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Assessing the impact of Tinnitus retraining Therapy using the resound relief app in an Acute Tinnitus case: A Case Study

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ABSTRACT

Tinnitus, the perception of sound without an external source, can significantly affect an individual's quality of life, particularly when caused by noise exposure. This case study explores the combination of Tinnitus Retraining Therapy (TRT) and the ReSound Relief app in managing acute tinnitus. A 37-year-old male, with minimal hearing loss and a moderate Tinnitus Handicap Inventory (THI) score, was treated using TRT, including counseling, Cognitive Behavioral Therapy (CBT), and sound therapy via the app. The ReSound Relief app offered customizable soundscapes such as white noise and environmental sounds. Following treatment, the patient reported a reduction in tinnitus severity, loudness, and annoyance, with a significant decrease in the THI score. These results suggest that combining TRT with the app's sound therapy can effectively manage acute tinnitus, providing both auditory enrichment and psychological benefits. Further research is needed to validate these findings and improve the app's features for broader use.

KEYWORDS:

Tinnitus Retraining Therapy (TRT), ReSound Relief app, Acute tinnitus, Noise-induced hearing loss (NIHL),Tinnitus Handicap Inventory (THI)

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INTRODUCTION:

Tinnitus is a frequent and often distressing symptom found among individuals with hearing impairments and within the general healthy population. Its prevalence tends to rise with age, as noted by Meikle and Taylor-Walsh in 19841. The causes of tinnitus are diverse, with one of the most prevalent being noise exposure. Following intense noise exposure, tinnitus and hearing loss are commonly reported, especially in cases of acute acoustic trauma.Tinnitus, the perception of sounds not originating from external sources, can range from faint background noise to sounds louder than environmental sounds. Classified into objective (audible to both the individual and others) and subjective (perceived only by the individual) types, tinnitus, particularly the subjective form, is often described using the term 'tinnitus' by medical professionals, while 'somatosound' typically refers to the objective type. The auditory sensations associated with tinnitus can resemble a wide array of sounds, including those of insects, environmental elements, mechanical processes, electrical devices, and machinery.

Noise-induced hearing loss (NIHL) is characterized by a decrease in hearing ability at high frequencies due to prolonged exposure to elevated sound pressure levels. The World Health Organization (WHO) recognizes noise as the second leading cause of pollution-related health issues globally, with Noise-Induced Hearing Loss (NIHL) being a prevalent occupational ailment. Noise-induced tinnitus can manifest acutely, persisting for minutes to weeks following noise exposure, or develop gradually over years, initially presenting as intermittent, low-intensity tinnitus that may eventually become bothersome. In tinnitus rehabilitation, clinicians utilize Tinnitus Retraining Therapy, which encompasses counselling and sound therapy. Various methods are employed in the treatment of tinnitus. Traditionally, the aim has been to eliminate the source of tinnitus and its perception, thereby striving for a cure. However, this objective has rarely been attained. The treatment of tinnitus has traditionally focused on eliminating its perception. One widely promoted method is "masking," which involves using external sounds to suppress tinnitus. However, the success of this approach has been inconsistent, with reported effectiveness ranging from zero to 60%. Recently, "masking" has been redefined to include using any sound that provides immediate relief for tinnitus. While this method has shown some effectiveness, it remains uncertain whether it is superior to other forms of sound therapy. According to Statista, in 2017, over 80% of the U.S. population owned cell phones, with 80% of those being smartphones. This indicates that a significant portion of tinnitus patients likely own a smartphone, offering an additional avenue for functional tinnitus tools through apps. Smartphone technology is ideally suited to help individuals manage, track, and learn about health-related data. The ReSound Relief app is a reliable and versatile tool for daily tinnitus management. For clinicians, it provides customizable sound therapy options that enhance their ability to support patients with tinnitus. The app also reinforces key concepts and information discussed during clinical sessions. For patients, it serves as a comforting tool that enables them to easily play and adjust sounds to their liking, while promoting effective tinnitus management practices. In this case study, we explored the impact of the ReSound Relief app on patients with acute tinnitus by incorporating tinnitus retraining counselling and sound therapy.

CASE REPORT

Patient information and History:

A 37-year-old male patient presented to the clinic with complaints of continuous high-pitched tinnitus in the left ear following exposure to a whistle sound. The patient reported no hearing loss or

other otological symptoms. Notably, the patient has a habit of listening to music at high volumes and works part-time as a video editor.

Clinical findings:

Prior to the detailed evaluation, informed written consent was obtained from the patient. A comprehensive audiological assessment was conducted, encompassing pure tone audiometry, tympanometry, and Otoacoustic Emissions (OAE) testing. Pure tone audiometry results indicated normal hearing sensitivity in the right ear, whereas the left ear exhibited minimal hearing loss with a notable dip at 4 kHz. Tympanometry results indicated bilateral Type A tympanograms, with acoustic reflexes present in the right ear for both ipsilateral and contralateral stimulation. In the left ear, acoustic reflexes were present at all frequencies except 4 kHz. Otoacoustic emissions were present in the right ear, whereas in the left ear, responses were absent at 4 kHz. An otoscopic evaluation revealed that both tympanic membranes were intact, with the cone of light visualized bilaterally. The Tinnitus Handicap Inventory (THI) is a concise self-report instrument utilized in clinical settings to assess tinnitus severity. It comprises 25 items rated on a three-point scale: "yes" (4 points), "sometimes" (2 points), and "no" (0 points). Scores range from 0 to 100, with higher scores signifying more severe symptoms. The THI categorizes tinnitus severity into functional, emotional, and catastrophic subgroups, offering insights into its impact on daily life. The Tinnitus Handicap Inventory (THI) was administered, yielding a score of 38, indicating a moderate level of tinnitus severity. Tinnitus matching was performed, and the patient matched the tinnitus to a pure tone at approximately 3 kHz with an intensity of 40 dB. Residual inhibition testing was conducted using a white noise stimulus at 30 dB, with the patient's white noise threshold established at 20 dB SL. The result of the residual inhibition test was "partial positive."

Tinnitus retraining therapy:

The patient was advised to undergo Tinnitus Retraining Therapy (TRT). The therapy was administered in three sessions per week, each lasting 30 minutes. At the beginning of each session, residual inhibition was performed using white noise stimulus, as previously described. Additionally, counselling was provided to focus on reducing the impact of tinnitus on the patient’s quality of life. Cognitive Behavioral Therapy (CBT) was used to alleviate stress, incorporating relaxation techniques such as a three-phase breathing exercise. This exercise involves practicing slow, deep, and normal breathing to help alleviate stress and promote relaxation.

The patient was introduced to the Resound Relief app 2, which was subsequently installed on their smartphone. Instructions on app usage, including the availability of various masking sounds, were provided. Initially, the patient was guided to listen to a "peaceful morning sound" for 10 minutes each morning. The patient was asked to listen to this sound for 10 minutes each morning. In the subsequent phase of therapy, (Therapeutic Sound) a mix of four noises—white noise, pink noise, brown noise, and violet noise—was played for 10 minutes. As the final step of therapy, an environmental sound that the patient reported as comfortable, such as a waterfall, rain, or ocean waves, was selected and played for 10 minutes. The patient was advised to continue this practice at home during the night.

Post TRT Evaluation

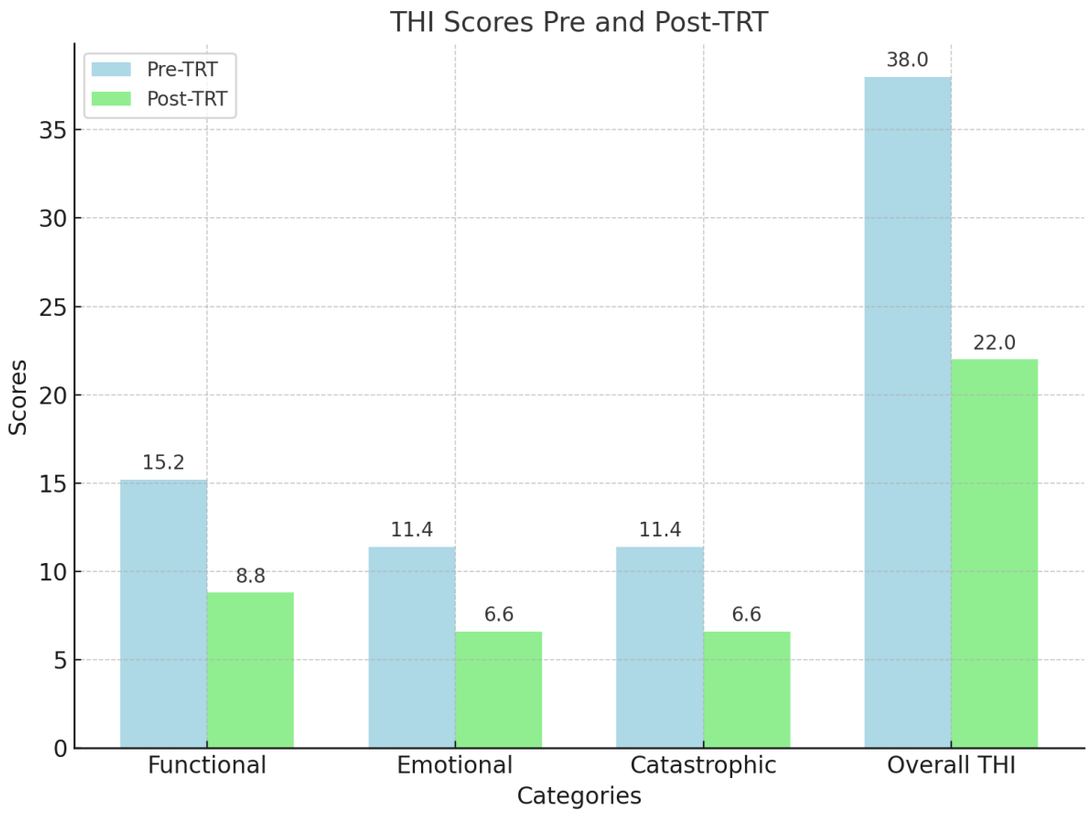

Fig1: Comparison of Tinnitus Handicap Inventory (THI) scores pre-and post-Tinnitus Retraining Therapy

One-month post-TRT, the patient reported a reduction in tinnitus loudness. Subsequent administration of the Tinnitus Handicap Inventory (THI) and Tinnitus Outcome Questionnaire revealed substantial improvement in the emotional subscale, followed by functional and catastrophic subscales. The overall THI score of 22 indicated mild tinnitus severity. The Tinnitus Outcome Questionnaire sound management domain demonstrated positive patient responses. Specifically, the patient rated tinnitus loudness as a 4 on a 0-10 scale (0 = not at all, 10 = extremely loud) and reported tinnitus as not annoying. The patient expressed a preference for environmental sounds as additional auditory stimuli. The patient also provided positive feedback regarding the utility of the intervention.

DISCUSSION:

In this study the patient reported reduction in tinnitus. The reduction in tinnitus severity may result from various mechanisms. Munir & Pryce in 20213suggested that listening to pleasant sounds could help patients divert attention from the intrusive nature of tinnitus, providing an escape from the problem. These sounds can also evoke pleasant memories and provide a mental escape from reality. Alternatively, sound enrichment devices may empower patients by granting them a sense of control over their tinnitus. The smartphone and its associated app can be viewed as tools facilitating the management of this invisible condition. Research by Dauman & Dauman in 2021 4indicated that the ability to choose what sounds to listen to fosters a sense of control over tinnitus, reducing the mental effort needed to distract from it. They further proposed that utilizing an external tool to manage tinnitus positively influences self-empowerment and enhances the patient's psychological well-being.

Also, the patient has reported environmental sounds as a preference for additional stimuli they wish to listen. These findings align with the results of Henry et al., in 20175, who also discovered that participants favored the sounds of ocean waves and rain. Similarly, in the study by Perreau et al., 2021 6the sounds most frequently chosen and enjoyed were rain and waves crashing on rocks and also reported preferences for heavy rain, pink noise, and waterfalls.

The study relied solely on self-reported data, which could not be independently verified. Currently, the app lacks a feature to record usage duration. This limitation could be addressed in future research by incorporating data logging functionality to track and store user activity.

CONCLUSION:

This case study demonstrates the potential benefits of Tinnitus Retraining Therapy (TRT) in conjunction with the ReSound Relief app for managing acute tinnitus. The patient reported a substantial reduction in tinnitus severity, as indicated by improvements on the Tinnitus Handicap Inventory (THI) and the Tinnitus Outcome Questionnaire. The use of sound therapy, particularly environmental sounds and therapeutic sound played a key role in alleviating the symptoms, contributing to a sense of control over the condition, and enhancing psychological well-being. While the results are promising, the study's reliance on self-reported data underscores the need for future research with more objective measures, such as incorporating data logging features in the app to track user activity and duration of use. These findings suggest that TRT, supported by smartphone apps like Resound Relief, may be an effective approach to managing acute tinnitus, although further research is warranted to confirm these results.

REFERENCES

1. Meikle M, Taylor-Walsh E. Characteristics of tinnitus and related observations in over 1800 tinnitus clinic patients. J Laryngol Otol. 1984 Jun; 98(S9):17–21.
2. Piskosz M. ReSound Relief: A Comprehensive Tool for Tinnitus Management [Internet]. AudiologyOnline. [cited 2025 Feb 2]. Available from: https://www.audiologyonline.com/articles/resound-relief-comprehensive-tool-for-20353
3. Munir S, Pryce H. How can sound generating devices support coping with tinnitus? International Journal of Audiology. 2021 Apr 1; 60(4): 312–8.
4. Dauman N, Dauman R. An Empowerment Model for Individuals with Chronic Tinnitus. Ear & Hearing. 2021 Mar; 42(2): 425–42.
5. Henry JA, Thielman E, Zaugg T, Kaelin C, Choma C, Chang B, et al. Development and field testing of a smartphone “App” for tinnitus management. International Journal of Audiology. 2017 Oct 3; 56(10): 784–92.
6. Perreau AE, Tyler RS, Frank V, Watts A, Mancini PC. Use of a Smartphone App for Cochlear Implant Patients with Tinnitus. Am J Audiol. 2021 Sep 10; 30(3): 676–87.