

Cognitive Behavioral Therapy and Tinnitus Retraining Therapy Outcomes: A Systematic Review

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Background

Tinnitus is defined as the perception of sound in the absence of external sound. Prevalence estimates are highly variable and are likely to increase with age as the prevalence of hearing loss increases, due to the association between the two conditions. Although tinnitus is highly correlated with hearing loss, many sufferers of tinnitus have measurably normal hearing. For some, tinnitus can become debilitating, interfering with quality of life and contributing to a cyclical relationship with depression and anxiety. Historically, many treatments for tinnitus have been explored, often with unsatisfactory results. However, for two of the most well-studied treatments, tinnitus retraining therapy (TRT) and cognitive behavioral therapy (CBT), research has shown evidence of symptom reduction and improvements of quality of life for tinnitus sufferers.

Aim

To analyze and compare outcomes of CBT and TRT for adults with subjective tinnitus

Methods

- Literature search: An electronic search of the literature was completed using the PubMed and PsychInfo databases. The following search strategy was used: tinnitus AND ("cognitive behavior therapy" OR "CBT" OR "retraining") AND ("symptoms" OR "subjective" OR "quality of life").
- Study selection: Only articles with a 100% inter-rater reliability were included for this systematic review. Inclusion criteria comprised the following: adult subjects (18 years and older) with diagnosed hearing loss (unilateral or bilateral); publication in or after 2006; publication in English; publication in a peer-reviewed journal; and study designs (meta-analysis, systematic review, randomized controlled trial (RCT), or cohort study). See **Figure 1**.
- Critical appraisal: The Cincinnati Children's Hospital LEGEND Appraisal Form was used to assess quality of articles.

Table 1: Articles analyzed for final review

Citation	Type of Study	Intervention Method	Population	Sample Size	Outcome Measure	Assessment Intervals	Results
Goebel et al., 2006	Cohort	CBT	Adult (mean age of 63 years)	N= 244	TQ, VAS, Derogatis Psychopathology Checklist	Pre-treatment; Post-intervention assessment at 15 years	CBT significantly correlated with long-term quality of life improvements
Mazurek et al., 2006	Cohort	TRT, hearing aids and/or sound generators (when indicated)	Adults (mean age of 54 years)	N=65	TQ	Pre-treatment; Post-intervention assessment at, 3, 6, and 9-12 months	Significant improvement in tinnitus symptoms and emotional and cognitive distress for patients who completed the full program.
Robinson et al., 2008	RCT	CBT	Adults 18+	N=41	THI, Tinnitus Reaction Questionnaire, Depression Questionnaires	Pre-treatment; Post-intervention at 8, 16, and 52 weeks.	CBT intervention groups showed significant improvement in reduction of tinnitus, emotional distress, and depression.
Grewal et al., 2014	Systematic Review	CBT, TRT	Adults 18+	9 studies	Variable	Variable	Significant improvements in quality of life (QOL) scores for both interventions; CBT improved depression scores.
Oishi et al., 2013	Cohort	TRT, noise generators (if indicated)	Adults 18+	N=95	THI, Self-Rating Depression Scale, State Trait Anxiety Inventory	Pre-treatment; Post-intervention assessment at 6, 12, and 24 months.	Significant improvement in THI scores; patients with higher levels of distress experienced more benefits than patients with moderate distress.
Cima et al., 2012	RCT	CBT, TRT, hearing aids and/or sound generator (when indicated)	Adults 18+	N=492	Health Related Quality of Life Index, tinnitus severity, and tinnitus impairment, Hospital Anxiety and Depression Scale	Pre-treatment; Post-intervention assessment at 3, 8, and 12 months	Significant improvements in QOL scores, tinnitus severity and impairment for patients who received CBT/TRT compared to control groups.
Nyenhuis et al., 2013	RCT	CBT delivered in traditional method and via telehealth	Adults 18+	N=304	TQ, Patient Health Questionnaire, Patient rated self-satisfaction of intervention, psychosomatic discomfort	Pre-treatment; post-intervention at 3 and 9 months	This study's high drop-out rate of 39% revealed that patients in the self-management conditions were significantly more likely to discontinue intervention. Fewer depressive symptoms.

Results

- **Search Results:**
 - The electronic search yielded 57 articles from PubMed and 8 articles from PsychInfo. Six duplicate studies were excluded. Another 36 articles were excluded based upon the title and abstract review. Inter-rater reliability was 87%. In the event of a disagreement, a third researcher assessed the article and contributed in resolving the issue.
- **Study Quality and Characteristics**
 - Twenty-one articles were critically assessed using the Cincinnati Children's Hospital LEGEND Appraisal Form. Each article was given a "good quality" or a "lesser quality" based upon the type of study, intervention method, population, sample size, and outcome measures.
 - Thirteen articles received a rating of "lesser quality" and eight articles received a "good quality" rating. The eight articles that received a "good quality" ratings were analyzed for final review and are shown in **Table 1**. Of the articles included, there was one systematic review, four cohort studies, and three randomized control trials.

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Discussion

The studies included in this systematic review show promising results for TRT and CBT on quality of life improvements and symptom reduction for individuals who suffer from tinnitus. In general, the high-quality studies we included consistently showed evidence of good outcomes with the employment of TRT and/or CBT for the adult population. Outcome measures generally showed improvement as soon as one week post-intervention and, for several studies, continued to show significant improvement in scores on validated questionnaires six months to one year post-intervention. Scores typically plateaued several months following intervention, which suggests some level of acclimation for patients to receive maximal benefit from these forms of tinnitus interventions.

While no "cure" for subjective tinnitus currently exists, great strides could be made in regards to management if more clinicians were aware of the current research available, which points to overall improvements in symptoms and quality of life with the utilization of TRT and CBT. With a more thorough understanding of the outcomes that can be expected through these treatments, more clinicians could refer their patients to appropriate services.

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