

1. Aazh 2008

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**Intervention groups (sample size)**

- 1) Simplified TRT (Counselling component mandatory only, sound generators were not mandatory; 42 patients)
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**Assessment content components**

- 1) Tinnitus Handicap Inventory
  - 2) VAS (tinnitus loudness, annoyance and effect on life)
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**Treatment content components**

- 1) Reassure patients that the annoyance from tinnitus would gradually reduce with the passage of time following the natural process of habituation
  - 2) Inform them that reduction in annoyance and distress caused by the tinnitus would promote habituation to the tinnitus and reduction of the tinnitus itself
  - 3) In cases of tinnitus combined with hearing loss to explain that if they could not hear properly, this was most likely because of their hearing loss and not the tinnitus
  - 4) Advise [the patient] to avoid silence by using sound enrichment
  - 5) Patients with bothersome tinnitus, but no hearing loss, and no decreased sound tolerance were advised about sound enrichment, but wearable sound generators were not offered (unless requested – see results and further notes)
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**Description of sample**

Inclusion:

- 1) Completed the self-assessment questionnaires
- 2) Attended at least two therapy sessions and continued the treatment for at least 3 months
- 3) Exhibited mild to severe tinnitus handicap based on the Tinnitus Handicap Inventory (THI) total score prior to treatment (total THI score  $\geq 18$ )

Baseline pre-assessment/treatment outcome measures

	Simplified TRT counselling	
	Mean	SD
THI	60.0	18.9
VAS loudness	6.2	1.7
VAS annoyance	6.5	2.0
VAS effect on life	6.0	2.1

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**Comorbid mental health problems**

Not reported

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**Delivering clinician**

Audiologist

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**Research methods**

Uncontrolled retrospective study

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**Outcome measures**

Primary:

- 1) Tinnitus Handicap Inventory
- 2) VAS (tinnitus loudness, annoyance and effect on life)

Secondary:

Not reported

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**Results**

The mean THI and VAS scores were significantly decreased after 3 to 23 months of

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treatment \*

**Associated intervention**

None

**Further notes**

\* THI: the effect of use of Sound Generators (SG) was also significant

2. Abbott 2009

**Intervention groups (sample size)**

- 1) Internet CBT (32 patients)
- 2) Information only control group (24 patients)

**Assessment content components**

- 1) Structured Interview for Tinnitus History and Complaints
- 2) Clinical Interview for Tinnitus Distress
- 3) Tinnitus Reaction Questionnaire
- 4) Depression Anxiety Stress Scale (DASS)
- 5) Quality of Life Questionnaire-Brief Version (WHOQOL-BREF)
- 6) Occupational Stress Inventory-Revised (OSI-R)
- 7) VAS (Tinnitus loudness, annoyance caused by tinnitus, control over tinnitus, quality of sleep)

**Treatment content components**

- 1) Participants read the requirements of the program and specified program goals and ways they would prioritise their time in order to complete the weekly modules
- 2) Program rationale
- 3) Instructions for a basic applied relaxation task (tense—relax)
- 4) Participants gradually learning to relax more quickly and in more challenging situations
- 5) Use of positive imagery to aid relaxation
- 6) Exercises to enhance ability to control where attention is directed
- 7) Information and advice regarding noise sensitivity (Andersson et al., 1999)\*
- 8) Behavioural sleep management (Lichstein & Riedel, 1994)\*
- 9) Sound enrichment by means of external sounds (Jastreboff & Hazell, 2004)\*
- 10) Improving concentration\*
- 11) Strategies to make the most of existing hearing abilities\*
- 12) Cognitive therapy presented in two stages\*
- 13) Participants were asked to make a plan for their future, incorporating the tools learned through the Internet program
- 14) Rate their success in achieving their program goals
- 15) Homework assignments and weekly diaries

**Description of sample**

Inclusion:

- 1) Age between 18 and 65 years (iCBT mean=50.5 sd=9.5, Control mean=48.7 sd=8.6)
- 2) Tinnitus for at least 3 months (iCBT mean=140.2 sd=115.3, Control mean=60.3 sd=53.8)
- 3) Tinnitus diagnosed by health professional
- 4) General practitioner contact details were provided
- 5) Not currently receiving psychological treatment for tinnitus
- 6) Being able to access the Internet and print instructions

# Baseline pre-assessment/treatment outcome measures

	Internet CBT		Information only control group	
	Mean	SD	Mean	SD
TRQ	19.29	12.7	14.21	9.2
DASS depression	4.71	5.4	2.74	4.5
DASS anxiety	3.57	3.8	3.04	3.3
DASS stress	9.61	7.5	6.43	5.7
WHOQOL-Bref physical	72.45	14.8	77.02	10.7
WHOQOL-Bref psychological	66.96	14.3	71.74	15.5
WHOQOL-Bref social	59.82	20.5	73.55	17.8
WHOQOL-Bref environment	69.42	12.9	76.49	9.5
OSI-R				
ORQ RO	49.32	12.6	52.09	11.8
ORQ RI	48.04	8.3	48.43	9.3
ORQ RA	51.18	10.0	50.00	10.3
ORQ RB	47.93	8.3	48.52	9.3
ORQ R	49.64	8.9	50.43	9.9
ORQ PE	51.39	8.6	49.22	7.3
PSQ VS	48.79	7.2	48.04	8.1
PSQ PSY	48.00	7.3	48.52	9.2
PSQ IS	47.57	10.2	45.74	8.1
PSQ PHS	50.71	10.0	49.22	8.9
PRQ RE	48.71	10.0	50.70	10.5
PRQ SC	48.21	12.3	48.48	6.1
PRQ SS	49.25	11.0	52.39	8.5
PRQ RC	46.14	10.5	47.65	9.3
VAS loudness	4.66	1.6	4.85	1.7
VAS annoyance	3.60	1.4	3.88	1.6
VAS control	6.61	2.7	6.65	2.5
VAS quality of sleep	4.11	1.9	4.52	1.9
Treatment Credibility Scale-Modified	32.60	6.72	*	*

ORQ = Occupational Roles Questionnaire

PSQ = Psychological Strain Questionnaire

PRQ = Personal Resources Questionnaire

\* Not reported

## Comorbid mental health problems

Not reported

## Delivering clinician

- 1) Registered Psychologists
- 2) Trainee Psychologists

## Research methods

Cluster randomised trial

**Outcome measures**

Primary:

- 1) Tinnitus Reaction Questionnaire
- 2) Depression Anxiety Stress Scale (DASS)
- 3) Quality of Life Questionnaire-Brief Version (WHOQOL-BREF)
- 4) Occupational Stress Inventory-Revised (OSI-R)
- 5) VAS (Tinnitus loudness, annoyance caused by tinnitus, control over tinnitus, quality of sleep)

Secondary:

Not reported

**Results**

CBT equivalence with Information only control group

**Associated intervention**

Kaldo 2008: Translated into English and adapted from a shortened version of the Swedish self-help program

**Further notes**

\* From Module 2 onward, participants could choose to work with one optional tool per week of the program, including

3. Amendt-Lyon 2004

**Intervention groups (sample size)**

- 1) Gestalt Therapy

**Assessment content components**

Not reported

**Treatment content components**

- 1) Using the empty chair, I ask her to “slip into the skin of her husband”
- 2) Setting more “generous” boundaries for herself, saying “no” to others instead of always complying and setting priorities for herself
- 3) Two-chair dialogue between the “good enough” and the “strict, over demanding and ambitious” part of her personality
- 4) Defining what is rest and relaxation to her
- 5) “Rehearse” for the upcoming vacation and envisage difficult situations and how she might be able to cope with them satisfactorily
- 6) Using two chairs, we bring two opposing forces in her (holding on to old patterns vs. longing to relax and let go) to the fore
- 7) Allowing herself periods of rest
- 8) Reflect on the personal meaning of [co-occurring issues]
- 9) We explore how she can deliberately take care of herself
- 10) We explore conflict-laden family relationships.
- 11) Suggest that high levels of stress and tension influence tenacious symptoms
- 12) "Rehearse" what she imagines will occur in the near future, we venture to explore a new mindset for her upcoming vacation in her native country: can it be "enjoyable work?"
- 13) Establishing negative emotions
- 14) Sat together in silence to absorb the impact of narrative statements
- 15) Alternative ways to perfectionism of dealing with daily demands are explored through two-chair dialogue between the short-fused patient and the relaxed, composed version of herself

- 16) Acknowledge fears and give space to voice them.
- 17) Understand the relationship between her backache symptoms and ability to listen to her body.
- 18) Take stock of what has been accomplished in therapy and what are the priorities [mid-therapy]
- 19) Role-play voices that have been associated with tinnitus
- 20) Put voices associated with tinnitus into the context of things past and explore personal meanings they have acquired.
- 21) Experiment with tinnitus in the context of situations in which she wants to say “no” or would like to openly resist what she doesn’t want to happen.
- 22) Suggest the patient brings photos of her children’s early years with her to the next session so that we can get a better feel for the atmosphere at home
- 23) Question; does tinnitus prevent her from having to deal with the fear of starting work; of beginning all over again, of proving herself outside the home?
- 24) Enact the tinnitus sound
- 25) We experiment with giving the term “laziness” both a secure place in her life (i.e., viewing it as part of two interrelated poles) and a more dignified name
- 26) Attempt to put her impatience with herself into a different, unfamiliar perspective, reminding her that socio-economic adaptation requires much energy, flexibility, patience and time, emotionally and physically
- 27) She would do well to ask herself what is necessary in order for her to adjust to her new circumstances, instead of treating herself like a machine that has to function perfectly
- 28) Summarise what has been accomplished in therapy and reflect on what remains to be done [end of therapy]

#### **Description of sample**

Case:

- 1) Recent onset (2 months)
- 2) Unilateral tinnitus

#### **Comorbid mental health problems**

- 1) Adjustment disorder
- 2) Depressed mood

#### **Delivering clinician**

Gestalt Psychotherapist

#### **Research methods**

Case study

#### **Outcome measures**

Not reported

#### **Results**

Patient was symptom free and more relaxed with herself, her family and friends; she was motivated to complete the studies that she had interrupted and she was re-entering her career confidently.

#### **Associated intervention**

None

#### **Further notes**

<b>Intervention groups (sample size)</b>
1) CBT (1 patient)
<b>Assessment content components</b>
1) Functional analysis: Cognitive Behavioural Assessment 2) Psychological assessment by means of questionnaires 3) History 4) VAS (annoyance, loudness, general well-being) 5) Tinnitus Effect Questionnaire (TEQ; short version)
<b>Treatment content components</b>
1) Reassured about the nature of her condition 2) Encouraged to express her feelings and thoughts about the background of her problems 3) Develop a trusting relationship 4) The first step of an applied relaxation programme. This was presented in vivo and was given a relaxation tape 5) Homework was reviewed 6) The rationale for the continued relaxation exercises was explained to the patient and the second step was implemented in vivo (relaxation without tension). A positive mental picture was used as imaginary technique during this relaxation training. It was important to choose a picture that was separate from her tinnitus problems, but included as many senses as possible (e.g., smell, vision and hearing). 7) [Discuss] how she wanted doctors to behave and what she could do to enhance the quality of these encounters. 8) The next step of the relaxation programme was presented in vivo 9) A discussion of her achievements up to this point in terms of homework 10) Relaxation (cue-controlled) and also to practice this skill during the session 11) Presenting and testing a cognitive-behavioural model for her distress (vicious circle) 12) Assign a certain time each day as worry time, with the aim of controlling the intrusive thoughts. 13) The patient was given a written statement that her experiences were not to be judged as fantasies and that she should accept that there was no 100% cure for her tinnitus as she definitely said no to surgery. Further, it was made clear that it is possible to experience less distress concerning the tinnitus and decrease the time devoted to thinking about it 14) The role of attention and the ability to switch attention was also included in treatment 15) As a further validation and behavioural test of her ability to relax, a tape of wave sounds (Tinnitus Surf Sounds issued by the British Tinnitus Association) was presented to the patient 16) Preparing her for a medical consultation at the clinic (which is a part of the regular management of tinnitus patients at the clinic). It was agreed that the therapist should consult the doctor 17) Self-efficacy was a useful concept when discussing how she could develop skills necessary for handling other medical consultations. 18) Follow-up session: the treatment was discussed and the possible benefits derived.
<b>Description of sample</b>
Case:

- 1) 66-year-old retired female.
- 2) She had impaired hearing in the right ear dating 30 years back

#### Baseline pre-assessment/treatment outcome measures

	CBT	
	Mean	SD
VAS annoyance	*	*
VAS loudness	*	*
VAS general wellbeing	*	*
TEQ – short version	80	n/a

\* Not reported (line graph only)

#### Comorbid mental health problems

[The patient] had a long history of psychiatric treatment and was currently using neuroleptics, benzodiazepines and medication for her sleep and was under surveillance for these conditions.

#### Delivering clinician

Clinical Psychologist \*\*

#### Research methods

Case study

#### Outcome measures

Primary:

- 1) VAS (annoyance, loudness, general well-being)
- 2) Tinnitus Effect Questionnaire (TEQ; short version)

Secondary:

Not reported

#### Results

No clear effects were found on these measures, although loudness showed a slight tendency to decrease. The patient also completed the TEQ at pretreatment and post-treatment on which no benefits were found.

#### Associated intervention

#### Further notes

\*\* Based on personal knowledge of the first author and the inference that the first author was the delivering clinician

Relaxation programme (Lindberg et al., 1988)

Further results: Verbal report and an in-session behavioural test showed positive effects of treatment, but were not mirrored in the self-reported results.

#### 5. Andersson and Larsen 1997

#### Intervention groups (sample size)

- 1) CBT (1 patient)

#### Assessment content components

- 1) Functional analysis
- 2) Identification of difficult situations in which the patient experienced emotional stress
- 3) Psychological assessment by means of questionnaires

- 4) TEQ (short version)
- 5) Frequency of tinnitus attacks
- 6) Ability to cope with tinnitus attacks
- 7) Ability to handle stressful situations

#### **Treatment content components**

- 1) Applied relaxation
- 2) Stress-management
- 3) Social skills training
- 4) Cognitive distraction
- 5) Information about the nature of tinnitus
- 6) In-vivo training of rapid relaxation in a situation that provokes emotional distress
- 7) Imaginary techniques in situations that provoke emotional distress. These consisted of focusing on the tinnitus and reformulating it as something controllable
- 8) Questioning negative thoughts and generating alternative interpretations

#### **Description of sample**

Case:

- 1) Hearing loss resulting from otosclerosis
- 2) [(1)] present for 12 years
- 3) [The patient] had been successfully fitted with bilateral hearing aids [16 years prior to treatment] in 1981

Baseline pre-assessment/treatment outcome measures

	CBT	
	Mean	SD
TEQ	107	n/a

#### **Comorbid mental health problems**

Psychological assessment by means of questionnaires showed normal levels of depression and anxiety

#### **Delivering clinician**

Clinical Psychologist\*

#### **Research methods**

Case study

#### **Outcome measures**

Primary:

- 1) TEQ (short version)

Secondary:

- 1) Frequency of tinnitus attacks
- 2) Ability to cope with tinnitus attacks
- 3) Ability to handle stressful situations

#### **Results**

Results assessed at pre- and post-treatment showed decreased annoyance and increased coping with tinnitus. The attacks became less frequent and easier to handle.

#### **Associated intervention**

#### **Further notes**

\* Based on personal knowledge of the first author and the inference that the first



author was the delivering clinician

6. Andersson and Vretblad 2001

**Intervention groups (sample size)**

- 1) Cognitive Behavioural Therapy (189 patients) \*

**Assessment content components**

- 1) Analysis of influencing factors (behaviour analysis)
- 2) A structured interview protocol was adapted to fit a self-report format ("Questions About Your Tinnitus")
- 3) Tinnitus Reaction Questionnaire
- 4) Klockhoff and Lindblom rating scale into 3 levels of distress

**Treatment content components**

- 1) Homework assignments
- 2) Rationale is presented for each treatment component
- 3) The outline of each session and the treatment as a whole are negotiated
- 4) It is made clear to the patient that work is required for the therapy to have any effect
- 5) Practicing and teaching applied relaxation (in 4 stages including positive imagery)
- 6) The development of coping strategies (e.g., sound enrichment and exercise)
- 7) Disputing negative beliefs about tinnitus
- 8) Practicing concentration and distraction skills
- 9) Advice regarding sleep
- 10) Advice is given to prevent relapse

**Description of sample**

Inclusion/ exclusion criteria:

Not reported

Baseline pre-assessment/treatment outcome measures

	CBT	
	Mean	SD
TRQ	34.5	3.9

**Comorbid mental health problems**

- 1) Depression n=104 (76%)
- 2) Anxiety n=86 (61%)

**Delivering clinician**

Clinical Psychologist

**Research methods**

Longitudinal follow-up of consecutive patients

**Outcome measures**

Primary:

- 1) A structured interview protocol was adapted to fit a self-report format ("Questions About Your Tinnitus")
- 2) Tinnitus Reaction Questionnaire
- 3) Klockhoff and Lindblom rating scale into 3 levels of distress

Secondary:

Not reported

**Results**

Tolerance of tinnitus increased over time overall after receiving CBT. For patients who had received cognitive behavioural therapy, there was a reduction in tinnitus-related distress. Further, an open-ended question showed that the benefits from treatment outnumbered the deficits.

#### **Associated intervention**

#### **Further notes**

\* Sample size: 146 patients that were followed-up responded with usable data

7. Andersson 2004

#### **Intervention groups (sample size)**

- 1) [Guided] Self-Help Treatment for Tinnitus Presented via the Internet (1 patient)

#### **Assessment content components**

- 1) Case Formulation: Structured clinical interview
- 2) Tinnitus Reaction Questionnaire
- 3) HADS
- 4) ISI

#### **Treatment content components**

- 1) Treatment rationale and information
- 2) Applied relaxation: Progressive relaxation
- 3) Applied relaxation: Short progressive relaxation
- 4) Applied relaxation: Cue-controlled relaxation
- 5) Applied relaxation: Rapid relaxation
- 6) Positive imagery
- 7) Sound enrichment by means of external sounds
- 8) Hearing tactics and advice regarding noise sensitivity
- 9) Modification of negative thoughts and beliefs
- 10) Behavioural sleep management
- 11) Advice regarding concentration difficulties
- 12) Exercises of concentration (mindfulness)
- 13) Exposure to tinnitus
- 14) Advice regarding physical activity
- 15) Relapse prevention

#### **Description of sample**

Case:

- 1) Duration: (1.5 years)
- 2) Localisation: (Both ears)
- 3) 43 years of age
- 4) Female

	Self-Help Treatment for Tinnitus Presented via the Internet	
	Mean	SD
TRQ	32	n/a
HADS	11	n/a
ISI	14	n/a

#### **Comorbid mental health problems**

History of depression

<b>Delivering clinician</b>
Not reported
<b>Research methods</b>
Case study
<b>Outcome measures</b>
Primary:
1) Tinnitus Reaction Questionnaire
2) HADS
3) ISI
Secondary:
Not reported
<b>Results</b>
The treatment was successful with reductions of tinnitus-related annoyance and anxious and depressive mood. For ISI, scores indicat[ed] that [the patient] still had some problems with sleep
<b>Associated intervention</b>
Andersson, G., Strömgren, T., Ström, T., & Lyttkens, L. (2002). Randomised controlled trial of Internet-based cognitive behavior therapy for distress associated with tinnitus. <i>Psychosomatic Medicine</i> , 64, 810–816.
<b>Further notes</b>
Discusses relaxation as a most important part of their CBT treatment

#### 8. Andersson 2005

<b>Intervention groups (sample size)</b>
16) CBT (12 patients)
17) Waiting list control (11 patients)
<b>Assessment content components</b>
1) Tinnitus Reaction Questionnaire
2) HADS
3) ASI
4) VAS (annoyance, loudness, quality of sleep)
<b>Treatment content components</b>
1) Information about tinnitus
2) Applied relaxation
3) Cognitive restructuring
4) Behavioural activation
5) Positive imagery
6) Sound enrichment (by means of environmental sounds rather than noise generators)
7) Exposure to tinnitus
8) Advice regarding hyperacusis
9) Hearing tactics
10) Relapse prevention.
11) Homework assignments were included in all sessions
12) Comments on assignments were made at the beginning of each session.
<b>Description of sample</b>
Inclusion:
1) [ $>$ ]65 years (across conditions mean=70.1, SD=3.90)

- 2) Patients should have problems with their tinnitus (for example tinnitus is audible in many acoustic environments, disturbs sleep, or is a dominating problem that affects quality of life)
- 3) Duration of tinnitus for at least six months. (across conditions mean=13 years, SD=12.5)
- 4) Be able to come to sessions, which included walking the stairs to the therapy room

Exclusion:

- 1) Received previous psychological treatment for tinnitus
- 2) Had medical reasons for not taking part in the treatment

Baseline pre-assessment/treatment outcome measures

	CBT		Waiting-list control	
	Mean	SD	Mean	SD
TRQ	16.9	13.5	29.4	18.0
HADS depression	4.0	3.4	6.1	4.1
HADS anxiety	3.4	1.8	6.5	4.0
ASI	12.7	6.0	18.9	10.0

#### Comorbid mental health problems

Exclusion:

- 1) Had a depression score above 22 on the Beck Depression Inventory (Beck et al, 1961),
- 2) A score above 2 on item 2 (hopelessness) and item 9 (suicidal ideation)

#### Delivering clinician

Therapists

#### Research methods

RCT

#### Outcome measures

Primary:

- 1) Tinnitus Reaction Questionnaire

Secondary:

- 1) HADS
- 2) ASI
- 3) VAS (annoyance, loudness, quality of sleep)

#### Results

Results showed statistically significant reductions of tinnitus-related distress. Thus, CBT was better than no treatment.

#### Associated intervention

#### Further notes

Described elsewhere:

(1) Andersson, G. 2001. The role of psychology in managing tinnitus: a cognitive behavioural approach. *Sem Hear*, 22, 65-76.

9. Andersson 2002

#### Intervention groups (sample size)

- 1) Internet delivered CBT (53 patients)
- 2) Waiting list control (64 patients)

#### **Assessment content components**

- 1) Tinnitus Reaction Questionnaire
- 2) HADS – anxiety subscale
- 3) HADS – depression subscale
- 4) ASI
- 5) VAS (loudness, annoyance, control over tinnitus, quality of sleep)

#### **Treatment content components**

- 1) Treatment rationale
- 2) The first step of applied relaxation (tense-relax)
- 3) The second week continued the applied relaxation (relax only)
- 4) Positive imagery
- 5) Sound enrichment by means of external sounds
- 6) Hearing tactics (optional)
- 7) Advice regarding noise sensitivity (optional)
- 8) Controlled breathing (as part of applied relaxation)
- 9) Cognitive therapy, which was adjusted to deal with negative thoughts and beliefs relating to tinnitus.
- 10) Differential relaxation
- 11) Behavioural sleep management
- 12) Rapid relaxation
- 13) Advice regarding concentration difficulties
- 14) Exercises of concentration (mindfulness)
- 15) Advice on physical activity
- 16) Relapse prevention
- 17) Summary of the contents of the treatment program
- 18) Homework assignments and weekly reports on webpage \*
- 19) Participants were encouraged to ask questions regarding the treatment
- 20) When submitting a week's report, the participant was sent an encouraging E-mail with the instruction to go to the next module

#### **Description of sample**

Inclusion:

- 1) Duration of tinnitus of at least 6 months (CBT=6.2, Waiting list=6.4)
- 2) Having seen a general practitioner (or ear, nose, and throat physician) on account of tinnitus
- 3) Age between 18 and 70 years (CBT= 48.5, Waiting list= 47.2)
- 4) Tinnitus a severe problem

Baseline pre-assessment/treatment outcome measures

	CBT		Waiting list	
	Mean	SD	Mean	SD
TRQ	42.6	21.6	38.2	24.0
ASI	20.6	10.2	19.1	12.7
HADS anxiety	7.9	4.6	7.8	4.9
HADS depression	6.9	4.0	6.2	3.8
VAS loudness	6.3	1.7	6.4	2.0
VAS annoyance	6.4	1.9	5.5	2.2

VAS control	3.9	2.5	3.8	3.0
VAS sleep quality	6.5	2.7	6.4	2.2

#### **Comorbid mental health problems**

- 1) 23% (assumed across conditions n=27) prevalence of anxiety (HADS)
- 2) 15% (assumed across conditions n=18) prevalence of depression (HADS)
- 3) Sleep problems (CBT=60%, Waiting-list 65%)

#### **Delivering clinician**

Clinical psychologist \*

#### **Research methods**

RCT

#### **Outcome measures**

Primary:

- 1) Tinnitus Reaction Questionnaire

Secondary:

- 1) HADS – anxiety subscale
- 2) HADS – depression subscale
- 3) ASI
- 4) VAS (loudness, annoyance, control over tinnitus, quality of sleep)

#### **Results**

For the treatment group in the randomized controlled phase, statistically significant differences in change scores were found on all measures except for quality of sleep ratings

#### **Associated intervention**

#### **Further notes**

\* Based on personal knowledge of the first author and the inference that the first author was the delivering clinician

10. Andersson 2001

#### **Intervention groups (sample size)**

- 1) Cognitive Behavioural Therapy (n/a)

#### **Assessment content components**

- 1) Structured Tinnitus Interview
- 2) Functional analysis of influencing factors on tinnitus annoyance should be conducted. This includes medical as well as psychosocial factors
- 3) Tinnitus Reaction Questionnaire
- 4) Tinnitus Handicap Inventory
- 5) BDI
- 6) HADS
- 7) ASI
- 8) Tinnitus adapted version of the Family Support Scale of the West Haven-Yale Multi- dimensional Pain Inventory
- 9) Adult Attachment Scale
- 10) VAS (e.g. tinnitus annoyance)
- 11) Digit-symbol test
- 12) Letter cancellation test

#### **Treatment content components**

**CBT:**

- 1) Advice regarding hearing loss
- 2) Remedy of this [hearing loss] as far as possible may be a part of the treatment.
- 3) This includes referral for the fitting of hearing aids and behavioural advice in the form of hearing tactics not only for the individual but also directed to people close to the patient
- 4) Use of environmental sound enrichment strategies for facilitation of habituation to tinnitus [is] important
- 5) Advice and analysis of fluctuations in tinnitus
- 6) Risk associated with trying to mask the tinnitus.
- 7) Applied relaxation is a method by which the patient is gradually taught to quickly relax and to use self control over physical and mental sensations (e.g., stress).
- 8) Imagery techniques are introduced
- 9) Cognitive restructuring of thoughts and beliefs. The patient is helped to identify the content of his thoughts and is taught ways to challenge or control those thoughts usually described as unhelpful or even inaccurate.
- 10) Attention diversion techniques
- 11) [Advise] Deal with adverse [emotional] reactions to silence (when this is a problem [i.e....] fear an avoidance, panic-like attacks).
- 12) Some patients develop fear for noise of any kind (e.g., hyperacusis) and in these cases it is important to gradually expose individuals to environmental sounds.
- 13) Problems with concentration are often a source of great distress for the tinnitus sufferer. Although not well developed for tinnitus, methods for improving concentration can be used in the treatment.
- 14) Sleep hygiene, bedtime
- 15) Worry-time restriction
- 16) Relapse prevention includes a proper discussion of risk factors for developing more severe tinnitus and hearing loss, and devising a plan for what to do should the tinnitus worsen. This plan can include returning to the relaxation training and to the sound enrichment strategies.

**Psychodynamic therapy:**

- 1) Deals with underlying conflicts and relational problems in the patient's life (often analysed in terms of transference and countertransference).

**Description of sample**

n/a

**Comorbid mental health problems**

n/a

**Delivering clinician**

- 1) Psychologist
- 2) Physician (ENT)
- 3) Audiologic scientists

**Research methods**

Overview – descriptive review

**Outcome measures**

n/a

**Results**

n/a

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**Associated intervention**

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**Further notes**

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11. Andersson and Kaldo 2006

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**Intervention groups (sample size)**

- 1) Cognitive Behavioural Therapy with Applied Relaxation (n/a)

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**Assessment content components**

- 1) Structured interview of tinnitus problems
- 2) Related problems such as hearing impairment and noise sensitivity
- 3) History
- 4) Check of previous treatments and consultations for tinnitus and other conditions
- 5) Assessment of available time needed to take part in the treatment
- 6) Questionnaires given as homework assignments, including daily diary[/VAS] ratings for at least 1 week
- 7) Rationale for the treatment
- 8) Goal setting and decision regarding type of treatment (i.e., group, individual, or Internet)

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**Treatment content components**

- 1) Feedback on functional analysis, home registrations, and questionnaires
  - 2) Repetition of treatment rationale and rationale for applied relaxation
  - 3) In-session training of [...] Progressive relaxation (tense and release body parts)
  - 4) Progressive relaxation twice daily as homework for the next week
  - 5) Plan, practice and prepare for problems
  - 6) Assessment of treatment credibility to bring back to next session
  - 7) Review of homework and feedback
  - 8) Tinnitus and environmental sounds
  - 9) Use of environmental "sound enrichment" strategies for facilitation of habituation to tinnitus (this may include tapes or CDs, but more importantly advice and analysis of fluctuations in tinnitus and the risk associated with trying to mask, i.e., cover the tinnitus).
  - 10) The effect of using sounds to cope with tinnitus is discussed, and the cognitive aspects of masking are covered, e.g., how masking of tinnitus and attention may interact)
  - 11) In-session training of release-only relaxation without tension
  - 12) Instruction on how to use imagery techniques and in vivo presentation
  - 13) Release-only relaxation including imagery given as homework for the next week (2 times per day)
  - 14) Registration of environmental sounds as homework
  - 15) Advice regarding hearing loss and remedy of this as far as possible. This includes not only referral for the fitting of hearing aid(s), but also behavioural advice in the form of "hearing tactics"\*. These are not only for the individual but also directed to the people close to the patient.
  - 16) Sleep management advice given when needed (may result in extra session; see McKenna, 2000)\*\*
  - 17) Positive imagery
  - 18) In-session training of cue-controlled relaxation (controlled breathing).
-



- 19) Cue-controlled relaxation as homework (2-5 times daily)
  - 20) Cognitive aspects of tinnitus
  - 21) Discussion of thoughts and beliefs associated with tinnitus and presentation of a model for changing maladaptive thoughts and beliefs when present
  - 22) Emotional reactions are also focused, especially fear and avoidance in relation to tinnitus.
  - 23) In-session training of Rapid relaxation in everyday situations (5-10 times per day)
  - 24) Rapid relaxation given as homework
  - 25) Management of hyperacusis, including gradual exposure to everyday sounds
  - 26) Attention-diversion techniques
  - 27) Reinterpretation of tinnitus
  - 28) Attention-shifting exercises
  - 29) Exposure to tinnitus/quiet environments
  - 30) Further practice of rapid relaxation in more difficult and stressful situations.
  - 31) Rapid relaxation, exposure, and cognitive tasks given as homework
  - 32) Exercise (graded, e.g., walking)
  - 33) Relapse prevention advice regarding likely lapses in resistance toward the intrusive effects of tinnitus, as well as to prevent more permanent relapses
  - 34) Exercise given as homework
  - 35) Questionnaires and scheduling of follow-up appointment
- \*\*\*

#### **Description of sample**

n/a

#### **Comorbid mental health problems**

- 1) Applied relaxation should not be used when there is a major clinical depression with signs of psychomotor retardation, or when a patient is on certain medications (e.g. asthma)

#### **Delivering clinician**

Psychologist

#### **Research methods**

Overview of protocol

#### **Outcome measures**

n/a

#### **Results**

n/a

#### **Associated intervention**

#### **Further notes**

The application of CBT for tinnitus follows standard methods developed for other problems such as anxiety and pain (Hawton et al 1989; Philips and Rachman, 1996)

\* (Andersson, 2000)

\*\* Optional component

\*\*\* And other components given when indicated

<b>Intervention groups (sample size)</b>		
1) Music therapy (146 patients) 2) Counselling (144 patients)		
<b>Assessment content components</b>		
1) Structured Tinnitus Interview 2) HADS 3) Tinnitus Questionnaire		
<b>Treatment content components</b>		
Counselling control: <ol style="list-style-type: none"> <li>1) A cognitive model of tinnitus based on neuroscientific principles should be established.</li> <li>2) The counselling then targeted at a reclassification of tinnitus to a category of neutral, impartial signals.</li> <li>3) Provide patients with key self-management strategies enabling them to cope with their tinnitus percept.</li> </ol>		
<b>Description of sample</b>		
Inclusion: <ol style="list-style-type: none"> <li>1) Clinical diagnosis of chronic tinnitus persisting for a minimum of 6 months</li> <li>2) Adults, aged 18 years or over</li> <li>3) Patients are able to understand, read and speak German fluently</li> <li>4) Patients are able to give written informed consent</li> <li>5) Constant tinnitus (no interruptions &gt; 1 hour</li> <li>6) 6 months before admission)</li> <li>7) Tinnitus with determinable center frequency “→” tinnitus is musically educible either as “tonal” (sinus tone: e.g. beeping, whistling) or “noisiform” (broadband or narrow-band noise; e.g. hissing, whooshing)</li> </ol>		
Exclusion: <ol style="list-style-type: none"> <li>1) Tinnitus related to anatomic lesions of the ear, to retrocochlear lesions or to cochlear implantation</li> <li>2) Tinnitus is concomitant symptom of a known systemic disease (such as Ménière's disease, vestibular schwannoma, endolymphatic hydrops)</li> <li>3) Status following craniocerebral trauma, cervicogenic or stomatognathogenic tinnitus</li> <li>4) Tinnitus is neither noisiform nor tonal (krieking, clacking, rumbling) or has different sound components or is pulsatile, intermittend or non-persistent</li> <li>5) Severe hearing impairment (greater than 60 dB HL in the region of the center tinnitus frequency)</li> <li>6) Severe hyperacusis</li> <li>7) One or two-sided deafness</li> <li>8) History of severe ischemic disorder (previous stoke, previous heart attack, peripheral arterial occlusion disease)</li> <li>9) Inability to discontinue drugs known to be associated with tinnitus (high-dose aspirin, quinidine, aminoglycosides) or psychotropic medication before entry into the study</li> <li>10) Patients are not able to understand, read and speak German fluently</li> <li>11) Patients are not able to give written informed consent</li> </ol>		
Baseline pre-assessment/treatment outcome measures		
	Music therapy	Counselling

	Mean	SD	Mean	SD
HADS anxiety	5.5	3.2	5.6	3.6
HADS depression	5.3	3.8	5.0	3.7
TQ	33.0	14.8	32.9	13.4

### **Comorbid mental health problems**

Exclusion:

- 1) Clinical diagnosis of severe mental disorder or psychiatric or neurological disease (psychosis, epilepsy, Parkinson's disease, dementia, alcohol or drug abuse)

### **Delivering clinician**

Psychologist

### **Research methods**

RCT

### **Outcome measures**

Primary:

- 1) Tinnitus Questionnaire

Secondary:

None

### **Results**

Both treatment groups achieved a statistically relevant reduction in TQ scores \*

### **Associated intervention**

### **Further notes**

\* Though 66% of patients in the music therapy group attained a clinically meaningful improvement (not clearly defined) compared to 33% in the counselling group

## 13. Cima 2012

### **Intervention groups (sample size)**

- 1) Stepped care approach based on CBT (245 patients)
- 2) Usual care (247 patients)

### **Assessment content components**

- 1) Intake psychology: extensive tinnitus specific diagnostic anamnesis
- 2) Intake psychology: general psychological diagnostic anamnesis
- 3) Health Utilities Index (HUI mark 3)
- 4) Tinnitus Questionnaire
- 5) Tinnitus Handicap Inventory (THI)
- 6) HADS
- 7) Tinnitus Catastrophising Scale (an adapted version of the pain catastrophising scale)
- 8) Fear of Tinnitus Questionnaire (FTQ)

### **Treatment content components**

Step 1

- 1) Tinnitus retraining therapy counselling elements
- 2) Extensive explanation of neurophysiological model
- 3) Fear avoidance discussion
- 4) General information about ('step 2') group care is provided
- 5) Group discussion and remaining questions answered

Step 2 (group and individual format)

- 6) Cognitive behaviour therapy
- 7) Psychoeducation
- 8) Cognitive restructuring
- 9) Exposure techniques
- 10) Mindfulness-based elements
- 11) Stress relief
- 12) Attention redirecting techniques by means of movement therapy
- 13) Attention redirecting techniques by means of applied relaxation

### **Description of sample**

Inclusion:

- 1) Adult patients referred to our centre with a primary complaint of subjective tinnitus were eligible for inclusion

Exclusion:

- 1) Patients who were unable to read and write in Dutch
- 2) Had health issues that impaired attendance or prevented participation (e.g., terminal illness or physical disability)
- 3) Had undergone treatment at our centre within 5 years before trial enrolment.
- 4) Pathological changes that needed immediate medical care

Baseline pre-assessment/treatment outcome measures

	Usual care		Stepped care approach based on CBT	
	Mean	SD	Mean	SD
TQ	48.78	19.23	49.32	18.49
THI	38.65	23.19	39.27	22.60
HUI mark 3	0.641	0.295	0.629	0.283
HADS	11.79	8.03	12.60	8.05
Tinnitus Catastrophising Scale	21.36	12.57	20.86	11.81
Fear of Tinnitus Questionnaire	7.31	3.65	7.19	3.54

### **Comorbid mental health problems**

Not reported (HADS: CBT=12.60, UC=11.79)

### **Delivering clinician**

Step 1

- 1) Educational session: Psychology assistant
- 2) Intake Psychology: Clinical psychologist formulates and plans with all other professionals in team meeting

Step 2

Group treatments: \*

- 3) Clinical psychologist
- 4) Movement therapist
- 5) Clinical physicist in audiology

Individual trajectory if group treatment is contraindicated:

6) Clinical psychologist 7) Movement therapist
<b>Research methods</b> RCT
<b>Outcome measures</b> Primary: 1) Health Utilities Index (HUI mark 3) 2) Tinnitus Questionnaire 3) Tinnitus Handicap Inventory (THI)  Secondary: 1) HADS 2) Tinnitus Catastrophising Scale (an adapted version of the pain catastrophising scale) 3) Fear of Tinnitus Questionnaire (FTQ)
<b>Results</b> Stepped care approach based on CBT superiority
<b>Associated intervention</b> None
<b>Further notes</b> * Three Step 2 group treatment clinicians are listed by authors without role clearly delineated 1) Physical therapist 2) Social worker 3) Speech therapist

#### 14. Degive 2006

<b>Intervention groups (sample size)</b> 1) Joint Medico-Psychological Consultation (89 patients)
<b>Assessment content components</b> 1) Assuming a calm attitude 2) Pay careful attention to the patients' statements 3) The patient should never be interrupted 4) During the consultation an ENT and a psychosocial history are requested from the patient 5) The patient is encouraged to ask all questions that come to his mind 6) Describe the fears he/she may have about the evolution of his/her tinnitus, from either a psychological or an ENT point of view. 7) Both therapists are concerned by all aspects of the history 8) Try to provide clear answers 9) Interactions, agreements and questions should be made between the patient and the ENT doctor, the patient and the psychologist and between both therapists 10) Explain which the currently recognized mechanisms originating this symptom are * 11) Helping [the patient to] perceive the unveiled causes of their intolerance* 12) Acknowledge a latent depressive state * 13) Offer the patient the opportunity to fix other appointments at short and medium term to give them the opportunity to reflect and reconsider their thoughts and feelings, integrate the information received, assess the usefulness

of what was said and report on the evolution.
<b>Treatment content components</b> n/a
<b>Description of sample</b> Inclusion: 1) Patient's visiting [the author's] clinic who did not accept their tinnitus or focussed on tinnitus annoyance  Exclusion: 1) Objective causes of tinnitus (i.e. retrocochlear disease)
<b>Comorbid mental health problems</b> Not reported
<b>Delivering clinician</b> 1) ENT Doctor 2) Psychologist
<b>Research methods</b> Non-controlled retrospective study
<b>Outcome measures</b> Primary: Whether they had consulted another doctor after the JMPC consultation. This last point was viewed as a positive result because it suggested that the patient had accepted and was able to cope with the problem  Secondary: None
<b>Results</b> 71% had not consulted another doctor after the JMPC consultation. The percentage was higher (85%) among the patients who came to the consultation during the initial stages of the disorder and accepted that no treatment existed. Three percent considered that the JMPC consultation was inappropriate and did not help them to cope with tinnitus. These patients continued to consult other doctors, searching for a treatment.
<b>Associated intervention</b>
<b>Further notes</b> Authors assume no treatment exists in paper  * Treatment components 10-12 need not all be applied to together, only one is required.

15) Dineen 1997

<b>Intervention groups (sample size)</b> 1) Information about tinnitus Group I (28 patients) 2) Information plus Long-term white noise (LTWN) stimulation Group ID (20 patients) 3) Information plus Relaxation training Group IR (28 patients) 4) Information plus LTWN stimulation plus Relaxation training Group IDR (20 patients)
<b>Assessment content components</b>

- 1) History of Tinnitus questionnaire
- 2) Perception of Tinnitus Scales
- 3) Derogatis Stress Profile
- 4) The Ways of Coping Check List Revised (WCCL-R)
- 5) Tinnitus Reaction Questionnaire
- 6) VAS (loudness, annoyance, coping, change in awareness)

### **Treatment content components**

Information:

- 1) Information on prevalence of tinnitus
- 2) Function of the auditory system
- 3) Contemporary theories of tinnitus generation
- 4) Tinnitus related pathologies
- 5) Pharmacological and dietary influences on tinnitus
- 6) Psychology of adaptation to tinnitus
- 7) Role of hearing aids and masking strategies in tinnitus management
- 8) Management of sleep problems
- 9) The influence of stress on tinnitus perception
- 10) Each subject received a 60 page manual: 'Tinnitus: How to live with it' (Dineen et al., 1995), which gave written details of the topics.

Plus Relaxation:

Not reported

### **Description of sample**

Exclusion:

- 1) Previously been referred for psychiatric treatment or psychological counselling in relation to their tinnitus

Baseline pre-assessment/treatment outcome measures

	I		ID		IR		IDR	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
TRQ	28.3	23.4	29.0	26.7	24.2	19.4	33.9	28.0
VAS loudness	6.1	2.1	6.1	3.0	5.3	0.5	5.4	2.0
VAS annoyance	6.0	2.3	6.2	3.1	5.0	2.5	5.8	2.9
VAS coping	7.4	7.4	7.0	3.2	7.7	1.8	6.1	2.9

### **Comorbid mental health problems**

Not reported

### **Delivering clinician**

Audiologists

### **Research methods**

Two or more single arm study

### **Outcome measures**

Primary:

- 1) Tinnitus Reaction Questionnaire
- 2) VAS (loudness, annoyance, coping, change in awareness)

Secondary:

Not reported

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**Results**

For the majority of subjects, the tinnitus was less annoying and less distressing three months after attending tinnitus management training. However, the majority of subjects reported no change in tinnitus loudness, or tinnitus awareness and no change in their tinnitus coping ability. Subjects receiving low level white noise stimulation reported greater improvement in tinnitus coping ability than subjects who received information and relaxation training, although there was no associated improvement in tinnitus awareness.

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**Associated intervention**

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**Further notes**

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16) Gans 2012

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**Intervention groups (sample size)**

- 1) Mindfulness based tinnitus stress reduction (10 patients)

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**Assessment content components**

- 1) Tinnitus Handicap Inventory
- 2) VAS (annoyance, sleep disruption, depression and concentration) and perceived tinnitus pitch and loudness judgements.
- 3) Percent of Awareness Scale (PAS)
- 4) SF-36 Health Survey (SF-36)
- 5) Symptom Checklist-90-Revised (SCL-90-R)
- 6) HADS
- 7) Five-Facet Mindfulness Questionnaire (FFMQ)

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**Treatment content components**

- 1) Psychoeducation related to the often co-occurring disorders (e.g., sleep disorder, anxiety, depression) common in people with tinnitus.
  - 2) Additional class-time was focused on guided mindfulness practices emphasizing awareness of sound and tinnitus perception
  - 3) Education about sleep and sleep hygiene
  - 4) Explaining the circular and complex connection between stress in daily life and tinnitus exacerbation
  - 5) Increasing relaxation and awareness skills
  - 6) The additional class time was added to improve the participant's understanding of the relationship among tinnitus and the comorbid symptoms.
  - 7) Foster the recognition of early warning signs of tinnitus exacerbation
  - 8) Teaching skills to come back to present
  - 9) Moment-by-moment awareness whenever the mind starts to dwell in the past or future
  - 10) Teaching how to access inner resources through the acquisition of mindfulness skills.
  - 11) In class and home-practice mindfulness exercises emphasized becoming aware of the tinnitus sensation, observing it with a certain spaciousness and affectionate curiosity instead of reacting in habitual ways.
  - 12) Participants were instructed to practice mindfulness throughout their day when tinnitus is perceived to be loud and troubling, including while eating meals, before sleeping, during social interactions, and during periods of quiet.
  - 13) In accordance with the non-goal setting that is inherent in mindfulness, participants were encouraged to let go of decreasing tinnitus as the "goal" of
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the program. Instead, participants were encouraged to develop a mindful outlook on their lives as a whole.

- 14) Between sessions, participants were asked to practice at home for 30 min/day, 6 days/week, aided by meditation CDs made by the course instructor.
- 15) At the start of the program, each participant was supplied with a copy of Full Catastrophe Living (Kabat-Zinn 2005), and a participant manual. Between classes, participants were instructed to enhance their participation through readings from the course materials.
- 16) During [a] day-long retreat, participants experienced various meditations (i.e., awareness of the breath sitting walking meditations)
- 17) Bringing moment-to-moment awareness to body sensations, thoughts, and emotions as they arise.
- 18) A group discussion of participants' individual experience with the practice, where they were encouraged to reflect on what they had learned.

### Description of sample

Inclusion:

- 1) Age  $\geq 18$  years
- 2) English-speaking
- 3) Duration of subjective chronic tinnitus  $\geq 6$  months
- 4) Moderate to strong tinnitus annoyance (minimum THI score of 20 per chart review)

Exclusion:

- 1) Age  $\leq 18$  years \*
- 2) Non-English-speaking
- 3)  $>40$  dB hearing loss
- 4) Duration of chronic subjective tinnitus  $<6$  months
- 5) Recent (within 3 months) history of alcohol or drug abuse or dependence other than tobacco or caffeine
- 6) No recent (within 3 months) start of new tinnitus treatment
- 7) THI score  $<20$
- 8) Currently undergoing litigation or legal matters related to auditory disorders

Baseline pre-assessment/treatment outcome measures

	Mindfulness	
	Mean	SD
THI	50.63	15.22
Tinnitus VAS	59	24.87
Tinnitus awareness	60	33.7
HADS	15.5	6.46
Five factor mindfulness questionnaire		
Non-judge	28	5.09
Observing	30.13	5.64
Non-reactivity	20.28	4.81
Describe	29.75	5.78
Acting with awareness	28	6.57
SF-36		
Social functioning	39.5	10.35
Mental health	44.8	11.21

Vitality	50.8	9.1
SCL-90-R		
Depression	66.5	12.3
Phobic anxiety	60.1	13.31
Somatisation	63.4	14.75
Anxiety	15.5	12.57

### **Comorbid mental health problems**

Exclusion:

- 1) Severe depression and/or anxiety (as measured by the HADS)
- 2) History of psychotic disorders or dementia

### **Delivering clinician**

Clinical Psychologist

### **Research methods**

Uncontrolled pilot

### **Outcome measures**

Primary:

- 1) Tinnitus Handicap Inventory

Secondary:

- 2) VAS (annoyance, sleep disruption, depression and concentration) and perceived tinnitus pitch and loudness judgements.
- 3) Percent of Awareness Scale (PAS)
- 4) SF-36 Health Survey (SF-36)
- 5) Symptom Checklist-90-Revised (SCL-90-R)
- 6) HADS
- 7) Five-Facet Mindfulness Questionnaire (FFMQ)
- 8) PIFF \*\*

### **Results**

Change scores on study measures all moved in the hypothesized direction, with the exception of negligible change found for the Acting with Awareness factor of mindfulness.

### **Associated intervention**

### **Further notes**

\* Apparent typographical error in original report (inclusion=exclusion criteria) altered here

\*\* The PIFF is a paper-and-pencil qualitative measure created for the purposes of this study. The PIFF asks participants with open ended and directed questions about the MBTSR intervention's usefulness, satisfaction, relevance, applicability, participant satisfaction with the training, and suggestions on how to improve the program.

17) Giraud 1992

### **Intervention groups (sample size)**

- 1) Cognitive and Behavioural program (approximately 125 patients)

### **Assessment content components**

All usual tinnitus case history questions\* are asked:

- 1) Care is taken to specify how long the tinnitus has been bothersome.
- 2) In [what] manner the tinnitus has been bothersome: what was going on at that

time at the personal, work and/or social levels?
3) Work is done to distinguish the individual's perceived difficulties, focusing either on tinnitus, hearing loss or other personal problems
<b>Treatment content components</b>
1) Focus on tinnitus in the stress process
2) Think about what could be done practically to lessen the disturbance of tinnitus
3) Each participant will effect changes in his habits to take control over his tinnitus instead of being controlled by it (the individual either learns about or reflects upon making changes in his personal habits)
<b>Description of sample</b>
Inclusion:
1) Hearing impaired adults
<b>Comorbid mental health problems</b>
Not reported
<b>Delivering clinician</b>
Not reported ***
<b>Research methods</b>
Not reported
<b>Outcome measures</b>
Primary:
1) Participant's feedback
2) Tinnitus Severity Scale ****
Secondary:
None
<b>Results</b>
It can be said that most participants in the program have taken better control of their tinnitus by the end of the intervention and on a long-term basis.
<b>Associated intervention</b>
<b>Further notes</b>
* Clark, J.G., Yanick, P. (1984). <i>Tinnitus and its Management. A Clinical Text for Audiologists</i> . Springfield: CC Thomas.
** There is a summary in French which might report additional or altered components of treatment
*** Program developed by one audiologist and one psychologist and delivered in a multidisciplinary rehabilitation centre
**** The authors proposed the future implementation of the Tinnitus Severity Scale pending translation to French
18) Graul 2008
<b>Intervention groups (sample size)</b>
CBT (179 patients)
<b>Assessment content components</b>
1) Tinnitus Questionnaire

- 2) CES-D
- 3) Complaints List (Beschwerde-Liste (B-L))
- 4) Whiteley Index

#### **Treatment content components**

- 1) Tinnitus counselling addressed issues around the anatomy of the ear,
- 2) The hearing process,
- 3) Models of tinnitus generation,
- 4) Audiometric diagnostics
- 5) Treatment modalities for tinnitus of different aetiologies
- 6) Addressed such issues as psychogenic factors and tinnitus annoyance
- 7) Influence of dysfunctional thoughts
- 8) Awareness,
- 9) The meaning of habituation
- 10) Coping with stress
- 11) Relapse prevention
- 12) Patients were taught to identify internal and external factors influencing tinnitus perception and mood
- 13) Modify dysfunctional thoughts and beliefs
- 14) Shifting awareness to different senses inside and outside their body instead of to the tinnitus
- 15) To confront the tinnitus signal itself in calm situations
- 16) To develop skills in coping with daily stress and symptoms
- 17) Patients wrote daily diaries to record tinnitus perception, tinnitus loudness, tinnitus annoyance, influence on tinnitus, daily mood, daily annoyances, and quality of sleep
- 18) Relaxation therapy (progressive muscle relaxation with guided imagination)
- 19) Problem solving

#### **Description of sample**

Inclusion/ exclusion criteria not reported – consecutive patients attending clinic were recruited

#### **Baseline pre-assessment/treatment outcome measures**

	CBT	
	Mean	SD
TQ	65.65	10.90
CES-D (ADS)	20.98	8.56
Complaints List (B-L)	30.44	12.06
Whiteley Index	5.48	3.36

#### **Comorbid mental health problems**

Affective disorders (72%), insomnia (12.9%), anxiety (8.4%), somatic symptoms (1.2%), miscellaneous (5%)

#### **Delivering clinician**

Report authors\*

#### **Research methods**

Prospective nonrandomised noncontrolled trial

#### **Outcome measures**

Primary:

- 1) Tinnitus Questionnaire
- 2) CES-D
- 3) Complaints List (Beschwerde-Liste (B-L))

#### 4) Whiteley Index

Secondary:  
Not reported

#### **Results**

After discharge, all patients showed improvement on tinnitus-related distress, depression, and somatic complaints for up to 12 months as compared to their condition at admission

#### **Associated intervention**

#### **Further notes**

\* Requires clarification

#### 19) Greimel 2011

#### **Intervention groups (sample size)**

- 1) Psychological assessment, psychoeducation/counselling, psychological treatment

#### **Assessment content components**

- 1) Characteristics of tinnitus
- 2) Progression of tinnitus
- 3) Cognitive emotional evaluation and coping responses to tinnitus
- 4) Psychological impairments related to tinnitus and effects of tinnitus and effects of tinnitus on daily life
- 5) Sources of stress apart from tinnitus
- 6) Operant factors
- 7) Further medical and psychological problems (comorbidity)
- 8) Treatment history
- 9) Treatment expectations
- 10) Disentangle connections between tinnitus and other afflictions
- 11) The patient's view of his/her problem
- 12) The way in which patients interpret the cause of tinnitus

#### **Treatment content components**

Psychoeducation:

- 1) Cover topics like assumptions about the causes of tinnitus
- 2) Give information about exacerbating factors and prognosis
- 3) Give an overview of treatment possibilities
- 4) Patients need to be taught about the relationship between selective attention on tinnitus and its cognitive-emotional and behavioural consequences
- 5) Inform patients that a large number of individuals are not impaired at all and are able to cope effectively with tinnitus.

Psychological treatment:

- 6) A therapeutic rationale has to be developed and offered
- 7) Attention-control techniques – direct attention away from tinnitus
- 8) Cognitive restructuring
- 9) Behaviour modification techniques aim at reducing avoidance behaviour motivated by tinnitus
- 10) Increase adaptive problem solving
- 11) Relaxation (different forms)

#### **Description of sample**

n/a
<b>Comorbid mental health problems</b>
n/a
<b>Delivering clinician</b>
Psychologist (desirable)
<b>Research methods</b>
Overview – book chapter
<b>Outcome measures</b>
Not reported
<b>Results</b>
n/a
<b>Associated intervention</b>
<b>Further notes</b>

20) Henry 1996

<b>Intervention groups (sample size)</b>
<ol style="list-style-type: none"> <li>1) Combined cognitive coping skills and education</li> <li>2) Education</li> <li>3) Waiting-list control</li> </ol> <p>(63 patients commenced treatment. Sample size given per condition only for those completing treatment)</p>
<b>Assessment content components</b>
<ol style="list-style-type: none"> <li>1) Tinnitus Reaction Questionnaire</li> <li>2) Tinnitus Handicap Questionnaire (THQ)</li> <li>3) Tinnitus Effects Questionnaire (TEQ) Emotional Distress</li> <li>4) TEQ Irrational beliefs</li> <li>5) Tinnitus Cognitions Questionnaire (TCQ)</li> <li>6) Tinnitus Coping Strategies Questionnaire (TCSQ) Frequency</li> <li>7) TCSQ Benefits</li> <li>8) Tinnitus Knowledge Questionnaire (TKQ)</li> <li>9) Beck Depression Inventory (BDI)</li> <li>10) Locus of Control of Behavior Scale (LCB)</li> <li>11) Self-Monitoring of Tinnitus (Tinnitus Rating Form; loudness, noticeability, bothersomeness)</li> </ol>
<b>Treatment content components</b>
<p>Cognitive coping skills training plus education: *</p> <ol style="list-style-type: none"> <li>1) It was explained to subjects that often it is a person's reaction to tinnitus, rather than the sound itself which may lead to distress</li> <li>2) Subjects were encouraged to learn to approach the problem of tinnitus in more adaptive and constructive ways, and to regard their reaction to tinnitus as potentially manageable and subject to modification as emphasised</li> <li>3) Attention diversion: subjects were taught to switch back and forth to various stimuli, such as other parts of the body, kinaesthetic cues (heat, muscle tension) external noises, or other external visual stimuli</li> <li>4) Imagery training: Several suggestions were offered of ways to use imagery techniques to transform the tinnitus (e.g., imagine that the sound of tinnitus is not just a sound in your head but imagine it is actually what it sounds like - an</li> </ol>

external source of sound). Imagery techniques involving focusing on a pleasant mental image or even neutral images were demonstrated

- 5) Cognitive Restructuring: techniques to identify and challenge negative thoughts. It was explained that the interpretation of the noises, and the train of thoughts associated with tinnitus might also play an important role in their reaction to the tinnitus. Subjects were instructed in strategies to change distressing, negative thoughts or more rational coping oriented statements, and to use the presence of distressing thoughts as a cue, to employ positive coping statements.
- 6) Subjects were provided with education about tinnitus to ensure thorough knowledge and to resolve any misconceptions
- 7) Each subject received a written treatment manual which covered the attention diversion strategies, imagery techniques, thought management skills and the educational material. They were also supplied with audiocassettes of attention diversion and imagery exercises for use in home practice of the techniques.

#### Education:

- 8) The auditory system, language and speech, and the nature of tinnitus
- 9) Audiological assessment
- 10) Causes of tinnitus
- 11) Theories of tinnitus and medical treatments
- 12) Audiological treatments
- 13) History of tinnitus
- 14) Details of the Australian Tinnitus Association

#### Description of sample

##### Inclusion:

- 1) A primary complaint of chronic tinnitus (i.e" duration greater than six months)
- 2) The tinnitus has been assessed by both an otolaryngologist and an audiologist
- 3) Traditional medical and audiological treatments were not recommended, or had been attempted and had failed
- 4) No provision of a hearing aid, masker or tinnitus suppressive medication within the previous six months
- 5) A demonstrated level of distress associated with tinnitus as indicated by a total score of at least 17 points on the Tinnitus Reaction Questionnaire (Cognitive/Educational mean=43.20 sd=21.19; Education mean=44.85 sd=21.96; Waiting list mean=47.46 sd=21.63)
- 6) Able to read and speak English
- 7) Willing to participate in a research-oriented treatment program

#### Baseline pre-assessment/treatment outcome measures

	Cognitive/Education		Education Alone		Waiting list	
	Mean	SD	Mean	SD	Mean	SD
TRQ	43.20	21.19	44.85	21.96	47.46	21.63
THQ	54.06	18.17	57.39	20.79	59.95	21.43
TEQ-ED	10.20	2.30	10.70	2.77	11.60	2.85
TEQ-IB	8.75	2.40	7.75	1.71	7.50	1.57
TCQ	51.30	19.02	52.00	17.83	39.15	11.27
TCSQ-F	36.00	16.53	34.45	23.24	38.50	25.57
TCSQ-B	35.25	19.86	29.50	26.25	30.15	23.95
TKQ	12.15	5.86	10.20	5.66	9.60	4.34

BDI	13.20	7.84	10.30	9.02	10.85	6.29
LCB	27.00	10.33	28.85	15.24	32.85	9.84
Loudness	2.78	0.91	3.05	0.82	3.06	0.90
Noticeability	2.86	1.03	3.16	0.87	2.84	0.97
Bothersomeness	2.64	0.84	3.04	1.02	2.66	0.95

### **Comorbid mental health problems**

Not reported

### **Delivering clinician**

Clinical Psychologist

### **Research methods**

RCT

### **Outcome measures**

Primary:

- 1) Tinnitus Reaction Questionnaire
- 2) Tinnitus Handicap Questionnaire (THQ)
- 3) Tinnitus Effects Questionnaire (TEQ) Emotional Distress
- 4) TEQ Irrational beliefs
- 5) Tinnitus Cognitions Questionnaire (TCQ)
- 6) Tinnitus Coping Strategies Questionnaire (TCSQ) Frequency
- 7) TCSQ Benefits
- 8) Tinnitus Knowledge Questionnaire (TKQ)
- 9) Beck Depression Inventory (BDI)
- 10) Locus of Control of Behavior Scale (LCB)
- 11) Self-Monitoring of Tinnitus (Tinnitus Rating Form; loudness, noticeability, bothersomeness)

Secondary:

Not reported

### **Results**

The two treatment groups improved significantly more than the waiting-list control on measures of frequency of use of coping strategies, benefits derived from the use of coping strategies, irrational beliefs and knowledge about tinnitus. Subjects who received the combined cognitive/education intervention demonstrated significantly greater reductions in distress and handicaps associated with tinnitus, and engagement in dysfunctional cognitions, than the subjects who received education alone. No significant effects were obtained on measures of depression, locus of control, or on daily ratings of subjective loudness, noticeability or bothersomeness of the tinnitus. At the 12-month follow-up, the differential treatment effects had dissipated.

### **Associated intervention**

### **Further notes**

Intention to treat participant numbers per condition not reported. The condition within which 3 participants dropped out are not reported.

\* The cognitive techniques employed in this treatment were based largely on the work of Turk, Meichenbaum and Genest in the area of chronic pain management, and the work of Bakal in the application of psychological interventions for chronic headache.



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**Intervention groups (sample size)**

- 1) Attention control and imagery training (ACI)
  - 2) Cognitive restructuring (CR)
  - 3) Combined attention control and imagery training plus cognitive restructuring (ACI+CR)
  - 4) Waiting list control (WLC)
- 

**Assessment content components**

- 1) Tinnitus Reaction Questionnaire
  - 2) THQ
  - 3) Tinnitus Effects Questionnaire (Emotional Distress and Irrational Beliefs Scores only)
  - 4) Tinnitus Cognitions Questionnaire (TCQ)
  - 5) Tinnitus Coping Strategies Questionnaire (TCSQ)
  - 6) Beck Depression Inventory (BDI)
  - 7) Automatic Thoughts Questionnaire (ATQ)
- 

**Treatment content components****ACI**

- 1) Attention control involves a series of practice sessions, aided by tape recordings, in which subjects attempt to use a number of approaches to divert their attention from the tinnitus to other bodily sensations, images, and external sounds or other stimuli, for example:
- 2) Imagine that the tinnitus is masked by the sound of a fountain or waterfall
- 3) Imagine controlling the direction of their attention to and from the tinnitus, perhaps alternating between the tinnitus sensations and the feelings in their feet or hands
- 4) Instructed in how to identify positive, negative and neutral thoughts
- 5) Introduced to a variety of techniques for controlling negative thoughts, such as thought stopping and:
- 6) Increasing positive thoughts
- 7) The attention control and imagery exercises were described on audiocassette provided with a detailed manual in order to assist participants in their home practice.
- 8) All subjects were provided with a written educational manual, which gave information about the causes of and treatments for tinnitus.

**CR**

- 1) A rationale for the use of cognitive therapy was provided: It was explained to subjects that reactions to tinnitus may be associated with their beliefs and interpretations of the sounds that they experienced.
  - 2) It was suggested that negative self-statements: Are likely to produce negative emotions, including anxiety, depression and irritability
  - 3) It was suggested that negative self-statements: May lead a person to become more absorbed in the tinnitus to the exclusion of more positive, enjoyable activities
  - 4) It was suggested that negative self-statements: Can result in a person avoiding certain activities (work and leisure) which may not only produce negative effects on mood, but may also result in an even greater focus on the tinnitus.
  - 5) Identify positive, negative and neutral thoughts and to distinguish between dysfunctional and constructive thinking
  - 6) Manage and control negative thinking (thought stopping)
-

- 7) Examine the validity of thoughts, challenge negative thoughts, and substitute realistic and rational thoughts (cognitive restructuring)
- 8) Anticipate, prepare for and deal with stressful situations
- 9) Employ coping self-statements (self-instructions)
- 10) All of these cognitive therapy techniques were outlined in a written treatment manual with case examples to illustrate each strategy
- 11) All subjects were provided with a written educational manual, which gave general information on the causes of and treatments for tinnitus

### **Description of sample**

#### **Inclusion:**

- 1) Primary complaint of tinnitus for more than 6 months duration
- 2) Previous assessment by both an otolaryngologist and an audiologist
- 3) Traditional medical and audiological treatments not recommended or failed
- 4) Demonstrated level of distress associated with tinnitus as indicated by a score of 17 points or higher on the Tinnitus Reaction Questionnaire (ACI mean=31.5 sd=14.5; CR mean=31.4 sd=11.3; ACI+CR mean=32.3 sd=15.4; WLC mean=31.9 sd=17.0)
- 5) Ability to speak and read English
- 6) Willingness to participate in a research-oriented management program

#### **Baseline pre-assessment/treatment outcome measures**

	CR		ACI		ACI+CR		Waiting list control	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
TRQ	31.4	11.3	31.5	14.5	32.2	15.4	31.9	17.0
THQ	42.4	12.9	45.1	17.2	43.7	19.1	42.1	21.0
TEQ emotional distress	10.8	1.8	11.0	2.3	10.9	2.2	11.5	2.4
TEQ irrational beliefs	6.9	1.4	9.6	1.7	9.0	2.2	7.7	1.8
TCQ	45.9	11.0	50.3	18.1	53.1	11.4	47.4	18.0
TCSQ frequency	34.1	13.9	36.0	13.7	28.2	9.1	37.3	11.5
TCSQ benefits	27.7	17.4	35.0	17.7	26.6	10.4	33.5	12.8
BDI	10.5	4.3	11.3	6.3	9.6	6.9	8.4	3.9
ATQ	46.1	12.1	48.8	19.5	52.9	23.2	45.3	15.9

### **Comorbid mental health problems**

Not reported

### **Delivering clinician**

Therapist

### **Research methods**

RCT

### **Outcome measures**

#### **Primary:**

- 1) Tinnitus Reaction Questionnaire
- 2) THQ

- 3) Tinnitus Effects Questionnaire (Emotional Distress and Irrational Beliefs Scores only)
- 4) Tinnitus Cognitions Questionnaire (TCQ)
- 5) Tinnitus Coping Strategies Questionnaire (TCSQ)
- 6) Beck Depression Inventory (BDI)
- 7) Automatic Thoughts Questionnaire (ATQ)

Secondary:  
Not reported

### **Results**

Relative to the WLC, the three treatment conditions (combined) were associated with improvements in tinnitus-related distress, reductions in tinnitus-related dysfunctional cognitions and an increase in the frequency of use of coping strategies. There was a significant effect in favour of the ACI group compared to the CR group on the measure of irrational beliefs. The analyses also revealed that the combined treatment condition (ACI + CR) showed significantly greater improvement on a measure of psychological distress and achieved a higher clinical response rate compared to the two single treatments. There were significant improvements from pretreatment to follow-up on some measures, although the mean scores revealed that some of the gains had been lost at this stage on the main measure of tinnitus-related distress. There were no significant group x time effects for any of the dependent variables at the six-month follow-up. The results were interpreted as supporting the practice of combining the two cognitive approaches.

### **Associated intervention**

### **Further notes**

22) Henry 2005

### **Intervention groups (sample size)**

- 1) Model of Tinnitus Progressive Intervention

### **Assessment content components**

Level 1: Screening for clinically significant tinnitus

- 1) TISI – to determine if an intake assessment was warranted (or other tinnitus questionnaire can be used - the screening clinician should use whatever best suits his or her clinic's requirements)
- 2) provided education about [one] common misconception (attributing hearing problems to tinnitus) and addressed many of their other tinnitus concerns.
- 3) If hearing loss was identified as a likely possibility, the caller learned that he or she might profit from the use of amplification and was advised to schedule a hearing evaluation for determining this.

Level 3: Tinnitus Intake Assessment

- 4) Consisting of a battery of hearing and tinnitus tests and of written and verbal questionnaires. We have previously published procedural details for performing a basic intake assessment for tinnitus patients \*
- 5) Educational counselling

Review with the patient – Patients identified with the progressive-intervention approach as needing Level 4 long-term management should meet the following

criteria:

- 6) Evaluation and treatment at lower levels of clinical management have been insufficient in meeting their needs.
  - 7) They have been referred to other medical specialists as appropriate.
  - 8) They are motivated to enter into a long-term treatment program.
  - 9) They can comply with all requirements of treatment.
- 10) A treatment plan should be agreed on by both patient and clinician. The short-term schedule of return appointments should be decided at this time, and a long-term schedule should be projected.

Level 5: Extended treatment

- 11) If consistent, individualized treatment has not resulted in significant improvement after 1 to 2 years, the clinician should attempt to determine why the intervention has not been successful. Every possible contributing factor should be explored, and referrals to other practitioners may be indicated more strongly at this point. Most importantly, patients should be considered (or reconsidered) for psychological management.

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**Treatment content components**

Level 2: Group Informational Counseling

- 1) a brief description of tinnitus within the context of the auditory system
  - 2) advice about how to use sound to make tinnitus less bothersome
  - 3) a delineation of lifestyle factors that may affect tinnitus.
- 
- 4) inform patients of symptoms that would suggest the need for medical or psychological diagnosis
  - 5) provide an explanation of tinnitus and its relation to hearing loss
  - 6) provide a realistic description of different methods of treatment for tinnitus, and delineate specific strategies for self-managing tinnitus

Level 4: Ongoing Treatment

- 7) All patients receive sound therapy

Level 5: Extended Treatment

- 8) It follows that all patients received sound therapy

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**Description of sample**

Inclusion:

- 1) Veterans

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**Comorbid mental health problems**

Not reported

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**Delivering clinician**

Audiologist

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**Research methods**

Model of tinnitus management

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**Outcome measures**

n/a

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**Results**

n/a

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**Associated intervention**

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**Further notes**

\* Henry JA. Audiologic assessment. In: Snow JB, editor. Tinnitus: Theory and management. Hamilton (ON): BC Decker; 2004. p. 220–36.

\*\* Outcome measures and results included are presented in full in other selected materials by Henry *et al.* – this model contributes novel assessment protocol

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**23) Henry 2007**

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**Intervention groups (sample size)**

- 1) Educational Counselling group (94 patients)
- 2) Traditional support group (discussion-type groups; 84 patients)
- 3) No treatment (91 patients)

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**Assessment content components**

- 1) Tinnitus history
- 2) Hearing history
- 3) Noise-exposure history
- 4) Medical history
- 5) Descriptions of the subjects tinnitus
- 6) Tinnitus Severity Index

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**Treatment content components**

- 1) Introduction and description of terms
  - 2) General overview of TRT
  - 3) Discussion of what patients “hear” as tinnitus
  - 4) Explanation of sound waves
  - 5) Basic anatomy and physiology of ear and auditory pathways
  - 6) How acoustic vibrations are converted to nerve impulses
  - 7) Neural pattern recognition
  - 8) Perception of sound in auditory cortex.
  - 9) “Selective” listening
  - 10) Brief review of Session material
  - 11) Nature of tinnitus as “phantom” auditory sensation
  - 12) Why tinnitus becomes a problem
  - 13) Addressing misconception that tinnitus causes hearing difficulties
  - 14) Explanation of audiogram, with examples of hearing loss
  - 15) Explanation of habituation as goal of TRT
  - 16) Subconscious processing of auditory stimuli
  - 17) “Filtering” and “blocking” auditory stimuli from reaching consciousness
  - 18) Why tinnitus enters consciousness
  - 19) Why monotonous sounds are habituated naturally
  - 20) Why tinnitus may not be habituated
  - 21) “Vicious circle” of listening and reacting
  - 22) Heller and Bergman’s 1953 experiment, and its relevance to tinnitus perception
  - 23) Explanation of TRT “sound therapy” with examples
  - 24) Why “maskers” are not used with TRT
  - 25) Use of ear-level sound generators for TRT
  - 26) Overview of TRT “neurophysiological model”
  - 27) Detailed description of cochlea and hair cells
  - 28) Detailed description of auditory nerve
  - 29) Description of otoacoustic emissions and cochlear amplifier
-

- 30) Brief description of hyperacusis
- 31) Detailed explanation of hyperacusis
- 32) Description of auditory gain and how it is controlled
- 33) Description of “neural networks”
- 34) “Discordant damage” theory of tinnitus generation
- 35) Further description of auditory processing - related to neurophysiological model
- 36) Relation of auditory cortex to neurophysiological model
- 37) Identification of and assigning meaning to auditory signals
- 38) Neurophysiological model—nonauditory systems
- 39) Description of limbic system
- 40) Explanation of emotions based on neurophysiological model
- 41) Description of autonomic nervous system
- 42) Feedback loops
- 43) Stress and tinnitus
- 44) Brain plasticity

### **Description of sample**

Inclusion:

- 1) Veterans
- 2) Had clinically significant tinnitus, i.e., if their tinnitus was sufficiently bothersome to warrant intervention
- 3) Were willing and able to complete all study requirements
- 4) Attended an open house, where they received further information about the study

Baseline pre-assessment/treatment outcome measures

	Educational Counselling		Traditional Support		No treatment	
	Mean	SD	Mean	SD	Mean	SD
TSI	24.9	8.7	23.6	10.4	22.0	8.4

### **Comorbid mental health problems**

Not reported

### **Delivering clinician**

Audiologist

### **Research methods**

RCT

### **Outcome measures**

Primary:

- 1) Tinnitus Severity Index

Secondary:

None

### **Results**

Educational counselling provided significantly more benefit than either traditional support or no treatment.

### **Associated intervention**

### **Further notes**

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**Intervention groups (sample size)**

- 1) Progressive Audiologic Tinnitus Management Educational Counselling Protocol
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**Assessment content components**

- 1) Collaborative problem definition
  - 2) Tinnitus Handicap Inventory
  - 3) Tinnitus-Impact Screening Interview
  - 4) Tinnitus and Hearing Survey
  - 5) Tinnitus Problem Checklist enable patients to define their tinnitus-related problems with their providers
- 

**Treatment content components**

Educating patients to use therapeutic sound [...] Patients first are taught the three uses of sound for tinnitus management:

- 1) 'Soothing sound' is used to provide an immediate sense of relief from the stress or tension that is caused by tinnitus
- 2) 'Background sound' is used to reduce contrast between tinnitus and the acoustic environment (thereby making it easier for the tinnitus to go unnoticed)
- 3) 'Interesting sound' is used to actively divert attention away from the tinnitus.
- 4) Use the sound plan worksheet to develop an action plan to manage their 'most bothersome tinnitus situation'
- 5) Carry out the plan for about one to two weeks, evaluate the effectiveness of the plan, and then modify the plan to improve its effectiveness
- 6) Patients are instructed to identify (using the tinnitus problem checklist) the situation in which their tinnitus bothers them the most

Group/Individualised education:

- 7) Discuss participants' experiences using the sound plan and sound plan worksheet from the first session
- 8) Engage in collaborative problem solving
- 9) Develop an improved sound plan
- 10) Various devices capable of producing sound that might be unfamiliar to the participants are explained.
- 11) Ideas for using sound at night are presented
- 12) Different sound-based methods of tinnitus management are explained
- 13) Participants are told about various lifestyle factors that can affect tinnitus and hearing

CBT

- 14) Teach the patient to be her/his own therapist
  - 15) Relapse preventions
  - 16) Identifying, evaluating, and responding to thoughts that precede irritability, anger, tension, anxiety, depressed mood, or feelings of helplessness
  - 17) Patients will learn healthy attitudes and constructive approaches to stress
  - 18) Patients will learn the 12 basic types of negative appraisals: (1) overgeneralization, (2) all-or-none thinking, (3) filtering or selective abstraction, (4) mind-reading, (5) magnification or catastrophisation, (6) minimization, (7) personalization, (8) jumping to conclusions or arbitrary
-

inference, (9) emotional reasoning, (10) 'should' statements, (11) labelling, and (12) blaming
19) Patients will be taught to systematically examine their thoughts and behaviours and modify them
20) Worksheets will be assigned as 'homework' to enable patients to apply their new skills to personal experiences
21) Progressive muscle relaxation: patients learn to attend to muscle groups during PMR, diverting their attention from tinnitus to other areas of the body.
22) Controlled breathing: encourages attention to the mechanisms of the lungs and sounds of breathing
23) Imagery
<b>Description of sample</b>
n/a
<b>Comorbid mental health problems</b>
n/a
<b>Delivering clinician</b>
1) Psychologist
2) Mental health provider
3) Audiologist
4) Clinicians from other disciplines
<b>Research methods</b>
Overview
<b>Outcome measures</b>
n/a
<b>Results</b>
n/a
<b>Associated intervention</b>
Henry
<b>Further notes</b>

25) Henry 2012

<b>Intervention groups (sample size)</b>
1) Telehealth management (36 patients)
<b>Assessment content components</b>
Traumatic Brain Injury (TBI) and mental health history evaluation appointment. The psychologist:
1) Assessed for any obvious cognitive impairment via a symptom checklist and mental status examination
2) Asked participants to describe their history of TBI(s) and to report relevant medical data so as to affirm the presence and severity of TBI(s)
3) Tinnitus Handicap Index
4) Tinnitus and Hearing Survey
<b>Treatment content components</b>
The audiologist:
1) Explained strategies for using sound to manage reactions to tinnitus
2) Facilitated completing the Sound Plan Worksheet that to develop an individualised plan to manage reactions to tinnitus over the following 2 weeks



The psychologist:

- 3) Introduced principles of CBT and stress management (or reviewed if already introduced during the assessment appointment)
- 4) Introduced the concept of “mindfulness,” whereby patients learn to attend to their own thoughts
- 5) Facilitated beginning use of the Changing Thoughts and Feelings Worksheet that is contained in the self-help workbook [34] to set goals and develop an individualized plan to psychologically manage reactions to tinnitus over the next 2 wk.

The audiologist:

- 6) Reviewed strategies for using sound to manage reactions to tinnitus
- 7) Discussed the participant’s experience carrying out the sound plan developed at the previous telephone call
- 8) Worked with the participant to refine the sound plan as needed
- 9) Helped the participant to identify tinnitus management activities to implement

The psychologist:

- 10) Reviewed CBT for tinnitus and stress management
- 11) Reviewed the mindfulness skill and the Changing Thoughts and Feelings Worksheet
- 12) Introduced healthy attitudes and steps for changing negative appraisals to neutral or positive appraisals
- 13) Developed a long-term plan to implement CBT coping skills to manage reactions to tinnitus
- 14) The audiologist reviewed the protocol, discussed progress made, and answered any questions.

15) Sleep hygiene

### **Description of sample**

Inclusion:

- 1) Veterans and military personnel
- 2) “Clinically significant” tinnitus as determined by a minimum total score of 3 on section A of the Tinnitus and Hearing Survey (THS)
- 3) Demonstrated understanding of the requirements of the study (based on adequate responses to the research coordinator’s questions that assessed capacity-to-consent)
- 4) Motivation and capability to participate (including ability to communicate over the telephone in English)

Baseline pre-assessment/treatment outcome measures

	Telehealth Management	
	Mean	SD
Tinnitus and Hearing Survey	*	*
Tinnitus Handicap Inventory*	58.1	20.9

For 12 week dataset completers (n=25)

\* Not reported

<b>Comorbid mental health problems</b>
<ol style="list-style-type: none"> <li>1) Almost two-thirds (63.9%) of the participants scored abnormally high (11–21) on the anxiety portion of the HADS</li> <li>2) For the depression portion of the HADS, the majority of participants (58.3%) scored within the normal (0–7) or borderline normal (8–10) range</li> <li>3) More than half the participants (61.1%) screened positive for PTSD</li> </ol>
<b>Delivering clinician</b>
<ol style="list-style-type: none"> <li>1) Audiologist</li> <li>2) Psychologist</li> </ol>
<b>Research methods</b>
Uncontrolled pilot
<b>Outcome measures</b>
Primary:
<ol style="list-style-type: none"> <li>1) Tinnitus Handicap Inventory *</li> </ol>
Secondary:
<ol style="list-style-type: none"> <li>1) Tinnitus and Hearing Survey</li> </ol>
<b>Results</b>
Trends reflecting improvement in self-perceived functional limitations due to tinnitus
<b>Associated intervention</b>
<b>Further notes</b>
* The THS was used as an eligibility screening tool and as part of a secondary outcomes assessment (data not reported in this article)

26) Hesser 2012

<b>Intervention groups (sample size)</b>
<ol style="list-style-type: none"> <li>1) Internet-delivered Acceptance and Commitment Therapy (iACT; 33 patients)</li> <li>2) Internet Cognitive Behavioural Therapy (iCBT; 27 patients)</li> <li>3) Control: Monitored Internet Discussion Forum (32 patients)</li> </ol>
<b>Assessment content components</b>
<ol style="list-style-type: none"> <li>1) Tinnitus Handicap Inventory</li> <li>2) HADS</li> <li>3) QoLI</li> <li>4) ISI</li> <li>5) PSS</li> <li>6) TAQ</li> </ol>
<b>Treatment content components</b>
iACT:
<ol style="list-style-type: none"> <li>1) Exercises that focused on mindfulness</li> <li>2) Distancing of internal experiences (i.e. defusion)</li> <li>3) Assignments with the purpose of identifying personal values and goals</li> <li>4) Exercises that promoted willingness to experience tinnitus in the context of value-based behaviour change.</li> <li>5) As in the CBT condition, participants in ACT were also offered behavioral interventions that were optional and that targeted specific tinnitus-related problems (i.e., hearing, noise sensitivity, and sleep problems)</li> </ol>
iCBT:

- 1) Applied relaxation
- 2) Positive imagery
- 3) Attention training
- 4) Cognitive restructuring
- 5) Exposure
- 6) The use of background sounds to cope with the experience of tinnitus.
- 7) Sleep restriction
- 8) Problem solving
- 9) Hearing tactics

### **Description of sample**

#### **Inclusion:**

- 1) Had tinnitus for more than 6 months (the diagnosis had to be confirmed by an ear-nose-throat specialist or an audiological physician) (CBT mean=8.9, sd=5.5, ACT mean=9.7, sd=9.5, control mean=9.0, sd=9.2)
- 2) To be at least 18 years old (CBT mean=48.8, sd=13.4, ACT mean=50.1, sd=16.4, control mean=48.4, sd=14.2)
- 3) To be a resident of Sweden
- 4) To have moderate to severe tinnitus distress (defined as a total score of > 38 on the Tinnitus Handicap Inventory (CBT mean=60.19, sd=14.59, ACT mean=52.74, sd=12.90, control mean=60.94, sd=14.79)
- 5) In addition, given the format of the treatments (i.e., self-help provided via the Internet), participants had to report that they were able to read and write sufficiently well to be able to work with text-based material
- 6) Had the time to complete the treatment (i.e., a minimum of 2 hr per week for a period of 8 weeks)
- 7) Had access to a computer with an Internet connection.

#### **Exclusion:**

- 1) Had an ongoing treatment for tinnitus
- 2) Or had previously received the treatments that were offered in the present trial

#### **Baseline pre-assessment/treatment outcome measures**

	CBT		ACT		Monitored Internet Discussion Forum Control	
	Mean	SD	Mean	SD	Mean	SD
THI	60.19	14.59	52.47	12.90	60.94	14.79
HADS anx.	8.44	3.70	7.66	3.77	8.22	3.94
HADS dep.	5.97	3.24	6.80	3.71	6.03	3.42
PSS	27.41	7.39	27.89	7.62	27.81	7.86
ISI	14.66	6.30	13.23	5.80	13.78	6.54
QoL	1.87	1.83	1.50	1.59	1.98	1.58
TAQ	41.94	9.43	34.74	10.27	32.47	9.93

### **Comorbid mental health problems**

#### **Exclusion:**

- 1) Participants were excluded if they had a severe medical or psychiatric condition
- 2) Presented with an imminent suicide risk, had an ongoing treatment for tinnitus

<b>Delivering clinician</b>
1) Psychologist 2) Clinical Psychology MSc students
<b>Research methods</b>
RCT
<b>Outcome measures</b>
Primary: 1) Tinnitus Handicap Inventory
Secondary: 1) HADS 2) QoLI 3) ISI 4) PSS 5) TAQ
<b>Results</b>
Significant effects on the primary outcome (Tinnitus Handicap Inventory) for CBT and for ACT compared with control at post treatment. Within-group effects were substantial from pre-treatment through 1-year-follow-up for both, with no significant difference between treatments.
<b>Associated intervention</b>
iCBT (previously evaluated elsewhere): (1) Kaldo, V., Cars, S., Rahnert, M., Larsen, H.-C., & Andersson, G. (2007). Use of a self-help book with weekly therapist contact to reduce tinnitus distress: A randomized controlled trial. <i>Journal of Psychosomatic Research</i> , 63, 195–202. doi:10.1016/j.jpsychores.2007.04.007 (2) Kaldo, V., Levin, S., Widarsson, J., Buhrman, M., Larsen, H.-C., & Andersson, G. (2008). Internet versus group cognitive-behavioral treatment of distress associated with tinnitus: A randomized controlled trial. <i>Behavior Therapy</i> , 39, 348–359. doi:10.1016/j.beth.2007.10.003  iACT (previously evaluated elsewhere): (1) Zetterqvist Westin, V., Schulin, M., Hesser, H., Karlsson, M., Zare Noe, R., Olofsson, U., . . . Andersson, G. (2011). Acceptance and commitment therapy versus tinnitus retraining therapy in the treatment of tinnitus distress: A randomised controlled trial. <i>Behaviour Research and Therapy</i> , 49, 737–747. doi:10.1016/j.brat.2011.08.001
<b>Further notes</b>

27) Hiller 2005

<b>Intervention groups (sample size)</b>
1) CBT with noise generator (33 patients) 2) CBT without noise generator (33 patients) 3) Tinnitus Education with noise generator (34 patients) 4) Tinnitus Education without noise generator (36 patients)
<b>Assessment content components</b>
1) Structured Tinnitus Interview (STI). This clinician-rated instrument covers all major aspects of tinnitus history, tinnitus aetiology and associated complaints

- 2) Tinnitus Questionnaire
  - 3) Tinnitus Cognition Scale (T-Cog)
  - 4) Tinnitus Diary (VAS: loudness, unpleasantness, general mood, perceived controllability, mood)
  - 5) SCL-90-R
  - 6) Whiteley Index
  - 7) Dysfunctional Analysis Questionnaire (DAQ)
- 

### **Treatment content components**

#### **Tinnitus Education:**

- 1) Patients are informed about the physiology and anatomy of the hearing process, the nature of tinnitus, etiological mechanisms and treatment options
- 2) The neurophysiological model of tinnitus and its implications for everyday life are explained in detail
- 3) All patients are advised to avoid silence in their everyday environments
- 4) Additionally, the “vicious cycle” and “coping cycle” [...] are introduced and applied to the participants’ personal situations
- 5) All patients are invited to ask open questions, discuss the hand-out materials and compare their experiences with those of the other participants

#### **CBT**

##### **Warming up and general orientation:**

- 1) Patients exchange information about their tinnitus and previous treatment/coping experiences
- 2) Expectations and treatment goals are discussed
- 3) Therapists inform about contents/treatment methods

##### **Education I:**

- 4) Anatomy and physiology of the auditory system
- 5) Definition and prevalence of tinnitus
- 6) Potential causes of tinnitus and overview of treatment options
- 7) Patients learn that tinnitus is a frequent phenomenon and in most cases not a dangerous disease
- 8) Introduction into progressive muscle relaxation technique (CDs are handed out to the patients).

##### **Education II:**

- 9) Comprehensive tinnitus model according to Jastreboff
- 10) Differentiation between triggering and maintaining factors
- 11) Vicious circle models involving cognitions, emotions and behaviour
- 12) Patients learn that avoiding silence is contraindicated to achieve habituation
- 13) Progressive relaxation

##### **Cognitions I:**

- 14) A general cognitive-behavioural model (A-B-C model) is introduced and illustrated with examples given by the patients
- 15) Patients learn to differentiate between thoughts and emotion; progressive relaxation

##### **Cognitions II (The cognitive-behavioural model is applied to tinnitus;):**

- 16) Dysfunctional cognitions are identified and restructured
-

- 17) Interdependence between cognition, emotion and reaction is demonstrated
- 18) Brief version of progressive relaxation.

Perception:

- 19) The role of attentional processes for tinnitus perception is demonstrated
- 20) Imagery training is introduced
- 21) Patients learn strategies of attention diversion and to reduce tinnitus awareness
- 22) 2-min version of progressive relaxation.

Tinnitus and everyday activities I:

- 23) Common consequences of the tinnitus are discussed and analyzed, especially avoidance behaviours and social withdrawal
- 24) Patients learn to differentiate between short- and long-term consequences, and between favourable and dysfunctional tinnitus-related cognitions and behaviours.

Tinnitus and everyday activities II:

- 25) Definition of illness behaviour with examples from tinnitus-related reactions of the patients
- 26) Potential positive consequences of the tinnitus (e.g., withdrawal from unpleasing obligations) are discussed.

Tinnitus and the health care system:

- 27) Criteria to consult ENT physicians and other health professionals are analyzed (with special emphasis on the “doctor-shopping” phenomenon)
- 28) Patients practice to be clear and purposeful in their patient–doctor contacts.

- 29) Relapse prevention: Strategies to cope with tinnitus-related crises are collected and discussed (“emergency plan”).

### Description of sample

Inclusion:

- 1) The tinnitus was characterized as chronic, i.e. lasted for at least 6 months
- 2) Motivation to participate in a psychological treatment approach
- 3) Completion of all necessary ENT examinations and no current indication for standard medical treatments

Baseline pre-assessment/treatment outcome measures

	TE with NG		TE without NG		CBT with NG		CBT without NG	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
TQ	26.9	10.7	24.4	9.0	53.4	12.4	48.8	12.8
T-Cog	27.8	12.1	27.2	10.8	41.4	16.0	39.7	13.4
VAS loudness	49.5	20.0	43.6	13.6	56.7	18.1	55.6	15.9
VAS unpleasantness	30.2	18.3	43.6	13.6	44.3	19.0	43.0	17.9
VAS Control	27.9	25.3	20.4	18.3	25.3	18.7	24.4	20.1
SCL-90-R PSDI	*	*	*	*	1.59	0.41	1.61	0.53
SCL-90-R depression	*	*	*	*	1.03	0.63	0.94	0.86

WI	2.47	2.09	3.75	2.16	4.23	2.70	5.36	3.07
DAQ	*	*	*	*	57.9	9.6	54.5	12.3

\* Not reported

### **Comorbid mental health problems**

Inclusion:

- 1) Evidence of psychological concerns or distress due to the tinnitus

Exclusion:

- 1) Absence of current mental disorder that would require psychiatric treatment or intense individual psychotherapy, such as severe depressive, psychotic or substance-related disorder.

(average demographics not reported)

### **Delivering clinician**

Clinical Psychologist

### **Research methods**

Non-randomised experimental trial (n.b. use of noise generators was randomised, CBT or education allocation was not)

### **Outcome measures**

Primary: \*

- 1) Tinnitus Questionnaire
- 2) Tinnitus Cognition Scale (T-Cog)
- 3) Tinnitus Diary (VAS: loudness, unpleasantness, general mood, perceived controllability)

Secondary:

- 1) Tinnitus Diary (VAS: mood)
- 2) SCL-90-R
- 3) Whiteley Index
- 4) Dysfunctional Analysis Questionnaire (DAQ)

### **Results**

No additive effects due to the NGs could be demonstrated. All groups improved significantly on measures of tinnitus-related distress

### **Associated intervention**

### **Further notes**

\* Primary measure inferred from discussion “Our primary outcome variables were tinnitus-related subjective complaints” (p. 609)

28) Hubbard 2014

### **Intervention groups (sample size)**

- 1) Cognitive Behavioural Therapy

### **Assessment content components**

Not reported

### **Treatment content components**

- 1) Careful thinking: Look at the patient’s thoughts to identify cognitive patterns that [increase] tinnitus distress [...] to develop reasonable judgments and expectations about tinnitus, a new perspective that is grounded by facts, to provide reassurance and guidance

- 2) Acceptance and mindfulness: [First], observe your experience, [second] turn your attention to your breath, breathing in a slow, relaxed manner, [third] return your attention to your experience as a whole, gently allowing tinnitus, any other sensations, thoughts and feelings, to occur in the present moment, without criticism and judgment
- 3) Exposure: Gradually reversing avoidance, reintroducing yourself to sound, to silence and to the activities you may have formerly believed to be [impaired] by tinnitus.

#### **Description of sample**

n/a

#### **Comorbid mental health problems**

Not reported

#### **Delivering clinician**

Clinical Psychologist

#### **Research methods**

Grey literature – overview

#### **Outcome measures**

n/a

#### **Results**

n/a

#### **Associated intervention**

#### **Further notes**

29) Jakes 1986

#### **Intervention groups (sample size)**

- 1) Progressive muscle relaxation (PMR)
- 2) Progressive muscle relaxation with attention-switching (PMRAS)

(24 patients – per condition figures not reported)

#### **Assessment content components**

Orientation phase:

- 1) The first assessment phase was designed to measure the effects of a short psychological interview
- 2) Hamilton Depression Scale (HDDepression/ HDSleep)
- 3) Experiential Index (CCEI)
- 4) Tinnitus Diary (loudness of tinnitus, annoyance occasioned by tinnitus, whether or not they had difficulty falling asleep)
- 5) TEQ
- 6) Interference with daily activities (IWDA)

#### **Treatment content components**

Orientation phase:

- 1) The provision of a 9-page booklet which presented the rationale of our therapy.
- 2) The need to passively accept the noises was emphasized. Examples were given of attitudes to be avoided such as ‘fighting’ the noises or worrying about their medical significance.

Therapy phase:



**PMRAS Group:**

- 3) Instructed to focus alternately (for 20-30 set) on their own tinnitus noises and then on distracting stimuli. According to preference, these were external background sounds or pleasant mental images.
- 4) The patients were encouraged to use attention-switching at the times when they were most aware of the noises, as well as during their own relaxation practice
- 5) During the therapy phase, the experimenters avoided discussion of topics unrelated to tinnitus, and their advice concerning tinnitus was limited to reiterating points contained in the orientation booklet
- 6) Continue to practise daily
- 7) Relaxation: patients progressed from lying on a couch to relaxing sitting up in a chair and were instructed to practise at least once daily with a cassette provided
- 8) Attempt to become more aware of their state of tension in a variety of situations
- 9) Advise to use relaxation as a general stress reducer and to facilitate sleep but were not given any systematic instructions to use tinnitus or the distress which it occasions as a cue for relaxation
- 10) Suggestions of calmness and relaxing imagery were used during training, but there was not attempt to incorporate tinnitus sensations into imagery

**Description of sample****Exclusion:**

- 1) 70 years of age or over (across conditions mean=55years sd not reported)
- 2) Recently been provided with a hearing-aid, masker or tinnito-suppressive drugs (not recently but previously prescribed across conditions; maskers n=9, hearing aids n=6, sleeping tablets n=14)
- 3) Treatable cause of the tinnitus

**Baseline pre-assessment/treatment outcome measures**

	All participants	
	Mean	SD
TEQ distress	11.7	1.02
TEQ intrusiveness	3.7	0.58
TEQ sleep	4.08	0.39
IWDA	17.7	1.7
HD	8.5	1.23
HDS	2.0	0.34
CCEI T	27.1	2.8
CCEI A	8.3	0.8
CCEI P	4.2	0.63
CCEI O	7.8	0.67
CCEI S	6.8	0.78
CCEI D	6.7	0.63
CCEI H	3.2	0.59

**Comorbid mental health problems**

Not reported

**Delivering clinician**

- 1) Clinical Psychologist
- 2) Cognitive Behavioural Therapist

### **Research methods**

Prospective non controlled trial

### **Outcome measures**

Primary:

- 1) Hamilton Depression Scale (HDeppression/ HDSleep)
- 2) Experiential Index (CCEI)
- 3) Tinnitus Diary (loudness of tinnitus, annoyance occasioned by tinnitus, whether or not they had difficulty falling asleep)
- 4) TEQ
- 5) Interference with daily activities (IWDA)

Secondary:

Not reported

### **Results**

The annoyance of tinnitus decreased more rapidly at the beginning of treatment than during the orientation period, and continued to decline during therapy. Neither the loudness nor the intrusiveness of the tinnitus declined during therapy. The distress arising from the tinnitus, and the 'activities affected' by the tinnitus declined during treatment, and also during the orientation phase. The effects on insomnia were inconsistent.

### **Associated intervention**

### **Further notes**

\* Based on personal knowledge of the named authors delivering the treatment

30) Jakes 1992

### **Intervention groups (sample size)**

- 1) Aural masker (12 patients)
- 2) Placebo masker (14 patients)
- 3) Waiting list (14 patients)
- 4) Group cognitive therapy (GCT; 30 patients)
- 5) GCT plus masker (14 patients)

### **Assessment content components**

- 1) Tinnitus Effects Questionnaire
- 2) Interference with Daily Activities (IWDA)
- 3) Crown Crisp Experiential Index (CCEI)

### **Treatment content components**

GCT:

- 1) Given a booklet (after the initial baseline assessment) explaining the importance of attitudes towards tinnitus in maintaining attention to it and how these could be changed by cognitive therapy. The essence of cognitive therapy was described
- 2) Members were each invited to introduce themselves to the group and to explain how their tinnitus affected them
- 3) The therapists guided the accounts toward the emotional effects of the tinnitus.
- 4) As the various members described their problems, similarities and contrasts were underlined by the therapists

- 5) At the end of each account other members were invited to ask questions
- 6) The cognitive model of emotional distress was then discussed. It had already been outlined in the orientation booklet sent to clients 2 weeks previously.
- 7) Training clients in recognition of negative automatic thoughts
- 8) Training clients in detection of negative automatic thoughts
- 9) Training clients in challenging of negative automatic thoughts
- 10) An ex-client who had been very distressed by tinnitus but who had adapted to it was introduced to the group. This encounter was important in disconfirming the almost universal prediction of the inevitability of emotional distress if tinnitus was present
- 11) Clients practiced challenging their cognitions in the sessions primarily by using role-reversal
- 12) In addition, videotapes of successful ex-clients discussing their experiences were used on occasion

### **Description of sample**

Inclusion:

- 1) Able to hear in a group
- 2) Tinnitus a significant problem to the client
- 3) Duration of complaint at least 1 year
- 4) Tinnitus the most significant problem for the client
- 5) Able and willing to attend the hospital for treatment
- 6) No previous treatment with maskers or cognitive therapy
- 7) Able to complete questionnaires without difficulty

Baseline pre-assessment/treatment outcome measures

	AM		AM+GCT		GCT		PM		WL	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	TEQ subscales									
Emot. Dis.	13.8	*	15.2	*	13.5	*	14.5	*	15.1	*
Aud. Percept.	9.1	*	8.2	*	10.0	*	9.9	*	10.8	*
Insomnia	7.5	*	9.1	*	7.8	*	9.1	*	8.0	*
Irrat. Beliefs	13.7	*	16.5	*	14.4	*	16.7	*	17.5	*

\* Not reported

### **Comorbid mental health problems**

Exclusion:

- 1) Major psychiatric disorder (usually severe depression)

### **Delivering clinician**

Cognitive Behavioural Therapists

### **Research methods**

RCT

### **Outcome measures**

Primary:

- 1) Tinnitus Effects Questionnaire
- 2) Interference with Daily Activities (IWDA)
- 3) Crown Crisp Experiential Index (CCEI)
- 4) Loudness and annoyance of tinnitus in a daily diary

Secondary:  
Not reported

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**Results**

At follow-up, only patients receiving GCT (with or without a masker) were significantly improved over baseline on a tinnitus distress questionnaire. Irrational beliefs about tinnitus were modified in the baseline period only in patients" receiving an explanatory booklet about cognitive therapy. These beliefs continued to change from baseline to follow-up only in GCT. Measures of general affective state changed little and not to a significantly greater extent in GCT than in other conditions. Overall results indicate a specific effect of GCT on tinnitus distress, not observed in alternative treatments.

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**Associated intervention**

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**Further notes**

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31) Jasper 2014

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**Intervention groups (sample size)**

- 1) Group CBT (43 patients)
- 2) Internet CBT (41 patients)
- 3) Web based discussion forum (control; 44 patients)

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**Assessment content components**

- 1) THI
- 2) Mini-Tinnitus Questionnaire
- 3) HADS
- 4) ISI
- 5) TAQ

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**Treatment content components**

Group CBT:

- 1) Warming up & general information: Discussion of expectations and goals
- 2) Progressive Muscle Relaxation: Long version of PMR Brief version of PMR 2-min version of PMR
- 3) Psychoeducation: Information about epidemiology, causes and mechanism of tinnitus distress
- 4) Cognitive restructuring: Identification and restructuring of negative thoughts
- 5) Focus exercises: Enhancing the ability to shift focus between tinnitus and other stimuli
- 6) Avoidance behaviour: Identification and reduction of avoidance behaviours
- 7) Patient-doctor communication: Reduction of "doctor-shopping"
- 8) Relapse prevention" Summary and planning how to maintain therapy success and cope with a relapse

Optional topics

- 9) Positive imagery
  - 10) Stress management
  - 11) Sleep management
  - 12) Hearing tactics
  - 13) Sharing experiences
  - 14) Discussing individual coping strategies
-

- 15) Demonstrating exercises
- 16) Handouts and homework assignments

Internet CBT:

- 1) Applied relaxation: Tension and relaxation of different muscle groups
- 2) Relaxation through controlled breathing
- 3) Establishing a relaxation routine in everyday life
- 4) Positive imagery: Focusing mentally on a positive image to relax
- 5) Focus exercises: Enhancing the ability to shift focus between tinnitus and other stimuli
- 6) Exposure to tinnitus: Reducing negative emotions and avoidance through exposure and habituation
- 7) Cognitive restructuring: Identification and restructuring of negative thoughts
- 8) Avoidance behaviour: Reducing avoidance behaviour, encouraging positive activities

Optional Modules:

- 9) Sound enrichment
- 10) Tinnitus reframing
- 11) Noise sensitivity
- 12) Sleep management
- 13) Concentration management
- 14) Hearing tactics
- 15) General information
- 16) Suggestions for exercising
- 17) Worksheets and solutions for common problems

**Description of sample**

Inclusion:

- 1) Age of at least 18 years
- 2) A score  $\geq 18$  on the Tinnitus Handicap Inventory or a score  $\geq 8$  on the Mini-Tinnitus Questionnaire [Mini-TQ; 26]
- 3) Tinnitus duration of at least 6 months
- 4) Tinnitus as the primary problem, for example not as a consequence of morbus menière
- 5) Consenting to be randomized
- 6) Internet access
- 7) Willingness and ability to attend the weekly group sessions
- 8) No anticipated absence of more than 2 weeks during the course of the study
- 9) No CBT for tinnitus within the last 2 years
- 10) No ongoing psychological tinnitus treatment

Baseline pre-assessment/treatment outcome measures

	ICBT		GCBT		DF	
	Mean	SD	Mean	SD	Mean	SD
Mini-TQ	12.20	4.58	14.19	4.51	12.50	4.83
THI	4.034	17.64	44.33	19.17	40.23	20.54
HADS anxiety	7.41	3.56	7.79	3.73	8.00	4.24
HADS depression	5.95	4.21	6.02	3.79	6.43	4.48
Insomnia	12.68	5.91	12.40	6.08	11.25	6.51

Severity Index						
Tinnitus Acceptance Questionnaire	42.07	11.70	40.26	11.87	42.84	13.48

### **Comorbid mental health problems**

Exclusion:

- 1) No psychiatric condition
- 2) No acute suicidality

### **Delivering clinician**

Clinical Psychologist

### **Research methods**

RCT

### **Outcome measures**

Primary:

- 1) THI
- 2) Mini-Tinnitus Questionnaire

Secondary:

- 1) HADS
- 2) ISI
- 3) TAQ

### **Results**

The primary outcomes (THI, Mini-TQ) [found] in favour of both CBT interventions, compared to the DF at post-assessment. There were no significant differences between GCBT and ICBT and treatment effects remained stable at the 6-month follow-up.

### **Associated intervention**

### **Further notes**

32) Kaldo-Sandstrom 2004

### **Intervention groups (sample size)**

- 1) Internet-based CBT (iCBT; 77 patients)

### **Assessment content components**

- 1) Structured psychological assessment
- 2) Tinnitus Reaction Questionnaire
- 3) HADS
- 4) ISI

### **Treatment content components**

- 1) Emails from the therapist with feedback on self-help homework
- 2) Therapists send encouraging emails if patients were not submitting homework as per protocol
- 3) When the patient reported that technical problems, lack of time, dissatisfaction with treatment results, or other problems made him or her want to end treatment in advance, this was discussed with the therapist via email or via the telephone
- 4) Our view of tinnitus

- 5) Applied relaxation 1: Presentation of the general treatment rationale. First tense and then relax different muscle groups.
- 6) Sound enrichment: Make tinnitus less noticeable by the use of external sounds, using naturally occurring sounds, not noise generators
- 7) Applied relaxation 2: Relax muscle groups without previous tension
- 8) Hearing deficit and tinnitus: How to minimize problems associated with hearing deficit
- 9) Sleep management: Brief description of general CBT techniques for sleep problems (Morin, 1996)
- 10) Applied relaxation 3: Relax through controlled breathing and cue-controlled relaxation
- 11) Positive imagery: Focusing mentally on a positive image to relax and cope better with tinnitus
- 12) Cognitive restructuring: Introduction to the influence and modification of negative automatic thoughts about tinnitus
- 13) Focus exercises: Exploring and enhancing the ability to shift focus between tinnitus and some other stimuli
- 14) Applied relaxation 4 (common situations): The use of rapid relaxation (controlled breathing and cue-controlled relaxation) in everyday situations
- 15) Exposure to tinnitus: Lessen negative emotions and avoidance of tinnitus through exposure to the sound
- 16) Concentration management: Advice regarding concentration (i.e., taking breaks, dividing tasks into smaller steps, problem solving)
- 17) Hyperacusis: Exposure to background sound and annoying but nondamaging noise to minimize hyperacusis and/or avoidance of noise
- 18) Applied relaxation 4b (stressful situations): Expanding the use of rapid relaxation to more stressful situations and to everyday tinnitus distress
- 19) Physical activity: Increase the level of physical activity to enhance well-being and to better manage stress and tinnitus
- 20) Applied relaxation (maintenance): Incorporate applied relaxation in everyday life in a realistic way
- 21) Summary, maintenance, and relapse prevention: Summarize what has been done during the treatment and how it has worked. Make a plan for the future

### **Description of sample**

#### **Exclusion:**

- 1) The psychologist judged tinnitus not to be the main problem or of no major concern, quantified as a Grade I tinnitus [...] when tinnitus is audible only in silent environments
- 2) Experienced other problems (e.g., social, or medical) that might interfere with the treatment.
- 3) He or she did not have access to or was not sufficiently skilled in using the Internet

#### **Baseline pre-assessment/treatment outcome measures**

	Internet-based CBT	
	Mean	SD
TRQ	33.0	17.0
HADS depression	6.4	3.6
HADS anxiety	7.6	3.7
ISI	19.2	6.9

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**Comorbid mental health problems**

Exclusion:

- 1) Experienced psychiatric problems

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**Delivering clinician**

Therapist

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**Research methods**

Nonrandomised (noncontrolled) clinical effectiveness study

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**Outcome measures**

Primary:

- 1) Tinnitus Reaction Questionnaire
- 2) HADS
- 3) ISI

Secondary:

Not reported

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**Results**

Significant reductions of distress on the TRQ, HADS and ISI. A 3-month follow-up showed that patients remained improved.

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**Associated intervention**

"Slightly revised version":

Andersson, G., Strömberg, T., Ström, L., & Lyttkens, L. (2002). Randomised controlled trial of Internet based cognitive behavior therapy for distress associated with tinnitus. *Psychosomatic Medicine*, 64, 810–816

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**Further notes**

The drop-out rate was 30%. Treatment compliance, external referral to the treatment and number of earlier treatments for tinnitus were associated with positive outcome. The number of e-mails between therapist and patient concerning treatment problems was associated with worse outcome.

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33) Kaldo 2007

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**Intervention groups (sample size)**

- 1) CBT-based self-help book with weekly phone calls (34 patients)
- 2) Wait-list control (38 patients)

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**Assessment content components**

- 1) Tinnitus Reaction Questionnaire
- 2) Tinnitus Handicap Inventory
- 3) VAS (loudness, distress caused by tinnitus, perceived stress during the day)
- 4) HADS anxiety
- 5) HADS depression
- 6) ISI

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**Treatment content components**

Introduction and preparation

- 1) Information about tinnitus, the distress it can lead to, and the aims and methods of CBT for tinnitus
- 2) Planning the treatment and choosing among the available tools
- 3) Defining treatment goals
- 4) Making priorities to find time to spend on the treatment assignments

The treatment tools:

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- 5) Applied relaxation (Steps 1 to 3; deep relaxation)
- 6) Applied relaxation (Step 4; quick relaxation in everyday situations)
- 7) Positive imagery (focus on a relaxing image)
- 8) Focus exercises (enhancing control over focus)
- 9) Exposure to tinnitus (reducing tinnitus-related anxiety and avoidance)
- 10) Sound enrichment (using external sound to make tinnitus less noticeable)
- 11) Hypersensitivity to sound (graded exposure to nonrisk sounds)
- 12) Hearing tactics (advice on how to cope with a hearing deficit)
- 13) Cognitive restructuring (finding and coping with negative thoughts)
- 14) Sleep management (established CBT methods to deal with sleep problems)
- 15) Concentration management (taking breaks, structure, and solve problems)

Evaluation and maintenance:

- 16) Summaries and evaluation of the treatment
- 17) Planning on how to maintain positive effects
- 18) Relapse prevention

### **Description of sample**

Inclusion:

- 1) Must have had a medical examination regarding tinnitus, which had been performed by an Ear–Nose–Throat specialist or an audio- logical physician
- 2) Must have a tinnitus duration of at least 6 months (Active mean=45.9 sd=13.0, Control mean=48.5 sd=15.7)
- 3) Must have an ability to read and understand the self-help book
- 4) Must be likely to complete the self-help process (e.g., participants were not expecting to travel abroad during the treatment)
- 5) Must be above 18 years of age (Active mean=8.6, sd=8.4, Control mean=12.4 sd=11.7)
- 6) Must have a score of 10 or above on the Tinnitus Reaction Questionnaire (Active mean=38.7 sd=23.1, control mean=36.9 sd=21.4)

Baseline pre-assessment/treatment outcome measures

	CBT-based self-help book with weekly phone calls		Waiting list control	
	Mean	SD	Mean	SD
TRQ	38.7	23.1	36.9	21.4
THI	53.1	23.7	53.2	18.2
VAS loudness	6.0	2.0	5.8	1.9
VAS distress caused by tinnitus	5.0	2.4	5.1	2.0
VAS perceived stress during the day	3.7	2.2	4.6	2.1
HADS depression	6.5	4.4	8.7	4.7
HADS anxiety	8.7	4.7	9.9	4.2
ISI	13.8	6.5	13.1	5.7

### **Comorbid mental health problems**

Exclusion:

- 1) Had any major medical or psychiatric condition

- 2) Must have a score of 18 or below on both the anxiety and depression subscales of the Hospital Anxiety and Depression Scale (HADS; Depression scale CBT mean=6.5, sd=4.4, Control mean=7.3, sd=4.4/ Anxiety scale active mean=8.7, sd=4.7, control mean=6.2, sd=4.4)

#### **Delivering clinician**

- 1) Cognitive Behavioural Therapist \*

#### **Research methods**

RCT

#### **Outcome measures**

Primary:

- 1) Tinnitus Reaction Questionnaire

Secondary:

- 1) Tinnitus Handicap Inventory
- 2) VAS (loudness, distress caused by tinnitus, perceived stress during the day)
- 3) HADS anxiety
- 4) HADS depression
- 5) ISI

#### **Results**

On the TRQ, significant reductions were found in the treatment group both immediately following treatment and at 1-year follow-up. In the treatment group, 32% reached the criteria for clinical significance (at least 50% reduction of the TRQ) compared to 5% in the wait-list group.

#### **Associated intervention**

#### **Further notes**

\* Clinician data extrapolated from Kaldo 2008

34) Kaldo 2008

#### **Intervention groups (sample size)**

- 1) iCBT (26 patients)
- 2) Group CBT (25 patients)

#### **Assessment content components**

- 1) Tinnitus Reaction Questionnaire
- 2) Tinnitus Handicap Inventory
- 3) VAS (tinnitus loudness, distress caused by tinnitus, perceived stress)
- 4) HADS
- 5) ISI
- 6) Overall distress was rated during the semistructured interviews. The interviewer rated seven different areas of distress; annoyance/ irritation, depression, anxiety/worry/stress, concentration, sleep, hearing deficit, and sensitivity to noise \*

#### **Treatment content components**

Both treatment conditions:

- 1) Applied relaxation – step one (tension-first muscle by muscle)
- 2) Applied relaxation – step two (release-only muscle by muscle)
- 3) Applied relaxation – step three (controlled breathing)
- 4) Applied relaxation – step four (quick relaxation in nonstressful situations)
- 5) Applied relaxation – step five (quick relaxation in more stressful situations)

- 6) Applied relaxation – step six (establish relaxation routine in every-day life)
- 7) Positive imagery (focus on a relaxing image)
- 8) Focus exercises (enhancing control over focus)
- 9) Exposure to tinnitus (reducing tinnitus-related anxiety and avoidance)
- 10) Sound enrichment (using external sound to make tinnitus less noticeable)
- 11) Cognitive restructuring – part one (finding negative thoughts)
- 12) Cognitive restructuring – part two (coping with negative thoughts)
- 13) Sleep management (established CBT methods to deal with sleep problems)
- 14) Concentration management (taking breaks, structuring and solving problems)
- 15) Hypersensitivity to sound (graded exposure to nonrisk sounds)
- 16) Hearing tactics (advice on how to cope with a hearing deficit)
- 17) Information is provided for dealing with common obstacles and misunderstandings
- 18) Define their own treatment goals and make priorities to free some time to spend on the treatment assignments
- 19) At the end of the treatment, a general summary is provided
- 20) Previously stated treatment goals are evaluated
- 21) The participants also plan how to maintain gains and to prevent relapse
- 22) The treatment is presented as an opportunity for the participant to try for a period of time new ways to cope with tinnitus and to incorporate helpful strategies into their everyday life. It is particularly highlighted that the effectiveness of the program depends on the active use of the tools and that merely discussing or reading material is not enough.

### **Description of sample**

#### **Inclusion:**

- 1) A medical examination of tinnitus, including measurement of hearing levels and an ear, nose, and throat examination
- 2) Participant at least 18 years old
- 3) Tinnitus duration of 3 months or more
- 4) Tinnitus the primary problem (e.g., not dizziness, hearing loss, major depression, etc.)
- 5) Scoring 10 or above on the Tinnitus Reaction Questionnaire (Wilson et al., 1991)
- 6) Ability to read and follow the Internet-based self-help program and no reported obstacles for participation, such as travelling abroad during the treatment period or suffering from a major medical
- 7) No history of previous CBT for tinnitus and no ongoing treatment for tinnitus
- 8) Agreeing to participate in both kinds of treatment and to be randomized to one of them
- 9) Be able to attend seven group sessions in Uppsala and have access to the Internet, e-mail, and a printer
- 10) Agreeing to work toward the main goal of the treatment, this being to reduce tinnitus distress even though tinnitus strength would remain the same

#### **Baseline pre-assessment/treatment outcome measures**

	Internet		Group	
	Mean	SD	Mean	SD
TRQ	26.4	15.6	30.0	18.0
THI	36.5	16.7	43.4	18.8
VAS tinnitus	4.7	2.0	4.7	1.8

distress				
VAS tinnitus loudness	5.3	1.8	5.5	1.8
VAS perceived stress	3.7	1.8	4.0	1.8
HADS depression	5.8	2.4	5.1	2.6
HADS anxiety	6.8	3.7	7.5	4.4
Insomnia Severity index	11.1	6.3	10.1	6.5
Therapist rated distress	9.6	2.9	11.4	3.5

### Comorbid mental health problems

Exclusion:

- 1) Scoring 18 or below on both the anxiety and depression subscales of the Hospital Anxiety and Depression Scale
- 2) No major psychiatric condition

### Delivering clinician

- 1) Clinical Psychologist
- 2) Cognitive Behavioural Therapist

### Research methods

RCT

### Outcome measures

Primary

- 1) Tinnitus Reaction Questionnaire

Secondary:

- 1) Tinnitus Handicap Inventory
- 2) VAS (tinnitus loudness, distress caused by tinnitus, perceived stress)
- 3) HADS
- 4) ISI
- 5) Overall distress was rated during the semistructured interviews. The interviewer rated seven different areas of distress; annoyance/ irritation, depression, anxiety/worry/stress, concentration, sleep, hearing deficit, and sensitivity to noise \*

### Results

Results showed that both groups had improved, and there were few [significant] differences between them[:]\*\*

### Associated intervention

### Further notes

\* The participants' distress in each area was judged by the interviewer as none (0), small (1), marked (2) or large (3). All the ratings were then summed into an overall distress rating scale, ranging from 0 to 21.

\*\* The Internet treatment consumed less therapist time and was 1.7 times as cost-effective as the group treatment.

**Intervention groups (sample size)**

- 1) Mindfulness and body psychotherapy-based group (18 patients)
- 2) Waiting list control (18 patients)

**Assessment content components**

- 1) Tinnitus Questionnaire
- 2) Tinnitus Handicap Inventory
- 3) BDI
- 4) Tinnitus numeric rating scales (loudness, discomfort, annoyance, distractibility, unpleasantness)

**Treatment content components**

- 1) Meditation elements
- 2) Imagination exercises
- 3) Self-massage
- 4) Individualised gentle movement exercises of the body
- 5) Individualised gentle movement exercises of the body
- 6) Exercises aiming at directing moment-to-moment awareness of body- and self-perception
- 7) Breathing exercises with emphasis on expiration in order to reduce muscle tension and increase relaxation

**Description of sample****Inclusion:**

- 1) Age between 18 and 80 years (Intervention mean=49.6 sd=8.8, Control mean=51.7 sd=16.0)
- 2) Location in the north-western part of Germany or in Belgium
- 3) The ability to understand the German language
- 4) No communicational problems
- 5) Individual burden caused by subjective tinnitus for at least 6 months (Intervention mean=100.5 sd=119.1, Control mean=142.3 sd=116.2)
- 6) Absence of any instable medical conditions

**Baseline pre-assessment/treatment outcome measures**

			Control	
	Mean	SD	Mean	SD
Tinnitus Questionnaire	34.6	16.7	38.5	14.7
Tinnitus Handicap Inventory	40.9	21.7	47.1	17.5
BDI	11.4	8.4	12.3	6.9
NRS loudness	5.9	2.5	6.7	2.1
NRS annoyance	6.2	3.1	7.4	2.3
NRS discomfort	7.1	2.8	7.6	2.0
NRS distractibility	6.4	2.8	6.6	2.6
NRS unpleasantness	6.2	2.8	7.0	2.2

NRS = Numeric Rating Scale

**Comorbid mental health problems**

Not reported

**Delivering clinician**

Therapist

**Research methods**

Randomised controlled pilot

**Outcome measures**

Primary:

- 1) Tinnitus Questionnaire

Secondary:

- 1) Tinnitus Handicap Inventory
- 2) BDI
- 3) Tinnitus numeric rating scales (loudness, discomfort, annoyance, distractibility, unpleasantness)

**Results**

The main finding of this pilot study was a significant reduction in the TQ score (baseline vs. week 9) after thirty hours of this new manualised group therapy compared to the waiting list control group.

**Associated intervention**

**Further notes**

36) Kroner-Herwig 1995

**Intervention groups (sample size)**

- 1) Cognitive Behavioural Tinnitus Coping Training (TCT; patients 15 patients)
- 2) Yoga (9 patients)
- 3) Self-monitoring control (19 patients)

**Assessment content components**

- 1) Diary variables ('subjective loudness' of tinnitus, 'tinnitus discomfort', 'sleep disturbance', 'interference with activity', 'control of tinnitus' and 'hours per day of tinnitus ignored')
- 2) Tinnitus Questionnaire
- 3) 'Befindlichkeits-Skala' assessing actual mood
- 4) 'Beschwerden-Liste' assessing various symptoms
- 5) 'Depressivitäts Skala' assessing depression

**Treatment content components**

TCT:

- 1) Patient education (morphological and functional characteristics of the hearing system)
- 2) Education: illness model of tinnitus as disorganized spontaneous activity in the hearing system
- 3) Education: importance of stress I ways of controlling tinnitus; coping not 'healing' as the goal of training)
- 4) Progressive relaxation was one main element in sessions
- 5) Analysing stressful events and their effect on tinnitus.
- 6) At the same time tinnitus was conceptualized as a main stressor.

- 7) Directing attention to and from tinnitus was demonstrated as a means of coping with tinnitus
- 8) Focused on cognition, i.e. trying to change dysfunctional irrational self-statements, catastrophizing thoughts and beliefs relating to tinnitus.
- 9) The maintenance of acquired coping skills after training was a topic of discussion.

### Description of sample

#### Inclusion:

- 1) Duration of tinnitus >6 months (TCT group 1 mean=29.3 sd=22.7, TCT group 2 mean=46.1 sd=39.5, Yoga mean=60.2 sd=69.1, Control mean=63.7 sd=63.9)
- 2) Impairment due to tinnitus >4 on a IO-point rating scale (TCT group 1 mean=7.7 sd=2.1, TCT group 2 mean=6.8 sd=2.1, Yoga mean=6.3 sd=2.0, Control mean=7.3 sd=2.0)
- 3) Hearing ability good enough to allow communication in a group setting
- 4) No treatable organic pathology
- 5) Medical examination completed
- 6) Willingness to participate in the assessment and in at least 8 of 10 treatment sessions

#### Baseline pre-assessment/treatment outcome measures

	TCT1		TCT2		Yoga		Waiting list	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Diary Variables								
Subjective loudness	3.9	1.0	4.3	2.5	4.0	2.1	5.5	1.8
Discomfort	3.1	1.3	3.0	2.1	3.3	2.6	3.6	1.4
Sleep Disturbance	2.0	1.3	1.6	1.3	1.6	3.0	2.2	2.8
Interference	2.3	1.8	2.5	1.9	3.2	2.7	2.0	1.9
Control	1.0	1.5	1.4	1.5	2.1	3.3	1.1	1.6
Ignoring	3.7	4.9	5.6	5.6	4.7	5.0	4.1	4.1
Tinnitus Questionnaire subscales								
Psych. impairment	1.9	0.8	1.5	1.1	1.6	0.7	2.2	0.8
Penetrating quality	2.4	0.9	2.2	1.1	2.9	0.5	3.0	0.8
Hearing problems	1.7	1.0	1.1	0.9	1.3	0.7	1.5	1.0
Sleep problems	1.4	1.1	0.8	0.8	1.7	1.2	1.5	1.4
Somatic complaints	1.0	0.6	1.2	1.0	1.2	1.2	1.5	1.4
Wellbeing								
Depression	82.9	15.3	66.0	31.7	78.3	19.1	76.4	22.7
Mood	73.1	17.4	61.1	27.9	65.2	29.8	77.2	21.4
Symptoms	78.4	17.1	69.3	18.0	65.2	26.3	78.4	17.3

### Comorbid mental health problems

#### Exclusion:

1) No psychopathologic disorder 2) No current psychotherapy
<b>Delivering clinician</b> 1) Graduate student clinical psychologist
<b>Research methods</b> RCT
<b>Outcome measures</b> Primary: 1) Diary variables ('subjective loudness' of tinnitus, 'tinnitus discomfort', 'sleep disturbance', 'interference with activity', 'control of tinnitus' and 'hours per day of tinnitus ignored') 2) Tinnitus Questionnaire 3) 'Befindlichkeits-Skala' assessing actual mood 4) 'Beschwerden-Liste' assessing various symptoms 5) 'Depressivitäts Skala' assessing depression  Secondary: Not reported
<b>Results</b> Statistical analyses showed effects favouring the TCT treatment in comparison to the control and yoga treatment. Participants in the self-monitoring control group were treated either by TCT or yoga after a waiting period. The outcome in this group was even better than in the experimental groups while yoga again showed rather poor effects. From the diary the TCT1 showed significant decrease in discomfort due to tinnitus and a significant increase in control over it. TCT2 also showed significant increase in control. This was only maintained in the follow-up of TCT1 however.
<b>Associated intervention</b>
<b>Further notes</b> "The program included interventions shown to be beneficial in the Swedish study but at the same time put a special emphasis on cognitive interventions."

### 37) Kroner-Herwig 2003

<b>Intervention groups (sample size)</b> 1) Tinnitus Coping Training (TCT; 56 patient) 2) Minimal Contact-education (MC-E; 20 patients) 3) Minimal Contact -relaxation (MC-R; 20 patients) 4) Waiting list (20 patients)
<b>Assessment content components</b> 1) Tinnitus diary (loudness, hours of being aware of tinnitus, and subjective control of tinnitus) 2) Tinnitus Questionnaire 3) Tinnitus Disability Questionnaire (TDI; German version of the tinnitus-adapted Pain Disability Questionnaire) 4) COPE (A German coping inventory) 5) SCL-90R 6) ADS (the German version of the CES-D)
<b>Treatment content components</b> TCT:



- 1) Education on tinnitus aetiology and maintenance
- 2) Training rationale
- 3) Relaxation
- 4) Thoughts, emotions, and bodily reactions (introduction to the ABC Model)
- 5) Tinnitus as a stress or (using the ABC Model) - dysfunctional and functional thoughts
- 6) Attention and distraction
- 7) Changing the emotional context of tinnitus (imagery exercises)
- 8) Habituation exercises
- 9) Withdrawal and avoidance (cognitions and behaviour)
- 10) Operant mechanisms in disability maintenance
- 11) Factors of tinnitus exacerbation
- 12) Coping
- 13) Problem solving (a systematic approach)
- 14) Attitudes toward illness and health
- 15) Review of training and maintenance of skills

#### Minimal Contact-education:

- 1) Education regarding tinnitus aetiology (neuroacoustical processes and an introduction to the psychological model of tinnitus disability)
- 2) Fears regarding tinnitus, its prognosis and consequences were discussed and, if possible, revised
- 3) Self-help strategies for coping with tinnitus (e.g., distraction, relaxed confrontation, reappraisal) were deduced from the model and recommended for use.
- 4) Subjects were given the opportunity to discuss their progress and problems followed after a 4-week period of implementing the recommended “self-help exercises.”
- 5) Patients were told that if they were not satisfied with the outcome, they could join a TCT group after post therapy assessment.

#### Minimal Contact -relaxation:

- 1) The importance of relaxation and distraction as strategies for coping with tinnitus was underlined
- 2) Subjects received two audiocassettes with verbal relaxation instructions and pieces of relaxing music (30 min) selected by a music therapist. Patients were given the audiocassettes for home use and were instructed to choose the pieces of music, which suited them best
- 3) Discuss problems and progress
- 4) The participants of this treatment condition were also told that they could join in TCT after post treatment

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### Description of sample

#### Inclusion:

- 1) Between 18 and 65 years old (TCT mean=44.7 sd=12.7, MC-E mean=48.5 sd=10.6, MC-R mean=50.0 sd=12.6, Control mean=47.3 sd=7.9)
  - 2) Duration of tinnitus exceeded 6 months (TCT mean=55.4 sd=51.5, MC-E mean=64.2 sd=44.5, MC-R mean=111.7 sd=125.4, Control mean=57.4 sd=44.9,)
  - 3) Medical diagnosis was “ideopathic tinnitus” (excluding patients with Morbus Menie`re)
-

- 4) Patients had to report that tinnitus was currently their main health problem
- 5) Subjective annoyance by tinnitus had to reach an average rating > 40 on nine scales (rating 0 – 100) assessing disruptive effects of tinnitus (TCT mean=65.3 sd=15, MC-E mean=59.3 sd=17.8, MC-R mean=62.5 sd=18.6, Control mean=68 sd=15.9)

**Exclusion:**

- 1) If hearing loss prevented them from participating in communication within groups (TCT 55.8%, MC-E 47.1%, MC-R 40%, Control 20%)
- 2) Currently in psychotherapeutic treatment

**Baseline pre-assessment/treatment outcome measures**

	TCT		MC-education		MC-relaxation		Waiting list control	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Diary loudness	4.73	1.51	4.21	1.19	4.34	1.53	5.60	1.13
Diary hour of being aware of tinnitus	2.93	1.35	3.38	1.37	2.92	1.20	3.01	0.95
Diary subjective control	1.70	1.84	2.59	1.59	1.80	1.97	2.17	1.88
TQ	35.60	14.02	38.47	16.23	42.33	12.78	38.65	13.15
TDI	2.54	1.56	2.52	1.74	2.74	1.73	3.29	1.59
COPE self-encouragement	3.87	0.73	4.15	0.94	3.81	1.01	3.63	0.73
COPE relaxation	2.88	0.92	3.17	1.15	2.79	1.08	2.51	1.0
COPE distraction	3.34	0.72	3.45	0.65	3.17	1.09	3.61	0.71
COPE catastrophising	2.45	0.76	2.55	0.62	2.91	0.98	2.74	0.77
Global Severity Index of SCL-90-R	0.59	0.36	0.71	0.53	1.09	0.76	0.70	0.35
ADS	13.89	8.3	15.5	9.38	20.98	14.55	17.25	9.01

**Comorbid mental health problems**

Not reported

**Delivering clinician**

- 1) Postgraduate Psychologist

**Research methods**

RCT

**Outcome measures**

Primary:

- 1) Tinnitus diary (loudness, hours of being aware of tinnitus, and subjective control of tinnitus)\*
- 2) Tinnitus Questionnaire
- 3) Tinnitus Disability Questionnaire (TDI; German version of the tinnitus-adapted Pain Disability Questionnaire)\*

- 4) COPE (A German coping inventory)\*
- 5) SCL-90R\*
- 6) ADS (the German version of the CES-D)\*

Secondary:  
Not reported

### **Results**

Findings reveal highly significant improvements in TCT in comparison to the control group (WC) and MC interventions. MC interventions do not differ significantly from each other, but are superior to WC in a few domains of outcome.

### **Associated intervention**

Modified original TCT protocol:

Kroñner-Herwig B, Hebing G, van Rijn-Kalkmann U, Frenzel A, Schilkowsky G, Esser G. The management of chronic tinnitus— comparison of a cognitive – behavioural group training with yoga. J Psychosom Res 1995; 39: 153 – 65.

### **Further notes**

\* Only (2) Tinnitus Questionnaire qualifies as a primary outcome measure for the second hypothesis concerning maintenance of positive therapeutic change at follow-up

38) Lain 2006

### **Intervention groups (sample size)**

- 1) Cognitive Behavioural Therapy (1 patient)

### **Assessment content components**

Not reported

### **Treatment content components**

- 1) Cognitive restructuring
- 2) Attention-control
- 3) Guided imagery
- 4) Sound matching
- 5) Relaxation training
- 6) Rehearsal
- 7) Reintroduce social and recreational activities
- 8) [Spousal attendance at] counselling sessions [...] to learn about their “tinnitus feelings” and express what they needed from each others

### **Description of sample**

Not reported

### **Comorbid mental health problems**

Mixed anxiety and depression

### **Delivering clinician**

Psychologist

### **Research methods**

Grey literature – case review

### **Outcome measures**

Not reported

### **Results**

Reintroduced social and recreational activities. Self-esteem improved. Outlook and focus changed, reduced avoidance behaviours. Depression, stress and anxiety greatly reduced.

<b>Associated intervention</b>
<b>Further notes</b>
39) Lain 2008
<b>Intervention groups (sample size)</b> Counselling (n/a)
<b>Assessment content components</b> Not reported
<b>Treatment content components</b> <ol style="list-style-type: none"> <li>1) Present to the patient the value of addressing the psychological aspects of their condition</li> <li>2) Coping skills</li> <li>3) Strategies to improve their quality of life</li> <li>4) Exploring [...] symptoms from a psychological perspective</li> </ol>
<b>Description of sample</b> n/a
<b>Comorbid mental health problems</b> n/a
<b>Delivering clinician</b> Psychologist
<b>Research methods</b> Grey literature: opinion piece
<b>Outcome measures</b> n/a
<b>Results</b> n/a
<b>Associated intervention</b>
<b>Further notes</b>

40) Lindberg 1988
<b>Intervention groups (sample size)</b> 1) Self-control training (1 patient)
<b>Assessment content components</b> 1) VAS (subjective tinnitus loudness; STL, discomfort from tinnitus; DT, ability to control tinnitus; TC)
<b>Treatment content components</b> <ol style="list-style-type: none"> <li>1) Training in progressive relaxation (e.g. Bernstein &amp; Borkovec, 1973).</li> <li>2) The rationale was introduced to the patient, i.e. to tense and relax muscles in a given order, before the actual relaxation was performed.</li> <li>3) Finally, the patient was given written instructions how to practice on her own between sessions.</li> <li>4) Training in short, progressive relaxation (i.e. relaxation without tensing muscle)</li> <li>5) Quick relaxation</li> </ol>

- 6) Applied relaxation (e.g. Ost, 1988).
- 7) Systematic refocusing on external stimuli constituted the coping behaviour used by the patient. She was asked to note any tinnitus-provoking situation, and from these notes, alternative focusing of her attention was decided upon. This technique is discussed in more detail by Scott et al. (1985).

### **Description of sample**

Case:

- 1) 26-year old female
- 2) 'Total deafness'
- 3) The patient reported headache and muscle pain which occurred several times a week in connection with "bad days" from the tinnitus point of view. She also had problems with dizziness as well as frequent attacks of vertigo [and] constant tiredness

Baseline pre-assessment/treatment outcome measures

	Self-control training
	Case
VAS loudness	4
VAS discomfort	6
VAS controllability	3

### **Comorbid mental health problems**

Not reported

### **Delivering clinician**

Not reported

### **Research methods**

Case study

### **Outcome measures**

Primary:

- 1) VAS (subjective tinnitus loudness; STL, discomfort from tinnitus; DT, ability to control tinnitus; TC)

Secondary

None

### **Results**

The general trend in the data shows reductions in STL and DT, and an increase of TC over time.

### **Associated intervention**

### **Further notes**

41) Lindberg 1989

### **Intervention groups (sample size)**

- 1) Psychological treatment: Relaxation and exposure (RE; 9 patients)
- 2) Psychological treatment: Relaxation and distraction (RD; 10 patients)
- 3) Waiting-list control (8 patients)

### **Assessment content components**

- 1) Behavioural Analysis
- 2) VAS (subjective loudness of their tinnitus (SLT), the discomfort from their

tinnitus (DT) and their ability to control the discomfort from tinnitus (AC))

#### **Treatment content components**

- 1) Behavioural Analysis
- 2) Progressive relaxation
- 3) Differential relaxation
- 4) Quick relaxation

RE

- 5) Exposure to tinnitus provoking environmental noise – direct attention to tinnitus sound, then asked to relax quickly and turn attention to environmental noise
- 6) Noise level increasing/decreasing in negative relationship with tinnitus coping

Distraction condition:

- 7) Applied relaxation
- 8) Distraction using pleasant images
- 9) Alternative behaviours in problematic situations suggested and discussed

#### **Description of sample**

Inclusion

- 1) Tinnitus should be the major otological complaint
- 2) Tinnitus should have been constantly present for at least one year
- 3) Psychologist deemed them suited for behavioural treatment during interview

Baseline pre-assessment/treatment outcome measures

	RE		RD		WLC	
	Mean	SD	Mean	SD	Mean	SD
STL	6.95	*	7.21	*	7.57	*
DT	5.90	*	6.72	*	7.23	*
AC	2.29	*	3.23	*	1.94	*

\* Not reported

#### **Comorbid mental health problems**

Exclusion

- 1) No other acute psychiatric or somatic disorder should be present

#### **Delivering clinician**

Psychologist

#### **Research methods**

RCT

#### **Outcome measures**

- 1) VAS (subjective loudness of their tinnitus (SLT), the discomfort from their tinnitus (DT) and their ability to control the discomfort from tinnitus (AC))

Secondary:

None

#### **Results**

The results confirmed favourable reports on behavioural methods in tinnitus. However, no differences were found between therapies.

#### **Associated intervention**

Lindberg P., Scott B., Lyttkens L. and Melin L. (1988) Behavioural therapy in the clinical management of tinnitus. Br. J. Audiol. 22, 265-272.

Distraction group:  
Has [...] been tried successfully in an experimental group study with long term follow-up (Scott et al., 1985)

#### **Further notes**

42) Lindberg and Scott 1988

#### **Intervention groups (sample size)**

1) Behavioural therapy (75 patients)

#### **Assessment content components**

Behavioural analysis:

- 1) The characteristics of discomfort arising from the tinnitus were noted
- 2) Situational factors influencing distress from the tinnitus as well as factors preceding and triggering annoyance from the tinnitus were noted
- 3) Hypotheses concerning the way in which the tinnitus influences the persons' psychological functioning were discussed and elaborated with the patient
- 4) VAS (discomfort from tinnitus, mood)
- 5) Structured interview
- 6) Tinnitus matching

#### **Treatment content components**

- 1) Goal setting
- 2) Information
- 3) Progressive relaxation
- 4) Conditioned and differential relaxation
- 5) Information on coping
- 6) Coping training: quick and cue-controlled relaxation
- 7) Distraction
- 8) Refocusing of attention
- 9) In-vivo practice of coping in increasingly difficult situations
- 10) Independent treatment elements based on the behavioural analysis.
- 11) Desensitisation and exposure techniques

#### **Description of sample**

Inclusion:

- 1) Tinnitus should be the major otological complaint
- 2) Necessary measures should have been taken to optimise the hearing ability (e.g. hearing aid fitting)

Baseline pre-assessment/treatment outcome measures

	Behavioural Therapy	
	Mean	SD
VAS discomfort from tinnitus	6.51	1.59
VAS mood	5.38	1.67

#### **Comorbid mental health problems**

Exclusion

- 1) There should be no acute psychiatric disorder

#### **Delivering clinician**

Therapists with special experience in tinnitus therapy
<b>Research methods</b> Consecutive case series
<b>Outcome measures</b> Primary: <ol style="list-style-type: none"> <li>1) VAS (discomfort from tinnitus, mood)</li> <li>2) Structured interview</li> </ol> Secondary: Not reported
<b>Results</b> Self-recordings showed significant reductions of 'discomfort from tinnitus' as well as significant elevations in 'general mood' over a 3-month follow-up period.
<b>Associated intervention</b>
<b>Further notes</b>

43) Mason 1996

<b>Intervention groups (sample size)</b>		
<div>1) Client centred hypnotherapy (44 patients)</div> <div>2) Counselling (46 patients)</div>		
<b>Assessment content components</b>		
<div>1) Tinnitus loudness match</div> <div>2) Subjective tinnitus symptom severity scale</div> <div>3) Trend of linear analogue scale (no tinnitus – worst tinnitus)</div>		
<b>Treatment content components</b>		
Counselling:		
<div>1) The tinnitus sufferer was given ample opportunity to talk specifically about their tinnitus and its associated problems.</div> <div>2) A discussion of the possible origins of tinnitus</div> <div>3) Reassurance that it was not a sign of sinister pathology</div> <div>4) All the available treatment options were explained to the patients and the advantages and shortcomings of each were discussed.</div> <div>5) Each patient was given an opportunity to ask questions.</div> <div>6) Finally advice was given regarding background masking, maintaining general health, getting adequate rest, and avoiding alcohol, nicotine, aspirin and noise abuse.</div>		
<b>Description of sample</b>		
Inclusion:		
<div>1) If they were referred to the ENT department</div>		
Exclusion:		
<div>1) Dizzy symptoms</div> <div>2) After careful assessment they needed further investigation, or required surgical or medical treatment for related conditions.</div> <div>3) They had had any form of therapy in the past five years for their tinnitus.</div>		
Baseline pre-assessment/treatment outcome measures		
	Client centred hypnotherapy	Counselling



	Mean	SD	Mean	SD
Subjective tinnitus symptom severity questionnaire	11.0	*	11.1	*

\* Not reported

### **Comorbid mental health problems**

Exclusion:

- 1) Clinical depression

### **Delivering clinician**

ENT registrar

### **Research methods**

RCT

### **Outcome measures**

Primary:

- 1) Subjective tinnitus symptom severity questionnaire
- 2) Trend of linear analogue scale (no tinnitus – worst tinnitus)
- 3) Request for further therapy
- 4) Whether the patient had an impression of improvement in their tinnitus after treatment

Secondary:

Not reported

### **Results**

Client Centred Hypnotherapy was no better than counselling in reducing the impact of tinnitus using the three quantitative measures of tinnitus, and requests for further follow up. Although both groups showed a reduction in subjective symptom severity.

### **Associated intervention**

### **Further notes**

44) Mohr 2008

### **Intervention groups (sample size)**

- 1) Existential psychotherapy (n/a)

### **Assessment content components**

- 1) Attention should be given to the fact that, as a consequence of grief, clients are sometimes unable to reach out and make use of all the good information and counselling provided by professionals. If the professional gets a feeling of being unable to make himself heard by the client, grief (or even depression) may be present.

### **Treatment content components**

- 1) First of all, during existential therapy the client will feel truly heard, accepted and understood in depth. One of the things that contribute to building up this feeling is that the therapist is not coming with suggestions or advice meant to reduce or alter the feelings of the client. The therapist thus refrains from being directive, counselling, advising or interpreting. The therapist instead will encourage the client to tell even more about how he is doing.

- 2) Existential therapy also offers the client a possibility to obtain an overview of his present situation with tinnitus. Metaphorically speaking, one could say that the client and therapist during therapy take their time to carry out a thorough investigation of the meaning and impact of each bit and piece which when put together constitute the jigsaw puzzle of the client's life with tinnitus.
- 3) Posing questions and seeking clarification in order to 'understand what [the patient] understands'
- 4) The therapist typically will initiate the process by saying something like: "Where would you like to start"
- 5) The existential therapy gives the client space to examine his awareness of the existential Freedom and Choice as well as how he makes use of these. For instance, what will happen to his tinnitus as well as his life if he more actively starts making use of these two existential focal conditions
- 6) Attach[ing] meaning to tinnitus can be very helpful. Attention, however, should be given to the fact that not all people are able to do this. Therefore the professional needs to be very careful not to make it his or her unspoken project to make the client create meaning
- 7) Endure being with the client [when unable to discover meaning for their tinnitus], offering company and willingness to try understanding what [the patient], is going through, as well as supporting him in examining how the Meaninglessness is influencing the "other bits and pieces of his jigsaw puzzle"
- 8) Find a way to live with or make use of this (death: how quickly things can happen, how little we are able to protect ourselves and how easily we can lose control) recognition. During therapy the client will have the possibility to explore how he can be made able to carry this recognition with him throughout his life without being continuously dominated or paralysed by it. An example of this is seen when clients with tinnitus begin to live more intensely in the 'now' instead of postponing plans and ideas to be undertaken sometime in the future.
- 9) [The patient's] anger may, for instance, provide him with sufficient courage to listen to music (in spite of having not dared to do so for a long time due to fear of worsening the tinnitus) that will provide him with the experience that listening to music is OK and not dangerous
- 10) Typically the client experiencing loss needs to find out in detail which part of his life-map is struck by the loss as well as how the parts are struck by it. It is as if the client needs to get a thorough sense of this before he is able to invest in new things that will contribute to his life in a positive way – as if in order to leave the loss behind he needs to know the full extent of the loss.
- 11) During therapy the client will have the opportunity to get hold of the Aloneness. For instance, the client can explore where he feels most alone and where he feels less alone and discover what ingredients are needed in order for him to feel less alone. Also, time will be spent on how he can live life together with this existential focal condition, the Aloneness, without this focal issue throwing dark shadows on the more pleasant things in life.

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**Description of sample**

n/a

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**Comorbid mental health problems**

Depression should "the professional gets a feeling of being unable to make himself heard by the client" – see assessment field

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**Delivering clinician**

Existentialist therapist
<b>Research methods</b>
Book chapter - Description of Existential psychotherapy
<b>Outcome measures</b>
n/a
<b>Results</b>
n/a
<b>Associated intervention</b>
<b>Further notes</b>

45) Mohr 2006

<b>Intervention groups (sample size)</b>
1) Tinnitus person-centred therapy
<b>Assessment content components</b>
<ol style="list-style-type: none"> <li>1) Determining the client's purpose for calling</li> <li>2) Determining the client's understanding of the aetiology of tinnitus and interventions already undertaken</li> <li>3) Determining why the client has chosen to contact this particular clinic</li> <li>4) Finding out about the client's previous or ongoing experience with therapy</li> <li>5) Examining the client's psychological "mindedness" and expectations of duration and outcome of therapy</li> <li>6) Providing information about ethics and confidentiality</li> <li>7) Summing up</li> <li>8) Clarifying formalities</li> <li>9) Administer the Tinnitus Background Questionnaire</li> <li>10) Go through the answers from the [Tinnitus background] questionnaire, paying particular attention to the information that we have highlighted for clarification.</li> <li>11) At the first meeting we are careful to start with a bit of informal talk because this normally makes the client feel comfortable and welcome</li> <li>12) We continue by encouraging clients to move their attention inward, reflecting upon what it feels like to be with us, the therapist, right now</li> <li>13) Such considerations can be important to examine further. What are they about? What exactly is it that is making the client nervous, and does this influence tinnitus? What are the client's thoughts on doing therapy "the right way"? Where do these thoughts come from?</li> <li>14) These considerations may lead to asking the client to be more explicit on how he or she would like therapy to be. Which demands does the client hold toward the therapist? What is important for the client in the therapeutic sessions? What would the client like to achieve? Explain that each therapeutic session belongs to the client and that it therefore is up to the client to decide where to start [and be]... attentive to whatever the client brings forth</li> <li>15) Extract themes or issues that we think could be valuable to work with during therapy</li> <li>16) We present our thoughts to the client, being very careful to make the client be as explicit as possible: Does the client agree with our thoughts, or are his or her thoughts and expectations headed in another direction? We want the client to be active and to take responsibility for the direction of the therapeutic</li> </ol>

process, and therefore we are willing to adjust our suggestions, as long as the client's ideas make sense and are realistic.

#### **Treatment content components**

- 1) Redirect the client's focus from tinnitus alone to the way the person tackles self-imposed demands, problems, and other dilemmas in life
- 2) Set priorities as well as to investigate the consequences of the actions and new attitudes that grow during the therapy
- 3) The therapist has to listen to what the client says about tinnitus and be attentive to whatever else the client is conveying about how he or she exists in life
- 4) The therapist, for instance, meets [the patient] in the now when asking her [for example]: "Do I seem shocked?" The therapist here employs one of the strategies used in the existential therapies approach; namely, using the relationship between the client and the therapist to see what their relation is like, what it gives to the client, and from there to explore whether it differs from the relations that the client with others
- 5) The existential therapist will encourage the client to use their relationship actively to try out new ways of thinking and being
- 6) When working existential[ly], different feelings like shame will be explored, with the focus on how they are experienced by the client in the present and on how they can be evolved so that they are less stressful and negative (i.e. "Could you please stay with your feeling of being ashamed, as painful as it may be for you, and tell me more about it?").
- 7) Have [the patient] clarify what it would feel to learn that a close friend has always hid her anxiousness, sadness, and other stressful feelings.
- 8) Consider a more balanced way of living, for instance, by exploring how it would be to let a close friend know of the feelings that are difficult
- 9) The therapist mirrors [the patient] and commends [them] for courage
- 10) Describe, don't explain". Instead of discussing, for instance, what clients have read or heard of the physiology of tinnitus, they are encouraged to describe all the different situations in which tinnitus is annoying them, how it annoys them, and how they then react

#### **Description of sample**

n/a

#### **Comorbid mental health problems**

n/a

#### **Delivering clinician**

Therapist

#### **Research methods**

Overview

#### **Outcome measures**

n/a

#### **Results**

n/a

#### **Associated intervention**

#### **Further notes**

Caveat:

“There is no cookbook method to systemizing or manualizing Tinnitus Person-Centered Therapy. First, there exists no grand, all-encompassing system for how to

undertake existential therapy (Cooper, 2004). Second, even if every existential therapist followed the overall principle for undertaking existential therapy for the same client, every course will have its own individual way of being (here existential therapy does not differ much from, for instance, psychodynamic-oriented therapy” (p215).

46) Nyenhuis 2013

#### **Intervention groups (sample size)**

- 1) Internet self-management cognitive behavioural intervention (79 patients)
- 2) Bibliotherapy cognitive behavioural intervention (77 patients)
- 3) Group training cognitive behavioural intervention (71 patients)
- 4) Information only control condition (77 patients)

#### **Assessment content components**

- 1) Tinnitus Questionnaire
- 2) Von Zerssen’s symptom list (BL)
- 3) PHQ-9
- 4) Sleeping difficulties were assessed by one item asking whether the participant’s sleep was disturbed by tinnitus

#### **Treatment content components**

- 1) Education regarding the aetiology of tinnitus
- 2) The morphological and functional characteristics of the hearing system
- 3) Treatment options
- 4) The psychological aspects of tinnitus distress (vicious circle of thoughts, emotions, bodily functions)
- 5) Coping by attention and distraction
- 6) Dysfunctional and functional thoughts – tinnitus as a stressor
- 7) Stress management and relaxation
- 8) A review of training and maintenance of skills
- 9) Tinnitus and sleep hygiene
- 10) At regular intervals, the manual contained multiple-choice self-tests to check text comprehension.
- 11) Presented central concepts regarding the neuro-acoustical and psychological model of tinnitus perception and the tinnitus distress response.
- 12) Attention diversion was explained
- 13) Cognitive reappraisal was explained
- 14) Progressive muscle relaxation was explained
- 15) General stress management was explained
- 16) Participants were asked to practise attention diversion at home
- 17) Homework to record one’s thoughts on tinnitus and to find alternative beliefs.

#### **Description of sample**

Inclusion:

- 1) If he or she had experienced idiopathic tinnitus for two to 26 weeks
- 2) Between 18 and 75 years old
- 3) Not receiving any other tinnitus-related psychological treatment.
- 4) All participants had to have access to the Internet and be able to take part in weekly group sessions.

Baseline pre-assessment/treatment outcome measures

Group		Bibliotherapy		Internet		Information	
Mean	SD	Mean	SD	Mean	SD	Mean	SD

TQ	36.9	14.9	39.2	16.8	35.8	13.4	34.5	13.0
PHQ9	6.9	5.6	8.2	5.3	6.7	4.2	5.9	4.6
BL	19.6	12.3	21.8	12.2	20.7	9.8	18.1	9.9

#### **Comorbid mental health problems**

Not reported

#### **Delivering clinician**

Psychologists

#### **Research methods**

RCT

#### **Outcome measures**

Primary:

- 1) Tinnitus Questionnaire

Secondary:

- 1) Von Zerssen's symptom list (BL)
- 2) PHQ-9
- 3) Sleeping difficulties were assessed by one item asking whether the participant's sleep was disturbed by tinnitus

#### **Results**

At the post-assessment tinnitus distress was significantly lower in the Internet and the group training conditions compared to the control condition. Inter-group effect sizes were moderate to large. At follow-up, all active training conditions showed significantly reduced tinnitus distress compared to the control condition (intention-to-treat analysis).

#### **Associated intervention**

#### **Further notes**

An additional completer analysis showed a significant reduction in tinnitus distress only for the group condition. All effect sizes were moderate. There were no differences regarding psychosomatic discomfort, but depressive symptoms were reduced in the group condition at the post-assessment (intention-to-treat analysis). Treatment satisfaction was significantly higher in the training conditions. The dropout rate was 39%.

47) Olsson 2001

#### **Intervention groups (sample size)**

- 1) Cognitive Therapy (n/a)

#### **Assessment content components**

- 1) History taking: the therapist might ask the patient to estimate what percentage of time he is aware of his tinnitus
- 2) The therapist might ask the patient to list activities that are affected by tinnitus awareness

#### **Treatment content components**

- 1) Empathize with the patient
- 2) Reassure the patient that his mind is operating normally
- 3) The patient and the therapist to identify a concrete issue, or problem, to be addressed [...] through open-ended questioning and careful listening
- 4) Identify thoughts and emotions triggered by the tinnitus.
- 5) Teach the patient the concept of cognitive distortions, and then help the patient

to identify whether, and what, cognitive distortions the patient subconsciously believes.
6) Help the patient to identify, ideally through discovery, if necessary by teaching, the relationship between irrational beliefs and their consequences.
7) On occasion it might be necessary to actually dispute the client's irrational beliefs.
8) Helping the patient distinguish between the experience of tinnitus and any maladaptive behaviour the patient might engage in when responding to the tinnitus.
9) Identifying the positive alternative thought is step seven.
10) Creating specific, identifiable objectives that can be realistically achieved and measured. These are activities that can realistically be achieved, can be measured, and are more constructive than the present behaviour
11) Recommend to patients that they get rid of their charts and diaries.
<b>Description of sample</b>
n/a
<b>Comorbid mental health problems</b>
n/a
<b>Delivering clinician</b>
Audiologist
<b>Research methods</b>
Protocol (dissertation chapter)
<b>Outcome measures</b>
n/a
<b>Results</b>
n/a
<b>Associated intervention</b>
<b>Further notes</b>

48) Robinson 2008

<b>Intervention groups (sample size)</b>
1) CBT (38 patients)
2) Waitlist control (27 patients)
<b>Assessment content components</b>
1) Tinnitus severity: one-item Likert scale, with 0 indicating “no problem” and 10 signifying “unbearable.”
2) Tinnitus annoyance: one-item Likert scale with 0 indicating “not at all annoying” and 100 indicating “extremely annoying.”
3) THQ
4) Tinnitus Reaction Questionnaire
5) Tinnitus Handicap Inventory
6) Tinnitus Questionnaire
7) Modified Somatic Perception Questionnaire (MSPQ)
8) Private Self-Consciousness Scale (PSC)
9) Hamilton Rating Scale for Depression 17-item version (HRSD)
10) BDI
11) SCL-90-R

## 12) Quality of Well-Being Scale (self-administered version (QWB-SA))

### Treatment content components

- 1) Introduction: Thoughts, Behaviors, Stress, and Tinnitus
- 2) Increasing Pleasant Activities
- 3) Relaxation Techniques
- 4) Cognitive Restructuring
- 5) Goal Setting
- 6) Summary and Review

### Description of sample

#### Inclusion:

- 1) Self-reported distress due to tinnitus

#### Exclusion:

- 1) Factors that interfered with patient ability to participate in a group for physical (e.g., unable to get to group)

### Baseline pre-assessment/treatment outcome measures

	CBT		Control	
	Mean	SD	Mean	SD
Severity	7.70	1.63	6.70	2.30
Annoyance	81.60	25.64	72.87	27.93
THQ	59.18	24.52	47.55	24.33
TRQ	53.00	22.54	38.04	23.40
THI	60.21	22.08	50.82	26.24
TQ	47.93	14.19	42.55	17.27
MSPQ	8.89	6.03	7.38	7.98
PSC	20.90	6.83	20.66	7.21
HRSD	12.79	7.74	11.37	6.16
BDI	16.32	11.03	13.16	7.20
SCL-90	1.17	0.73	1.01	0.67
Quality of wellbeing	0.49	0.16	0.57	0.13

### Comorbid mental health problems

#### Exclusion:

- 1) Factors that interfered with patient ability to participate in a group for psychological reasons (e.g., psychosis or dementia)

### Delivering clinician

- 1) Psychiatrist
- 2) Psychology doctoral students
- 3) Nursing staff specialising in psychiatry \*

### Research methods

RCT

### Outcome measures

#### Primary:

- 1) Tinnitus severity: one-item Likert scale, with 0 indicating “no problem” and 10 signifying “unbearable.”
- 2) Tinnitus annoyance: one-item Likert scale with 0 indicating “not at all annoying” and 100 indicating “extremely annoying.”
- 3) THQ



- 4) Tinnitus Reaction Questionnaire
- 5) Tinnitus Handicap Inventory
- 6) Tinnitus Questionnaire
- 7) Modified Somatic Perception Questionnaire (MSPQ)
- 8) Private Self-Consciousness Scale (PSC)
- 9) Hamilton Rating Scale for Depression 17-item version (HRSD)
- 10) BDI
- 11) SCL-90-R
- 12) Quality of Well-Being Scale (self-administered version (QWB-SA))

Secondary:  
Not reported

### **Results**

Repeated-measure analysis of covariance revealed significant group-by-time interactions on measures of tinnitus distress and depression, indicating that CBT led to greater improvement in those symptoms

### **Associated intervention**

### **Further notes**

\* Administration of assessment only

49) Sadlier 2008

### **Intervention groups (sample size)**

- 1) CBT/Mindfulness meditation (14 patients)
- 2) Waitlist control (11 patients)

### **Assessment content components**

- 1) Exploration of patient's model of tinnitus
- 2) Tinnitus Triggers Questionnaire
- 3) Tinnitus Questionnaire
- 4) VAS ('What is the overall effect your tinnitus is having at present?')
- 5) HADS
- 6) Satisfaction with life scale

### **Treatment content components**

- 1) Outline of therapy
- 2) Introduction of concept of neurocognitive plasticity/change.
- 3) Exploration of predisposing and perpetuating variables to tinnitus exacerbation.
- 4) Introduction of cognitive reconstruction
- 5) Behavioural adaptation to tinnitus stimuli.
- 6) Graded exercise
- 7) Breathing techniques
- 8) Introduction to mindfulness meditation
- 9) Control over autonomic nervous system (heart rate monitors)
- 10) Depersonalising tinnitus
- 11) Sleep facilitation and sleep hygiene principles
- 12) Application of techniques to cue control situations
- 13) Change management

### **Description of sample**

Inclusion:

- 1) Patients complaining of (intrusiveness of) tinnitus

- 2) Patients who were deemed would benefit from psychological input as well as audiological management approach

Exclusion:

- 1) Those who had a treatable cause to their tinnitus such as otitis media
- 2) Those who merely needed reassurance that there was no sinister cause to their tinnitus

Baseline pre-assessment/treatment outcome measures

	CBT Mindfulness	
	Mean	SD
HADS anxiety	9.4	*
HADS depression	4.8	*

\* Not reported

**Comorbid mental health problems**

Not reported

**Delivering clinician**

Not reported

**Research methods**

Pre-post consecutive allocation controlled trial

**Outcome measures**

Primary:

- 1) Tinnitus Questionnaire
- 2) VAS ('What is the overall effect your tinnitus is having at present?')

Secondary:

- 1) HADS
- 2) Satisfaction with life scale
- 3) How they felt [...] 'better', 'no change' or 'worse'

**Results**

CBT/Mindfulness meditation superiority over wait-list control. Significant statistical reductions in tinnitus variables both in the active and also in the [waiting-list] control group [post-therapy]. [...] No significant change was found after the waiting list period. The improvement was maintained at the four to six month period.

**Associated intervention**

**Further notes**

50) Scott 1985

**Intervention groups (sample size)**

- 1) Psychological Treatment (12 patients)
- 2) Waiting-list control (12 patients)

**Assessment content components**

- 1) The treatment was commenced with an interview aimed at assessing what significance the tinnitus had on the patient's life, i.e. a behaviour analysis
- 2) VAS (subjective tinnitus loudness, discomfort from tinnitus, depression, irritation)

**Treatment content components**

- 1) The aim of the treatment had been discussed with the patient
- 2) Progressive relaxation, patients were instructed to practise relaxation between sessions
- 3) Specific problems in relaxing were discussed from the reported results of the practising
- 4) Conditioned relaxation (Bernstein & Borkovec, 1973). To be able to relax on cue, the patient associated a relaxed state with slow, relaxed breathing and the word "relax".
- 5) Quick relaxation (Bernstein & Borkovec, 1973), i.e. the patient was to put himself in a state of deep relaxation by silently saying the cue word and taking a few deep breaths
- 6) Training of distraction with the help of exercises to relocate attention. Patients should transfer their attention from their tinnitus to something unrelated to this phenomenon
- 7) Perceptual restructuring began with a presentation by the therapist of a situation associated with tinnitus, for example being exposed to noise, at bedtime, or in stressful situations at work. When the patient's attention had focused on the tinnitus, quick relaxation was introduced. When relaxed, the patients were instructed to imagine themselves in a pleasant situation, i.e. a situation associated with a relaxed condition, incompatible with tinnitus, and afterwards to report the effects on the tinnitus. Step by step the patient practised with imagined situations associated with increasing tinnitus discomfort. When the patient became more skilled, the therapist gradually decreased the instructions
- 8) The application of the [whole] method in the patient's daily life. At first the therapist accompanied the patient and helped him or her to apply the self-control technique. Finally, the patients were instructed to use the technique on their own

### **Description of sample**

Inclusion:

- 1) Constant subjective tinnitus

Baseline pre-assessment/treatment outcome measures

	Psychological treatment		Control	
	Mean	SD	Mean	SD
Loudness direct	7.24	1.83	7.04	2.11
Loudness retrospective	6.88	2.15	6.71	2.10
Discomfort direct	6.21	1.74	6.43	2.04
Discomfort retrospective	6.24	2.26	6.01	2.03
Depression	2.95	1.73	2.78	1.48
Irritation	2.81	1.86	2.60	1.40

### **Comorbid mental health problems**

Not reported

### **Delivering clinician**

- 1) Psychologist
- 2) Audiologist (or Psychologist) for final interview only

### **Research methods**

RCT

**Outcome measures**

Primary:

- 1) VAS (subjective tinnitus loudness, discomfort from tinnitus, depression, irritation)

Secondary:

None

**Results**

The treatment group improved significantly more than the waiting-list control group. After treatment of the latter group, combined data of both groups showed statistically significant improvements in all variables.

**Associated intervention**

**Further notes**

51) Searchfield 2010

**Intervention groups (sample size)**

- 1) Counselling with hearing aid as sound therapy (29 patients)
- 2) Counselling without hearing aid as sound therapy (29 patients)

**Assessment content components**

- 1) THQ

**Treatment content components**

- 1) Provide reassurance as to the origins of tinnitus
- 2) Advice to avoid silence
- 3) An explanation of the hearing test and tinnitus evaluation results were provided
- 4) Simple description of related auditory physiology and central auditory processing of sound.
- 5) Pen and paper exercises, explaining tinnitus and its management, were completed by the patient and their audiologist.
- 6) Practical methods of relaxation
- 7) Attention diversion
- 8) Stress management
- 9) A CD of relaxation exercise training: breathing exercises
- 10) A CD of relaxation exercise training: progressive muscle relaxation \*
- 11) Information about sleep hygiene
- 12) Involved family members/friends

**Description of sample**

Exclusion:

- 1) Fitted with combination instruments
- 2) Received additional therapies (e.g. neuromonics, cognitive behavioural therapy)
- 3) Had a low tinnitus handicap (THQ<15) at their first evaluation
- 4) Suffered additional potentially confounding injuries (e.g. stroke, noise trauma) during the study period
- 5) Did not use their hearing aids as recommended.

#### Baseline pre-assessment/treatment outcome measures

	HA		Counselling	
	Mean	SEM	Mean	SEM
THQ	59.16	3.38	50.75	3.89

#### Comorbid mental health problems

Not reported

#### Delivering clinician

Audiologist

#### Research methods

Retrospective survey analysis of treatment

#### Outcome measures

1) THQ

#### Results

THQ scores were reduced 12 months following counselling but improvement in THQ only reached statistical significance for the group that received hearing aids. The hearing aid group had reduced; psychosocial handicap and tinnitus-hearing handicap.

#### Associated intervention

#### Further notes

52) Searchfield 2011

#### Intervention groups (sample size)

1) Counselling and psychoeducation

#### Assessment content components

Not reported

#### Treatment content components

- 1) Needs and [SMART] goals setting
- 2) Anatomy/neurophysiology of the ear
- 3) Results of audiological assessment
- 4) Perception of sounds and tinnitus
- 5) Habituation
- 6) Attention
- 7) Treatment approaches
- 8) Self-management/coping strategies:
- 9) Sleep Hygiene: Going to bed strategies
- 10) Sleep Hygiene: Falling asleep strategies
- 11) Sleep Hygiene: Sleeping environment
- 12) Sleep Hygiene: Daytime habits
- 13) Progressive muscle relaxation
- 14) Deep breathing exercise
- 15) Attention control techniques
- 16) Distraction
- 17) Communication tips (when tinnitus accompanies hearing loss)
- 18) Referral
- 19) Relapse prevention
- 20) Hyperacusis
- 21) Homework
- 22) Relapse prevention: ma[ke] aware of potential triggers and means to manage

<p>them;</p> <p>23) Reassurance that the re-emerged tinnitus is likely a consequence of stressors, anxieties and life events</p> <p>24) Hearing conservation should be addressed with caution. Care should be taken to distinguish damaging from helpful sound.</p> <p>25) Provide written materials</p>
<p><b>Description of sample</b></p> <p>n/a</p>
<p><b>Comorbid mental health problems</b></p> <p>n/a</p>
<p><b>Delivering clinician</b></p> <p>1) Suggested psychologist</p> <p>2) Suggested audiologist</p>
<p><b>Research methods</b></p> <p>Overview – book chapter</p>
<p><b>Outcome measures</b></p> <p>n/a</p>
<p><b>Results</b></p> <p>n/a</p>
<p><b>Associated intervention</b></p>
<p><b>Further notes</b></p>

53) Sweetow 1984

<p><b>Intervention groups (sample size)</b></p> <p>1) Cognitive-Behavioral modification</p>
<p><b>Assessment content components</b></p> <p>1) The examiner obtains a thorough case history of the patient's otologic and general health pattern.</p> <p>2) Questions concerning the patient's ability to manage stress and his/her overall outlook on life (including work and family matters). All pertinent records are discussed and any audiologic testing.</p> <p>3) The patient also is asked to discuss and specifically identify those times when the tinnitus truly dominates his/her consciousness and is considered unbearable.</p>
<p><b>Treatment content components</b></p> <p>1) During this initial meeting, patients are educated about the nature of tinnitus</p> <p>2) The numerous causes of the symptom</p> <p>3) The correlation between increased tinnitus perception and such factors as noise exposure, lack of sleep and increased stress.</p> <p>4) The number of individuals who experience tinnitus (nearly 37 million according to a 1962 survey) is emphasized with special attention given to the relatively small percentage of people who report their lives to be significantly altered by the tinnitus.</p> <p>5) The concepts of cognitive restructuring and behavioral modification are introduced.</p> <p>6) The patient is informed that the tinnitus is real, not imagined, and it has a definite physical basis</p>

- 7) The patient is informed that the tinnitus may be permanent
- 8) The patient is informed that it is a person's reaction to the tinnitus, not the sound itself which creates a problem
- 9) The patient is informed that a person's reaction to a disorder is a manageable commodity that is subject to modification.
- 10) When resistance (to the implications that this problem is psychological) occurs, the patient needs to be reassured that there is no psychiatrist or psychologist facilitating the group
- 11) When resistance (to the implications that this problem is psychological) occurs, the patient needs to be reassured that it is assumed that each member of the group has a physical cause for tinnitus
- 12) When resistance (to the implications that this problem is psychological) occurs, the patient needs to be reassured that if the primary problem is believed to be abnormal psychology, the patient will not be asked to participate in the group process

Group:

- 13) Setting ground rules
- 14) Explaining the function of the group
- 15) Disavowing himself/herself (the therapist) as the expert who will find the solution.
- 16) Identify the behaviors the patients wish to modify.
- 17) List behaviors which he/she would like to modify.
- 18) The group will consider whether or not this is a behavior which is subject to modification:
- 19) If so, it will become a target of systematic experimentation that will take place over the next several sessions
- 20) If not, the group would challenge it and eliminate this behavior from systematic exploration
- 21) Patients are asked to reconstruct aloud their thoughts and expectations, and these are subject to examination by the group to determine whether such thoughts and expectations are rational and whether they are productive or counter-productive.
- 22) If irrational or counter-productive, then they (thoughts) must be replaced with other thoughts
- 23) Diversionary tactics (such as music, a puzzle, meditation, open focus, a hobby, etc.) also are suggested so that the patient has some strategies prepared before a noxious episode.
- 24) Role playing can be useful during these middle sessions. Rehearsing such [diversionary] strategies is far preferable to having to quickly devise tactics during the crisis itself.
- 25) The cognitive pattern preceding bedtime and during the time the patient is trying to fall asleep should be analysed
- 26) Certainly, the possibility that the patient can look at sleep loss differently might help
- 27) The results of the [behavioural] experiment should be recorded in the form of a diary as part of a homework assignment. Specifically, the group should help devise methods of quantifying the behaviour under study and systematically determining which of the suggestions appear to be having an effect.
- 28) Any attempt at change, even if unsuccessful, should be praised.

- 29) Remind patients that the gains they have achieved were accomplished by themselves, not by the leader of the group.
- 30) Inform the group that success is not measured only in terms of achieving the ultimate goal. The fact that each patient has taken chances, risks and identified behaviours that he/she recognizes as needing to be changed is a success in itself.
- 31) Members should be encouraged to continue experimenting on their own, to remember that these things take time and that behaviours are always subject to modification.
- 32) Most importantly, patients are reminded of the knowledge learned during the past several months pertaining to the effects of their cognitions and pre-cognitions of the manner in which they will cope with the tinnitus.
- 33) Patients are invited to return in three months for a "reunion session." Members often exchange phone numbers for support purposes and are reassured that they can call on the group leader for specific problems.
- 34) It should be emphasized, however, that the time has come for each patient to accept responsibility for his/her own situation

#### **Description of sample**

n/a

#### **Comorbid mental health problems**

n/a

#### **Delivering clinician**

n/a

#### **Research methods**

Overview

#### **Outcome measures**

n/a

#### **Results**

n/a

#### **Associated intervention**

#### **Further notes**

54) Sweetow 1986

#### **Intervention groups (sample size)**

- 1) Cognitive aspects of tinnitus patient management (2 patients, one within scope)

#### **Assessment content components**

Questionnaire:

Relevant Otologic History:

- 1) Suspected aetiology
- 2) Surgical history
- 3) Diagnostic tests performed
- 4) Contraindicated for earmold use

Audiology:

- 5) Presence of hearing
- 6) Interference with communication



7) History

8) Exercise

Diet:

9) Allergies

10) Coffee, salt and caffeine usage

11) Alcohol

12) Well balanced diet

Previous treatment:

13) Masker

14) Drug

15) Biofeedback

16) Hypnosis

17) Counselling

Stress Pattern:

18) Does patient consider himself tense?

19) How is tension manifested?, TMJ, shoulders, etc?

20) How does patient release tension?

21) How does tension affect tinnitus?

22) Stressors

Defining the problem:

Time:

23) Night

24) Morning only

25) At work

26) All the time

Behaviours affected:

27) Sleep

28) Work

29) Social

30) Family

31) Isolation

32) Hearing

Attitudes and Thoughts:

33) Frequency

34) Duration

35) Intensity

36) Cognitive distortions

Establishing therapeutic 'ground rules':

Patient acceptance of ultimate responsibilities:

37) Homework

38) Attendance

39) Audiologist's unconditional acceptance of patient, but not necessarily patient's ideas

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- 40) Treatment of patient, not tinnitus
- 41) Establishment of realistic expectations

Outcome Measures:

- 42) Frequency of negative thinking relating to tinnitus
- 43) Duration of negative thinking relating to tinnitus
- 44) Intensity of negative thinking relating to tinnitus
- 45) Daily loudness function chart
- 46) Daily annoyance function chart

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**Treatment content components**

Case 1:

- 1) The parameters which were to become the focus of therapy were defined
- 2) The concept of cognitive distortions was introduced
- 3) Homework assignment: Chart filled out by the patient depicting the perceived loudness of her tinnitus on a day to day basis, along with the perceived annoyance level (intensity of reaction).
- 4) After the first session, it was decided to determine the specific maladaptive behaviours and thought patterns that were subject to modification.
- 5) Explained examples of [...] cognitive distortion, [such as] “fortune telling.”
- 6) To combat negative behaviour, the patient maintained a detailed (every 30 minutes) log of her activity schedule to discuss in therapy each week.
- 7) This “schedule” was modified to force reportedly pleasurable activities on her on those very days she had been depressed and inactive.
- 8) Another “goal” was to ignore the advice she was receiving, though not wanting, from her sister-in-law and to begin taking her stomach medication as prescribed.
- 9) [The patient] was instructed not to equate all of her physical ailments with her tinnitus.
- 10) Improve self confidence in the ability to “fight back” at unacceptable thoughts and behaviours.
- 11) Cognitive preparation – the patient should be informed that the tinnitus has a physical origin but the way it is ultimately perceived is psychological.
- 12) The patient should be taught to identify (but not be ashamed of) their own cognitive distortions so they can proceed toward replacing them with productive thoughts
- 13) Therapeutic plans are based on altering frequency, duration , intensity/annoyance of tinnitus-related behavioural and attitudinal characteristics
- 14) Break the problem down into smaller components and then work on each one
- 15) All lines of communication with relevant spouse or friend should be opened up as early in the therapeutic process as possible
- 16) The Audiologist should listen and express empathy
- 17) The audiologist should explain the purpose of the therapy

Case 2 (N.B. included biofeedback relaxation and masker treatment)

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**Description of sample**

Case 1

- 1) Presented a mild bilateral presbycusis sensorineural hearing loss
  - 2) Present for 2 years
  - 3) Constantly present
-

<b>Comorbid mental health problems</b>
Depression
<b>Delivering clinician</b>
Audiologist
<b>Research methods</b>
Case study
<b>Outcome measures</b>
Primary: <ul style="list-style-type: none"> <li>1) Frequency of negative thinking relating to tinnitus</li> <li>2) Duration of negative thinking relating to tinnitus</li> <li>3) Intensity of negative thinking relating to tinnitus</li> <li>4) Daily loudness function chart</li> <li>5) Daily annoyance function chart</li> </ul>
Secondary: <ul style="list-style-type: none"> <li>n/a</li> </ul>
<b>Results</b>
Case 1 <p>The patient now attends follow-up sessions once every 3 months. Both she and her husband have begun swimming and other shared activities. While she still reports loud tinnitus, she confidently states she has learned how to accept and cope with it. This, in turn, had led to greater self confidence and a happier life. In addition, she has controlled her nervous stomach by taking her medication as prescribed*</p>
<b>Associated intervention</b>
<b>Further notes</b>
* n.b. “Of over 100 tinnitus patients treated with the above program, 78% have reported themselves to be “significantly” improved in their ability to handle their tinnitus.”

55) Tucker 2013

<b>Intervention groups (sample size)</b>
<ul style="list-style-type: none"> <li>1) Cognitive Behavioural Therapy (8 patients)</li> <li>2) Tinnitus Workshop (12 patients)</li> </ul>
<b>Assessment content components</b>
<ul style="list-style-type: none"> <li>1) Tinnitus Questionnaire</li> <li>2) VAS (reaction towards tinnitus)</li> <li>3) Short Form 36 Health Survey (SF-36)</li> <li>4) HADS</li> <li>5) Open Questions (based on an example in the Tinnitus Handbook, edited by Tyler (2000))</li> </ul>
<b>Treatment content components</b>
CBT: <ul style="list-style-type: none"> <li>1) General introduction</li> <li>2) Psychological tinnitus</li> <li>3) Education about tinnitus</li> <li>4) Approaches to management of tinnitus</li> <li>5) Homework.</li> <li>6) The effect of thoughts on feelings and behaviour; the A-B-C model</li> </ul>

- 7) Identifying styles of Negative Thinking
- 8) Relaxation training (educational)
- 9) Controlling Negative Thoughts
- 10) Overview and summary of the programme

#### Tinnitus workshop

- 1) Education: informing [patients] about tinnitus and co-existing symptoms. The neurophysiological and psychological approaches to tinnitus were described. In addition, the physiology and anatomy of the auditory and related systems were explained, along with their effect on tinnitus
- 2) When participants identified their coping strategies, they were encouraged to continue them and make them habitual, or incorporate them into their daily routines
- 3) The negative idea that there is nothing that can be done about tinnitus was constantly dispelled
- 4) Relaxation: elementary descriptions of the ANS and stress arousal were discussed. Two subdivisions within the ANS were introduced
- 5) Progressive Muscle Relaxation (PMR) instructions were presented
- 6) Abdominal breathing instructions were presented
- 7) Distraction exercise: the distraction exercise used in this project was based on showing a famous British television sitcom for about five minutes, with instructions to memorize as much of it as possible. Later, a few questions were asked about the programme, then the participants were asked whether they had thought about or heard their tinnitus while watching the sitcom.
- 8) Sleep hygiene: The sleep-hygiene element of the workshop focused on giving participants an insight into the physiological function of sleep. The effects of sleepless nights or insomnia were discussed; this included explaining the differences between Rapid Eye Movement (REM) and non-rapid Eye Movement (NREM). The importance of sleep and its benefit to our bodies was also explained. The cognitive process model was covered during the explanation of the sleep process, with topics such as arousal, distress, distorted perception and constant night-time worrying. Finally, instructions on a good sleep routine were given to participants; these described how to benefit from sleep and how to maintain the most effective sleep process.

#### Description of sample

##### Inclusion:

- 1) Cochlear implant (unilateral or bilateral)
- 2) Residual bothersome tinnitus
- 3) Age of 18 years or older (CBT mean=59.1 sd=13.4; Tinnitus Workshop mean=60 sd=2.6)

#### Baseline pre-assessment/treatment outcome measures

	CBT		Tinnitus workshop control	
	Mean	IQR	Mean	IQR
Tinnitus Questionnaire	42.38	48.50	42.17	40.50
VAS tinnitus severity	5.138	6.40	4.26	41.00
HADS depression	6.00	5.50	3.67	3.50

HADS anxiety	7.25	8.00	8.17	8.50
SF-36 physical health	80.75	89.00	63.33	63.00
SF-36 mental health	73.00	84.50	68.67	69.50

IQR = Interquartile Range (SD not reported, however raw data is provided)

### **Comorbid mental health problems**

Not reported

### **Delivering clinician**

Cognitive Behavioural Therapist

### **Research methods**

RCT

### **Outcome measures**

Primary:

- 1) Tinnitus Questionnaire

Secondary:

- 1) VAS (reaction towards tinnitus)
- 2) Short Form 36 Health Survey (SF-36)
- 3) HADS

### **Results**

[Tinnitus Questionnaire scores], when compared between-groups, did not show any significant differences. However, in the research group, the TQ scores after intervention (CBT) decreased compared with TQ scores before intervention, [but the change was not statistically different]. Such a change was not observed in the control group, whose intervention consisted of a Tinnitus Workshop.

### **Associated intervention**

### **Further notes**

56) Tyler 1989

### **Intervention groups (sample size)**

- 1) Counselling (n/a)

### **Assessment content components**

- 1) Assessing the tinnitus handicap: Open-ended questionnaire (asks clients to list the problems they attribute to their tinnitus)
- 2) Tinnitus Handicap Questionnaire
- 3) Listen to the client (objectively and genuinely, avoiding jargon, and demonstrate acceptance of their clients as important human beings): clients should be asked to describe their tinnitus and any problems associated with it.

### **Treatment content components**

- 1) Provide information: Describe the tinnitus reported by other clients,
- 2) Prevalence,
- 3) Other diseases,
- 4) Mechanisms,
- 5) Causes,
- 6) Treatment options,
- 7) The problems listed by the client on the handicap questionnaires can be

reviewed to be sure that they are clearly defined by the client and are understood by the audiologist. Operational definitions of these problems are useful.
8) Clients can be shown that many of their problems are shared by others
9) Clients are informed that success is achieved sometimes, but in other cases the treatment is not completely satisfactory.
10) It is helpful to inform them that new tinnitus treatments are being tested.
<b>Description of sample</b>
n/a
<b>Comorbid mental health problems</b>
Depression
<b>Delivering clinician</b>
Variably described as the counsellor and the audiologist
<b>Research methods</b>
Description of treatment plan
<b>Outcome measures</b>
n/a
<b>Results</b>
n/a
<b>Associated intervention</b>
<b>Further notes</b>

57) Tyler 2001

<b>Intervention groups (sample size)</b>
1) Nurturing patient expectations (n/a)
<b>Assessment content components</b>
n/a
<b>Treatment content components</b>
Be perceived as a knowledgeable Professional:
1) Act professionally
2) Impart useful knowledge
3) Be organized and clear
Be sympathetic toward the patient:
4) Listen
5) Acknowledge problems
6) Demonstrate that you understand the problem: Discuss: problems, causes, treatments
7) Provide a clear therapy plan: [that is] reasonable, achievable
Show that you sincerely care:
8) Be sincere
9) Provide follow up
Provide feelings of mastery:

10) Patient participates in therapy
11) Patient knows what is expected of him/her
12) Provide hope: Share similar stories from other patients
13) Provide hope: Assure the patient that there is at least some likelihood of success, that there is active research in the field and that others have benefitted from similar treatments
14) Instil confidence: Provide all of the above
<b>Description of sample</b>
n/a
<b>Comorbid mental health problems</b>
Stressed or depressed patients are more likely to benefit from nurturing expectations
<b>Delivering clinician</b>
n/a
<b>Research methods</b>
Overview
<b>Outcome measures</b>
n/a
<b>Results</b>
n/a
<b>Associated intervention</b>
<b>Further notes</b>

58) Tyler 2006

<b>Intervention groups (sample size)</b>
1) Counselling (n/a)
<b>Assessment content components</b>
n/a
<b>Treatment content components</b>
1) Be perceived as a knowledgeable professional
2) Demonstrate that you understand tinnitus.
3) Provide a clear therapy plan.
4) Be sympathetic.
5) Show that you sincerely care
6) Provide reasonable hope
Provide Information:
7) How we hear
8) Anatomy and physiology of hearing
9) Anatomy and physiology of hearing loss
10) Consequences of hearing loss
11) Prevalence of tinnitus
12) Causes of tinnitus
13) Common problems associated with tinnitus
14) Spontaneous activity of nerves
15) Neurophysiological models
16) Role of the brain in perceiving and reacting to sound

- 17) Effect of repeated exposure to stimuli
- 18) Consequences of fearful stimuli
- 19) Consequences of not habituating to tinnitus
- 20) Factors that contribute to attention
- 21) Factors that contribute to learning
- 22) Factors that influence sleep
- 23) Factors that contribute to concentration
- 24) Things that influence our hearing and understanding
- 25) How our overall lifestyle, including eating, exercise, and activities, influences our health
- 26) How our self-image influences our beliefs and reactions
- 27) Treatment options for hearing loss
- 28) Treatment options for tinnitus

Counseling:

- 29) Changing thoughts
- 30) Changing behaviour
- 31) Understanding an individual patient's needs

#### **Description of sample**

n/a

#### **Comorbid mental health problems**

n/a

#### **Delivering clinician**

- 1) Audiologist
- 2) Psychologist
- 3) Psychiatrist

#### **Research methods**

Overview – book chapter

#### **Outcome measures**

n/a

#### **Results**

n/a

#### **Associated intervention**

#### **Further notes**

59) Tyler 2007

#### **Intervention groups (sample size)**

- 1) Tinnitus Activities Treatment (n/a)

#### **Assessment content components**

- 1) Administer the Iowa Tinnitus Activities Questionnaire

#### **Treatment content components**

Listening to the patients:

- 1) What is important for the patient?
- 2) Why is the patient here?
- 3) What does he or she expect?
- 4) Is the patient alone, or does he or she have support?
- 5) Are other things going on in the patient's life in addition to tinnitus?



- 6) Have the patient describe how tinnitus has affected his or her life.
- 7) Tinnitus Problems Questionnaire: list the difficulties that [the patient] thinks have been caused by their tinnitus
- 8) Providing information about hearing, hearing loss, tinnitus and attention including commons questions: Am I going to become deaf? Do I have a tumour? Will my tinnitus get worse?
- 9) Discussing ways to make tinnitus less important: Have patients consider how they view their tinnitus
- 10) Encourage patients to refocus their attention on other activities, such as joining new clubs and learning new tasks
- 11) It is important for patients to know that many people have tinnitus and are able to lead happy and productive lives.
- 12) Changing lifestyle to manage better: Patients are asked to list situations where their tinnitus is worse and situations where their tinnitus is better.
- 13) Discuss these situations and determine if the patient's environment can be modified to increase the good situations and decrease the bad ones

#### Sleep Hygiene:

- 14) Understanding normal sleep patterns
- 15) Exploring factors that can affect sleep (stress, environmental noise, room temperature)
- 16) Arranging the bedroom to promote sleep (i.e. comfortable bedding, removing non-sleep-related items from the bedroom)
- 17) Avoiding drinking alcohol, smoking and eating before bedtimes
- 18) Learning relaxation exercise: progressive muscle relaxation
- 19) Learning relaxation exercise: visual imagery

#### Description of sample

n/a

#### Comorbid mental health problems

n/a

#### Delivering clinician

n/a

#### Research methods

Overview

#### Outcome measures

n/a

#### Results

n/a

#### Associated intervention

#### Further notes

60) Westin 2011

#### Intervention groups (sample size)

- 1) ACT (21 patients)
- 2) TRT (20 patients)
- 3) Wait-list control (22 patients)

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**Assessment content components**

- 1) Assessment of tinnitus and tinnitus distress
- 2) Evaluating the patients' current coping strategies in relation to tinnitus
- 3) Examining costs and benefits of patient's current coping strategies
- 4) Tinnitus Handicap Inventory
- 5) ISI
- 6) QoLI
- 7) HADS
- 8) TAQ

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**Treatment content components**

- 1) Introduction to tinnitus and tinnitus distress
- 2) Treatment rationale
- 3) Brief introduction to mindfulness
- 4) Mindfulness exercise
- 5) Creative hopelessness (contacting valued direction, evaluating earlier and current coping strategies related to tinnitus).
- 6) Creative hopelessness (examining the costs of current strategies, introducing control as the problem and willingness as an alternative)
- 7) Willingness and acceptance (including a mindfulness exercise in which the patient approaches tinnitus and associated reactions in a non-judgemental way)
- 8) Working with values and life goals
  
- 9) Changing tinnitus related behaviour patterns
- 10) Address tinnitus impact (e.g. insomnia or hypersensitivity to sound)
- 11) Homework assignment (daily ACT-ratings)

Commitment and dealing with barriers:

- 12) Defusion
- 13) Acceptance
- 14) Behavioural hearing tactics
- 15) Exposure to sound
- 16) Problem solving

Behaviour therapy related to insomnia:

- 17) Sleep restriction
- 18) Stimulus control

- 19) Relapse prevention, repetition and preparation for possible difficult situations.

---

**Description of sample**

Inclusion:

- 1) To have tinnitus as their primary problem
  - 2) To be >18 years old (ACT mean=53.5 sd=12.84, TRT mean=48.95 sd=14.5, Control mean=49.59 sd=11.86)
  - 3) To have a score of >30 on the Tinnitus Handicap Inventory (THI; Newman, Jacobson, & Spitzer, 1996) (ACT mean=45.27 sd=14.99, TRT mean=47.00 sd=18.19, Control mean=49.27 sd=17.43)
  - 4) A duration of tinnitus of >6 months (ACT mean=6.77 sd=5.95, TRT mean=9.19 sd=6.61, Control mean=7.11 sd=7.73 (years))
  - 5) Not to have previously received a psychological or sound-generator treatment
-

for tinnitus

- 6) Not be in need of immediate medical consultation and
- 7) Have hearing thresholds which would allow for the use of wearable sound generators (i.e., in severe hearing loss the sound stimulation may not be heard or need to be so loud that the person would have problems hearing conversations)

#### Baseline pre-assessment/treatment outcome measures

	ACT		TRT		WLC	
	Mean	SD	Mean	SD	Mean	SD
THI	45.27	14.99	47.00	18.19	49.27	17.43
ISI	11.90	4.66	12.60	5.70	11.91	6.60
QoLI	2.43	1.30	2.24	1.42	1.77	1.76
HADS anxiety	6.24	4.00	8.2	3.75	7.64	5.64
HADS depression	4.05	3.06	5.80	3.79	6.41	4.77
TAQ	41.05	9.49	36.65	9.96	36.68	12.4

#### Comorbid mental health problems

Exclusion:

- 1) Not to suffer from a severe psychiatric disorder

#### Delivering clinician

- 1) Clinical psychologist
- 2) Clinical psychology MSc student

#### Research methods

RCT

#### Outcome measures

Primary:

- 1) Tinnitus Handicap Inventory

Secondary:

- 1) ISI
- 2) QoLI
- 3) HADS
- 4) Clinical Global Impression-Improvement
- 5) TAQ

#### Results

ACT superiority over TRT and control

#### Associated intervention

#### Further notes

\* (Eifert & Forsyth, 2005, revised for tinnitus)

61) Wilson 2000

#### Intervention groups (sample size)

- 1) Psychological management (cognitive and behavioural techniques; sample size n/a)

#### Assessment content components

- 1) Description of current tinnitus: types of sounds, loudness, pitch, location,

variability

- 2) History of tinnitus: duration, possible origin, treatments received
- 3) Other problems: balance problems, dizziness
- 4) Other problems such as headaches, facial pain
- 5) Effect of tinnitus on sleep (falling asleep, staying asleep)
- 6) Effect of tinnitus on work
- 7) Effect of tinnitus on participation in enjoyable activities
- 8) Effect of tinnitus on social interaction (with friends, family, partner)
- 9) Cognitive reactions to tinnitus: thoughts noticed when tinnitus is at its worst
- 10) Cognitive reactions to tinnitus: thoughts noticed when trying to fall asleep
- 11) Behavioural aspects — avoidance of situations
- 12) Factors that appear to increase or decrease loudness
- 13) Factors that worsen or alleviate distress
- 14) Sources of stress in person's life: common daily hassles
- 15) Sources of stress in person's life: major life events
- 16) Effect of daily stressors on tinnitus perception and distress
- 17) Effect of major life events on tinnitus perception and distress
- 18) Current depression and anxiety levels
- 19) Disentangling causal connection between tinnitus distress, other stressors, and emotional states (such as depression, anxiety and anger)

Risk of suicide:

- 20) Effects of tinnitus on mood and view of the future
- 21) Does the person ever have thoughts about committing suicide?
- 22) Frequency, recency, and controllability of suicidal thoughts
- 23) Analysis of any previous attempts (how recent, means used, what prevented it)
- 24) Current availability of means of committing suicide (such as pills, firearms)
- 25) Look for themes of "hopelessness" or "sense of burden on others"

Outcome measures:

- 26) Ratings of self-reported loudness, annoyance, interference and sleep disturbance
- 27) Tinnitus Reaction Questionnaire
- 28) Tinnitus Effects Questionnaire
- 29) Tinnitus Handicap Questionnaire
- 30) Tinnitus Severity Scale
- 31) Tinnitus Cognitions Questionnaire
- 32) Tinnitus Coping Style Questionnaire
- 33) BDI

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### **Treatment content components**

Relaxation Training:

- 1) Information about relaxation
- 2) Identification of stressors
- 3) Link between stressors and tension
- 4) Discussion of tinnitus as a stressor
- 5) Relaxation of each major muscle group
- 6) Home practice
- 7) Use of relaxation in real-life situations

Cognitive Therapy:

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- 8) Identification of negative, maladaptive thoughts and beliefs
- 9) Thought monitoring
- 10) Challenging of unhelpful cognitions
- 11) Substituting with constructive thoughts
- 12) Applying the challenging in real life settings

Attention Control:

- 13) Learning to direct attention to and from tinnitus
- 14) Applying the attention control in real life settings

Imagery Training:

- 15) Absorbing the tinnitus sound into image (for example, rushing sound into waterfall)
- 16) Using pleasant visual imagery
- 17) Applying the imagery training in real-life settings

**Description of sample**

n/a

**Comorbid mental health problems**

n/a

**Delivering clinician**

Psychologist

**Research methods**

Overview – book chapter

**Outcome measures**

Primary: \*

- 1) Ratings of self-reported loudness, annoyance, interference and sleep disturbance
- 2) Tinnitus Reaction Questionnaire
- 3) Tinnitus Effects Questionnaire
- 4) Tinnitus Handicap Questionnaire
- 5) Tinnitus Severity Scale
- 6) Tinnitus Cognitions Questionnaire
- 7) Tinnitus Coping Style Questionnaire

Secondary: Not reported

**Results**

n/a

**Associated intervention**

**Further notes**

\* Described as assessment devices in text excluding outcome measure 1)

62) Zachariat 2004

**Intervention groups (sample size)**

- 1) Cognitive Behavioural tinnitus coping training (TCT; 29 patients)
- 2) Habituation-based treatments (31 patients)
- 3) Education (23 patients)

**Assessment content components**

- 1) Symptom Checklist (SCL-90R; German version)\*

- 2) Minimal Diagnostic Interview of Psychological Disorders \*
- 3) Tinnitus Questionnaire (German version)
- 4) Jastreboff Questionnaire (JQ)
- 5) Tinnitus Perception Diary (subjective loudness, awareness of tinnitus)
- 6) Questionnaire of Catastrophizing Cognition (QCC)
- 7) Questionnaire of Dysfunctional Cognitions (QDC)
- 8) Tinnitus Coping Questionnaire (TCQ)

### **Treatment content components**

#### **TCT:**

- 1) Patients were educated on physiological and psychological factors playing a role in tinnitus.
- 2) They were taught relaxation exercises
- 3) Use of attention distraction strategies
- 4) They were trained to identify cognitive processes (e.g. automatic thoughts regarding tinnitus, worrying, catastrophizing) and emotional responses (e.g. depression, anger, helplessness, fear) relating to tinnitus and to modify them.
- 5) Avoidance behaviour was analysed and cognitive behavioural coping techniques were introduced in order to learn how to cope with tinnitus as a stressor and to cope with stress as an exacerbator of tinnitus.
- 6) Attitudes towards illness and health, and their influence on dealing with tinnitus were explored
- 7) Finally coping with relapse was discussed

### **Description of sample**

#### **Inclusion:**

- 1) Tinnitus for a period of more than 3 months
- 2) Absence of treatable organic causes of tinnitus
- 3) Absence of Morbus Meniere
- 4) Hearing capacity sufficient for communication within groups
- 5) Tinnitus disability score > 25 (see tinnitus questionnaire (TQ))
- 6) No ongoing psychotherapy or masker treatment.

#### **Baseline pre-assessment/treatment outcome measures**

	TCT		Habituation		Education	
	Mean	SD	Mean	SD	Mean	SD
TQ	48	14.91	44.5	12.68	42.25	13.58
JQ	6.19	1.67	5.92	1.85	5.47	2.04
Tinnitus perception diary – subjective loudness	4.93	1.34	5.10	2.29	4.93	2.02
Tinnitus perception diary – awareness tinnitus	8.97	4.15	11.73	4.83	9.36	6.25
JQ – awareness of tinnitus	65.97	29.72	75.19	26.66	65.52	29.56
QCC	2.64	0.86	2.43	0.87	2.58	1.04

QDC	19.41	9.38	17.3	10.85	23.15	8.76
TCQ self-encouragement	42.74	9.84	45.33	7.3	49.1	9.48
TCQ relaxation	19.82	6.37	17.63	7.04	17.55	7.3
TCQ distraction	34.52	8.8	33.23	7.25	33.45	9.21
TCQ control of tinnitus	1.44	2.07	1.37	1.93	1.33	1.67

### **Comorbid mental health problems**

Not reported

### **Delivering clinician**

Psychologists

### **Research methods**

RCT

### **Outcome measures**

Primary:

- 1) Tinnitus Questionnaire (German version)

Secondary:

- 1) Jastreboff Questionnaire (JQ; plus the following subscales in isolation; tinnitus awareness, annoyance, improvement of quality of life, one more activity possible again)
- 2) Tinnitus Perception Diary (subjective loudness, awareness of tinnitus)
- 3) Questionnaire of Catastrophizing Cognition (QCC)
- 4) Questionnaire of Dysfunctional Cognitions (QCD)
- 5) Tinnitus Coping Questionnaire (TCQ)
- 6) Questionnaire of subjective success (SSR)
- 7) Wellbeing and adaptive behaviour (VEV)

### **Results**

Findings reveal highly significant improvements in both tinnitus coping training and habituation-based treatment in comparison with the control group. While tinnitus coping training and habituation-based treatment do not differ significantly in reduction of tinnitus disability, improvement in general well-being and adaptive behaviour is greater in tinnitus coping training than habituation-based treatment. The decrease in disability remains stable throughout the last follow-up in both treatment conditions.

### **Associated intervention**

### **Further notes**

Treatment was given in adherence to a detailed training manual (Kroner-Herwig, 1997).

\* [These tools] were administered to measure extent of psychopathology and co-morbidity according to DSM-III-R at T1 – n.b. purpose of use as research screening tool/ therapeutic assessment not reported

63) Zenner 2013

### **Intervention groups (sample size)**

- 1) CBT (166 patients)
- 2) Waitlist control (120 patients)

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**Assessment content components**

Structured interview:

- 1) Loss of control
- 2) Subjective suffering at different levels
- 3) Subjective disease model
- 4) Negative counselling
- 5) Coping strategies
- 6) Limitations on rational thinking
- 7) Auditory perception and communication
- 8) Hyperacusis
- 9) Impairments of coping resources
- 10) Tinnitus-induced comorbidities
- 11) Disease-maintaining function of the tinnitus
  
- 12) Tinnitus Questionnaire
- 13) Tinnitus Loudness Score (6-point numeric verbal rating scale of tinnitus loudness)
- 14) Tinnitus Annoyance Score (8-point numeric verbal rating scale of tinnitus annoyance)

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**Treatment content components**

- 1) Tinnitus evaluation: Peripheral audition and central auditory cognition, discussion of the individual disease model
- 2) Education: Therapeutic principles and planning of the CBT, muscle relaxation therapy, therapy of comorbidities: e.g., sleep training in case of sleep disorders, training of hearing tactics, if necessary fitting of hearing aids
- 3) Cognitive defocusing: cognitive processing
- 4) Tinnitus coping: tinnitus stressors
- 5) Cognitive defocusing: attention refocusing
- 6) Cognitive defocusing: attention diversion by given imaginations
- 7) Cognitive defocusing: attention diversion by the patient's own positive imagination
- 8) Emotional defocusing: emotional modification
- 9) Cognitive defocusing: sensory attention
- 10) Tinnitus coping: dealing with stress situations
- 11) Functional cognitive handling: avoidance behaviour
- 12) Functional cognitive handling: illness gains
- 13) Tinnitus coping: coping with highly significant stress situations
- 14) Tinnitus evaluation: cognitive response to the disease
- 15) Therapy closure procedure: relapse prevention

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**Description of sample**

Inclusion:

- 1) Persistent and stable tinnitus for >11 weeks
  - 2) Normal findings using an ear microscope
  - 3) Normal tympanic membrane mobility and stapedial reflex
  - 4) Ability to fill out relevant questionnaires
  - 5) Gap between the sound pressure level in the audiometric tinnitus matching (tinnitus level above threshold) and the tinnitus loudness using the TLS (Zenner and de Maddalena, 2005).
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**Exclusion:**

- 1) Pulsatile, intermittent, or non-persistent tinnitus,
- 2) Tinnitus as a concomitant symptom of a known systemic disease (such as vestibular schwannoma, endolymphatic hydrops, or Menière's disease)
- 3) Known retrocochlear hearing defect (such as those detected through brainstem evoked response audiometry)
- 4) Conductive hearing loss exceeding 10 dB at two or more frequencies
- 5) Ear canal or middle ear inflammation or effusion
- 6) One or two sided total deafness
- 7) Status following a craniocerebral trauma
- 8) Cervicogenic or stomatognathogenic tinnitus
- 9) Start of therapy with maskers 2 months preceding therapy
- 10) Start of autogenic training or psychotherapy <4 weeks before therapy
- 11) Ongoing acupuncture therapy
- 12) Ongoing drug treatment for tinnitus within 24 h preceding therapy
- 13) Other concomitant tinnitus treatment
- 14) Inability to discontinue drugs known to be associated with tinnitus (high-dose aspirin, quinidine, aminoglycosides)
- 15) Inability to discontinue psychotropic medication prior to entry into the study
- 16) Epilepsy
- 17) Parkinson's disease
- 18) Dementia
- 19) Acute allergic disease
- 20) Neurological disease
- 21) Consuming diseases
- 22) History of a severe ischemic disorder (previous stroke, previous heart attack, peripheral arterial occlusion disease)
- 23) Exposure to an investigational agent within the previous 4 weeks
- 24) Anticipated non-availability for study visits or procedures,
- 25) Insufficient command of German

**Baseline pre-assessment/treatment outcome measures**

	CBT		WLC	
	Median	Quartiles	Median	Quartiles
TQ	27	18-2.5	28.5	15-46.5
Loudness	3	2-4	3	2-4
Annoyance	4	3-5	4	2.5-5

**Comorbid mental health problems****Exclusion:**

- 1) Psychiatric disease or drug or alcohol abuse that would interfere with regular completion of the study

**Delivering clinician**

- 1) Physicians
- 2) Psychologists

**Research methods**

Parallel waiting group-controlled study

**Outcome measures****Primary:**

- 1) Tinnitus Change Score (8-point numeric verbal rating scale of tinnitus change)

Secondary:

- 1) Tinnitus Questionnaire
- 2) Tinnitus Loudness Score (6-point numeric verbal rating scale of tinnitus loudness)
- 3) Tinnitus Annoyance Score (8-point numeric verbal rating scale of tinnitus annoyance)

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**Results**

The primary outcome measure, tinnitus change score, showed an efficacy of treatment. Significant between group difference detected

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**Associated intervention**

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**Further notes**

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64) Zoger 2008

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**Intervention groups (sample size)**

- 1) Group Psychotherapy, founded on a psychodynamic, interpersonal approach and influenced by techniques used in CBT (37 patients)
- 2) SSRI Placebo Control (38 patients)

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**Assessment content components**

- 1) Standardized diagnostic interview (SCID-P) for multiaxial psychiatric diagnostics (Axis I-V) in accordance with DSM-III-R
- 2) Tinnitus Severity Questionnaire
- 3) VAS ('Tinnitus loudness last week', 'Tinnitus annoyance last week')
- 4) HADS

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**Treatment content components**

- 1) Introduction, presentations and expectations
  - 2) Habituation and emotional reactions to tinnitus
  - 3) Positive images and self-confidence
  - 4) The relationship between feelings and thoughts
  - 5) Separation anxiety and change
  - 6) Thoughts, reflections and questions
  - 7) Visualization and progressive relaxation training
  - 8) Follow-up on [visualisation] images and summing up
  - 9) If there were absolute needs for short clarifications on some point during the sessions the therapists were willing to provide them
  - 10) Explain that there are many ways in which tinnitus can be looked upon and understood; however, the professional perspective in this group psychotherapy was psychological/psychosocial.
  - 11) Patients were given a possibility to disclose and share distressing and worrying thoughts about the future with each other
  - 12) The first session focused on therapeutic goals
  - 13) [Outlining] the meaning and essence of the themes
  - 14) The therapists described how the group could be understood as a resource for each of its members
  - 15) The [therapists] elucidated their own role
  - 16) Each subsequent session started with the patients' thoughts, questions, and reflections emanating from the previous session
  - 17) The patients were encouraged to speak freely and interact with each other
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18) Promoting techniques \*

19) Time for working through of arising thoughts and feelings was given, for example questions on self-identity and object relations.

### **Description of sample**

#### **Inclusion:**

- 1) Pure-tone averages (PTA 0.5, 1, 2, or PTA 3, 4, 6 kHz) better than 50dB HL in the worse hearing ear (determined by PTA criteria)
- 2) High risk for severe and disabling tinnitus based on a screening procedure
- 3) Between 18 and 65 years of age (Psychotherapy mean=46.3 sd=12.1, Placebo Control mean=44.5 sd=10.7)
- 4) Patients' motivation to share their experiences with other members of the group
- 5) Be able to imagine tinnitus distress from other than a strict medical and/ or physical viewpoint.

#### **Exclusion:**

- 1) Being on sick leave or retirement due to illness
- 2) Social problems that interfered with ability to participate (including socially disabling hearing loss)
- 3) Language difficulties including dyslexia [that interfered with ability to participate]

#### **Baseline pre-assessment/treatment outcome measures**

	Group Psychotherapy		SSRI placebo control	
	Mean	SD	Mean	SD
Tinnitus Severity Questionnaire	23.74	4.26	22.68	3.85
VAS tinnitus loudness	62.4	15.3	61.16	18.25
VAS tinnitus annoyance	61.7	15.6	60.76	20.05
HADS anxiety	8.91	4.36	9.13	4.22
HADS depression	7.33	4.16	6.95	4.37
HADS total	16.33	8.02	16.08	7.82

#### **Comorbid mental health problems**

- 1) Any current not comorbid depressive disorder: (Psychotherapy n=14 %=37.8, Placebo Control n=14 %=36.8)
- 2) Any current not comorbid anxiety disorder: (Psychotherapy n=2 %=5.4, Placebo Control n=2 %=5.3)
- 3) Any current comorbid depressive and anxiety disorder: (Psychotherapy n=14 %=37.8, Placebo Control n=15 %=39.5)

#### **Exclusion:**

- 1) Current active psychiatric treatment
- 2) Having a severe psychiatric condition in need of acute treatment
- 3) Psychiatric problems that interfered with ability to participate

#### **Delivering clinician**

Psychotherapists

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**Research methods**

Historical Control Study

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**Outcome measures**

Primary:

- 1) Tinnitus Severity Questionnaire
- 2) VAS ('Tinnitus loudness last week', 'Tinnitus annoyance last week')
- 3) HADS

Secondary:

Not reported

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**Results**

Equivalence of psychotherapy and placebo-control. Within-groups improvement observed in psychotherapy condition at follow-up.

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**Associated intervention**

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**Further notes**

\* ... were used in order to create a dynamic group atmosphere, for example the patients were requested to write down on a piece of paper what aspects of themselves that they found agreeable. The notes (with no names) were placed in the middle of the circle, and each patient picked up one of the notes and read it out loud to the others.

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