



Functional Impact Of Tinnitus On The Prevalence Of Anxiety And Depression

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ABSTRACT

Objective: Quantify the relationships between tinnitus, anxiety and depression among adults.

Study design: Cross-sectional analysis of national health survey.

Methods: Adult respondents in the 2007 Integrated Health Interview Series tinnitus module were analyzed. Data for tinnitus symptoms and severity and reported anxiety and depression symptoms were extracted. Associations between tinnitus problems and anxiety, depression, lost workdays, days of alcohol consumption, and mean hours of sleep were assessed.

Results: Among 21.4 ± 0.69 million adult tinnitus sufferers, 26.1% reported problems with anxiety in the preceding 12 months, while only 9.2% of those without tinnitus reported an anxiety problem (p<0.001). Similarly, 25.6% of respondents with tinnitus reported problems with depression, while only 9.1% of those without tinnitus reported depression symptoms (p<0.001). Those reporting tinnitus symptoms as “big” or “very big” problem were more likely to concurrently report anxiety (odds ratio 5.7; CI: 4.0-8.1; p<0.001) and depression (OR 4.8; CI: 3.5-6.7; p<0.001) symptoms. Tinnitus sufferers reported significantly fewer mean hours of sleep per night (7.00 vs 7.21; p<0.001) and greater mean days of work missed (6.94 vs 3.79, p<0.001) compared to those who did not report tinnitus. Mean days of alcohol consumption between the two groups were not significantly different.

Conclusion: Tinnitus symptoms are closely associated with anxiety, depression, shorter sleep duration, and greater workdays missed. These comorbidities and sequelae should be recognized and addressed to optimally manage patients with chronic and bothersome tinnitus.

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INTRODUCTION

- Tinnitus is the perception of sound in the absence of an external auditory stimulus, affecting 8 to 25.3% of the population of the United States and the world.¹⁻⁷
- Psychiatric disorders such as anxiety and depression are often comorbid in patients with chronic tinnitus .
- We aimed to better evaluate the relationship of tinnitus symptoms with rates of mood disorders among adults by utilizing the tinnitus module from the 2007 National Health Interview Series.
- We also sought to further expand on the comorbidities associated with tinnitus looking specifically at the impact on sleep, work days missed, and alcohol abuse.

METHODS AND MATERIALS

- Adult responses in the household-based **2007 National Health Interview Series** were analyzed as aggregated in the Integrated Health Interview Series.
- Corresponding responses from the data were extracted for **all adult patients** (age≥18.0 years).
- Prevalence** of self-reported tinnitus was determined along with the self-reported level of **severity** of the tinnitus problem.
- Data for frequent **anxiety** in the past 12 months, feeling frequently **depressed** in the past 12 months, **hours** slept per night, **workdays missed** in the past 12 months, and **mean days of alcohol consumption** in the past 12 months were also analyzed.
- The prevalences of anxiety and depression were compared between tinnitus sufferers and non-sufferers with chi-square.
- Subgroup analyses were conducted for respondents reporting tinnitus as a big or very big problem for both anxiety and depression.
- Mean hours of sleep** per night, mean number of **workdays missed** and mean **days alcohol consumption were also compared**

Anxiety in the past 12 months	Tinnitus: “not a big problem”	Tinnitus: “big/very big problem”	p	Odds ratio
Yes	10.6%	40.4%	<0.001	5.696
No	89.4%	59.6%		

Table 1. Anxiety and Tinnitus Severity

RESULTS

- Among 21.4±3.4 million subjects who reported tinnitus within the past 12 months, 26.1% (5.59 ± 0.31 million adults) also had problems with anxiety in the same period, versus 9.2% (18.4 ± 0.65 million adults) (p<0.001) without tinnitus.
- 25.6% (5.47 ± 0.29 million adults) of tinnitus sufferers reported problems with depression in the preceding 12 months, compared to only 9.1% (18.3 ± 0.57 million adults) of those without tinnitus reported depression symptoms (p<0.001).
- Subgroup analysis reveals higher concordance of both anxiety and depression in respondents reporting tinnitus symptoms as “big” or “very big” problem (tables 1 and 2).
- Those with tinnitus symptoms had fewer mean hours of sleep per night (7.00 versus 7.21 hours, p<0.001) and greater mean days of work missed (6.94 versus 3.79 days, p=0.001) compared to those who did not report tinnitus (table 3).

Depression in the past 12 months	Tinnitus: “not a big problem”	Tinnitus: “big/very big problem”	p	Odds ratio
Yes	10.6%	36.5%	<0.001	4.85
No	89.4%	59.6%		

Table 2. Depression and Tinnitus Severity

Tinnitus	Mean hours of sleep	SE	95% CI	p
Yes	7.00	0.044	7.19 - 7.23	
No	7.21	0.012	6.91 - 7.08	<0.001

Tinnitus	Mean days of EtOH consumption	SE	95% CI	Tinnitus
Yes	64.35	1.101	59.44 - 63.77	
No	61.61	3.424	57.61 - 71.09	0.431

Tinnitus	Mean days of missed work	SE	95% CI	Tinnitus
Yes	6.94	1.57	3.48 - 4.10	
No	3.79	0.913	5.15 - 8.74	0.001

Table 3. Impact of Tinnitus on Quality of Life

DISCUSSION

- It has been suggested that the tinnitus percept may produce an inappropriate activation of the limbic and sympathetic components of the autonomic nervous systems⁸
- The consequent hyperactive state can be concomitant with and can contribute to anxiety, depression, panic and sleep disorder symptoms.
- In the current study, we report substantial comorbidity of tinnitus and mood disorders: we found that when compared to those without tinnitus, there is a significantly higher prevalence of depression (25.6% versus 9.1%) and anxiety (26.1% versus 9.2%)
- This is the first study incorporating a large sample that shows an actual reduction in total duration of sleep in tinnitus sufferers (table 3).
- Treatment and evaluation of insomnia, particularly in the more vulnerable populations, could provide tinnitus patients substantial benefit to their sleep quality and quantity.
- The data shows strong a strong and significant relationship between tinnitus symptoms and work days missed (table 3), which yields a **loss of \$907 per tinnitus sufferer**, with a **total economic loss of \$19.4 billion dollars per year** to the workforce of the United States.

CONCLUSIONS

- This large population-based study demonstrates a strong association among tinnitus, depression and anxiety.
- This association also bears a strength relationship between the severity of tinnitus and the likelihood of anxiety/and/or depression
- There is also evidence for reduced duration of sleep and increased days of work missed among individuals with tinnitus symptoms, with tinnitus sufferers sleeping less and missing significantly more work than tinnitus non-sufferers.
- Such comorbidities and sequelae should be recognized and appropriately addressed to effectively manage patients with chronic and bothersome tinnitus.

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