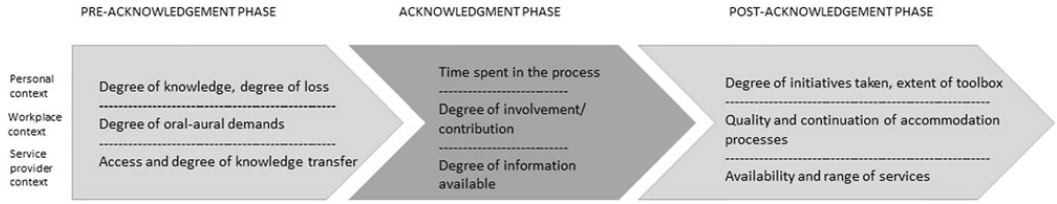

Figure 2. Influential factors in working life trajectories.

peers, in addition to professionals, valuable, were the most important benefits were sharing of experiences and a feeling of fellowship.

> [For two years] I put a lot of effort into attending courses […] It included mindfulness and "find your peace", which I obviously needed. I attended practically oriented [courses] regarding assistive devices. I desperately craved something that could help me have a better everyday life. I joined all kinds of Facebook groups to see how other people were trying to cope. The sum of all of that and that I was granted one treatment day per week, as well as receiving physiotherapy […] all of that is the reason that I can manage. *(No. 7, female, 46–55, moderate hearing loss, tinnitus, full-time employment office and communication work sector)*

Proficiency: The participants were concerned about the proficiency in the execution of services when meeting with professionals, both in health care and welfare. In proficiency, they included the professional's ability to detect individual needs and finding a flexible way of reaching the goal of the services. Some participants claimed that encounters with professionals should be characterised by dialogue and transmission of knowledge from the professional (e.g., an audiologist or a case manager) to the participant. Rigid ways of handling the process could increase the strain. The effort would then be used on fulfilment of the demands from the service providers instead of on improving health and work ability. Encounters without dialogue and transmission of knowledge were experienced as particularly exhaustive for participants on long-term sick leave or with fatigue.

> The path has taken seven years – to have the Labour and Welfare Administration accept and recognise me as a working member of society. It has been quite hard sometimes, because the system is difficult and slow. It goes slowly, and you have to meet so many people and attend so many meetings and centres, and you must try and fail so much. […] I have been tested in many work situations, been to lectures, career counselling, and work-related rehabilitation. I must have tried everything there is to try. I knew myself and that my goal had to be disability pension. If I could manage to work 50%, then that would be my contribution in life. That is what I can give to society. […] The Labour and Welfare Administration didn't agree, of course […] And I did what they told me. 'Try this, try this, try this', and I tried everything. I attended every meeting, and I attended every consultation. Every time it ended with: 'No, maybe it wasn't the right thing for you'. At the end, they actually didn't have more alternatives. At that time, my general practitioner, a psychologist, and the head physician at the ear-nose-throat department had sent documentation that I should be granted disability pension. It took about a year before the application answer arrived […] that I was granted 50%. A huge burden was taken off my shoulders. I could concentrate on the 50% part, not on everything else. I could finally go all in at work, feel that I was doing my part. It was a very good feeling – to be recognised for who I am. *(No. 16, female, 30–45, severe hearing loss, part time employment education sector)*

Participants who had a network of supporters, both professionals and nonprofessionals, felt assured in their daily life, knowing that assistance was at hand whenever problems would occur. Participants without a supporter network were, on the other hand, far more vulnerable and at the mercy of one's own initiative and endurance.

Forming trajectories through phases

The working life trajectories evolved through three phases of acknowledgement of the impact of the hearing loss: Phase 1: pre-acknowledgment, phase 2: acknowledgement, and phase 3: post-acknowledgement. Different influential factors during the phases affected the direction of the trajectories either towards sustainability of work or towards disconnection. In the following, the three phases are presented chronologically, including influential factors and trajectory outcomes (see Figure 2).

Phase 1: Pre-acknowledgement

The pre-acknowledgement phase started with the time of onset of the hearing loss. Participants with adult-onset hearing loss were often unaware of the time of onset, but had in retrospect frequently a notion of an extended period before they had their hearing loss diagnosed. Having the hearing loss diagnosed and hearing aids fitted did not lead to acknowledgment in itself, but rather to a period continuing as usual while adapting to the hearing aids. Participants with childhood-onset hearing loss had also experienced the same pre-acknowledgment phase when they had limited interventions during childhood and education, resulting in limited knowledge about the hearing loss. Consequently, they would not have prerequisites to make informed choices on education and work concerning their hearing loss and its impact.

The degree of strain during this phase depended on the degree of hearing loss and the type of work. The level of strain the participant experienced (Figure 1) influenced how much energy and time the participant spent in this phase. Lack of knowledge in both the personal and the workplace context resulted in few prerequisites for initiating change. Hence, neither the participants nor their manager requested support from service providers.

> It was not until 2008, when my problems become so grave, when the tinnitus and the hearing had become worse, that I went to see a doctor. At that moment, it was so troubled… I managed my job, but I was so tired when I got home. I had no energy, and I was irritable and short-tempered. […] I was offered a stay at [a rehabilitation centre], a course for mastering tinnitus. [...] I learned a lot there […] I learned what tinnitus is and what it does to you. That was a revelation. […] I understood that the hearing loss and the aggravated tinnitus was a stress factor – I had to be told that – a nurse who said: 'Are you aware of how much energy you spend on hearing?' Then I started to think – that it is associated with a tight neck, which I have suffered from for a long time. I had hearing troubles earlier, but hadn't seen the connection, and that it can result in difficulties with concentrating. Having a job in which you need to keep up – it affects the tinnitus, like a volume button, and it increases. […] It was only after the stay [at the rehabilitation centre] that I started to realise how much the hearing problems affected my everyday life. *(No. 12, male, 56–67, moderate hearing loss, severe tinnitus, in disability assessment, office and communication work sector)*

Influential factors. Mild hearing loss and low oral-aural demands were important protective factors in this phase, while troublesome tinnitus and poorly fitted hearing aids were important risk factors.

Furthermore, spending an extended period of time in the pre-acknowledgement phase constituted a risk of an accumulation of strain, especially with high oral-aural demands. The most important factor in limiting the duration and the negative impact of this phase was the participants' experience of proficiency in the audiological encounter. A process with little knowledge transfer and limited dialogue in the fitting-process was common and could result in an adverse effect on the self-efficacy, limiting the access to tools to bring into the workplace. In this case, the pre-acknowledgement phase stabilised and lasted for years. The toil during a long-lasting pre-acknowledgement phase lead to exhaustion and/or sick leave in some participants.

Phase 2: Acknowledgement

The acknowledgement of the impact of the hearing loss started as a growing sense of awareness and constituted a life course transition. Prior to the transition a need for change evolved as the level of strain increased. Some experienced a period of long-term sick leave or a sense of fatigue or burnout, which initiated the process. The participants started with a search for knowledge or they accidentally got access to information on relevant hearing loss matters, such as courses with various relevant subjects. Through access to broad information from various professions and meeting peers in the same situation, the connection between their daily life struggles and the hearing loss was established. The knowledge gained was used to create a personal toolbox in order to deal with the challenges.

A life course transition, which reduced the level of strain in the personal context (as described in Figure 1), was a good starting point for initiating constructive changes. Through knowledge and contact with peers, negative attitudes were altered and broader strategies were developed. Thus, a favourable situation was created where the hearing loss could be incorporated as an accepted part of the working situation.

> It is about learning relaxation techniques, not doing things you don't have to engage in. I was very enthusiastic earlier, socially minded, my thoughts were always ahead of what I was doing. That is OK, but when you can't bear it, you can't bear it. When you get home and you realise 'Oh s***, now it's whistling [in your ears]. You understand that your head is stressed. To practise to reduce the stress in your head … we work a lot on that. Use nature a lot. Actually, I have started to kayak. That experience was an eye-opener. I had to sell my motor boat since it made too much noise, and I didn't think it was possible to have a life without a boat. I have always had a boat. […] Getting out into nature […] and you notice 'God, now it doesn't bother me that much'. […] I have never experienced that before. I have always been accompanied by the sounds of the things that I have done, boats and all that … sound, sound, sound, model plane, racing cars, always sound. The quietness, the here-and-now stuff, mindfulness, oh gosh, what good it has done for me. […] Now it is actually possible to live with this. *(No. 14, male, 56–67, moderate hearing loss, severe tinnitus, in disability assessment, practical work/support sector)*

Influential factors. Extended and highly accessible information was an important protective factor. Through extensive knowledge, a deeper insight into the hearing loss impact developed. If information was not abundant, the knowledge tended to evolve slowly and the process would halt before thorough insight was gained. Adequate measures were taken, but they were less extensive, and the transition could stop and restart at a later point in time prolonging the process and not sufficiently reducing the degree of strain.

Phase 3: Post-acknowledgement

The quality of the post-acknowledgment phase depended on how the accommodation suggestions were met by the manager and the service providers involved. If the manager had a positive inclination towards the initiatives taken, a constructive and cooperative process started to find adequate measures. If the manager took little interest in or was opposed to accommodation measures, the process stopped and change was less likely. This would add to the strain and to the risk of disconnection. Having access to adequate service provision influenced the post-acknowledgement phase positively. To find and to build up the relevant network formed a basis at which the participant could stand firmly during working life.

> We [the participant and the manager] had meetings about adjustments of different work tasks and stuff like that. What he always said was 'Teaching is what we do here'. […] He did not really understand what kind of duties a manager has […] I spent a lot of effort showing him … in addition to the fact that I was tired already. I felt that I constantly had to show him that I was entitled to this and that it had to be sorted out. I felt quite alone […] When I finally realized the situation I talked to the employee representative and then the head safety delegate, and they joined me at all meetings. That is the smartest thing that I have ever done. […] I can't attend meetings alone with a manager who doesn't know the right time to strike. *(No. 8, female, 56–67, moderate hearing loss, part-time position education sector)*

Influential factors. Shared responsibility of finding and implementing relevant measures was an important protective factor, which reduced strain and helped sustain the labour market participation. Solitary responsibility, on the other hand, increased the risk of discouragement and disconnection. If either the workplace or service provider context was reluctant or unsupportive, it resulted in added strain and discouragement. The previous exhaustion would be prolonged increasing the risk of disconnection from the labour market.

Additionally, change of colleagues or managers had a potentially adverse effect. New coworkers meant frequent repetition of information, while change of manager meant starting afresh with creating understanding for their specific needs. It also meant an additional uncertainty of whether accommodation measures could be withdrawn, or if a constructive relationship could be established. Changing case officer or having multiple case officers also meant explaining one's needs repeatedly with a risk of not succeeding. This could have an adverse effect on the adequacy of the services given, such as having suitable welfare benefits withdrawn.

A serious risk factor was long-lasting severe tinnitus. To cope with severe tinnitus a high level of knowledge was necessary, but not sufficient. A high flexibility level at work, allowing for a variety of measures to reduce strain, was equally important. Still, severe tinnitus was a high-risk component for disconnection even in adequately functioning workplaces.

Outcome of working life trajectories

To have a vocational affiliation was described as important to all participants. Disconnection from working life was perceived as a last resort and was associated with grief and a feeling of inadequacy, also for those with a partial disconnection in combination with disability or welfare benefits. Finding ones limit of endurance concerning working hours within an acceptable auditory environment was crucial to sustain participation.

The two possible outcomes of the working life trajectories, sustainable working life participation or a disconnection, are illustrated in Figure 3. Sustainable vocational participation was associated with balancing the level of strain without making the job less interesting. On the other hand, the risk of disconnection increased when the hearing impairment was not an integrated part of the daily working situation. The situation would then be characterised by insecurity, solitude, and unnecessary toil.

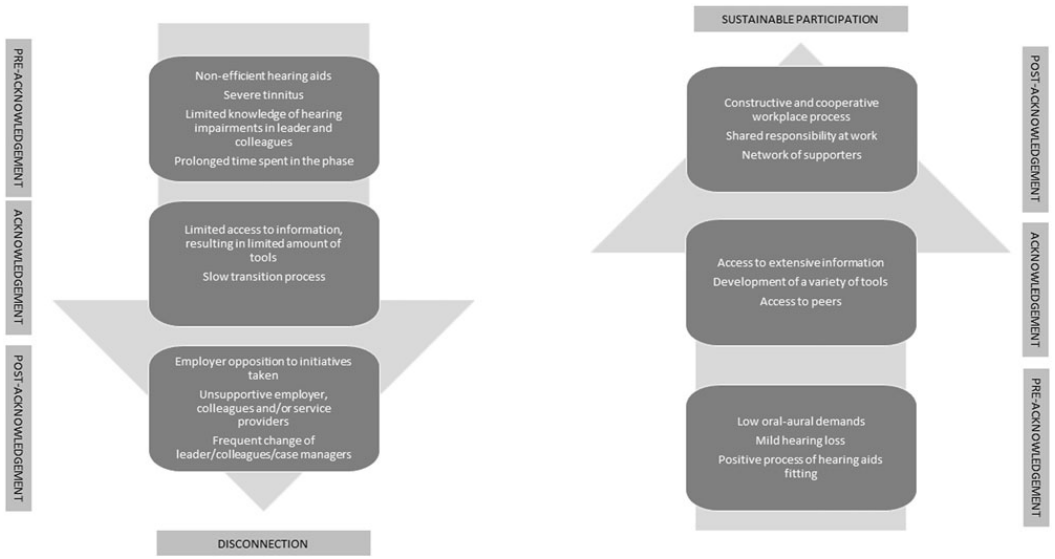

Figure 3. Outcome of working life trajectories through the phases of acknowledgement.

Disconnecting trajectories

An accumulation of risk would constitute a strenuous working situation and increase the likelihood of entering disconnecting trajectories. Remaining ignorant of how hearing loss could have an impact on life hindered a development of suitable and sufficient coping strategies. Such ignorance maintained ambivalence or negative attitudes towards hearing impairments. Service provision encompassing technical assistance only, such as hearing aids, limited the possibility of developing further knowledge and strategies. When a low level of knowledge endured over time the risk of fatigue increased. An unengaged manager reduced the possibility to implement adequate measures and possible adjustments became marginal. Lack of knowledge by managers narrowed the room for manoeuvre, while lack of knowledge in coworkers meant having to repeat hearing loss needs frequently. Change of manager or case-officer created uncertainty about future maintenance of accommodation measures.

> I spent so much energy at work to fulfil the goal I had aimed at, to convince myself and others that it was possible, that I was like a worn-out rag when I was at home, and not possible to contact that much. I slept a lot, on the couch. I had dinner, and then I was just gone. And it was not a break of fifteen minutes like I can have now. It could be two hours actually, it could be three hours. […] I am proud because I convinced myself and others, but I am disappointed with myself because I actually put the wrong priority on the values that are the far most important in life. *(No. 4, male, 56–67, cochlear-implant user, full-time position office and communication work sector)*

Sustainable trajectories

An accumulation of facilitating factors supported sustainable trajectories. An acknowledging attitude towards the hearing situation seemed to constitute a safe platform for handling the work situation. This attitude tended to invite key persons into joint efforts towards a manageable daily life. Acknowledgement was reached through knowledge rather than experience, and a wide range of professionals facilitated the acknowledgment process and served as a security net for future challenges. Access to peers reduced the sense of loneliness through the fellowship and sharing of experiences. A high degree of flexibility in shaping the work schedule and accomplishing the work tasks was important in maintaining a low degree of strain.

> If I am to sum it up, I am obviously in a very favourable situation. Suppose that I had had to be at school 100%, then the strain would have felt a lot worse. […] Then I believe I would have ended up with a graded [position] of some kind, and then I think I would have at least been tempted to take partial AFP [contractual early retirement scheme] or something like that. […] Because then I would have had so many daily situations that I would have perceived as challenging and stressing to say the least. And what is difficult with stress you know – how are you going to understand it – is it the hearing capacity, or is it me as a person, or is it my way of thinking at base? And it is entirely impossible to find an exact answer to that, and then maybe you will feel that you have to defend something all of the time. *(No. 1, female, 56–67, moderate hearing loss, two half-time positions education sector and health and care sector)*

Discussion

The aim of this study was to identify and explore factors that facilitate or hinder work participation, as described by employees with hearing impairments. The analysis resulted in a conceptual framework of working life trajectories evolving through three phases of acknowledgement of the impact of the hearing loss. The phases were influenced by the qualities of three contexts: the personal, the workplace, and the service provider. The qualities of the contexts, together with the amount of time spent in a pre-acknowledgement phase, formed the trajectories towards continuation of work participation or towards a disconnection. Accumulated risk factors increased the likelihood of disconnecting trajectories, while accumulated facilitating factors supported sustainable trajectories.

An important barrier to participation found in this study was spending a long time in the pre-acknowledgement phase. Previous studies have shown that accepting a hearing loss frequently takes time for individuals with acquired hearing loss [20,21]. The time

spent has been described as a process from avoidance to acceptance where key persons could facilitate the process [20]. A study among working-age adults with acquired hearing loss found that the participants had mainly been persuaded into hearing assessment by key persons [21]. Two different trajectories were described in early hearing correction, where one was embedded in social pressure and the other as a situational sense of need where the hearing problem was located in the periphery of their lives. Thus, the participants' perspective of their hearing loss was not restricted to the disease, and could not be solved by a medical solution [21]. This study showed a somewhat similar process from reluctance towards an awakening in the pre-acknowledgement phase. A lack of acceptance and acknowledgement could prevent initiation of accommodation processes and thus be a barrier to fatigue prevention.

We also found that lack of knowledge of the impact of hearing loss was an important barrier in reaching acknowledgement. Such knowledge tended to be a key to self-efficacy, but was frequently accessed coincidentally. A lack of access to knowledge of how to enable efficient work accommodation processes in employees with hearing impairments has been found previously [22]. Thus, to avoid exhaustion it seems pivotal to access knowledge earlier and thus limit the time spent in the pre-acknowledgement phase. Systematic follow-up is needed to secure knowledge transfer. Additionally, the follow-up has to encompass the process of avoidance-acceptance to succeed with knowledge transfer.

In this study, we found that flexibility and accommodation offered by manager and coworkers were important facilitating factors. However, the flexibility and accommodation by manager and coworkers tended to be restricted to task adjustments and occasional communication adaptations normally without the use of assistive listening devices. A cross-sectional study in Norway also found a low use of assistive listening devices (18.9%) additional to hearing aids among persons with hearing impairments in working age [14]. The same study also found that 30.7% reported to be in need of hearing related accommodation without receiving it. Thus, we hypothesise that there is an unexploited room for manoeuvre in reducing strenuous working conditions among employees with hearing impairments. A systematic follow-up using knowledge on the impact of hearing loss would improve the prerequisites for initiation of adequate measures.

We found that the participants were reluctant to cause inconvenience when considering accommodation measures. Measures that implied actions from others were often considered inappropriate or embarrassing. Previous studies have addressed the subject of willingness to request accommodation among employees with hearing impairments [23–26]. Baldridge and Veiga [23] claimed that there are reasons to believe that people with disabilities often withhold requests for useful accommodation despite their right to claim it. They presented a conceptual framework consisting of nine propositions concerning the requester's beliefs about pros and cons of making the requests, which contributed to a request likelihood. For instance, an accommodation measure or a request for such might make the disability more visible and by such potentially lead to a negative assessment from colleagues and the manager ("anticipated image cost"). Moreover, receiving additional advantages over colleagues would be perceived as unjust. Thus, to increase the request likelihood the requester must perceive the need as a sufficient reason for the fairness ("perceived fairness"). The reluctance and embarrassment found in this study might be interpreted as "anticipated image cost" and "perceived fairness," and as such functioning as barriers to adequate accommodation processes. Furthermore, anticipated social consequences were important factors when deciding on whether to make a request or not for recurring needs [24]. Particularly difficult was the imposition which the request put on others, because the colleagues and manager were exposed to a repeated burden [24]. Difficulties concerning recurring communication needs were an issue in this study as well. Hearing loss is a permanent condition, and accommodation needs will inevitably be recurrent. Thus, this is a factor which needs to be addressed in a follow-up process. Receiving assistance in the accommodation process when assessing measures could relieve the employee with hearing impairment of responsibility. Furthermore, the assistance needs to encompass how to avoid an actual loss of image and increase the colleagues' perceived fairness if the measures involve special treatment.

The role of aural rehabilitation in sustainable participation

The lack of access to adequate service providers, particularly, services with audiological knowhow, was a major barrier to sustainable participation, thus confirming previous research [22]. Danermark and Gellerstedt [27] found in a cross-sectional study that employees with hearing impairments reported higher demands and lower control in stressful work than their normal-hearing peers, and the authors claimed a need for more intense aural rehabilitation. In a qualitative study, three narratives revealed gaps in services and supports [28]. Professional assessment of the impact of the hearing loss at the workplace had not been performed in these cases, and the authors requested appropriate tools for such assessment together with educational programmes for stakeholders. In a qualitative study on conceptions of working life among employees with mild-moderate hearing impairment, Hua et al. [29] argued that there is a need for extensive services after hearing aid fitting also for this group due to the impact of the hearing loss on the work situation.

This study showed that few participants had access to a variety of supporters, and that referral to aural rehabilitation measures other than hearing aid fitting was rare. A lack of such rehabilitation measures in Norway has been described in public reports over the years [30]. A systematic review of vocational rehabilitation services for hearing loss found that statistical evidence for the effectiveness of the vocational rehabilitation programmes was scarce [31]. The authors questioned if programmes directed at the employee with hearing loss alone would meet the needs of the employee in the most efficient and appropriate way. Three programmes in the review had an integrated approach where stakeholders in the workplace were included in the process to increase implementation likelihood of suggested accommodations. One of the programmes included in the review was a multidisciplinary vocational enablement protocol in the Netherlands [32]. The protocol was implemented in a Dutch audiological centre, and the majority of the patients reported that it facilitated work participation. The effectiveness of the Dutch vocational enablement protocol was measured in a randomised controlled trial [33]. No differences were found between the groups apart from a minor increase in "self-acceptance" in the intervention group. The authors pointed to the low implementation rate of the advices provided as one explanation for the lack of effect. Further, they suggested that the implementation rate could have increased with a closer contact with relevant stakeholders at the workplace. This argument is in line with Danermark and Gellerstedt [27], who claimed a need for more intense aural rehabilitation and that there ought to be coordination between the clinical audiological rehabilitation and the rehabilitation at the worksite. Kramer [32] as well argued that it is of great importance to perform an

extensive evaluation of the workplace, the tasks, and the workplace conditions because hearing status and job title do not provide sufficient information *per se*. Hence, a more integrated approach involving managers and other stakeholders in vocational rehabilitation are needed.

Hearing loss occurs in a wider social context as it affects both the person with hearing impairment and the communication partner [34]. This study has pointed to a need for having a wider perspective on vocational participation of employees with hearing loss. Stakeholders at work and service providers should play a more prominent part in the accommodation process. A multidisciplinary approach at the worksite could benefit employees with hearing impairment in reducing strain at work.

Strengths and limitations

Recruiting participants through the Norwegian Association of the Hearing Impaired was done with the intention of reaching a wide range of people of working age with hearing loss. In Norway, this is only efficiently done through their own organisation. Members of a special interest organisation might not be representative of the target population by e.g., being more knowledgeable about their situation than nonmembers. However, the Norwegian Association of the Hearing Impaired has a large number of members. This might partly be explained by a compensation arrangement if hearing aids are lost, which they offer their members, and new hearing aid users are routinely informed about this arrangement.

The participants represent different educational areas and managerial levels, but unfortunately, we did not succeed in recruiting self-employed participants, or traditional blue collar workers. Thus, their experiences are not represented, which might have limited the range of experiences. However, one participant had worked in a factory for many years. Due to a noise-induced hearing loss, he had been transferred to perform support tasks in the same company. Among our participants, there was a majority who experienced their manager as somewhat positive towards accommodation matters. We cannot say if this reflects the general attitude in the Norwegian labour market or is due to the recruitment process. Further, health conditions other than hearing loss may influence work performance. Such information has not been available in this study and may be considered a limitation.

The life course perspective as described in Amick et al. [19], was an appropriate gateway to the analysis of this study. Particularly the concepts of trajectories and contexts were adequate within these narratives. However, the complete life course perspective as Amick et al. [19] employed was beyond the scope of this article since our narratives were limited to hearing loss matters in a life course perspective. Furthermore, the contexts could have been elaborated further. For instance, the service provider context could be expanded to a societal context including legislation, political incentives, and other distant factors influencing the working conditions. Similarly, the concepts in the workplace context could be described more thoroughly through sub-concepts. However, we consider that the account given of the contexts here covers the most significant experiences and hence depicts their importance.

The first author is trained as an educational audiologist and has long-term experience in working with people with hearing impairments, implying a position as an informed outsider as an interviewer and throughout the analysis process. Being informed implies insight into the issues in question and thus the possibility to pursue important subjects when arisen, while being an outsider implies a necessary emotional distance to the theme. Nevertheless, previous experiences may intervene and disturb in both the interviewing and the analysis resulting in a search for ones' own prejudices. In this study, an unprejudiced attitude was pursued through performing as unstructured interviews as possible. Additionally, thorough notes on experiences and prejudices were written down in advance. A wider perspective was also secured by being two individuals throughout parts of the analysis process.

Conclusions

This study confirms previous research showing that hearing impairment is a strenuous condition which may have adverse effects on work participation. Lack of knowledge on the impact of hearing loss tended to be a barrier to satisfactory accommodation processes. Access to service providers who transferred knowledge on hearing loss impact tended to be a prerequisite for gaining acknowledgement of the condition and its impact. The knowledge gained was facilitating an accommodation process including key persons at the workplace. Thus, there is a need for extended support at the workplaces, which includes the manager, colleagues, and professionals in the aim of preventing exhaustion and facilitates work participation among employees with hearing impairments. Joint action in facilitating communicative participation would share the responsibility for accommodation measures and broaden the room for manoeuvre at the workplace.

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PAPER III

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