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Review Article

The Impact of Tinnitus on Mental Health

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ABSTRACT

Introduction: Tinnitus—the perception of sound in the absence of an external stimulus—affects approximately 14.4% of adults worldwide and significantly impacts mental health. It is frequently associated with anxiety, depression, and cognitive dysfunction, leading to a reduced quality of life (QoL). Tinnitus may be classified as subjective or objective, with severity and related psychological distress varying considerably among individuals.

Materials and Methods: A comprehensive review of literature published between 2010 and 2024 was conducted using databases including PubMed, Scopus, Web of Science, and Google Scholar. Keywords related to tinnitus and mental health (e.g. anxiety, depression, mood disorders) were used to identify human studies examining the psychological impact of tinnitus.

Results: Research consistently indicates that individuals with tinnitus experience varying prevalence rates of anxiety and depression, ranging from 18.5% to 48.33% for anxiety and from 6% to 84% for depression. Shared neural circuits—including the anterior cingulate cortex, insula, and amygdala—are implicated in both tinnitus and mental health conditions. Psychological interventions such as cognitive behavioral therapy (CBT) and mindfulness-based interventions (MBIs) have demonstrated effectiveness in alleviating tinnitus-related distress and enhancing mental well-being.

Conclusion: Tinnitus significantly affects mental health, contributing to anxiety, depression, and sleep disturbances. A multidisciplinary treatment approach that addresses both auditory and psychological dimensions of tinnitus is essential for effective management. Further research is warranted to refine therapeutic strategies and better understand the complex relationship between tinnitus and mental health.

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Introduction

Tinnitus is a common auditory condition characterized by the perception of sound—such as ringing—in the absence of an external auditory stimulus. It affects a substantial portion of the population and varies in severity and its impact on quality of life (QoL). Tinnitus is generally classified into two main types: Subjective and objective. Subjective tinnitus—the most prevalent form—is only audible to the affected individual. In contrast, objective tinnitus, which is relatively rare, can also be heard by an examiner. Additionally, tinnitus may be categorized as either primary (idiopathic) or secondary (associated with a specific underlying cause) [1].

Globally, tinnitus affects approximately 14.4% of adults, with prevalence rates ranging from 4.1% to 37.2% across different populations. The condition is more prevalent with increasing age, affecting about 23.6% of individuals aged 65 years and older. Women, individuals with a history of smoking, those experiencing high levels of stress, and individuals with certain medical conditions—such as hearing loss, hyperlipidemia, and depression—are at increased risk of developing tinnitus [2].

Research consistently shows an elevated risk of anxiety and depression among individuals with tinnitus. A population-based study reported significantly higher odds of depression and anxiety in individuals with tinnitus, with odds ratios of 2.033 (95% CI, 1.584%, 2.601%, P<0.0001) and 1.841 (95% CI, 1.228%, 2.728%, P=0.0027), respectively [3]. Moreover, another study found that individuals with tinnitus exhibited higher scores for anxiety and depression, as well as lower levels of self-esteem and well-being [4].

Given the significant psychological burden associated with tinnitus, this study aims to review the existing literature on the relationship between tinnitus and mental health—particularly its effects on anxiety, depression, self-esteem, and overall well-being. This review seeks to provide a comprehensive understanding of how tinnitus influences mental health, which is essential for developing effective and multidisciplinary management strategies for individuals affected by this condition.

Materials and Methods

A comprehensive literature search was performed using electronic databases, including PubMed, Scopus, Web of Science, and Google Scholar. A combination of keywords related to tinnitus (e.g. “tinnitus,” “auditory phantom perception”) and mental health (e.g. “anxiety,” “depression,” “anxiety disorders,” “mood disorders,” “psychological distress”) was employed. Search filters were applied to include only human studies published in English between 2010 and 2024.

Tinnitus and anxiety

The prevalence of anxiety disorders among individuals with tinnitus is notably high. Studies report anxiety prevalence rates ranging from 18.5% to 48.33% in this population [5, 6]. Factors such as female gender, hearing loss, and sleep disturbances are associated with increased anxiety levels in individuals with tinnitus. The COVID-19 pandemic has further exacerbated anxiety symptoms among this group [6, 7].

Generalized anxiety disorder (GAD), characterized by persistent, excessive, and uncontrollable worry across various life domains, is one of the most prevalent anxiety subtypes observed in individuals with tinnitus. A strong correlation exists between tinnitus severity and the presence of GAD, suggesting that increased tinnitus intensity heightens the likelihood of experiencing generalized anxiety [3]. Panic disorder—marked by recurrent, unexpected panic attacks and anticipatory anxiety—has also been linked to tinnitus severity. Additionally, agoraphobia, involving avoidance behaviors and fear of specific situations, is present in approximately 5% of individuals with tinnitus, although it is less common [8].

Anxiety symptoms in tinnitus patients often manifest cognitively as excessive worry and physically as somatic symptoms such as restlessness. These anxiety dimensions are strongly associated with perceived tinnitus severity. Clinically significant levels of cognitive and somatic anxiety have been reported in 60% and 48% of tinnitus patients, respectively [9].

Neurobiological evidence suggests that tinnitus and anxiety share overlapping brain regions, including the anterior cingulate cortex, insula, and amygdala—structures involved in attention, distress, and emotional regulation. These areas form part of the affective component of the pain matrix and are implicated in distress perception in both conditions. Moreover, the hippocampus—central to memory processing—shows abnormal connectivity in tinnitus patients, particularly in relation to tinnitus duration and distress levels. This suggests that memory traces may contribute to the chronic nature of tinnitus and its comorbid anxiety. Shared cortico-subcortical networks, including those connected to the hypo-

thalamic-pituitary-adrenal (HPA) axis, further underline the neurobiological overlap, although the directionality of dysfunction remains unclear [10, 11].

Commonly used tools for assessing anxiety in individuals with tinnitus include the state-trait anxiety inventory (STAI), Beck anxiety inventory (BAI), and the self-rating anxiety scale (SAS). These instruments have demonstrated strong psychometric properties and are widely employed to identify and quantify anxiety levels in clinical and research settings involving tinnitus patients [12].

Tinnitus and depression

Depression is another common psychiatric comorbidity among individuals with tinnitus. Prevalence rates vary widely across studies, with a systematic review reporting a median prevalence of 33%, and individual study estimates ranging from 6% to 84%—a reflection of diverse methodologies and populations [13]. Another review identified clinically significant depression scores in 4.6% to 41.7% of tinnitus patients, emphasizing the psychological burden of the condition [14]. A cohort study found that depression was nearly twice as prevalent in individuals with tinnitus (7.9%) compared to those without (4.6%) [3].

Neuroimaging research reveals that tinnitus and depression activate overlapping neural circuits, indicating a complex interaction rather than coincidental comorbidity. Alterations in the HPA axis—commonly observed in depression—have also been identified in tinnitus patients, suggesting a shared neuroendocrine dysfunction. The dorsal cochlear nucleus, which exhibits hyperactivity in tinnitus, is implicated in attention control and emotional processing, linking it to mood regulation and depressive symptoms [15].

Tinnitus-related cognitive impairments—particularly in cognitive control and attention-switching—mirror those found in depression, potentially contributing to a feedback loop wherein emotional distress exacerbates both conditions [16]. Tinnitus-induced emotional distress has been significantly correlated with depressive symptom severity, further reinforcing their clinical connection [17]. Some studies have identified genetic susceptibilities common to both disorders, such as variations in the brain-derived neurotrophic factor (*BDNF*) gene, which may predispose individuals to depression and tinnitus [15].

Distinct yet interconnected neural activity patterns are associated with tinnitus-induced distress and depression. Distress is primarily linked to activation in the right frontopolar and orbitofrontal cortex, while depression correlates more with the left frontopolar and orbitofrontal cortex—suggesting partially overlapping, but distinguishable, neurobiological pathways [18].

Shared risk factors for both conditions include socioeconomic hardship, chronic health conditions, and elevated perceived stress, the latter of which has been shown to mediate the relationship between tinnitus and depressive symptoms [19]. Tinnitus severity is positively correlated with depression severity, particularly with the somatic component of depressive symptomatology, although some of this association may reflect overlap in measurement tools [20].

Assessment of depression in tinnitus populations commonly relies on instruments such as the Beck depression inventory (BDI) and the hospital anxiety and depression scale (HADS). In recent years, machine learning models have also been developed to predict depression severity in tinnitus patients using sociodemographic and questionnaire data, demonstrating strong predictive accuracy [21].

Tinnitus alone is a significant predictor of both depression and anxiety. This psychological burden is further amplified in individuals who also experience hearing loss. The co-occurrence of tinnitus and hearing impairment tends to exacerbate symptoms of both depression and anxiety, with tinnitus exerting a more substantial effect on depressive symptoms than hearing loss alone. However, the severity of hearing loss still contributes meaningfully to the overall mental health impact of tinnitus. Notably, the severity of both conditions is positively correlated with higher levels of psychological distress [4, 22–24].

Tinnitus and other mental health conditions

Insomnia is highly prevalent among individuals with tinnitus, with studies reporting that over 40% of patients experience clinically significant symptoms of insomnia. These sleep disturbances often impair daily functioning and reduce QoL, while also contributing to psychiatric conditions such as anxiety and depression [25]. Among individuals with chronic tinnitus, heightened anxiety and depression are frequently observed, both of which correlate strongly with the severity of insomnia. Tinnitus-related distress may exacerbate sleep difficulties, creating a vicious cycle in which insomnia intensifies tinnitus perception, and vice versa [26].

Gender differences have also been identified in the manifestation of tinnitus-related mental health symptoms. Men with tinnitus more commonly report depressive symptoms, while women are more likely to experience psychosomatic complaints such as headaches and stress-related increases in tinnitus loudness [27].

Burnout—a state of emotional, physical, and mental exhaustion caused by prolonged stress—has emerged as an important mediator in the relationship between stress and tinnitus. Research suggests that symptoms of burnout may worsen tinnitus severity, and addressing burnout could help reduce tinnitus-related distress [28]. Emotional exhaustion (EE), in particular, has been identified as a strong predictor of both tinnitus prevalence and severity. Individuals with higher EE scores are significantly more likely to report experiencing tinnitus, and this pattern appears consistent across various demographic groups. The presence of burnout symptoms intensifies the perception of tinnitus, further amplifying its psychological burden [29].

Tinnitus also shares symptomatic and neurobiological features with post-traumatic stress disorder (PTSD), including hyperarousal, anxiety, and sleep disturbances. These shared symptoms suggest a reciprocal exacerbation, whereby tinnitus may intensify PTSD symptoms, and vice versa, leading to increased distress and functional impairment [30]. The interaction between tinnitus and PTSD is thought to be mediated by common neural mechanisms, particularly in brain regions involved in attention, distress, and memory processing. Both conditions are associated with dysregulation of the HPA axis, further supporting a shared pathophysiological basis [31].

Current treatment approaches for tinnitus-related mental health issues

Cognitive behavioral therapy (CBT) is the most widely used and evidence-supported psychological intervention for managing tinnitus-related distress. CBT aims to reduce the emotional impact of tinnitus by helping individuals identify and modify maladaptive thoughts and behaviors associated with their condition. Studies consistently demonstrate that CBT significantly improves tinnitus-related QoL when compared to no treatment, standard audiological care, or other active interventions. Both face-to-face and guided self-help formats are effective, although face-to-face delivery tends to produce more robust outcomes [32].

In addition to reducing tinnitus distress, CBT has been shown to produce modest but clinically meaningful reductions in comorbid anxiety and depression symptoms [33]. One of the primary mechanisms by which CBT exerts its effects is through reducing negatively biased interpretations of tinnitus, which are known to intensify emotional distress [34].

Mindfulness-based interventions (MBIs)—including mindfulness-based cognitive therapy (MBCT) and mindfulness-based stress reduction (MBSR)—have also demonstrated efficacy in alleviating tinnitus-related distress. Evidence suggests that MBIs lead to significant reductions in tinnitus severity and psychological distress, with benefits that may persist over time [35]. The effectiveness of mindfulness appears to be linked to its emphasis on acceptance and non-reactivity, enabling individuals to reframe tinnitus as a non-threatening sensation and thereby reduce its emotional salience.

The role of antidepressant medications in tinnitus management remains unclear. While some studies suggest that tricyclic antidepressants may provide limited benefits, methodological shortcomings limit the strength of these findings. A clinical trial investigating selective serotonin reuptake inhibitors (SSRIs) reported no significant improvement in tinnitus symptoms overall, although higher doses may yield partial benefit. Similarly, trials of the atypical antidepressant trazodone revealed only minimal, statistically non-significant improvements. Although antidepressants may be useful in alleviating comorbid depression and anxiety, their direct effect on tinnitus perception appears limited. Proposed mechanisms include modulation of serotonergic pathways; however, side effects such as sedation, sexual dysfunction, and dry mouth reduce their practical utility [36].

In summary, a multidisciplinary approach remains the most effective strategy for addressing tinnitus-related mental health conditions. Optimal care typically involves a combination of psychological therapies (e.g. CBT, MBIs), sound therapy, and—in selected cases—neuromodulation techniques or pharmacologic interventions. Future research should focus on refining treatment protocols, identifying the most effective therapeutic combinations, and tailoring interventions to individual patient needs and preferences.

Discussion

This review underscores the complex and bidirectional relationship between tinnitus and various mental health conditions, including anxiety, depression, insomnia, burnout, and PTSD. Far from being a solely auditory phenomenon, tinnitus is deeply intertwined with psychological processes that both shape and are shaped by the condition. These findings reinforce the understanding of tinnitus as a multifactorial disorder with significant emotional and cognitive dimensions.

The consistently high prevalence of anxiety and depression among tinnitus patients, coupled with shared neural circuitry—including the anterior cingulate cortex, amygdala, and insula—supports a bidirectional interaction in which tinnitus intensifies emotional distress, and negative affect, in turn, worsens tinnitus perception [3, 10, 13, 15]. Similarly, the associations between tinnitus, insomnia, and burnout suggest a self-reinforcing loop, whereby EE and poor sleep not only heighten tinnitus severity but are themselves aggravated by the distress it causes [25, 28]. The dysregulation of the HPA axis and altered functional connectivity in memory- and emotion-related brain regions may explain the overlapping symptomatology between tinnitus and PTSD, including hyperarousal, intrusive thoughts, and impaired concentration [11, 30, 31].

Clinically, these findings underscore the necessity of a multidisciplinary approach to tinnitus management—one that simultaneously addresses its auditory, psychological, and behavioral components. Psychological therapies such as CBT and MBIs have demonstrated robust efficacy in reducing both tinnitus-related distress and comorbid symptoms of anxiety and depression [32, 33, 35]. While pharmacological treatments, including antidepressants, have shown limited direct effects on tinnitus perception, they may offer adjunctive benefits in managing associated mood disorders [36]. Tailoring therapeutic strategies to individual profiles—considering factors such as gender, stress resilience, and emotional coping—may further improve outcomes.

This review builds upon previous literature by confirming the high prevalence of psychiatric symptoms in tinnitus populations—especially depression, with median rates around 33% [13, 37]—and by extending the discussion to underexplored variables such as burnout and EE. The inclusion of these factors enriches the current understanding of tinnitus as a condition profoundly influenced by chronic stress and psychosocial vulnerability [38, 39]. In line with prior studies, this review reinforces the value of non-pharmacological, psychologically oriented interventions while emphasizing the limitations of pharmacotherapy as a standalone strategy [40].

Conclusion

In conclusion, tinnitus represents a paradigmatic example of a condition that blurs the boundaries between sensory and psychological health. This review highlights the importance of integrative care approaches that target both domains. Future research should prioritize longitudinal and mechanistic studies to clarify causal pathways and optimize individualized treatment protocols. Addressing the emotional dimensions of tinnitus is not ancillary—it is essential for improving QoL and clinical outcomes in affected individuals.

Limitations

This review has several limitations. First, while it identifies potential mechanisms linking tinnitus and mental health conditions, it does not establish definitive causality. It remains unclear whether psychological symptoms precede, result from, or coexist independently with tinnitus. Second, the review may not sufficiently account for cultural, socioeconomic, and healthcare access factors that influence how tinnitus is experienced and its psychological burden. Third, the reliance on self-report behavioral questionnaires as the primary assessment tools limits the depth of neurophysiological insight. Future research incorporating objective methodologies—such as functional neuroimaging, electrophysiological assessments (e.g. EEG), or biomarkers like cortisol—may offer a more comprehensive understanding of the underlying mechanisms.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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Authors' contributions

Conceptualization, methodology, investigation and formal analysis: All authors; Writing the original draft: Asad Hameed Alnajar; Supervision, review and editing: Bashar Ali Naji.

Conflict of interest

The authors declared no conflict of interest.

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