




# Exploring the job demands experienced by employees with hearing impairment in South Africa



## Authors:

Strauss Chelius<sup>1</sup>   
 Bouwer E. Jonker<sup>1</sup>   
 Marissa Brouwers<sup>1</sup> 

## Affiliations:

<sup>1</sup>School of Industrial Psychology and Human Resource Management, Faculty of Economic and Management Sciences, North-West University, Potchefstroom, South Africa

## Corresponding author:

Bouwer Jonker,  
 bouwer.jonker@nwu.ac.za

## Dates:

Received: 21 May 2022  
 Accepted: 29 July 2022  
 Published: 27 Sept. 2022

## How to cite this article:

Chelius, S., Jonker, B.E., & Brouwers, M. (2022). Exploring the job demands experienced by employees with hearing impairment in South Africa. *SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur*, 20(0), a1998. <https://doi.org/10.4102/sajhrm.v20i0.1998>

## Copyright:

© 2022. The Authors.  
 Licensee: AOSIS. This work is licensed under the Creative Commons Attribution License.

## Read online:



Scan this QR code with your smart phone or mobile device to read online.

**Orientation:** South Africa's employment equity agenda towards persons with disabilities requires more insight to develop policies and standards of practice.

**Research purpose:** This study sought to inductively inquire about job characteristics that employees with hearing impairment (EWHIs) experience as job demands.

**Motivation for the study:** Scholarly research regarding job demands experienced by EWHIs is underrepresented in low- and middle-income countries (LMICs) and specifically on the African continent. Therefore, this study aimed to address this gap in literature within the South African context.

**Research approach/design and method:** An exploratory, qualitative research approach was used. Social constructivism served as the paradigm. The approach was complemented by a descriptive phenomenological design aimed at deeply understanding the job demands of EWHIs within South Africa. Purposive sampling was used to identify 14 respondents. Data were collected by using open-ended deaf-accessible questionnaires. Inductive qualitative content analysis was used to analyse the data.

**Main findings:** Communication demands and environmental stimuli demands emerged as unique job demands experienced by EWHIs. These job demands were not previously listed in the literature.

**Practical/managerial implications:** The findings of this study have implications for policy, practice and decision-making. The implications relate to overcoming communication and task barriers as well as minimising task orientation variance experienced by EWHIs.

**Contribution/value-add:** Unlisted themes of job demands that apply to EWHIs in South Africa were discovered. The improved understanding of these job demands contributes to the body of knowledge on both the theory of job demands and managing the work environments of EWHIs.

**Keywords:** deaf; employee; hard-of-hearing; health impairment; hearing-impaired; job demands.

## Introduction

### Orientation

Numerous findings involving employees with hearing impairments (EWHIs) suggest a health impairment commonality among individuals of this employee group. To start with, higher levels of hearing loss have been found to be associated with lower health-related quality of life and lower energy levels (Ringdahl & Grimby, 2000). In other research, the health states of EWHIs were found to be below par, in comparison to a hearing reference group (Coniavitis Gellerstedt & Danermark, 2004). Likewise, other findings substantiated that hearing impairment should be considered a risk factor for employee fatigue and mental distress. Kramer, Kapteyn and Houtgast (2006) found EWHIs to report sick leave because of fatigue, strain or burnout at a rate of 26%, compared to 7% in the hearing comparison group. Furthermore, the need for recovery was found to be more common among employees with reduced hearing ability (Nachtegaal et al., 2009). In an EWHI case study, almost a decade later, Svinndal, Solheim, Rise and Jensen (2018) reported similar types of findings. The conclusion reached was that hearing loss relates significantly to low workability, fatigue and sick leave. Moreover, EWHIs have been found more likely to report depression than hearing respondents do (Woodcock & Pole, 2008).

The International Classification of Functioning model (World Health Organization, 2013) evolves its conceptualisation of disability around an individual's health, judging it within context.

Accordingly, disability interventions concern guarding a person's health to afford them functionality instead of disability. Therefore, attention is also paid towards external factors that significantly relate to the individual's health.

In the present study, the job demands of EWHIs were considered. Job demands are energy-consuming aspects in the workplace that will lead an employee to exhaustion and eventually health deficits and lower performance capacity, if not controlled (Bakker & Demerouti, 2017).

## Research purpose and objectives

The purpose of the study was to qualitatively inquire about workplace aspects that EWHIs experience as job demands. The primary objective of this study was to explore the job demands experienced by EWHIs in South Africa.

## Literature review

### Job demands

The term, *job demands*, relates to job characteristics that incur effort-related costs on the employee (Bakker & Demerouti, 2018). Such costs are described as taxes that employees inherit as charge for their involvement in the job environment (Boudrias et al., 2011). Therefore, job demands entail those aspects of a job that incur sustained efforts from an employee (Bakker & Demerouti, 2017). The more taxing job demand-related matters are, the more prolonged the mandatory level of effort that will be required from the employee (Sonnentag & Zijlstra, 2006). While job demands primarily cost energy from the employee (Bakker & Demerouti, 2014), they also have the positive effect of strengthening the motivational effect of job resources (Bakker & Demerouti, 2017). However, unmanaged job demands have the potential to take an employee beyond exhaustion towards health impairment (Bakker & Demerouti, 2017) and, ultimately, to a point of eliciting self-undermining behaviour (Bakker & Demerouti, 2014).

Consequently, job demands are noteworthy predictors of employee outcomes such as exhaustion, psychosomatic health complaints and repetitive strain injury (Bakker & Demerouti, 2014), accidents and injuries, adverse events, depression, negative work-home interference, physical ill health and unsafe behaviours (Schaufeli & Taris, 2014). While some job demands have a general application such as workload, others are unique to the context, for example, physical and/or psychological demands (Bakker & Demerouti, 2014).

### Hearing impairment

South Africa's Department of Labour (2015) classifies hearing impairment as a physical impairment incurred because of 'partial or total loss of a bodily function' (pp. 8, 11). 'Normal' hearing is typically used to refer to hearing thresholds of 20 dB or better in both ears (WHO, 2021). Hearing impairment refers to hearing acuity outside the standard range (Edwards & Crocker, 2008).

The stage of hearing loss onset can be distinguished as congenital (incurred during birth or acquired soon thereafter) or acquired (hearing loss onset at a stage later than the congenital). A case of acquired hearing loss can be further classified as either pre-lingual or post-lingual. In a case of pre-lingual onset, hearing loss occurred before the individual acquired speech and language skills; in a case of postnatal onset, the hearing loss occurred after the individual acquired speech and language skills. Hearing loss can also be categorised in terms of whether it occurred to only one ear (unilateral hearing loss) or both ears (bilateral hearing loss). Furthermore, a case of bilateral hearing loss can be categorised in terms of whether the degree of hearing loss is equal among the ears (symmetrical) or not (asymmetrical) (Centres for Disease Control and Prevention [CDC] 2021).

Degree of hearing impairment can range from mild hearing loss to total hearing loss or deafness (WHO, 2021). The WHO's earlier framework for classifying the severity of hearing loss (WHO, 2016) suggested that hearing loss, applied to the better ear, will count as *slight* if it is amid the range of 26 – 40 dB; *moderate* if within the range of 41 – 60 dB; *severe* for the range of 61 – 80 dB; and *profound* if equivalent to or more than 81 dB. Accordingly, *hard-of-hearing* (HoH) refers to hearing loss ranging between mild and severe; 'deaf' refers to profound hearing loss (Table 1).

The WHO's (2021) latest framework includes more subcategories and suggests that communication-related assumptions can be made about each.

Prevalence of hearing impairment is said to be constantly increasing on a global scale, with Africa being among the regions expected to experience the highest increase, to the extent of more than doubling (WHO, 2021). In South Africa, the last reported prevalence rate of hearing impairment was estimated at 3.6%, making it the third highest reported disability after vision (11%) and cognitive disability (4.2%) (Statistics South Africa, 2011). Hearing impairment among South Africans was found to be mainly prevalent in the age group of 35–39 years, and the majority of individuals with hearing impairment were found to be beyond the retirement age of 65 years. In the age groups preceding 35–39 years, only approximately 2% of South Africa's people were found to be hearing-impaired. However, the count of South Africans with severe hearing loss was found to constitute approximately 1% of the country's population.

Hearing impairment has often been referred to as an 'invisible disability', not just because of the lack of visible symptoms, but for reasons including that it has long been overlooked by policymakers. The extent to which hearing loss impacts a person's life depends significantly on contextual factors, such as attention towards communication needs and environmental factors. Management thereof through effective rehabilitative interventions will require attention to particular needs. However, relevant depth of insight may be lacking, thereby restricting the intervention that can be provided towards persons with hearing impairment (WHO, 2021).

**TABLE 1:** World Health Organization framework for hearing loss.

Grade	Hearing threshold in better hearing ear in decibels (dB)	Hearing experience in a quiet environment for most adults	Hearing experience in a noisy environment for most adults
Normal hearing	Less than 20 dB	No problem hearing sounds	No or minimal problem hearing sounds
Mild hearing loss	20 dB to < 35 dB	Does not have problems hearing conversational speech	My have difficulty hearing conversational speech
Moderate hearing loss	35 dB to < 50 dB	May have difficulty hearing conversational speech	Difficulty hearing and taking part in conversation
Moderately severe hearing loss	50 dB to < 65 dB	Difficulty hearing conversational speech; can hear raised voices without difficulty	Difficulty hearing most speech and taking part in conversation
Severe hearing loss	65 dB to < 80 dB	Does not hear most conversational speech; may have difficulty hearing and understanding raised voices	Extreme difficulty hearing speech and taking part in conversation
Profound hearing loss	80 to < 90 dB	Extreme difficulty hearing raised voices	Conversational speech cannot be heard
Complete or total hearing loss/deafness	95 dB or greater	Cannot hear speech and most environmental sounds	Cannot hear speech and most environmental sounds
Unilateral	< 20 dB in the better ear, 35 dB or greater in the words ear	May not have problem unless sound is near. May have difficulty locating sounds	May have difficulty hearing speech and taking part in conversation, and in locating sounds

Source: World Health Organization. (2021). *World report on hearing*. Retrieved from <https://www.who.int/publications/i/item/world-report-on-hearing>

### Employee with hearing impairment

A definition of EwHI was not found in the literature. However, a classification was developed by integrating the above description of hearing impairment (CDC, 2021; Edwards & Crocker, 2008; WHO, 2015) into the definition of an employee provided by section 200A(1) of South Africa's *Labour Relations Act* (No. 66 of 1995: LRA). Section 200A(1) states that, until an opposing case is proven, an individual who works for or renders service to another party is regarded as an employee, notwithstanding the form of the employment contract.

In light of the discussion above, the term *EwHI* therefore refers to an individual with a hearing impairment who works for or renders a service to another party, irrespective of the type of employment contract.

In addition to the introductory discussion about the health impairment trend among EwHIs, international studies also suggest disengagement and self-undermining behaviour among EwHIs. Employees experiencing hearing loss are said to be more likely to occupy jobs that do not require high levels of skill (Hogan, O'Loughlin, Davis, & Kendig, 2009); however, Tye-Murray, Spry and Mauzé's (2009) findings included EwHIs reporting to believe to have lost their competitive edge. Furthermore, hearing impairment is associated with a higher risk of early retirement (Helvik, Krokstad, & Tambs, 2012; Kramer, 2008).

Literature covering EwHIs in South Africa was found to be limited. Statistics South Africa (2011) states that in South Africa persons with disabilities face barriers to entering the labour market, and those whose impairments are more severe face the most obstacles. The most prevalent barriers include insufficiency of information about disability and lack of support in work environments. Furthermore, the Department of Labour (2015) reports that persons with disabilities who are employed in South Africa often remain in low-status jobs (Statistics South Africa, 2011).

South Africa's Department of Social Development (2016) states that while significant progress has been made over the past 20 years in terms of disability consideration in the

attitudinal sense, this alone has not proved sufficient. In addition, equity should also be pursued substantively. This includes disability-specific transversal interventions for addressing barriers to participation and creating more enabling environments for persons with disabilities; the 'one-size-fits-all' approach is not viable for developing disability policy. Novel local research is required of countries so that they can assess their own requirements and develop interventions most applicable to serving their population's needs (WHO, 2021).

### Job demands of employees with hearing impairment

Job satisfaction among EwHIs is negatively related to on-the-job limitations (Geyer & Schroedel, 1998). Relatedly, commotion and competing speech in the work environment are experienced as complications by EwHIs (Hua, Anderzén-Carlsson, Widén, Claes, & Lyxell, 2015). Likewise, EwHIs indicate that meetings and training activities are problematic because of the experience of commotion (Punch, Hyde, & Power, 2007). Specifically, meetings, in-service training sessions and work-related social events are reported as challenging for EwHIs (Punch, 2016). Moreover, lower levels of efficiency in the dominant language spoken in the workplace are related to higher levels of stress (Van Gils, Van Den Bogaerde, & De Lange, 2010).

Furthermore, the energy and stress levels of EwHIs are negatively affected by noise, the number of people in the room and difficulty to communicate (Lund, 2015). Likewise, valid sick leave days taken are positively correlated with exposure to noise and reverberation as well as the difficulty to distinguish between sounds and effort in hearing (Kramer et al., 2006). Employees with hearing impairments are required to concentrate more when exposed to background noise that causes elevated levels of fatigue and stress (Punch, 2016).

Lower physical functioning and higher perceived effort among EwHIs experiencing conditions of increased noise levels are reported by Hua et al. (2013). In addition, higher levels of noise are found to be more stressful to EwHIs as compared to their hearing colleagues (Jahncke & Halin, 2012). Specifically, increased noise levels are associated with

reduced task performance that requires the recall of semantic information, increased fatigue and higher levels of stress hormones (Jahncke & Halin, 2012). These scholars do, however, state that the results should be interpreted with caution because of the small sample size.

In contrast, Van Gils et al. (2010) reported that EwhIs do not experience significantly higher levels of stress. However, EwhIs experience significantly higher degrees of job demands than their hearing counterparts, even though the degree of job control (the level of control an individual has over his or her job, e.g., autonomy) is comparable between the two groups (Van Gils et al., 2010).

From the EwhI job demands literature review, it is clear that the typology of job demands, experienced by EwhIs, is not all represented in the mainstream body of knowledge noted either by Bakker and Demerouti (2017) or Schaufeli and Taris (2014) – namely, the physical, psychological, social or organisational job demands themes. Therefore, an EwhI-focused job demands inquiry is suggested. Furthermore, it is currently unclear how EwhIs in South Africa experience job demands because no local studies that have investigated this phenomenon could be located.

Based on the gap in the literature explained above, the present study qualitatively explored job demands from the perspective of EwhI in South Africa.

## Research design

### Research approach

A qualitative research approach and descriptive phenomenological research design were used to explore the job demands of EwhIs. Consequently, the study sought to develop a general structure about the lived experiences unique to the EwhIs' job demands while deriving conclusions from actual empirical samples (Finlay, 2009).

Social constructivism was employed as the paradigm through which the study is viewed. The study presupposed norm-deviant outlooks (Creswell, 2014) among EwhIs regarding workplace factors that they experience as job demands. Therefore, established assumptions and theoretical frameworks were acknowledged, but new perspectives were probed for by allowing EwhIs to describe the subjective interpretations they attach to workplace factors.

### Research strategy

An interpretive description was used as the research strategy to guide the researchers in the exploration of the experiences of various participants in a specific social setting (Thorne, Reimer-Kirkham, & MacDonald-Emes, 1997). This strategy was deemed appropriate to explore the job demands experienced by employees with hearing impairment in South Africa. The interpretive description research strategy allows for the conception of a description encompassing the themes and patterns communicated by participants (Thorne, 2008).

## Research method

**Research setting:** Workplaces of EwhIs in South Africa served as the research setting. In one organisation, EwhIs represented the majority of the workforce. However, in most of the organisations that participated in this study, EwhIs were in the minority. The researcher used email to make data collection arrangements with willing participants. The self-administered, open-ended qualitative questionnaire for the 5 working days' data collection was administered in two modes: online or as a Microsoft Word document, based on a respondent's indicated preference.

**Entrée and establishing researcher roles:** Following an application to the Research Ethics Committee, consent (EMSMHW16/06/10-01/05) was obtained on 01 September 2016. All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Contact was established with a facilitating organisation that specialises in the training and development of hearing-impaired individuals in South Africa. This organisation is linked to EwhIs who work in a variety of organisations and sectors. The human resource (HR) manager of this facilitating organisation disseminated the invitation to participate in the study to EwhIs who fit the inclusion criteria of this study. In addition, the HR manager distributed the invitation to employees within the facilitating organisation who also fit the inclusion criteria. Written informed consent was obtained from all respondents who chose to participate in this study.

The language of the text was simplified in the event that a deaf respondent may possess a basic vocabulary (Spencer & Marschark, 2010). The questionnaires were distributed to participants individually. In addition to textual format, each question was accompanied by a link to a video clip of a South African Sign Language (SASL) translation (e.g. <https://www.youtube.com/watch?v=fVXVEvMQjic>). The content validity of the questionnaires and validity of the SASL interpretations were verified by an accredited interpreter throughout the development process. Reminders to return the day's completed questionnaire were sent to the participants daily.

The researchers were responsible for coordinating the processes, obtaining permission from organisations to collect data, securing informed consent from participants, collecting and storing the data, ensuring that ethical standards were adhered to as well as organising, analysing and interpreting the data and reporting the findings.

**Research participants and sampling methods:** The study participants comprised EwhIs within the South African context. These participants represented various categories of hearing impairment, for example, HoH and deaf.



A purposive sampling was used to ensure that participants who can offer specific insights related to the phenomenon were included (Jensen & Laurie, 2016). The inclusion criteria of this sampling technique concerned having a hearing impairment – in the pre-lingual, post-lingual, unilateral, bilateral and/or HoH or deaf sense – and being employed in South Africa. The attained sample consisted of eight pre-lingually deafened employees, four post-lingually deafened employees and two employees who are HoH ( $N = 14$ ). Transferability of the results was increased by using purposive sampling with specific inclusion criteria.

**Data collection methods:** A self-administered, open-ended questionnaire was used to collect data about EwHIs' job demands experiences. This was the most appropriate data collection technique for the present study because the researchers are not fluent in SASL and using an interpreter could have posed an ethical risk. This decision by the researchers increased the dependability of the study.

The open-ended question for data collection during days 1–4 is presented below: firstly, the text, then the backward translation of the SASL rendition in italics. Note that the backward translation in SASL is slightly different because of a dissimilar grammatical structure as compared to that of English:

Text question: When thinking about all of the things that happened to you today while at work, what are the experiences that took energy from you? Please list all of the cases and explain each in detail.

SASL question: *When you think about all the things that happened to you today while at work, what are the experiences that took energy from you? Please list all the cases and explain each in detail.*

The open-ended question for the fifth day's data collection was preceded by an individualised summary of the first four working days' responses. Each participant therefore had a chance to check the accuracy of the data and to add additional responses if needed. This member checking strategy increased the confirmability of the study:

All of the work experiences of the last four working days that you listed as taking energy from you are listed below:

Day 1:

Day 2:

Day 3:

Day 4:

The fifth working day's question aimed to include more cases of job demands, experienced by EwHIs, during a more extended period than reported in the previous four consecutive working days:

Please tell us about any other work experiences from the last six months that took energy from you. In the box below, please list all of the cases and explain each in detail.

In addition, a biographical questionnaire was used to collect information about the sample. Employees with hearing

impairments were asked about: the category of hearing loss (deaf or HoH), the stage of onset of the hearing impairment (pre- or post-lingual), the laterality of hearing loss (unilateral or bilateral), gender, industry and whether their workplace predominantly comprises hearing people. Data collected from the biographical questionnaire enabled the researchers to accurately describe the characteristics of the sample, which increased the transferability of the study.

Data collection was initiated as a pilot study. The pilot study indicated that the questions used to probe responses were well understood. No adjustments were required to the questionnaire. Therefore, the researcher proceeded with the main data collection phase on the same basis.

**Data recording:** Respondents were asked, as part of the invitation, to avoid discussing their responses with any hearing-impaired colleague until after conclusion of the data collection. For each day of the data collection process, a new questionnaire was used. The final copies of the data were transferred to a Microsoft Word file as exact copies of the source texts. This practice increased the dependability of the study. The storage location of the data remained confidential and was not publicly accessible. Data files were saved on a computer hard drive with an encrypted password.

**Strategies employed to ensure data quality and integrity:** The following strategies, as recommended by Anney (2014), Teddie and Tashakkori (2009) and Shenton (2004), were used to enhance the trustworthiness of the results of this study:

**Credibility:** this refers to the plausibility of research findings. The researchers enhanced the credibility of this study by using well-established research methods, obtaining thick descriptions of the job demands experienced by EwHI and making use of co-coders.

**Transferability:** this denotes the generalisability of the results of the study and the extent to which the findings can be applied to related contexts. The use of purposive sampling with inclusion criteria and by accurately describing the characteristics of the sample increased the transferability of this study.

**Confirmability:** this implies that strategies are put in place to ensure that results are a true reflection of the data collected. The researchers eliminated bias by allowing the respondents to inspect their individual responses after 4 days of data collection, thereby verifying the quality of the data. In addition, the researchers co-coded the data to guard against interpreter bias.

**Dependability:** this refers to fidelity of the findings over time. The researchers enhanced the dependability of the study by providing in-depth and clear descriptions of the respondents' experiences and by explaining the decisions of the researchers regarding the procedures followed.

**Data analysis:** Data analysis was aimed at capturing job demands categories without being anchored by previously defined job demands structures or knowledge – as prior research about job demands of EwHI is not extensive. Accordingly, an inductive qualitative content analysis process, as recommended by Elo and Kyngäs (2008), was adopted to analyse the data. This decision of the researchers enhanced the credibility and transferability of the study. The phases of this process are explicated below:

**Preparation:** The researchers immersed themselves in the qualitative data and climate of the texts. Consequently, the responses were read through several times.

**Open coding:** The researchers used the brainstorming technique to derive potential labels to the texts. In addition, the researchers co-coded the data to ensure credibility and confirmability

**Creating categories:** The individual labels were grouped, and a structure of overarching themes, and subthemes, was established.

**Abstraction:** Titles were inductively assigned to themes and subthemes – without reverting to established classifications.

**Reporting:** A thorough narrative discussion was provided about the data analysis process and the conceptual model that emerged.

**Reporting style:** The themes and subthemes that emerged from the data analysis are delineated in the results section of this study. Reporting was done in the form of a qualitative narrative, providing a rich and thick description of the job demands experienced by EwHIs in South Africa. This narrative was substantiated by direct quotations from the participants. This practice enhanced the credibility of the study.

## Results

The sample was predominantly compiled of deaf employees (86%). For most of the respondents (79%), hearing impairment applied to both ears, while 50% reported that the degree of hearing loss was equal in both ears. Hearing loss having occurred before learning verbal communication was more common among the participants (64%). This finding is significant when the direct quotations of participants are considered. Readers will observe that the use of language may seem underdeveloped, in some instances, with a variety of grammatical errors made. This is not uncommon when hearing loss occurred before verbal (and written) communication was properly developed (Edwards & Crocker, 2008). The male gender was the modal (57%), and the most common industries in which the respondents worked were those of education (36%), information technology (14%) and law (14%). Half of the respondents (seven) indicated their workplaces to be mainly compiled of hearing staff members.

The research objective of this study was to explore the job demands that are experienced by EwHIs. Pursuant of this objective, the researchers analysed the data with a view of demystifying the phenomenon. The main themes that emanated from the data level concerning the experiences of job demands of EwHIs include communication barriers, task hindrances, task pressure, task environment variance, lack of cooperation, inconsideration and bounded rationality. These themes are explicated below and further refined in the form of subthemes.

### Theme 1: Communication barriers

A variety of communication-related barriers were identified that need prolonged effort from EwHIs in South Africa. These barriers included the rates of speech of hearing individuals that are too fast, misunderstanding of the other party, having to explain repeatedly, experiencing a communication commotion and a communication gap. Each of these hindrances constitutes subthemes of communication barriers and is elucidated below.

#### Subtheme 1: Rate of speech too quick

Respondents indicated that a non-hearing-impaired person's rate of speech can be experienced as too quick. Therefore, an HIE may find it difficult to follow what is being said and/or to respond at a reciprocal rate. This experience is illustrated in the following excerpt:

'I'm struggling to communicate faster even when a person talks too fast, and I can't keep up with every word though.' (Participant [P]6, deaf, both ears, male, 24 years old)

#### Subtheme 2: Misunderstanding of other party

The participants shared that misunderstandings in the workplace occur often, even if the organisation has basic Sign Language capabilities. The quotation below by participant 4 illustrates this effort-inducing job demand:

'... [I]t is hard for me because there are lots of misunderstandings ... They have sign language but not enough ...' (P4, deaf, both ears, male, 42 years old)

#### Subtheme 3: Explaining repeatedly

The experience of having to explain a work-related issue repeatedly emerged from the data. Participants in this study found the process of repetitive explanation exhaustive. This taxing experience is substantiated by the following excerpt:

'... [H]aving to constantly explain ...' (P5, HoH, one ear, female, 59 years old)

In support of this view, participant 9 explained that:

'I had to explain to them twice ...' (P9, deaf, both ears, male, 32 years old)

#### Subtheme 4: Communication commotion

The subtheme of communication commotion was extracted from descriptions of cases where EwHIs found themselves surrounded by several instances of communication, making

it difficult to follow the discussion directed at them. The following response illustrates this job demand:

'In an open-plan environment, with people talking all around, it is hard to decipher who is actually addressing you and this can make one quite tired.' (P5, HoH, one ear, female, 59 years old)

Furthermore, participant 6 added the following:

'There are a lot of communication going around and I had to ask them to write down on paper for what they order while I do not understand what they are saying.' (P6, deaf, both ears, male, 24 years old)

### Subtheme 5: Communication gap

The communication gap subtheme highlights the prolonged hindrances experienced by EwHIs regarding communication with task associates or clients. Participants indicated that they had to find different ways to communicate with people and this takes a great deal of effort. The following excerpt illustrates the communication gap experienced by EwHIs:

'Difficult communication that took me lot of effort to find ways of communication with people.' (P6, deaf, both ears, male, 24 years old)

In support of this view, participant 8 said:

'In the beginning [*it*] was so hard for me, because I am profound deaf, and they don't have [*an*] interpreter.' (P8, deaf, both ears, male, 36 years old)

## Theme 2: Task hindrances

Two subthemes, poor task orientation and subordinate lack of motivation emerged from the data and constitute task hindrances. These subthemes are discussed next.

### Subtheme 1: Poor task orientation

Participants indicated that poor task orientation is experienced as energy consuming. The following quotation by participant 4 substantiates this view.

'I did do [*the*] drawing as what he want but [*he did*] not explain [*it to*] me enough.' (P4, deaf, both ears, male, 42 years old)

Moreover, participant 6 added that:

'I needed a partner to work with and [*to*] see what they do and how it [*should be*] done in the job, which will help me understand [*the task*] better.' (P6, deaf, both ears, male, 24 years old)

### Subtheme 2: Subordinate lack of motivation

The lack of motivation among subordinates is another task hindrance that takes effort from EwHIs who participated in this study. The following extract supports this statement:

'Students [*who were*] absent made me [*very*] disappoint[*ed*]. That [*made me feel as if I*] lost energy.' (P3, deaf, both ears, female, 27 years old)

This view is supported by participant 9, who shared that:

'Learner's lack of motivation ... [*takes effort from me*].' (P9, male, deaf, both ears, 32 years old)

## Theme 3: Task pressure

Task pressure emerged as a theme during the data analysis and comprises inquiry from authority holder, and creative output. These two subthemes are explicated below.

### Subtheme 1: Inquiry from authority holder

Some participants experience an inquiry from a higher authority as energy consuming. This experience is illustrated in the following quotation:

'Some time[s] I get stress with [*an*] email [*coming*] from [*a*] moderator.' (P3, deaf, both ears, 27 years old)

In support of this view, participant 4 stated that:

'... [*The boss*] asked me why I took so long to complete my drawings.' (P4, deaf, both ears, male, 42 years old)

### Subtheme 2: Creative output

Employees with hearing impairments participating in this study indicated that being pressured by someone in a managerial position to be inventive (creative output) is draining. Participant 4 shared the following instruction to him from his manager:

'Do the drawing of conveyor in new ways and reduce for less cost.' (P4, deaf, both ears, male, 42 years old)

Another example of creative output requiring considerable effort from an HIE is:

'... [*H*]aving a meeting to come up with the idea...' (P14, deaf, both ears, female, 32 years old)

## Theme 4: Task environment variance

Changes in the task environment are experienced as energy sapping for EwHIs who participated in this inquiry. Two subthemes were identified and are discussed below.

### Subtheme 1: Interruption of task processes

Interruption of the task process takes considerable effort from some participants of this study. An example of such an interruption while the HIE is performing a task is presented in the following quotation:

'... [*W*]hen I started my drawing, then my boss asked me to do [*a*] delivery immediately. So, I saved my drawing. When I returned from delivery, I [*wanted to*] catch up [*with*] my drawing. Then [*second in charge*] asked me to watch her dogs or staff [*for a*] while ... Lots of interruption[s]...' (P4, both ears, deaf, male, 42 years old)

### Subtheme 2: Travelling

Some participants reported that travelling is experienced as energy depleting. The following excerpt supports this statement:

'Underground work is nice and doesn't require too much effort but travelling up and down takes lots of energy.' (P8, deaf, both ears, male, 36 years old)

Also relating to travelling, participant 14 reported that:

'... [T]ravelling to Braamfontein, from Centurion, really [makes me] tired, from driving in the traffic.' (P14, deaf, both ears, female, 32 years old)

## Theme 5: Lack of cooperation

From the EwHIs' responses, it becomes apparent that they view the lack of cooperation from another party as a job demand. This lack of cooperation ranges from the subordinate to the management level.

### Subtheme 1: Subordinate

One participant indicated that taking on additional work, because their subordinate did not deliver the required service, was energy consuming. The following quote conveys the point clearly:

'Dealing with unskilled staff and having to constantly explain procedures which their immediate bosses should cover.' (P5, HoH, one ear, female, 59 years old)

In another case, a subordinate did not complete a task:

'Learners' lack of motivation of their gaining knowledge as they did not want to research more work of the tasks that I gave them.' (P9, deaf, both ears, male, 32 years old)

### Subtheme 2: Co-worker

Some participants stated that co-workers fail to take on personal responsibility as part of the team. This behaviour of co-workers causes prolonged disappointment on the part of the participants. The following extract conveys a feeling of distress:

'I [have] learnt that a large portion of the staff are only interested in what they are working on and have no time to pass knowledge on or are only trying to enhance their careers at the expense of others. There would appear to be [a] lack of respect for others, which is very disheartening.' (P5, HoH, one ear, female, 59 years old)

### Subtheme 3: Management

Some participants indicate that the lack of cooperation from management is emotionally exhausting. This point is illustrated by the following excerpt:

'In the beginning, the company was not deaf friendly at all ... the former manager was not willing to co-operate with me ... it was hell to deal with them.' (P7, deaf, both ears, male, 35 years old)

## Theme 6: Inconsideration

Inconsideration was identified as an overarching theme experienced by participants in this study. From this theme, three subthemes emerged, namely, unreasonable expectation, unreasonable confrontation and critique without empathy. These subthemes are elucidated next.

### Subtheme 1: Unreasonable expectation

Participants stated that situations occur in the workplace where undue pressure is placed upon them to perform without taking

their point of view or auditory disability into consideration. This view is supported by the following extract:

'... [Boss] asked me why I took so long to complete my drawings. And I told him that he didn't give me chance to finish my drawing.' (P4, deaf, both ears, male, 42 years old)

In addition, a quotation from participant 6 can be offered in support of the statement:

'Also, when a person said something [and] when I do not understand, they get frustration [frustrated].' (P6, deaf, both ears, male, 24 years old)

### Subtheme 2: Unreasonable confrontation

Some participants noted that unreasonable confrontation in the work environment is experienced as energy sapping. The following two instances entail EwHIs who are hastily reprimanded by an ill-informed party:

'... [Boss] asked me why I took so long to complete my drawings. And I told him that he didn't give me chance to finish...' (P4, deaf, both ears, male, 42 years old)

Participant 7 added:

'The company was not deaf friendly at all, and I got several verbal warnings and seven warning letters.' (P7, deaf, both ears, male, 35 years old)

### Subtheme 3: Critique without empathy

Participants shared emotionally draining experiences where they received feedback from individuals who showed no empathy or consideration towards the realities of having a hearing impairment:

'I feel mostly frustrated. My colleague responds to me, "Relax ..."' (P2, deaf, both ears, 38 years old)

This view was supported by participant 4 who added that:

'I showed him my idea. ... [boss'] reaction is: "Expensive, not right." No appreciation ...' (P4 deaf, both ears, male, 42 years old)

## Theme 7: Bounded rationality

The EwHIs participating in this study seemed to experience energy loss in relation to another party's lack of comprehension. This view is directed at two groups of individuals, namely subordinate and co-worker. These groups therefore represent the subthemes that are discussed next.

### Subtheme 1: Subordinate

Some participants indicated that the delayed comprehension of subordinates requires prolonged effort on the part of EwHIs. Participant 5 explained this finding in the following quotation:

'These learners who are struggled [struggling] to understand during the training.' (P1, deaf, both ears, female, 31 years old)

Participant 5 added the following:

'Dealing with unskilled staff and having to constantly explain procedures which their immediate bosses should cover.' (P5, HoH, one ear, female, 59 years old)



### Subtheme 2: Co-worker

Participants shared that the lack of perspective shown by some co-workers is another source of energy depletion. This experience is evidenced by the following response:

'I am constantly amazed by people's lack of common sense and I find this debilitating and it drains me ... people are clearly not taught [*taught*] to think for themselves or manage their tasks.' (P5, HoH, one ear, female, 59 years old)

This view was shared by participant 7, who added the following:

'After five years they understand me better; it was hell to deal with them.' (P7, deaf, both ears, male, 35 years old)

## Discussion

### Outline of the results

The objective of this study was to explore the job demands experienced by EWHIs in South Africa. Job demands are normally categorised as physical demands, psychological demands, social demands or organisational demands (Bakker & Demerouti, 2017). Even though the findings of this study generally correspond with those themes, two noticeable exceptions emerged, namely, communication barriers and task environment variance.

Communication barriers were derived from accounts where EWHIs experienced energy depletion from job aspects primarily related to communication involving colleagues or clients. Participants indicated that non-hearing-impaired individuals' *rate of speech* can be experienced as too fast for their degree of audio receptivity. The idea is supported by a comparable finding, where EWHIs experienced distinguishing sounds as demanding (Kramer et al., 2006). *Misunderstanding of the other party* is another subtheme that emerged, as well as having to *explain repeatedly*. Similarly, it has been found that EWHIs' lower efficiency in the modal language can be associated with higher levels of stress (Van Gils et al., 2010). The subtheme of *communication commotion* was also inferred from the data of this study. Employees with hearing impairments reported experiencing energy depletion while surrounded by several instances of communication because of difficulty in following the discussion that applied to them. Correspondingly, several scholars have found that communication within commotion can be associated with HIE health impairment (Hua et al., 2015; Kramer et al., 2006; Lund, 2015; Punch, 2016). Furthermore, the *communication gap* subtheme, where EWHIs highlighted the prolonged difficulties they experienced concerning communication with task associates and clients, was also drawn from the data. Comparably, it has been concluded that EWHIs' energy levels are demoted, and stress levels are promoted, when they experience difficulties with communication (Lund, 2015).

Task demand variance was derived from responses suggesting that EWHIs experience exhaustion from variance in surroundings in terms of both intangible (e.g. sound waves) and/or tangible aspects (e.g. people moving around).

*Interruption of the task process* emerged as particularly exhausting for the participants. Relatedly, EWHIs are reported to commonly have low job control (Punch, 2016), which can increase the risk of psychological strain (Karasek, 1979). Comparably, perceived reverberation has been found to correlate with EWHIs' stress-related sick leave (Kramer et al., 2006). Likewise, background noise may require higher concentration from EWHIs and lead them to hypervigilance, stress and fatigue (Punch, 2016). The responses grouped and labelled under *travelling* also convey the notion of environmental stimulus demands. Hornsby (2013) suggests that while processing environmental stimuli, the absence of hearing may require more cognitive processing, thereby having an exhaustive effect.

### Practical implication

The results of this study have important practical implications for organisations that employ workers and supervisors with hearing impairments. To address possible communication barriers, communicators can speak slower and allow EWHIs to respond. In addition, supervisors can consider using transcription technology to allow EWHIs to follow group discussions and determine whether the HIE has any queries or opinions to add. Moreover, organisations can enhance its capacity to offer sign language interpretation. Office managers should avoid placing EWHIs in open plan arrangements where commotion and noise are unavoidable. Task barriers can be addressed by providing adequate task orientation to EWHIs. Poor task orientation can be reduced by developing orientation manuals and/or videos with SASL translation and avoiding the interruption of EWHIs during their initial review of task requirements. In addition, recognition should be given that the variation of tangible and/or non-tangible environmental aspects can intensify concentration required from an HIE during task-related matters. Supervisors should be more considerate towards EWHIs by avoiding unrealistic expectations and unreasonable confrontations, and continuously making an effort to identify and manage mediating and/or moderating factors. Moreover, supervisors should make a point of using a professional tone towards EWHIs when consulting with them. Furthermore, supervisors are advised to pair EWHIs with subordinates or co-workers who are quick to understand what is expected of them.

### Limitations and recommendations

Despite the contributions to the field of study, certain limitations must be factored in. Firstly, the researchers' proficiency in SASL is not at the level required for personal interviews. Consequently, another method was needed to collect the data. The option of using a third party as interpreter in a semi-structured interview setting was rejected by the researchers because it would prove difficult to ensure confidentiality and privacy. The researchers circumvented the challenge by opting for a self-administered qualitative questionnaire, which included URL links to online SASL translations of each question. Secondly, the chosen data collection method meant that responses were provided by text. However, not all respondents were equally fluent in written

communication – as evidenced by the sentence construction of some responses. Proposed areas for further investigation could include socio-economic factors and other environmental aspects that may limit EwHIs' participation and/or functionality. Insight that could allow preventative measures to be developed is also encouraged (Mitra & Shakespear, 2019).

## Conclusion

This research highlights the types of job demands experienced by EwHIs across various South African industries. The main themes that emerged from the data and that represent job characteristics that are experienced as job demands include the following: communication barriers, task hindrances, task pressure, task environment variance, lack of cooperation, inconsideration and bounded rationality. While most of these themes are corroborated in mainstream literature (Bakker & Demerouti, 2017; Schaufeli & Taris, 2014), the communication barriers and task environment variance themes represent novel findings related to EwHIs. Attention towards job demands may advance awareness about work environment factors to consider or manage an HIE's functionality or disability, as well as aspects that may limit participation. The results of this study provide organisations with valuable information that can inform and/or enhance practices, decision-making and policy relating to EwHI.

## Acknowledgements

The authors thank all the individuals for participating in this study and the organisations for disseminating the research invitations on behalf of the authors. Without their contributions, this study would not have been possible.

## Competing interests

The authors have declared that no competing interests exist.

## Author's contributions

S.C. made a substantial contribution to the conception and design of the study, acquisition of the data, and the analysis and interpretation of the data. Furthermore, the primary author critically revised the manuscript for important intellectual content. In addition, S.C. approved the final version to be published. B.E.J. made a substantial contribution to the conception and design of the study, and analysis and interpretation of the data. In addition, he drafted the manuscript and approved the final version to be published. M.B. made a substantial contribution to the conception and design of the study, and analysis and interpretation of the data. Moreover, this author critically revised the manuscript for important intellectual content and approved the final version to be published.

## Ethical considerations

Ethical clearance to conduct the study was obtained from the Research Ethics Committee of the Faculty of Economic and Management Sciences at the North-West University (ethical clearance number: EMSMHW16/06/10-01/05).

## Funding information

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

## Data availability

The data of this study will be available upon written request to the corresponding author.

## Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

## References

- Anney, V.N. (2014). Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria. *Journal of Emerging Trends in Educational Research and Policy Studies*, 5(2), 272–281.
- Bakker, A.B., & Demerouti, E. (2014). Job Demands-Resources theory. In P.Y. Chen & C.L. Cooper (Eds.), *Wellbeing: A complete reference guide, work and wellbeing* (pp. 37–64). John Wiley & Sons, Inc.
- Bakker, A.B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22(3), 273–285. <https://doi.org/10.1037/ocp0000056>
- Bakker, A.B., & Demerouti, E. (2018). Multiple levels of Job Demands-Resources theory: Implications for employee well-being and performance. In E. Diener, S. Oishi, & L. Tay (Eds.), *Handbook of well-being* (pp. 1–12). DEF Publishers.
- Boudrias, J.-S., Desrumaux, P., Gaudreau, P., Nelson, K., Brunet, L., & Savoie, A. (2011). Modeling the experience of psychological health at work: The role of personal resources, social-organizational resources, and job demands. *International Journal of Stress Management*, 18(4), 372–395. <https://doi.org/10.1037/a0025353>
- Centres for Disease Control and Prevention (CDC). (2021). *Types of hearing loss*. Retrieved from <https://www.cdc.gov/ncbddd/hearingloss/types.html>
- Coniavitis Gellerstedt, L., & Danermark, B. (2004). Hearing impairment, working life conditions, and gender. *Scandinavian Journal of Disability Research*, 6(3), 225–245. <https://doi.org/10.1080/15017410409512654>
- Creswell, J.W. (2014). *Research design: Qualitative, quantitative, & mixed methods approaches* (4th ed., p. 342). Sage.
- Edwards, L., & Crocker, S. (2008). *Psychological processes in deaf children with complex needs* (p. 204). Jessica Kingsley.
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1), 107–115. <https://doi.org/10.1111/j.1365-2648.2007.04569.x>
- Finlay, L. (2009). Exploring lived experience: Principles and practice of phenomenological research. *International Journal of Therapy and Rehabilitation*, 15(9), 474–481. <https://doi.org/10.12968/ijtr.2009.16.9.43765>
- Geyer, P.D., & Schroedel, J.G. (1998). Early career job satisfaction for full-time workers who are deaf or hard of hearing. *Journal of Rehabilitation*, 64(1), 33–37. <https://doi.org/10.1353/aad.2016.0028>
- Helvik, A.S., Krokstad, S., & Tambs, K. (2013). Hearing loss and risk of early retirement. The HUNT study. *The European Journal of Public Health*, 23(4), 617–622. <https://doi.org/10.1093/eurpub/cks118>
- Hogan, A., O'Loughlin, K., Davis, A., & Kendig, H. (2009). Hearing loss and paid employment: Australian population survey findings. *International Journal of Audiology*, 48(3), 117–122. <https://doi.org/10.1080/14992020802449008>
- Hornsby, B.W. (2013). The effects of hearing aid use on listening effort and mental fatigue associated with sustained speech processing demands. *Ear Hear*, 34(5), 523–534. <https://doi.org/10.1097/AUD.0b013e31828003d8>
- Hua, H., Anderzén-Carlsson, A., Widén, S., Claes, M., & Lyxell, B. (2015). Conceptions of working life among employees with mild-moderate aided hearing impairment: A phenomenographic study. *International Journal of Audiology*, 54(11), 873–880. <https://doi.org/10.3109/14992027.2015.1060640>
- Hua, H., Karlsson, J., Wildén, S., Möller, C., & Lyxell, B. (2013). Quality of life, effort and disturbance perceived in noise: A comparison between employees with aided hearing-impairment and normal hearing. *International Journal of Audiology*, 52, 642–649. <https://doi.org/10.3109/14992027.2013.803611>
- Jahncke, H., & Halin, N. (2012). Performance, fatigue and stress in open-plan offices: The effects of noise and restoration on hearing impaired and normal hearing individuals. *Noise & Health*, 14(60), 260–272. <https://doi.org/10.4103/1463-1741.102966>
- Jensen, E., & Laurie, C. (2016). *Doing real research* (p. 400). Sage.
- Karasek, R.A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24(2), 285. <https://doi.org/10.2307/2392498>

- Kramer, S.E. (2008). Hearing impairment, work, and vocational enablement. *International Journal of Audiology*, 47, S124–S130. <https://doi.org/10.1080/14992020802310887>
- Kramer, S.E., Kapteyn, T.S., & Houtgast, T. (2006). Occupational performance: Comparing normally-hearing and hearing-impaired employees using the Amsterdam checklist for hearing and work. *International Journal of Audiology*, 45(9), 503–512. <https://doi.org/10.1080/14992020600754583>
- Lund, K. (2015). *Hearing loss, health, stress and work-life: How to reduce labour market stress among persons with hearing loss*. Doctoral thesis. Retrieved from [http://www.cbg.dk/media/286468/Katja\\_Lund\\_phd.pdf](http://www.cbg.dk/media/286468/Katja_Lund_phd.pdf)
- Mitra, S., & Shakespeare, T. (2019). Remodeling the ICF. *Disability and Health Journal*, 12(3), 337–339. <https://doi.org/10.1016/j.dhjo.2019.01.008>
- Nachtegaal, J., Kuik, D.J., Anema, J.R., Goverts, S.T., Festen, J.M., & Kramer, S.E. (2009). Hearing status, need for recovery after work, and psychosocial work characteristics: Results from an internet-based national survey on hearing [Article]. *International Journal of Audiology*, 48(10), 684–691. <https://doi.org/10.1080/14992020902962421>
- Punch, R. (2016). Employment and adults who are deaf or hard of hearing: Current status and experiences of barriers, accommodations, and stress in the workplace. *American Annals of the Deaf*, 161(3), 384–397.
- Punch, R., Hyde, M., & Power, D. (2007). Career and workplace experiences of Australian university graduates who are deaf or hard of hearing. *Journal for Deaf Studies & Deaf Education*, 12(4), 504–517. <https://doi.org/10.1093/deafed/enm011>
- Republic of South Africa. Department of Labour. (2015). *Revised draft code of good practice on the employment of persons with disabilities (Government Gazette 38872, Notice 581, 15 May 2015)*. Pretoria: Government Printer.
- Republic of South Africa. Department of Social Development. (2016). *White paper on the rights of persons with disabilities: Official publication and gazetting of the White Paper on the Rights of Persons with Disabilities (Government Gazette 39792, Notice 230, 9 March 2016)*. Retrieved from [http://www.gov.za/sites/www.gov.za/files/39792\\_gon230.pdf](http://www.gov.za/sites/www.gov.za/files/39792_gon230.pdf)
- Ringdahl, A., & Grimby, A. (2000). Severe-profound hearing impairment and health-related quality of life among post-lingual deafened Swedish adults. *Scandinavian Audiology*, 29(4), 266–275. <https://doi.org/10.1080/010503900750022907>
- Schaufeli, W.B., & Taris, T.W. (2014). A critical review of the Job Demands-Resources model: Implications for improving work and health. In G.F. Bauer, & O. Hämmig (Eds.), *Bridging occupational organizational and public health: A transdisciplinary approach* (pp. 473–503). Springer Science & Business Media.
- Shenton, A.K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2), 63–75. <https://doi.org/10.3233/EFI-2004-22201>
- Sonnentag, S., & Zijlstra, F.R.H. (2006). Job characteristics and off-job activities as predictors of need for recovery, well-being, and fatigue. *Journal of Applied Psychology*, 91(2), 330–350. <https://doi.org/10.1037/0021-9010.91.2.330>
- Spencer, P.E., & Marschark, M. (2010). *Evidence-based practice in educating deaf and hard-of-hearing students: Professional perspectives on deafness, evidence and applications* (p. 264). Oxford University Press.
- Statistics South Africa. (2011). *Census 2011: Profile of persons with disabilities in South Africa*. Retrieved from <http://beta2.statssa.gov.za/publications/Report-03-01-59/Report-03-01-592011.pdf>
- 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. <https://doi.org/10.1080/14992027.2018.1464216>
- Teddie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioural sciences* (p. 387). Sage.
- Thorne, S. (2008). *Interpretive description* (p. 272). Sage.
- Thorne, S., Reimer-Kirkham, S., & MacDonald-Emes, J. (1997). Interpretive description: A non-categorical qualitative alternative for developing nursing knowledge. *Research in Nursing and Health*, 20(2), 169–177.
- Tye-Murray, N., Spry, J.L., & Mauzé, E. (2009). Professionals with hearing loss: Maintaining competitive edge. *Ear and Hearing*, 30(4), 475–484. <https://doi.org/10.1097/AUD.0b013e3181a61f16>
- Van Gils, G., Van Den Bogaerde, B., & De Lange, R.O.B. (2010). The use of modern information and communication systems and technology and experienced stress at work in mixed deaf-hearing teams. *Sign Language Studies*, 10(2), 231–257. <https://doi.org/10.1353/sls.0.0041>
- Woodcock, K., & Pole, J.D. (2008). Educational attainment, labour force status and injury: A comparison of Canadians with and without deafness and hearing loss. *International Journal of Rehabilitation Research*, 31(4), 297–304. <https://doi.org/10.1097/MRR.0b013e3282fb7d4d>
- World Health Organization. (2013). How to use the ICF: A practical manual for using the International Classification of Functioning, Disability and Health (ICF). Geneva: World Health Organization. Retrieved from <https://www.who.int/classifications/drafticpracticalmanual2.pdf?ua=1>
- World Health Organization. (2015). *Deafness and hearing loss*. Retrieved from <http://www.who.int/mediacentre/factsheets/fs300/en/>
- World Health Organisation. (2016). *Grades of hearing-impairment*. Retrieved from [http://www.who.int/pbd/deafness/hearing\\_impairment\\_grades/en/](http://www.who.int/pbd/deafness/hearing_impairment_grades/en/)
- World Health Organization. (2021). *World report on hearing*. Retrieved from <https://www.who.int/publications/i/item/world-report-on-hearing>