

# The Challenge of Aging in the Workforce: Hearing Impairment and Vocational Enablement

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## Introduction

The rapid growth in the elderly population worldwide is expected to continue in the near future. An important consequence of this development is a drastic decrease in the number of workers per retiree in the society, putting high strains on national pension funds and health care systems. One of the measures taken by governments to deal with this problem is increasing the retirement age for pensioners.

Whereas pension reforms seem attractive and straightforward solutions to prevent a drastic reduction of the workforce, there are some negative consequences as well. For example, a rise of the minimum retirement age will unavoidably lead to larger numbers of employees with hearing impairment in the workforce. This inevitably entails challenges and these are discussed in the present paper.

Several studies have demonstrated that people with hearing impairment in the labor force comprise a vulnerable group for whom the conditions at work are more challenging than for normally hearing colleagues (for a review see Danermark, 2005). In Sweden there is an overrepresentation of people with hearing impairment in the group of workers taking early retirement (Danermark & Coniavitis Gellerstedt, 2004). Also, hearing impairment has been found to be related to a greater likelihood of a low income (Hogan et al., 2009) or unemployment (Parving & Christensen, 1993). To illustrate, the US labor statistics revealed that communication disorders

are associated with an unemployment rate of 41.9% compared with 29.5% for the same working-age population without disability (Ruben, 2000).

Adverse work-related consequences of hearing loss are related to high societal costs. Mohr et al. (2000) demonstrated that the largest proportion of the societal costs related to hearing impairment are due the loss of work productivity. In the US, the cost of communication disorders to the economy is estimated to be 2.5% of the Gross National Product (Ruben, 2000).

The above facts are quite alarming and signify that the number of clients in our clinics requiring help for work-related difficulties may increase in the near future. The challenge for us as professionals is to foster better understanding of the specific consequences of hearing impairment in the workplace and to provide rehabilitation services that address their specific needs. The present paper describes how hearing impairment may affect participation in work and presents an example of an integrated approach to facilitate and improve the working situation for individuals with hearing impairment.

## The Workplace as a Challenging Context

The relationship between hearing and work is mostly associated with the risks of exposure to occupational noise and the effects on workers' health. Loud noise can cause temporary or permanent hearing impairment. There is a large body of literature available on the underlying mechanisms of noise-induced hearing loss, how to reduce excessive noise at work and hearing conversation programmes (Nelson et al., 2005). Attention to these issues is relevant because hazardous occupational noise levels remain a problem in all regions in the world (Concha Barrientos et al., 2004). However, the number of people with noise-induced hearing loss is rel-

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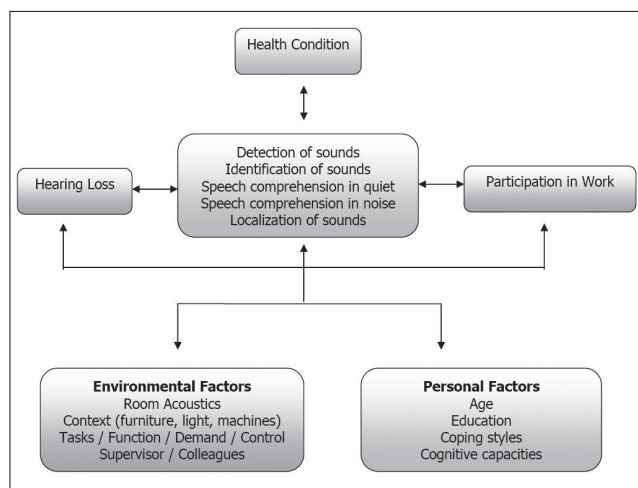
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atively small compared to the number of employees with other types of hearing impairment. Existing or acquired hearing impairment, regardless of its origin, and even mild degrees of hearing loss may adversely affect occupational performance and well-being. People with hearing impairment are more sensitive (or disturbed by) background noise than normally hearing people, due to a distorted signal-to-noise ratio in their ears. With any background noise (even if the noise level in the workplace does not exceed the critical level of 80 dBA, people with hearing impairment may experience great difficulties. Individuals with hearing loss need enhanced signal-to-noise ratios at work.

Besides background noise, there is a range of other barriers. For many people with hearing loss, the workplace is a very complex environment with many different actors and factors playing a role. Hence, for an adequate assessment of a hearing-impaired employee's limitations and the consequences for work performance, a multifactorial understanding is required, just as outlined in the International Classification of Functioning Disability and Health (ICF framework; WHO, 2001) (see Figure 1). A person's disability and functioning should be viewed as outcomes of interactions between an individual's health condition (e.g. hearing impairment) and contextual factors. Among contextual factors are environmental factors (room acoustics, colleagues, tasks, schedules), and personal factors (age, cognitive capacities, coping styles, education etc). Thus, in such an ecological context, not only an individual's health condition, but also the environmental and personal factors play a



**Figure 1.** The ICF framework applied to the workplace. It illustrates how various factors interact and determine an employees' functioning and disability.

prominent role and should be addressed in vocational programs aimed at improving and facilitating the employment situation.

The precise implications of auditory difficulties in the workplace are not well understood yet (Jennings and Shaw, 2006). It is a relatively unexplored area of research.

## Consequences of Hearing Impairment in the Workplace

So far, a small number of studies have been performed. Among the issues that have been addressed are "job control", "mental distress", "sick-leave", "fatigue" and "lack of knowledge".

### Job Control

Kramer et al. (2006) compared the occupational performance of a group of 151 employees with hearing impairment with that of a group of 60 workers with normal hearing. The groups were matched for age, gender, educational level and type of job. A questionnaire was used to assess the participants' self-reported environmental conditions at work, type of job, type of contract (permanent vs. temporary; full-time vs. part-time), general working conditions (job demand, control, support) and activities required for the performance of the job, including hearing activities. An analysis of group differences revealed the reported "effort in hearing" needed during listening was significantly higher in the group with hearing impairment ( $p < 0.001$ ). No differences between the two groups were found for general working conditions (demand, support, career satisfaction), except for "job control" (the possibility to interrupt work or take breaks when wanted). Hearing-impaired participants perceived themselves to have significantly less "control" at work compared to their normally hearing colleagues ( $p < 0.01$ ). It is worth noticing that these findings very much support the results of comparable investigations, such as a study by Danermark and Coniaviti-Gellerstedt (2004) on a group of 445 employees who completed a questionnaire on the psychosocial environment at work. The scores were compared with reference data obtained from more than 8,000 people employed by local municipalities. The results showed that the psychosocial environment at work was much more demanding for the hard-of-hearing group compared with the normally hearing reference group. The most important difference appeared to be the lower self-as-

sessed degree of control at work for those with hearing impairment.

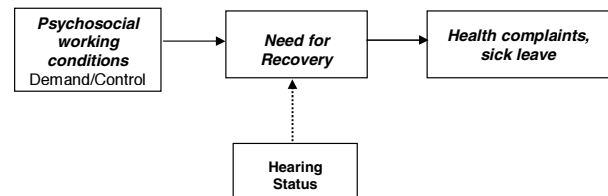
People with hearing impairment feel a greater need to have control over their work (i.e. organizing their own schedules so as to be able to take breaks; interrupting work after having had auditory demanding activities). Providing control over their work for employees with hearing impairment enhances their wellbeing.

### *Sick-Leave and Mental Distress*

The study by Kramer et al. (2006) also revealed that normal hearing workers and employees with hearing impairment differed significantly in the amount of sick-leave they take. In the hearing impaired group, the proportion of employees reporting sick-leave during a period of 12 months was significantly higher (77%) than in the normal hearing group (55%) ( $p < 0.01$ ). This appeared to be exclusively due to a higher proportion of people reporting sick-leave due to stress-related complaints (fatigue, strain, and burnout) in the hearing impaired group (26%) than in the normally hearing group (7%) ( $p < 0.05$ ). When examining the proportion of sick-leave due to “usual” reasons (flu, a cold, or a hospital appointment) the proportions in both groups were equal, indicating that people with hearing impairment are not different from their normally hearing colleagues within that respect. It is the issue of distress that is more often experienced by those with hearing impairment as compared to those without.

### *Fatigue and Need for Recovery After Work*

The issue of mental distress at work was further explored in a study by Nachtegaal et al. (2009a). The degree to which employees are able to recover from fatigue and distress after a day of work is an important factor influencing their physical and mental health status. In occupational health care, this so-called “*need for recovery after work*” is seen as an acute short-term reaction to work. Repeated inadequate recovery after work has been found to be an intermediate stage between exposure to stressful psychosocial working conditions and the development of psychosomatic health problems (Sluiter et al., 2003). This is illustrated in Figure 2. The model is an extension of the Job Demand Control (JDC) Model by Karasek and Theorell (1990) and offers a helpful framework to understand the mechanisms behind the development of stress, fatigue and strain among employees. According to the JDC model, high psychologi-



**Figure 2.** The relationship between psychosocial working conditions, short term effects (need for recovery after work) and long-term effects, according to Sluiter et al. (2003), extended with the effect of hearing impairment on need for recovery after work.

cal job demands combined with a lack of control are associated with psychological strain and health problems (Karasek et al. 1998). Several studies have shown associations between chronic diseases and increased levels of “need for recovery after work” (Jansen et al., 2002, Weijman et al., 2004).

Nachtegaal et al. (2009a) examined the association between “need for recovery after work” and hearing status (see Figure 2). Data for this study were derived from the Dutch National Longitudinal Study on Hearing (NL-SH). The NL-SH is an ongoing prospective cohort study examining the relationship between hearing impairment and several domains in the life of adults between 18 and 70 years of age, and is conducted over the Internet. Both normally hearing and hearing impaired persons are participating in the NL-SH. A more detailed description of the NL-SH can be found in Nachtegaal et al. (2009b).

In all, data of 925 workers were available and used for the analysis. Their ages ranged from 18 to 65 years with a mean of 44.3 years (sd 10.6). Hearing status was determined using the 3-digits-speech-in-noise test over the Internet (Smits et al., 2004; Smits et al., 2006a, Smits et al., 2006b). A total of 495 participants (55%) had a “good” hearing status and the proportion of subjects with “insufficient” or “poor” hearing was 45%, ( $N = 430$ ).

Need for recovery after work was measured using the *Need for Recovery scale*, an 11-item subscale of the Dutch Questionnaire on the Experience and Assessment of Work (Van Veldhoven & Meijman 1994; De Croon et al. 2006). Examples of characteristic items are: “*At the end of the day I am really feeling worn out*” and “*I find it hard to relax at the end of a working day*”.

Linear regression analyses were performed with “need for recovery after work” as the dependent variable and hearing status as the independent variable, adjusting for relevant confounders. The analyses revealed a significant association ( $p < 0.001$ ) between hearing status and need for recovery after work. People with poorer hearing status reported a higher need for

recovery after work compared to individuals with better hearing. For every dB signal-to-noise ratio (SNR) poorer hearing test score, the need for recovery increased with about 1.4 points ( $b = 1.35$ ; 95%CI = 0.79–1.92). Whereas a significant association between psychosocial work characteristics (job demand and job control) and need for recovery after work was found, hearing status did not influence that relationship. Details regarding the range of confounders entered in the regression models and other aspects of the study can be found in Nachtegaal et al. (2009a).

The findings of the above study again emphasize the relevance of “mental distress” and “need for recovery” as associates of hearing impairment. This was also observed by Ringdahl and Grimby (2000). Thus, these issues should be addressed in clinical practice. Stakeholders (e.g. occupational physicians, otolaryngologists, general practitioners, employers and the hearing-impaired employees themselves) should also be aware of the fact that hearing loss may be the underlying cause of fatigue. In most cases, hearing loss develops gradually over time and hence, monitoring an individual’s need for recovery after work in clinical practice or in the workplace may be considered as a useful measure. Thus, if employees present themselves to their GP or occupational physician with complaints of fatigue and mental distress, hearing loss should be considered as a possible cause. Early detection of enhanced levels of need for recovery will identify patients at risk and enable stakeholders to take timely actions. Such measures can contribute to the prevention of long term sick-leave.

### *Lack of Knowledge and Other Factors*

Whereas mental distress and auditory fatigue are critical consequences of hearing loss in the workplace, employees with auditory difficulties expressed additional factors that limit their participation in work. One is the lack of knowledge among colleagues, supervisors, employers and others about the impact of hearing loss in the workplace (Detaille et al., 2003) or about legal issues (Tye-Murray et al., 2009). This may include concerns about job safety, job control, internal locus of control, job performance, the reduced ability to monitor the environment, embarrassment and concerns about future employability and perceptions of co-workers and supervisors (Kramer, 2008; Morata et al., 2005, Tye-Murray, 2009). Also, hearing impaired employees report an overall lack of recognition of the multidimensional needs (Jennings & Shaw, 2008, Kramer 2008) and

a lack of timely coordination of services (Jennings & Shaw 2008, Hallberg & Jansson, 1996).

In sum, the research findings so far indicate that for many workers with hearing impairment, the conditions at work are more challenging than for normally hearing colleagues. Hearing loss in the workplace is associated with embarrassment, fear, distress, anxiety, loss of control, lack of energy, fatigue and need for recovery after work.

### **Implications for Clinical Practice**

As outlined in the above sections, there is a number of key issues that need to be addressed to service the needs of employees with difficulties at work due to hearing loss. These are:

- the need for enhanced signal-to-noise ratio’s
- the need for control
- mental distress and fatigue
- lack of knowledge

There is general agreement that for a successful management of these issues, a timely and integrated approach is required (see also Jenning & Shaw, 2008). Additionally, a multi-level approach as proclaimed by the ICF (WHO, 2001) is crucial. The problem solving process, including a functional status assessment, goal setting and treatment planning, should not only focus on the individual’s abilities, but also reveal as to what extent the environment can be changed to facilitate the individual’s performance. Actions on a single level (e.g.. restricting the enablement process to the prescription of hearing aids) would have little effect.

The following section presents an example of an integrated program that is currently operating in the Netherlands. Experiences with the protocol in clinical practice are described.

### **Vocational Enablement Protocol (VEP)**

The term “enablement” is defined as a problem-solving process aimed at enhancing the activities and participation of an individual, improving their quality of life, minimizing any effect on significant others and facilitating the acceptance of any residual problems (Stephens & Kramer, 2010). In line with this definition, vocational enablement refers to services for maintaining, facilitating and improving the employment situation (Kramer, 2008).

In line with the work of Héту and Getty (1991), an optimized Vocational Enablement Protocol (VEP) was developed (De Jager & Goedegebure, 2003, Sorgdrager et al., 2006, Kramer 2008). It addresses the specific needs

of those who are occupationally involved and who report problems at work due to loss of hearing

The VEP provides the following elements:

- Evaluation of the workplace difficulty from various perspectives (e.g. patient, employer)
- Diagnostic examination of the patient's auditory performance and coping abilities
- Multidisciplinary recommendations
- Written report and contact with stakeholders in the workplace

### *Procedure*

The Vocational Enablement Protocol (VEP) goes beyond standard pure-tone and speech audiometry. Once an individual is referred (mostly by the occupational physician), two questionnaires are sent to the patient's home. One is the Amsterdam Checklist for Hearing and Work (Kramer et al., 2006) which deals with the following issues:

- The persons' work tasks and performance (e.g. type of job, type of contract, work hours, work tasks, self-reported environmental noise) and sick-leave.
- Auditory demands at work. Respondents are asked how often they have to "communicate in quiet", "communicate in noise", "detect sounds" "localize sounds" and "distinguish between sounds" and how effortful they regard each of those hearing activities.
- General working conditions (e.g. job control, job demand, support at work and career satisfaction).

Also, to assess a person's ability to cope with hearing impairment, several scales of the Dutch version of the Communication Profile for the Hearing Impaired (CPHI), including "maladaptive behaviours", "(non) verbal strategies", "self-acceptance", "acceptance of loss" and "stress and withdrawal" are administered (Mokkink et al, 2009). Patients are instructed to complete the questionnaires and bring them when visiting the clinic.

The VEP goes beyond care-as-usual and comprises a half-day assessment of complex problems in the Audiology clinic conducted by a team of professionals from different disciplines: ENT physician, audiologist, occupational physician specialized in audiology, social worker or psychologist, speech therapist. The patient's auditory performance is assessed using an extensive battery of auditory tests, including pure-tone and speech audiometry, various Speech-Reception-Threshold (SRT) tests (in quiet, in steady state noise and in fluctuating noise) and – if indicated – tests for localization

and loudness scaling. In addition, free-field SRT-tests are used, measuring spatial speech intelligibility, to assess unaided and aided hearing performance. Together with the findings from the subjective assessment, the test scores convey a profile of the individual's auditory capacities.

In addition, a semi-structured interview is conducted by the psychologist evaluating the psychosocial history of the person, their specific needs, attitude and expectations and an evaluation of the problems at work from the patient's perspective. Referral information is taken into account. The interview is attended by the occupational physician of the team to specifically evaluate the work-related problems and to discuss the patient's view on possible solutions and legal and assurance issues. The CPHI scores provide an assessment of a person's coping abilities.

If indicated, the workplace itself is visited and is acoustically examined by conducting a Speech-Transmission-Index (STI) measurement (Houtgast and Steeneken, 1973). The STI measures the combined effects of background noise and reverberation. It provides an assessment of the intelligibility of speech in the workplace and offers an estimate of whether speech is intelligible for the employee, given the hearing impairment and the acoustical conditions.

At the end of the session, all test results are examined and considered by the psychologist, specialist occupational physician and the audiologist and explained to the patient. Here, we identify the (mis)match between the auditory capacities of the employee and the auditory demands in the workplace. Possibilities of technical, acoustical, speech-therapeutic, psychosocial and/or vocational interventions are then discussed. We argue that a patient-centered approach (i.e. involving the patient in the problem solving process) is crucial.

Additionally, all findings are discussed in a broad multidisciplinary team. At the end of the procedure and following the multidisciplinary team meeting, a written report is compiled, including the specific recommendations for the patient and the management plan. The report is then sent to the referrer. To clarify the diagnostic findings and to elucidate the reasonableness of recommendations proposed, each referrer is telephoned by the occupational physician of the team. The duty of the occupational physician on site is to communicate with the employer and to monitor and supervise the implementation of the recommendations.

Finally, to address the lack of knowledge among professionals, employers, colleagues and significant others

about issues related to hearing and work, an extensive information package presented on a CD-rom was developed (Kramer, 2008). The package provides information on a large number of matters related to hearing and work. It focuses on the understanding of difficulties of working when the individual has a hearing impairment and the various options available to reduce the occupational problems of such people. Most of the referring occupational physicians receive the CD-rom information package as well as patients enrolled in the VEP.

### *Recommendations after interdisciplinary assessment*

Data of 86 consecutive patients enrolled in the VEP were collected and the type of recommendations they received were examined. Characteristics of the 86 employees are presented in Table 1.

An analysis of the frequency of the different recommendations (Kramer, 2008) showed us that one of the most frequently proposed interventions (54%) was a hearing aid fitting or a re-fitting. This is illustrated in Figure 3. Hearing aid refitting is necessary in case of inappropriate fine-tuning or obsolete hearing aids (i.e. older than 5 years). Assistive listening devices, additional to hearing aids, were prescribed in 20% of the cases in our evaluation study. These comprised FM systems, loops, infrared systems, amplified phones and visual alerting systems.

Work-related accommodations included “re-delegation of assignments” (18%), “restructuring of time schedules” (16%) and “environmental modifications” (30%). “Re-delegation of assignment” comprised elimination of nonessential job functions or removal of highly demanding tasks (e.g. meeting, telephone work). If auditory demanding tasks could not easily be eliminated

**Table 1.** Characteristics of the 86 patients who were enrolled in the VEP.

Variable	Description	N	Mean (sd)
Age	19–64 year	86	48 (10)
Gender	Male Female	46 40	50 (10) 46 (10)
Referring Specialist	Occupational Physician Otolaryngologist  GP	51 27  8	
Hearing loss (PTA 0.5, 1, 2, 4 kHz)	6–113 dB	86	44.1 (23)
Hearing aid	Yes No	36 50	

The employees belonged to different professional groups. The largest proportion of the patients (29%) was involved in educational settings. A somewhat smaller proportion of patients (23%) was engaged in administrative jobs. Seventeen percent were involved in health care. The proportion of people working in the transportation sector was 14% and 12% were engaged in sales. A minority (4%) worked in call centers and there was one musician in the sample. It must be mentioned here that the vast majority of patients were employed in settings where hearing protection was not obligatory.

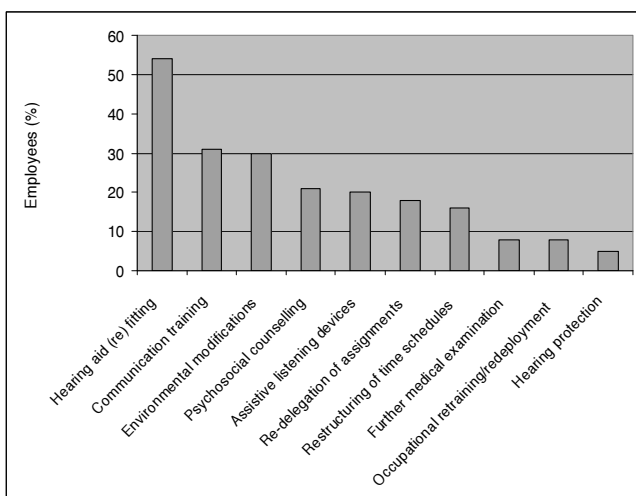
or the individual did not wish to forego them, restructuring of time schedules was advised. Effortful listening situations, such as meetings, should be rescheduled to the morning, since lack of energy at the end of the day may worsen the listening conditions even further. Also, the insertion of breaks during the day is frequently recommended and, if possible, a whole day off in the middle of the week is preferred above an extra day off right before or after the weekend.

Workplace modifications included rearrangements of the furniture in the room, the provision of light, the

improvement of room acoustics by providing absorption materials such as furniture, carpets and curtains. In addition, removal of machines generating noise (e.g. fax machines, printers and copiers) from the room was a highly essential recommendation within this respect.

Psychosocial counselling was suggested in 21% of the cases. This service was delivered either in individual or in a group setting under the supervision of a social worker. Most patients received individual counselling that was provided “at home” by means of the Home Education Program (Kramer et al., 2005). This intervention involves the communication partner (i.e. family members, colleagues) to be involved.

Communication training (31%), mainly refers to lip-reading (speech reading). This skill may be particularly suitable for challenging situations where understanding is difficult, with or without assistive listening devices.



**Figure 3.** Recommended interventions versus the proportion of employees (N total = 86) who received the particular recommendation.

In a minority of cases (8%) occupational retraining or ending employment was advised. Employees were declared unfit for duty, only when both the auditory performance and the conditions and circumstances under which they had to function, had been carefully considered.

Hearing protection was recommended in 5% of the cases. Three cases required a workplace visit, including a STI-measurement.

Implementation of the entire VEP protocol, including the half-day assessment, a written report, recommendations to the occupational physician (or employer) and the implementation changes in the workplace covered 3 to 4 months on average.

## Discussion

Due to changing demographic trends worldwide and decisions taken to increase the retirement age for pensioners, the number of adults with hearing impairment in the workforce will increase. This will inevitably lead to larger numbers of clients in our clinics with specific requests for services that go beyond standard care (i.e. prescription of hearing aids). This paper described an integrated multidisciplinary approach aimed to address the needs of employees with hearing loss. The protocol follows the multi-factorial approach as outlined in the ICF framework (WHO, 2001).

Experience with the Vocational Enablement Program (VEP), applied to 86 workers, yielded useful information. In agreement with Héту and Getty (1991), it was found that an integrated approach is indispensable for an accurate assessment and management of the occupational difficulties experienced by employees with hearing impairment. Patients were satisfied with the integrated service. Neither the hearing status in itself, nor the job title as such provides sufficient information to determine the extent to which the worker matches the job. An extensive evaluation of the workplace, the tasks to be performed and the conditions under which one has to work is of utmost importance.

The different elements of the VEP are broadly similar to those used in models of auditory rehabilitation as described in the literature. Héту and Getty’s model has already been mentioned. Another example is Stephens’ updated model, including “*evaluation*” (of activity limitation, participation restriction, contextual factors), “*integration and decision making*” (goal setting), “*short term remediation*” (instrumentation, strategies, ancillary help) and “*ongoing remediation*” (Stephens, 2003). The model of Kiessling (2003) contains the same elements and includes an extra section on “*outcome measurement*”, which is an issue that needs further attention in the VEP. However, applicability of Stephens’ and Kiessling’s models to employees with hearing-related problems at work has not been demonstrated yet. As such, the present data may have added value. Furthermore, even though both Stephens’ and Kiessling’s model largely imply a multidisciplinary approach, this issue received less explicit attention.

An interdisciplinary approach has added values. It provides specialized knowledge and ample experience in the various disciplines involved. Also, contact with and taking the message (recommendations) to the stakeholders at the workplace (e.g. occupational physi-

cians, employers) is much easier when the message is communicated by a member of the team who is coming from the same discipline as the contact person at work (e.g. occupational physician).

A further important conclusion is that the requirement of vocational enablement programs is not restricted to workplaces where background noises are hazardous. The vast majority of employees in the present project were employed in places where hearing protection was not required. Despite that, barriers in the workplace had interfered with effective job performance.

A wide range of recommendations aiming to improve the occupational conditions and to facilitate participation in and retention of work were given. These varied from the prescription of hearing aids to environmental modifications. Usually, combined advices were offered, for example, hearing aid fitting + workplace modifications + additional listening devices.

It must be mentioned that a relatively large number of patients enrolled in the VEP were experienced hearing aid users. This observation just confirms the limited effect of hearing aid fitting alone when solving the workplace difficulties of employees with hearing loss.

Even though the VEP may be regarded as a step forward in the management of people with hearing loss who experience problems at work, there is still room for improvement. For example, tests examining a person's cognitive and linguistic capacities are not included in the protocol yet. There is ample evidence for the importance of cognitive and linguistic abilities in determining a person's auditory performance (Pichora-Fuller & Souza, 2003, Rönnberg et al., 2008, Kramer et al., 2009).

Furthermore, a possible drawback of a multidisciplinary approach might be that none of the team members may feel finally responsible for the patient. One team member has to fulfill the role of a case manager who monitors the process from the very beginning to the very end and who facilitates communication among professionals and with the patient.

A limitation of the present evaluation is that because of the relatively small group and the vast heterogeneity in hearing impaired employees, the findings so far cannot be generalized to other groups of employees with hearing impairment. The proportions of recommended accommodations may be different in other groups of patients, with different types of hearing loss and different professions.

Finally, evidence at the level of a Randomized Controlled Trial (RCT) for the effectiveness and efficiency of the recommendations proposed is not available. Em-

pirical research should investigate the short- and long-term effectiveness of the multidisciplinary approach and to what extent each of the recommendations separately significantly reduces barriers at work, enhance wellbeing and improve occupational performance. Also, variables affecting the effect (i.e. age, gender, degree of hearing loss) should be systematically examined in future studies.

## Conclusion

Due to changing demographic trends worldwide and decisions taken to increase the retirement age for pensioners, the number of adults with hearing impairment in the workforce will increase in the near future. Several studies have demonstrated that people with hearing impairment in the labor force comprise a vulnerable group for whom the conditions at work are more challenging than for normally hearing colleagues. They are over-represented in the group of people taking early retirement and their unemployment rates are higher than in the general population. Common problems in the workplace are lack of control, mental distress, fatigue, concerns about job safety, environmental noise and lack of knowledge. It is argued that a timely and integrated approach is required to successfully manage the difficulties of employees with hearing loss. According to the ICF framework, vocational enablement should not only focus on the individual's abilities, but also identify the extent to which the environment can be changed to maintain, improve and facilitate the individual's performance.

This paper presents a recently developed Vocational Enablement Protocol (VEP) which uses an integrated approach to service the patient's needs. The protocol may be regarded as a potential model for good practice in this field. Experiences with the procedure among 86 workers are described and an overview of recommended accommodations is given. Suggestions for clinical practice and future research are discussed.

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