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Original Article

A cognitive therapy program for hearing-impaired employees suffering from mental distress

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Abstract

Objective: To develop a cognitive therapy program to reduce mental distress among hearing-impaired employees. *Design:* In a pilot study we measured the development of mental distress and avoidant coping among hearing-impaired employees. Levels of mental distress were assessed using the hospital anxiety and depression scale (HAD), and the extent of avoidance with conversation tactics checklist CONV(AVOID). The findings were compared with the development in a treatment as usual (TAU) sample. *Study sample:* Fifteen participants with an equal distribution of male and female participants (M = 49.2 years) took part. The majority had mild to moderate hearing impairment. *Results:* The program appeared to be feasible and the adherence was good. The mean depression score was identical at pre- and post-intervention in the intervention group, and increased from 2.9 (SD 2.1) to 3.1 (SD 2.0) in the TAU group. Symptoms of anxiety ($p < 0.01$, 95 % CI (.82, 3.98)) and avoidant communication ($p < 0.05$, 95% CI (.5, 4.61)) decreased significantly in the intervention group, while an opposite pattern was observed during the TAU program. *Conclusions:* The program showed promising results. However, the preliminary results should be further investigated in a randomized controlled trial using a larger sample.

Key Words: Behavioral measures; Cognitive therapy; hearing impairment; psycho-social/emotional; speech perception; hearing-aid satisfaction

Hearing impairment is associated with increased levels of mental distress, which can affect every day functioning and health (Brennan & Bally, 2007; Kvam et al, 2007). The relationship between the level of distress and the degree of the hearing impairment is not unequivocal (De & Bijl, 2002; Tambs, 2004; Wie et al, 2010), which indicates the presence of some mediating factors. Within audiology, avoidant coping strategies have been especially focused on and linked to mental distress, non-compliance in rehabilitation, and unsuccessful psychosocial adaptation (Brennan & Bally, 2007; Carlsson et al, 2011; Hallam et al, 2006; Hetu et al, 1990).

The need for interventions to reduce mental distress and to improve psychosocial functioning is now widely recognized within aural rehabilitation services. Traditional aural rehabilitation includes hearing-aid adjustments, teaching listening strategies, as well as speech-reading, auditory training (recognize speech sounds, patterns, words, phrases, or sentences via audition), and training in various forms of manual communication (finger-spelling and sign language) (Montgomery & Houston, 2000). Adapting to a hearing impairment requires high levels of continuous, cognitive functioning, such as in speech-in-noise recognition tasks, when using spatial cues in speech perception and when overcoming asymmetrical hearing. One intervention study has been conducted among elderly individuals with impaired hearing, but in this study hearing tactics rather than mental distress were targeted as the outcome variable (Andersson et al, 1997). At present no evidence-based intervention specifically tailored to alleviate mental distress due to deteriorating hearing is available. Several studies indicate that disorder-specific forms of cognitive behavioral therapy (CBT) are useful not only for mental disorders, but also for somatic ailments (Harvey et al, 2007; Kroenke 2007; Sierpina et al, 2007). Treatment effects of CBT interventions for tinnitus have been investigated and documented (Baguley et al, 2013; Langguth et al, 2013; Martinez et al, 2007; Vander Ghinst et al, 2013). CBT manuals in most of these cases are based on models depicting specific clinical phenomena. CBT interventions specifically tailored to reduce mental distress among hearing-impaired individuals have yet to be developed. We wanted to develop a program designed to reduce avoidance and mental distress in this group. The etiology of the hearing impairment was not significant for this purpose, as mental distress among those with congenital hearing impairment will not principally differ from the distress among those with acquired hearing impairment.

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Abbreviations

CBT	Cognitive behavioral therapy
CONV	Conversation tactics checklist
CP	Communication partner
HAD	Hospital anxiety and depression scale
TAU	Treatment as usual

We developed a manual to address mental distress and avoidance among our hearing-impaired participants based on the CBT model for social phobia (Clark & Wells, 1995; Clark & Beck, 2010; Mörtberg et al, 2011). A central tenet of this model is the suggestion that the disorder is maintained by a predominant use of avoidant coping strategies. Patients suffering from social phobia will adopt such strategies to protect themselves from a self-perceived negative evaluation by others. Characteristic strategies are social withdrawal and self-focus; i.e. direct and fixated monitoring of bodily reactions (blushing, trembling, etc.). Similar strategies have been reported among individuals with impaired hearing (Hallam et al, 2007). Individuals with social phobia and hearing impairment employ avoidant coping strategies to minimize the risk of ridicule or of being viewed by others as less competent (Helvik et al, 2007). Many hearing-impaired individuals will postpone use of hearing aids and hide their hearing impairment from others as long as possible (Erler & Garstecki, 2002; Kochkin, 2000, 2007).

Some degree of understanding and accommodation from communication partners is beneficial for the hearing-impaired individual. Thus, being open and informing the surroundings about the hearing impairment will assumingly be the most expedient approach in terms of adaptation. But persistently asking for repetitions and proclaiming one's disability will not always be an efficient communication strategy. Firstly, any given number of repetitions will not guarantee the hearing-impaired individual's comprehension. Repetitions of utterances slow down the communication process and make the exchange cumbersome. Secondly, an individual who constantly asks for messages to be repeated risks being perceived as less competent. There is an undeniable stigma (Erler & Garstecki, 2002; Hetu, 1996; Southall et al, 2010) attached to being hearing impaired, and the individual has to find a balance in terms of being sufficiently open in order to achieve efficient communication with others. If the individual considers it hazardous to inform others, successful adaptation will be more difficult to achieve. Correcting faulty appraisals of threat and personal vulnerability is a fundamental approach in cognitive therapy. This may be attained through interventions such as psychoeducation, behavioral experiments, and cognitive restructuring (Clark & Wells 1995). The workplace is of special interest in this context, as it serves as an arena where various coping strategies are constantly at play.

The aims of this pilot study were threefold. We wanted to investigate whether the participants presented difficulties that could be dealt with by the use of the CBT model of social phobia, and if these challenges could be addressed within the time frame that was set up, we would consider the intervention *feasible*. We assumed that the drop-out rate would give some indications as to whether the participants found the course *relevant*. The course would be considered *useful* to the extent that the overall aim of the intervention was reached: reduced communicative avoidance (decrease in CONV(AVOID)) scores, and symptoms of mental distress (decrease in HAD scores).

Method

Participants

In a pilot study, pre- and post-intervention levels of mental distress (anxiety and depression) and avoidant communication strategies were measured and compared for participants who completed a CBT program for hearing-impaired employees (n = 15) and a traditional audiological rehabilitation program; the treatment as usual (TAU) group (n = 18).

Intervention group

Hearing-impaired employees experiencing mental distress who were interested in taking part in the research project were invited through advertisements placed in the largest newspaper in Oslo, Norway, and through e-mails that were sent to members of the Norwegian Association of the Hard of Hearing. Subjects, who after an initial telephone screening expressed interest in participating in to take part in the study, were invited for preparatory counselling, conducted by specialists in psychiatry or psychology.

Eligible participants needed to be 18–70 years of age, be economically active and provide medical documentation of their hearing loss (audiogram). As this was a pilot study of an intervention never previously tested, no clinical exclusion criteria were set. The group comprised of ten women and eight men who initially signed up for the program. Two females and one male withdrew before the course started, leaving 15 in total who took part in the intervention.

Participants ranged in age from 38 to 61 (M = 49.2 years) and the majority were educated at college or university level. Average pure-tone hearing impairment ranged from 7.5 to 82.5 dB (Table 1); three individuals had unilateral hearing loss.

Treatment as usual (TAU) sample

Participants attending "Keep your job" courses during the fall of 2011 and winter of 2012 (n = 25) made up the pretest TAU sample. The "Keep your job" course is the only rehabilitation program available for hearing-impaired employees in the country. The courses are announced in the membership magazine "Your Hearing" produced by The Norwegian Association of the Hard of Hearing and otherwise passed through word of mouth. Participants personally apply for course admission. Expenses related to absence from work, transport, and lodging are covered by The Norwegian Labour and Welfare Service. The program is held at the Briskeby School and Resource Center, a nationwide facility for the hearing impaired which is owned by The Norwegian Association of the Hard of Hearing. The course

Table 1. Pretest comparison of the intervention and the TAU group; demographic variables and levels of hearing impairment.

	Intervention group (n = 15)		*TAU group (n = 25)*	
Variable	*n*	*Mean (SD)*	*n*	*Mean (SD)*
Male	7		7	
Female	8		18	
Age	15	49.2 (8.4)	25	52.6 (9.4)
Hearing impairment				
Unilateral	3	7.5 (13) dB	3	19.4 (4.2) dB
Slight	2	32.5 (2.15) dB	4	34.2 (5) dB
Moderate	6	47.8 (6.3) dB	10	48.7 (5.3) dB
Severe	1	70 (−) dB	4	67.9 (7.5) dB
Profound	2	82.5 (2.1) dB	1	100 dB

lasts for nine days spread over six months and mainly consists of lectures about hearing and hearing loss; psychosocial consequences of hearing loss; information about technical hearing devices and how to use them, and about legislation, support and governmental subsidizing arrangements.

The program also includes balance training and stress-management methods. The lectures are held by pedagogues, physiotherapists, lawyers, and psychologists, as well as experienced peers. The psychosocial part of the 'treatment as usual' (TAU) course included lectures held by acknowledged specialists on topics including common work-related challenges, well-known reactions to hearing loss, and how to efficiently communicate the hearing impairment to one's surroundings. The course is open for employed people aged between 18–67 years with documented hearing impairment.

Among the TAU sample, seven participants withdrew from the study and 18 (M = 52.6 years) completed the program and the pre-to-post tests. Average pure-tone hearing impairment ranged from 19.4 (unilateral) to 100 dB (Table 1). As among the interventional sample, three individuals had unilateral hearing loss.

The study was approved by the Regional Committee for Medical Research Ethics and the Norwegian Data Inspectorate.

Treatment

The intervention was administered as a weekly two-hour CBT course over eight weeks (16 hours in total). This number of hours corresponds to the amount of mental distress-related content (lectures on psychosocial consequences of hearing impairment) presented in the TAU course. The course was presented in Norwegian, and an inductive hearing loop system was provided for participants using hearing aids. All participants received the course material containing lecture notes in print, with supplementary reading and descriptions of homework to be completed between sessions. The course was facilitated by a psychologist experienced in treating hearing-impaired individuals with special training in CBT.

Each session was divided into two standard parts. During the first hour each participant gave their report from the between-sessions homework assignments. The second hour was devoted to lectures comprising the rationale behind the upcoming homework assignments. The participants were given a course curriculum containing the consecutive topics to be addressed at each group session. At the end of each session the participants were briefed on how to conduct the homework exercise for the following week.

Manual

We developed a course manual based on the CBT model for social phobia (Clark & Beck, 2010), which describes three fundamental features unique to this disorder. First, feelings of embarrassment caused by negative evaluation by others are presented as the dominant, negative emotion (Barlow & Hofmann, 2002). Second, this emotional reaction will elicit inhibitory behaviors that have the unfortunate effect of disrupting social performance (Rapee & Heimberg, 1997). This provides the basis for a self-fulfilling prophecy in which the individual ends up actually achieving negative evaluation by others. We find that this model translates to some common challenges reported by several of our patients. A hearing-impaired person who doesn't ask her or his conversation partner to repeat messages, when this is needed, out of a concern that the others will find this bothersome, can end up actually becoming a nuisance due to the resulting misinterpretations. Anxiety then becomes a secondary threat as the individuals believe they have to conceal their distress to avoid negative evaluation from others. In our experience, this translates to those individuals who go to great lengths to conceal their hearing problem. Several authors have reported that hearing impairment is associated with a stigma (Hetu, 1996; Southall et al, 2010), a factor that might serve to reinforce the need to keep the hearing problem a private matter.

Correcting faulty appraisals of threat and personal vulnerability is a fundamental approach in CBT and is achieved by interventions such as guided discovery, psychoeducation, and cognitive restructuring. The intervention consisted of traditional CBT interventions adapted to the special case of hearing impairment. In contrast to depression, a hearing impairment cannot be viewed as the result of faulty or biased cognitive processing, but is *de facto* physical damage to the hearing organ. This distinction is important to acknowledge in therapeutic work. Efficient treatment goals are not directly tied to the hearing impairment itself, but rather to the negative *consequences* of impaired hearing. The stated goal of the cognitive restructuring phase was not correcting faulty cognitions as much as exploring costs and benefits of holding on to negative beliefs. Some negative emotions and reactions are unavoidable when hearing is impaired, and the treatment goal of the manual was to attain higher levels of acceptance of negative emotions rather than elimination of these reactions altogether. By this refinement the manual was predominantly based on the CBT model for social phobia, but we also have drawn from other sources. A brief overview of the programs is presented in Table 2 and Table 3.

Measures

No exclusion criteria with regard to the degree of mental distress or hearing impairment were set, but all subjects were required to present formal, audiometric measurements. The degree of hearing impairment (HI) was evaluated according to standards established by the World Health Organization (WHO, 2014). Applied to the better hearing ear—averaged across 500, 1000, 2000, and 4000 Hz—hearing impairment is rated as *slight* (over 26 dB and less than 40 dB), *moderate* (over 41 dB and less than 60 dB), *severe,* (over 61 dB and less than 80 dB) or *profound* (equal to and above 81 dB). Unilateral hearing impairment was categorized as hearing impairment in one ear as classified by the WHO and hearing thresholds in the better ear better than or equal to 20 dB.

The hospital anxiety and depression scale (HAD) was used to assess level of mental distress. The HAD scale is self-administered and consists of 14 items; seven related to anxiety (HAD-A) and seven to depression (HAD-D). Each item is scored from 0 to 3. The total sum score ranges from 0 to 42 and the subscale scores range from 0 to 21. The two scales are normally strongly correlated, which accords with the known comorbidity between depressive and anxiety disorders. A score ≥ 8 on one subscale indicates the case level of mental distress. The internal consistency (Cronbach's $\alpha = 0.73$–0.85) of the Norwegian version is satisfactory (Mykletun et al, 2001).

The 54-item self-report questionnaire, conversation tactics checklist (CONV), was originally developed by Hallam et al (Hallam et al, 2007) to assess how people behave when they find it difficult to communicate with others due to hearing impairment. Items were grouped into eight *a priori* categories based on what is known from the literature about processes of communication when conversations are set up, break down, and are repaired: (1) FACILitate: to what degree the communication partners (CPs) catch each other's attention and optimize the communication environment (four items).

Table 2. Overview: CBT program.

Session curriculum	*Case #1*	*Case #2*	*Case #3*
Description of negative consequences	Difficulties at work	Social withdrawal	Painful emotional reactions
	↓	↓	↓
Description of negative cognitions	*I misinterpret messages. They see me as incompetent*	*I don't laugh when they do. I'm a party pooper*	*My grandchildren will get frustrated if I ask for repetitions*
	↓	↓	↓
Identification of cognitive processing	*I should absolutely not make any mistakes at any time* (all-or-nothing-thinking)	*I should never be a bore Always the entertainer!* (perfectionism)	*I'm an old nuisance* (jumping to conclusions)
	↓	↓	↓
Identification of avoidant strategies	Keep the hearing problem secret. Not wear/hide hearing aids	Pretend to understand. Laugh just because others do	Mentally disconnect. Not ask for repetitions
	↓	↓	↓
Challenge negative cognitions	What is the evidence that they see you as incompetent? What would be the worst case scenario if you let them know that you have impaired hearing? What is the most likely scenario if you wore hearing aids at meetings?	Why is it so important that others should always see you as fun-loving? What evidence suggests that they find you to be dull? Are you always dull all the time in all social encounters? No exceptions?	What are the (immediate) benefits and (long-term) costs associated with not asking them to repeat?
	↓	↓	↓
Test non-avoidant strategies (experiential learning)	Wearing hearing aids at meetings Ally with colleague who can give hints about the topic under discussion Make a request that minutes be made at meetings	Not pretending to understand at upcoming lunch Not laugh when having not understood what the joke was about Planned participation in upcoming social event	Ask for repetitions twice Explain to them that Granny has bad hearing
	↓	↓	↓
Share experiences with peers and therapist	*Wearing my hearing aid at work was a great help and nobody seemed to react. I felt that I was burdening my colleague, but she was really helpful and gave me clues. My secretary will make minutes from meetings from now on*	*It felt so risky not paying close attention to everything. But it was a great stress relief not trying so hard! Helped me grasp more of what they were saying!*	*Unbelievable! In contrast to what usually happens when I explain my hearing problem to adults, the children remember to always show their face while speaking to me - and they keep reminding the grownups when they forget!*
	↓	↓	↓
Conclusion/consolidation phase	*My diehard preconception turned faulty. I will request accomodations if needed.*	*My personal standards were unrealistic. Now they are high and better calibrated.*	*Experimenting with coping strategies gave me access to new information.*

(2) ALTernative: CPs use alternative modes of communication (three items). (3) OPTImise: CPs optimize the sensory and contextual information available to them (10 items). (4) META: CPs employ meta-communication skills to organize their thoughts, interpret what has been said, construct what they are about to say, and ensure that the message is conveyed (nine items). (5) HREP: CPs attempt to repair a breakdown of communication by requesting that their CPs repeat, or change their delivery or content of the message (nine items). (6) PREP: CPs repeat or change their delivery or message, in order to repair a breakdown of communication (five items). (7) COERCe: CPs use a non-verbal coercive means of influencing or repairing a conversation (four items). (8) AVOID: CPs avoid communicating, or escape a conversation when difficulties arise, or avoid repairing a conversation breakdown (10 items). As the study aim for this investigation was to focus on avoidance, pre- and post-scores on the AVOID category only were examined to determine whether or not the level of avoidance changed over the course of the intervention (see Table 4).

Table 3. Overview: The TAU program.

	Course topic
Day 1	Lectures on hearing and hearing loss
Day 2	Balance training and psycho-motor stress reduction
	Lectures on technical hearing devices and on how to use them
	Lectures on psychosocial consequences of hearing loss
Day 3	Experience-exchange between peers; group activities
Day 4	Experience-exchange between peers; group activities
	Balance training and psycho-motor stress reduction
Day 5	Lectures on legislation, employee rights, governmental support services
Day 6	Lectures on legislation, employee rights, governmental support services
	Experience-exchange between peers; group activities
Day 7	Experience-exchange between peers; group activities
	Lectures on psychosocial consequences of hearing loss
Day 8	Lectures on psychosocial consequences of hearing loss
	Lectures on use of efficient communication strategies
	Balance training and psycho-motor stress reduction
Day 9	Experience-exchange between peers; group activities
	Lectures on hearing and hearing loss

The response categories of the CONV are related to frequency of use and items are scored as *never* = 0, *rarely* = 1, *sometimes* = 2, or *usually* = 3; and total scores accordingly ranged from 0 to 30. With the author's permission, CONV was translated into Norwegian by the first author and back-translated into English by a bilingual staff member at another hospital unit. The translation was evaluated by a psychiatrist affiliated with the center, who concluded that, except for some grammatical irregularities, the translation was valid and acceptable.

For the intervention group, the HAD and CONV(AVOID) self-report scores were obtained before the pre-course counselling session. The pre-test procedure for the TAU sample was performed on the first day of the program. Post-test data were collected immediately following the last-course session (approximately six months after the start of the course). Participants completed questionnaires individually in a private area. No names appeared on the questionnaire, to protect the anonymity of the respondents. Participants could return the envelope containing the questionnaire without filling it in if they chose not to participate in the study.

Table 4. Conversation tactics checklist: AVOID items.

Item	*Description*
3	Give up trying to understand and switch off
9	Pretend to understand what the talker is saying
19	Make the minimum amount of effort and withdraw into your own thoughts
24	Try to look interested when you are not hearing clearly
32	End the conversation if the other person looks irritated
34	Avoid having the conversation altogether if you think it will be difficult
36	Decide that what you are saying is not important enough to keep repeating it
45	Give up and leave if conversing is too difficult
47	Just keep on talking so you don't have to listen
49	Keep quiet to avoid the effort of conversing

Table 5. Changes of HAD anxiety, HAD depression, and use of avoidant communication strategies CONV(AVOID) from start to end of treatment in the pilot group (score = 1) and the TAU group (score = 0). Multivariate and univariate analyses. MANOVA, N = 33. Multivariate test: Wilks lambda = 0.518, p = 0.003.

	Change	*T*	*p*	*Effect size**	*F*	*p*
HAD anxiety					10.03	< 0.001
Pilot	− 2.40	− 3.70	0.001	0.310		
TAU	1.50	2.53	0.017	0.170		
HAD depression					0.13	0.879
Pilot	0.07	0.14	0.894	0.001		
TAU	0.22	0.49	0.627	0.008		
CONV(AVOID)					4.59	0.018
Pilot	− 2.33	− 2.62	0.013	0.182		
TAU	1.22	1.51	0.142	0.068		

*Partial eta squared

Statistics

Descriptive statistics and multivariate analysis of variance (MANOVA) was performed. IBM SPSS Statistics version 20.0 (2011) was used for all analyses. All tests were two- tailed and, if not indicated otherwise, chi square tests were applied when comparing categorical data and student's t-test for group comparisons of continuous data. Level of significance was set to p = .05. Correlations were calculated as two-tailed Pearson's r. Effect sizes were calculated as partial eta squared.

Results

All participants who attended the first group session of the pilot course (n = 15) completed the program; there were no drop-outs.

Pre-program assessments indicated differences in the intervention and TAU groups. Mean HAD anxiety scores in the intervention group were 6.9 (SD 3.6) compared to 4.7 (SD 3.2) in the TAU group ($p < 0.05$) (see Table 5). Mean HAD depression scores were 4.5 (SD 3.2) in the intervention group and 2.9 (SD 2.1) in the TAU group ($p > 0.05$).

The pre-intervention scores (mean and SD) on the CONV (AVOID) scale were similar in the intervention group (19.6, SD = 4.6) and the TAU (19.3, SD = 4.0) group ($p > 0.05$).

The mean HAD anxiety score dropped to 4.5 (SD 3.0) in the intervention group [($p < .01$), 95% CI (0.02, 3.98)] and increased to 6.2 (SD 3.0) in the TAU group [($p < 0.01$), CI (− 2.60, − 0.40)] post-program. The mean depression score was identical at pre- and post-intervention in the intervention group, and increased from 2.9 (SD 2.1) to 3.1 (SD 2.0) in the TAU group. The use of avoidant coping decreased from 19.6 (SD 4.6) to 17.2 (SD 4.2) in the intervention group [($p < 0.05$), CI (0.05, 4.61)], whereas the mean AVOID score increased from 19.3 (SD 4.0) to 20.5 (SD 4.0) in the TAU group [($p > 0.05$), CI (− 2.6, 0.15)].

A multivariate analysis of variance was performed to investigate differences in change scores between the pilot group and the TAU group. Distinct differences between the groups were demonstrated in terms of changes in anxiety and avoidant coping scores, whereas the change in depression scores did not differ between the pilot group and TAU group.

Discussion

The mental distress presented by participants in this study fit the adapted CBT model and the eight sessions gave sufficient time for

participants to complete all the steps in the program. Thus we judge the program and manual to be a feasible intervention. In addition to dealing with problems that each individual participant presented, we believe that the course was a relevant experience for the participants as no participant withdrew once they had started the program.

Following the assumption made by several authors that avoidance is a maladaptive coping strategy that can be attributed to mental distress among hearing-impaired individuals, we tested whether levels of avoidance and anxiety would be reduced. We found that during participation in the adapted CBT course the extent of avoidant communication and symptoms of anxiety decreased. For the TAU participants, HAD anxiety scores increased but there was no significant change in CONV (AVOID) scores during the program participation. The pre-treatment HAD scores for the TAU group were so low that only minor changes could be expected due to program participation.

There are several aspects that should be taken into account when interpreting the results. The difference in pre-program level of anxiety between the groups could be attributed to a selection bias. The participants in the intervention group had signed up for a course specifically addressing mental distress, while the TAU sample comprised of individuals attending a regular rehabilitation course. It is natural to assume that the motivation for attendance will differ between the participants in these two programs. Although psychosocial adaptation to some extent was addressed in both courses, only the CBT course specifically addressed avoidance in relation to mental distress.

As part of the CBT course each participant was instructed to describe what strategies that he or she used at work, which in turn could be related to problem maintenance. There was a large variation in strategies reported. Some participants found it difficult to retreat from activities, even in a state of exhaustion, due to concern of letting others down. Others, however, had an excessive tendency to isolate themselves from their surroundings. Even if the strategies diverged, all of them fitted well with the model. Throughout the course of the program it was possible to do planned, structured, and therapist-supervised explorations of the efficiency of current coping strategies. More importantly, the participants were encouraged by therapist and peers alike to try out new strategies they otherwise would have avoided due to fear of negative evaluation from surroundings. This guided discovery gave the participants access to information and experiences that would otherwise be unavailable to them.

In contrast to the TAU program, the participants in the intervention group were supervised more consistently and the program structure consisted of a series of inseparable, distinct steps. The TAU program contained a range of topics that were related, but these were not progressively presented so as to guide and supervise the participant in specific, behavioral explorations. Our experience is that when mental distress has developed, and it is apparent that the individual makes use of maladaptive coping strategies, it is critical that the individual is supervised consistently over some time in order to be able to change their coping habits. The CBT manual provides a step by step description on how to conduct interventions that target problem maintaining coping strategies. The intervention was specifically designed so as to train the participants in being more communicatively assertive. Post-test assessments show that levels of avoidant communication strategies decreased significantly in the intervention group, while remaining unchanged among the TAU participants. Our experience is that to be effective, such training has to target avoidance specifically and be supervised by a therapist with special training in CBT.

According to CBT theory, different forms of avoidance constitute a core feature in various anxiety disorders. This forms the background rationale for targeting communicative avoidance in the program. It is, however, imperative to bear in mind that all behaviors which appear avoidant at first glance are not necessary maladaptive. For example, social withdrawal appears intuitively "avoidant." But restitution is an important element in successful adaptation, as some level of continuous compensation strain is an inevitable aspect of adequate performance in communication settings, when hearing is impaired (Andersson & Hägnebo, 2003). Reluctance against revealing to the environment that one has impaired hearing and unwillingness to make use of hearing aids (Hallam et al, 2007; Hetu et al, 1990; Kochkin, 2000, 2007), are other coping strategies that are commonly regarded as expressions of unsuccessful adaptation. However, as it has been established that being hard of hearing is a social stigma (Erler & Garstecki, 2002; Hetu, 1996; Southall et al, 2010), this view should be regarded as simplistic. Intuitively, openness should be beneficial, but several of our participants had experienced career-related discrimination and humiliation when being open about their hearing impairment. In regular aural rehabilitation courses it can be difficult to handle this issue, as hearing-aid adjustments are imperative elements. We find that what constitutes "good coping" cannot be evaluated in isolation from contextual factors. In some cases social withdrawal is healthy and adaptive. In others, social isolation represents a core problem for the individual. Avoidance is a well-established element in the development of anxiety disorders, but to our knowledge no previous studies have addressed the assumed negative link between avoidant communicative strategies and mental distress among hearing-impaired persons. Our findings could serve as a starting point for further investigation into how to efficiently address avoidant and related mental distress among hearing-impaired individuals.

Limitations

Being a pilot study of a novel program, the sample size was small. The treatment and control groups differed on important variables at baseline. Participants were not randomly assigned to treatment and control groups, and we have no follow-up data. Participants were recruited through newspaper advertisement and through the Norwegian Association of the Hard of Hearing, and as a result those who responded self-selected to participate and may not represent the general population of employed hearing-impaired individuals.

Conclusion and future development

In spite of methodological shortcomings it is interesting that both the level of avoidant coping and mental distress decreased significantly during the program, in contrast to what was found in the TAU sample. The results are promising, and should be further examined in randomized controlled clinical trials with larger samples and longitudinal follow-up.

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Declaration of interest: The authors report no conflicts of interest.

References

Andersson G., Green M. & Melin L. 1997. Behavioural hearing tactics: A controlled trial of a short treatment programme. *Behav Res Ther*, 35, 523–530.

Andersson G. & Hägnebo C. 2003. Hearing impairment, coping strategies, and anxiety sensitivity. *J Clin Psychol Med Settings*, 10, 35–39.

Baguley D., McFerran D. & Hall D. 2013. Tinnitus. *Lancet*, 382, 1600–1607.

Barlow D.H. & Hofmann S.G. 2002. Social phobia (social anxiety disorder). In: *Anxiety and its Disorders: The* Nature *and Treatment of Anxiety and Panic, 2nd ed*. New York: Guilford Press, pp. 454–476.

Brennan M. & Bally S.J. 2007. Psychosocial adaptations to dual sensory loss in middle and late adulthood. *Trends Amplif*, 11, 281–300.

Carlsson P.I., Hall M., Lind K.J. & Danermark B. 2011. Quality of life, psychosocial consequences, and audiological rehabilitation after sudden sensorineural hearing loss. *Int J Audiol*, 50, 139–144.

Clark D.M. & Wells A. 1995. A cognitive model of social phobia. In: R.G. Heimberg, (ed.) *Cognitive Therapy of Anxiety Disorders.* New York: Guilford Press, pp. xii, 435.

Clark D.A. & Beck A.T. 2010. *Cognitive Therapy of Anxiety Disorders*. New York: Guilford Press.

De G.R. & Bijl R.V. 2002. Determinants of mental distress in adults with a severe auditory impairment: Differences between prelingual and postlingual deafness. *Psychosom Med*, 64, 61–70.

Erler S.F. & Garstecki D.C. 2002. Hearing-loss-related and hearing-aid-related stigma: Perceptions of women with age-normal hearing. *Am J Audiol*, 11, 83–91.

Hallam R., Ashton P., Sherbourne K. & Gailey L. 2006. Acquired profound hearing loss: mental health and other characteristics of a large sample. *Int J Audiol*, 45, 715–723.

Hallam R.S., Ashton P., Sherbourne K., Gailey L. & Corney R. 2007. Coping, conversation tactics, and marital interaction in persons with acquired profound hearing loss (APHL): Correlates of distress. *Audiol Med*, 5, 103–111.

Harvey A.G., Sharpley A.L., Ree M.J., Stinson K. & Clark D.M. 2007. An open trial of cognitive therapy for chronic insomnia. *Behav Res Ther*, 45, 2491–2501.

Helvik A.S., Wennberg S., Jacobsen G. & Hallberg L.R.M. 2007. Coping ability and everyday life situations in relation to audiological rehabilitation. *Audiol Med*, 5, 112–118.

Hetu R. 1996. The stigma attached to hearing impairment. *Scand Audiol Suppl*, 43, 12–24.

Hetu R., Riverin L., Getty L., Lalande N.M. & St-Cyr C. 1990. The reluctance to acknowledge hearing difficulties among hearing-impaired workers. *Br J Audiol*, 24, 265–276.

IBM SPSS Statistics for Windows, Version 20.0.

Kochkin S. 2000. MarkeTrak V: "Why my hearing aids are in the drawer": The consumer's perspective. *Hear J*, 53, 34–42.

Kochkin S. 2007. MarkeTrak VII: Obstacles to adult non user adoption of hearing aids. *Hear J*, 60, 27–43.

Kroenke K. 2007. Efficacy of treatment for somatoform disorders: A review of randomized controlled trials. *Psychosom Med*, 69, 881–888.

Kvam M.H., Loeb M. & Tambs K. 2007. Mental health in deaf adults: Symptoms of anxiety and depression among hearing and deaf individuals. *J Deaf Stud Deaf Educ*, 12, 1–7.

Langguth B., Kreuzer P.M., Kleinjung T. & De R.D. 2013. Tinnitus: Causes and clinical management. *Lancet Neurol*, 12, 920–930.

Martinez D.P., Waddell A., Perera R. & Theodoulou M. 2007. Cognitive behavioural therapy for tinnitus. *Cochrane Database Syst Rev*, CD005233.

Montgomery A.A. & Houston T. 2000. The hearing-impaired adult: Management of communication deficits and tinnitus. In: J.G. Alpiner & P.A. McCarthy (eds.): *Rehabilitative Audiology: Children and Adults, 3rd ed*. Philadelphia, USA: Lippincott Williams & Wilkins, pp. xii, 690.

Mörtberg E., Clark D.M. & Bejerot S. 2011. Intensive group cognitive therapy and individual cognitive therapy for social phobia: Sustained improvement at 5-year follow-up. *J Anxiety Disord*, 25, 994–1000.

Mykletun A., Stordal E. & Dahl A.A. 2001. Hospital anxiety and depression (HAD) scale: Factor structure, item analyses and internal consistency in a large population. *Br J Psychiatry*, 179, 540–544.

Rapee R.M. & Heimberg R.G. 1997. A cognitive-behavioral model of anxiety in social phobia. *Behav Res Ther*, 35, 741–756.

Sierpina V., Astin J. & Giordano J. 2007. Mind-body therapies for headache. *Am Fam Physician*, 76, 1518–1522.

Southall K., Gagne J.P. & Jennings M.B. 2010. Stigma: A negative and a positive influence on help-seeking for adults with acquired hearing loss. *Int J Audiol*, 49, 804–814.

Tambs K. 2004. Moderate effects of hearing loss on mental health and subjective well-being: results from the Nord-Trondelag hearing loss study. *Psychosom Med*, 66, 776–782.

Vander Ghinst M., Verbeurgt C., Hassid S. & Choufani G. 2013. (Tinnitus management in 2013). *Rev Med Brux*, 34, 245–250.

WHO. Grades of hearing impairment. 2014. Ref type: Online source

Wie O.B., Pripp A.H. & Tvete O. 2010. Unilateral deafness in adults: Effects on communication and social interaction. *Ann Otol Rhinol Laryngol*, 119, 772–781.