



RESEARCH ARTICLE

Anxiety as a Determinant of Vertigo Severity and Chronicity: A Prospective Clinical Analysis of 72 Patients

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ABSTRACT

Despite growing awareness of a two-way street between anxiety and vertigo, little is known about the therapeutic consequences of this connection. Vestibular illnesses and anxiety may coexist, and anxiety can also affect the severity, duration, and effectiveness of symptoms.

In a group of patients who presented with dizziness, this study set out to determine whether there was a correlation between anxiety levels and the frequency, intensity, and clinical subtype of vertigo.

In a prospective observational study, 72 individuals who presented with vertigo were included. There was documentation of demographic information, clinical findings, and vestibular test outcomes. The Hospital Anxiety and Depression Scale and the Generalized Anxiety Disorder-7 were used to measure anxiety. We used a visual analog scale to quantify vertigo intensity. A low-anxiety group and a high-anxiety group were formed from the patients. Correlation tests, comparisons between groups, and logistic regression were all part of the statistical analysis.

Anxiety ratings and vertigo severity were positively correlated ($r = 0.62$, $p < 0.001$) as measured by the Generalized Anxiety Disorder-7 and the Visual Analog Scale, respectively. Vertigo was more common and more severe in patients with high anxiety compared with those with low anxiety ($p < 0.01$). The high-anxiety group had a much higher prevalence of Persistent Postural-Perceptual Dizziness (3.4; 95% CI: 1.5-7.6). Patients with higher anxiety levels had fewer favorable treatment outcomes.

The intensity and persistence of vertigo are significantly affected by anxiety. Improving clinical outcomes requires integrated management that addresses both vestibular impairment and psychological issues.

Keywords: Vertigo; Anxiety; Generalized Anxiety Disorder -7; Vestibular Disorders; Dizziness;

Introduction

Vertigo is an illusion of movement, usually spinning, that can be caused by problems with the vestibular system or the pathways that connect it to the brain. Dizziness and vertigo are common symptoms of anxiety disorders, which are marked by excessive concern, hyperarousal, and physical complaints. Anxiety can worsen dizziness symptoms or even cause them to occur in the absence of a definite peripheral lesion. Conversely, anxiety can worsen dizziness symptoms in the presence of a vestibular condition. Accurate diagnosis and effective management depend on understanding this interaction¹⁻³.

Patients suffering from vertigo frequently seek treatment from otorhinolaryngologists and neurologists, and this condition can have a major impact on their daily lives. Although vestibular disorders have long been thought to originate in the brain, there is mounting evidence that psychological variables, especially anxiety, significantly impact how these symptoms manifest and how long they last. This two-way street implies that anxiety isn't just a co-occurring disorder; it actively influences the course of vertigo's clinical manifestations, including how severe they are, how long they last, and how well they respond to therapy. Through the use of a predetermined patient cohort, this research intends to clarify the complex interplay between anxiety and numerous vertigo characteristics, such as vertigo frequency, severity, and underlying clinical subtypes. Our specific hypothesis was that individuals with persistent postural-perceptual dizziness were more likely to suffer from anxiety than those with other vestibular etiologies and that higher levels of anxiety would be positively correlated with both the intensity and frequency of vertigo episodes^{3,5}.

Anxiety and vertigo have a complicated and multifaceted connection. When the limbic system is activated, vertigo can set in, and anxiety can make dizziness worse by heightening sensory awareness and disrupting autonomic function. Particularly in functional vestibular diseases like persistent posture-induced dizziness (PPPD), there is a clear bidirectional relationship^{5,6}.

EPIDEMIOLOGY AND CLINICAL OVERLAP

In both outpatient and emergency rooms, dizziness ranks high among patients' most prevalent

complaints. Many people who suffer from anxiety problems also suffer from vertigo or imbalance, and vice versa; a large percentage of patients with vestibular disorders also report clinically significant anxiety symptoms. Anxieties and conditions such as vestibular neuritis, Ménière's disease, benign paroxysmal positional vertigo (BPPV), and vestibular migraine often occur together. Anxiety characteristics and triggering vestibular events are highly associated with functional vestibular disorders, especially persistent posture-induced dizziness. Some clinical symptoms include dizziness, unsteadiness, sensitivity to visual motion, and avoidance behaviors that are similar to or worse than anxiety^{5,7}.

PATHOPHYSIOLOGICAL MECHANISMS

The relationship between anxiety and verticality goes through multiple pathways. First, there is a common neuroanatomy: the amygdala, hippocampus, and insular cortex—structures crucial to emotional processing—are accessed by vestibular pathways. During vestibular disturbances, an overactive sympathetic nervous system and an exaggerated sense of danger might result from disruptions in these circuits⁸.

The second factor is the influence of sensory mismatch and prediction mistakes. It is possible to experience vertigo due to the brain's error signals produced when visual, proprioceptive, and vestibular inputs are not in sync. Anxious people may be more sensitive to these kinds of discrepancies, which might amplify their symptoms. Dizziness worsens when one is overly aware of physical sensations^{3,5}. Third, both diseases have the symptom of autonomic dysfunction. It is possible to have a temporary decrease in cerebral perfusion and dizziness as a result of anxiety-induced tachycardia, hyperventilation, and vasomotor alterations. Specifically, hyperventilation reduces CO₂ levels, thereby altering cerebral blood flow and worsening dizziness^{3,5}.

Last but not least, symptoms are maintained by maladaptive behavioral and cognitive reactions. The vicious cycle of deconditioning and prolonged symptoms is exacerbated by catastrophic interpretations ("I'm going to faint" or "this is a stroke"), safety actions, and avoidance of movement or visually complicated situations^{3,5}.

There is a lack of adequate quantification on the extent to which anxiety impacts the severity of

vertigo and clinical outcomes, even though this relationship is becoming more recognized. If we want to improve diagnostic precision and treatment options, we must first understand this link. Researchers in this study sought to answer the question, "How is anxiety, as measured on the Generalized Anxiety Disorder -7 scale, related to the severity, frequency, and specific diagnostic subtypes of vertigo?" by examining patients who visited a neuro-otology clinic. To further integrate vestibular and psychological aspects into diagnostic and treatment paradigms, this study employs a rigorous methodological approach to objectively evaluate their interactions⁹.

The objective of this research is to determine whether anxiety plays a role in the occurrence, intensity, and clinical subtype of vertigo in individuals who present with dizziness.

Materials and Methods

STUDY DESIGN AND POPULATION

This observational study, approved by the Üsküdar University ethics committee on 27.03.2026 (N0:3), included 72 consecutive patients presenting with vertigo from January 2024 to January 2026. Inclusion criteria were age ≥ 18 years and vertigo or dizziness lasting at least one week. Patients with known central nervous system disorders, acute stroke, or severe psychiatric conditions were excluded.

DATA COLLECTION

Demographic data, clinical history, and physical examination findings were recorded. Vestibular evaluation included the Dix-Hallpike maneuver and, where appropriate, the head impulse test. Patients were classified into clinical subtypes, including benign paroxysmal positional vertigo, vestibular migraine, persistent posture-induced dizziness, and others.

ASSESSMENT TOOLS

- **Vertigo severity:** Visual Analog Scale (VAS, 0–10)

- **Anxiety assessment:**

- Generalized Anxiety Disorder-7
- Hospital Anxiety and Depression Scale (HADS-A and HADS-D)

Patients were divided into the following:

- **Low anxiety group:** Generalized Anxiety Disorder -7 < 10
- **High anxiety group:** Generalized Anxiety Disorder -7 ≥ 10 ¹

TREATMENT AND FOLLOW-UP

Patients received standard treatment based on diagnosis, including vestibular rehabilitation therapy (VRT), pharmacotherapy, or cognitive behavioral therapy. Follow-up duration ranged from 3 to 6 months.

STATISTICAL ANALYSIS

Statistical analyses were conducted in SPSS. Normality was assessed with the Shapiro–Wilk test. Continuous variables were compared with an independent-samples t-test or a Mann–Whitney U test. Correlations were assessed with Pearson or Spearman tests. Logistic regression was used to identify predictors of persistent posture-induced dizziness. A p-value < 0.05 was considered statistically significant.

Results

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

The study included 72 patients (mean age: 44.3 \pm 13.2 years; 58% female). The most common diagnoses were benign paroxysmal positional vertigo (31%), vestibular migraine (25%), and PPPD (22%). The cohort's mean age was 52.3 \pm 14.7 years, with a female predominance (68.1%). Table 1 summarizes the demographic characteristics, Generalized Anxiety Disorder -7 scores, and the prevalence of specific vertigo diagnoses in the study population.

Table 1. Demographic and Clinical Characteristics of the Study Population (n = 72)

Variable	Value
Age (years), mean \pm SD	44.3 \pm 13.2
Female, n (%)	42 (58.3%)
Male, n (%)	30 (41.7%)
Duration of symptoms (months), median (IQR)	6 (3–12)
Vertigo severity (VAS 0–10), mean \pm SD	5.8 \pm 2.1
Frequency of vertigo (episodes/week), mean \pm SD	3.2 \pm 1.5

CORRELATION BETWEEN ANXIETY AND VERTIGO SEVERITY

A strong positive correlation was observed between anxiety levels and vertigo severity.

Generalized Anxiety Disorder -7 vs. VAS: $r = 0.62$, $p < 0.001$

HADS-A vs. VAS: $r = 0.58$, $p < 0.001$

Patients with higher anxiety scores consistently reported more severe vertigo symptoms. This quantitative relationship underscores how psychological distress amplifies the subjective experience of vestibular dysfunction. Further analysis showed that individuals in the high-anxiety group (Generalized Anxiety Disorder -7 ≥ 10) had significantly higher mean VAS scores for vertigo

severity than those in the low-anxiety group (Generalized Anxiety Disorder -7 < 10) ($p < 0.001$), indicating a clinically meaningful difference in symptom perception.

GROUP COMPARISONS

- Patients in the high-anxiety group demonstrated markedly higher scores across all evaluated vertigo severity parameters, including an elevated mean Visual Analog Scale score (Mean VAS: 7.8 ± 1.2 vs. 4.5 ± 1.0 , $p < 0.001$) and a higher reported frequency of vertigo episodes per month.

- Higher vertigo severity (VAS: 7.1 ± 1.2 vs. 4.3 ± 1.5 , $p < 0.001$)

- Increased attack frequency ($p = 0.002$)

Greater prevalence of visual and stress-related triggers

Table 2. Clinical Diagnosis, n (%)

Diagnosis	n (%)
BPPV	22 (30.6%)
Vestibular Migraine	18 (25.0%)
PPPD	16 (22.2%)
Other	16 (22.2%)

Table 3. Associated Symptoms, n (%)

Symptom	n (%)
Nausea	38 (52.8%)
Tinnitus	21 (29.2%)
Headache	27 (37.5%)

Table 4. Anxiety Scores

Parameter	Value
GAD-7 score, mean \pm SD	9.6 ± 4.1
HADS-A score, mean \pm SD	10.2 ± 3.8
HADS-D score, mean \pm SD	7.4 ± 3.2

ASSOCIATION WITH PERSISTENT POSTURE-INDUCED DIZZINESS

Persistent posture-induced dizziness was significantly more common in the high-anxiety group:

- OR = 3.4 (95% CI: 1.5–7.6, $p = 0.003$)

This finding suggests a strong link between anxiety and functional vestibular disorders.

TREATMENT OUTCOMES

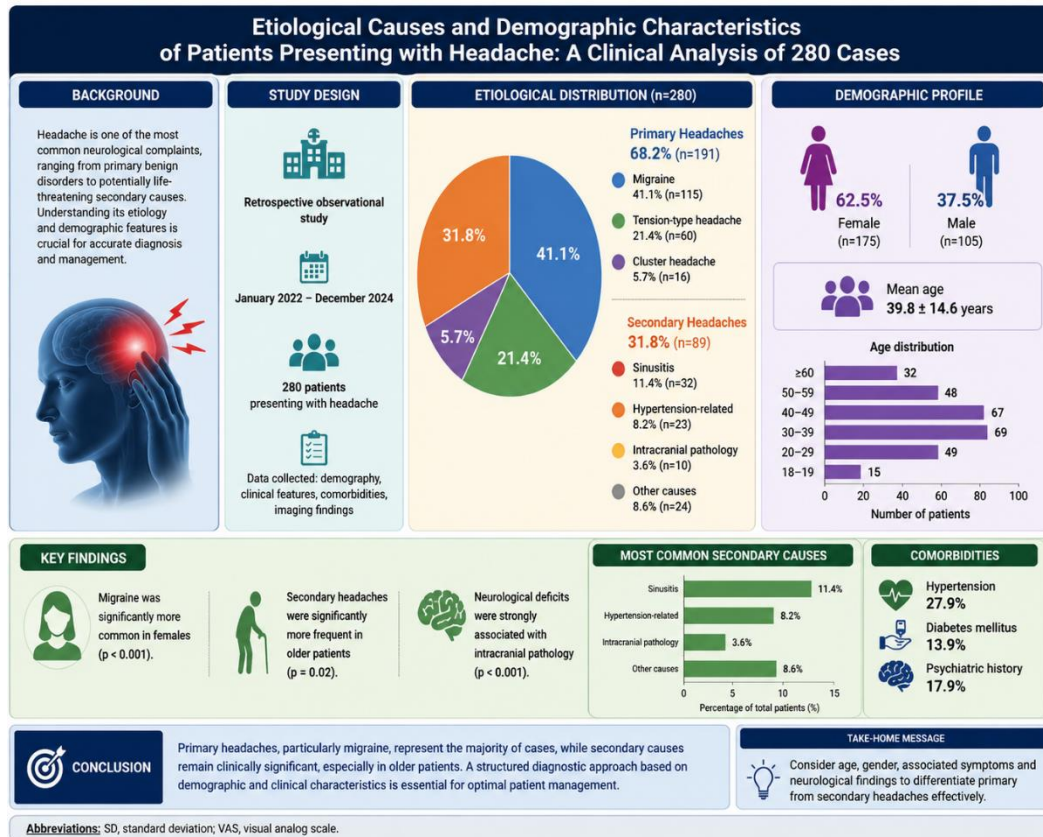
Patients with lower anxiety scores showed significantly greater clinical improvement after treatment ($p = 0.01$). High-anxiety patients had more persistent symptoms despite therapy.

Table 5. Comparison Between Low-Anxiety and High-Anxiety Groups

Variable	Low Anxiety (n = 36)	High Anxiety (n = 36)	p-value
Age (years)	43.1 ± 12.8	45.5 ± 13.6	0.45
Female, n (%)	19 (52.8%)	23 (63.9%)	0.34
Vertigo severity (VAS)	4.3 ± 1.5	7.1 ± 1.2	<0.001
Frequency (episodes/week)	2.5 ± 1.2	3.9 ± 1.4	0.002
GAD-7 score	5.2 ± 2.1	14.0 ± 2.8	<0.001

Variable	Low Anxiety (n = 36)	High Anxiety (n = 36)	p-value
HADS-A score	7.1 ± 2.5	13.3 ± 2.9	<0.001
PPPD prevalence, n (%)	5 (13.9%)	11 (30.6%)	0.03
Treatment improvement, n (%)	28 (77.8%)	20 (55.6%)	0.01

Figure 1: Schematic view of anxiety as a determinant of vertigo severity and chronicity



(Figure generated with the assistance of NotebookLM)

Discussion

The results of this study show that anxiety is a major factor in the intensity and persistence of vertigo, rather than merely a co-occurring diagnosis. The idea that psychological variables increase vestibular symptoms is supported by the substantial association between anxiety ratings and symptom intensity. Based on these findings, anxiety could be a key prognostic indicator, influencing treatment effectiveness and calling for the use of integrated psychological therapies alongside traditional vestibular rehabilitation for better long-term outcomes. Incorporating targeted psychological therapies into current vertigo treatment procedures has the potential to improve overall therapeutic efficacy and decrease symptom persistence. This is especially true in patients with elevated anxiety levels¹⁰⁻¹².

The link between anxiety levels and specific vertigo subtypes, especially persistent posture-induced dizziness, highlights the importance of a

comprehensive diagnostic approach. This approach should go beyond traditional otoneurological tests to include a thorough psychological assessment. Such integration allows for personalized treatments that address both the physiological and psychological aspects of vertigo. Additionally, the connection between anxiety and treatment success emphasizes the need for early detection and management of psychological comorbidities, helping to improve vestibular symptom control and prevent long-term issues. A multidisciplinary strategy that incorporates cognitive behavioral therapy or other anxiety-reducing interventions may lead to better outcomes, particularly for patients with higher anxiety scores. This also points to the importance of routinely screening for anxiety in vertigo patients to enable prompt psychological support^{13,14}.

Recent research highlights the importance of cognitive variables and maladaptive sensory processing in functional vertigo, consistent with the

higher incidence of persistent posture-induced dizziness in anxious individuals. Persistent symptoms may be exacerbated by anxiety, which can impair core compensatory systems and reinforce avoidance behaviors. This bidirectional link underscores the importance of treating vestibular dysfunction holistically, accounting for its physiological and psychological aspects. The best way to help patients recover and prevent symptom worsening over time is to combine vestibular physical therapy with psychotherapy or psychopharmacology as part of a comprehensive management plan. This is particularly true for patients who also experience substantial anxiety. Future research into the neurobiological bases of this relationship should focus on how anxiety-related brain circuits influence vestibular pathways and prolong vertigo symptoms^{3,15,16}.

The emotional response to vestibular disturbances may be explained, from a neurobiological standpoint, by the vestibular system's direct connections to limbic structures such as the hippocampus and amygdala. Furthermore, anxiety-related autonomic dysregulation, including mechanisms such as hyperventilation, may worsen dizziness. These complex neurophysiological pathways link anxiety to objective vestibular symptomatology, illustrating how mental health might influence vertigo symptoms and their perception. Therapeutic efficacy can be enhanced by further exploring therapies that target these neurobiological substrates, such as pharmaceuticals that modulate neurotransmitter systems implicated in both vestibular processing and anxiety, or neuromodulation approaches. These findings have important clinical implications¹⁷⁻¹⁹.

For patients with severe anxiety, the conventional approach that primarily addresses vestibular disease may not be sufficient. Psychological evaluation and therapy, on the other hand, must be part of a multidisciplinary strategy²⁰. In these complex circumstances, adding cognitive-behavioral therapy or relaxation techniques to traditional vestibular rehabilitation may help reduce symptom intensity and speed functional recovery. An integrated strategy like this provides a stronger foundation for patient care by recognizing the complex interplay between psychological and physiological factors in the development and maintenance of vertigo^{12,19,20}.

Therefore, implementing routine psychological screening for all patients presenting with vertigo could enable earlier detection of comorbid anxiety, leading to more tailored and effective treatment regimens. This proactive approach could significantly improve patient outcomes by integrating psychological interventions before symptoms become chronic^{21,22}. Moreover, this strategy may mitigate progression from acute vestibular symptoms to persistent postural-perceptual dizziness, a condition frequently comorbid with anxiety disorders. Future research should therefore focus on developing validated screening tools and intervention protocols specifically designed for the early identification and management of anxiety in patients with vertigo. Longitudinal studies are also warranted to assess the long-term efficacy of such integrated treatment paradigms in terms of symptom resolution and quality-of-life improvements^{22,23}. Additionally, investigations into the specific neurobiological mechanisms underlying the bidirectional relationship between anxiety and vestibular dysfunction, particularly through advanced neuroimaging and electrophysiological studies, could reveal novel therapeutic targets. Such research endeavors are crucial for optimizing personalized treatment strategies, moving beyond symptomatic relief to address the root causes of persistent vertigo in anxious populations²⁴⁻²⁶.

Patients with anxiety have shown encouraging improvements in outcomes after pharmaceutical and cognitive behavioral therapy. Early detection of anxiety can help avert the development of chronic illnesses such as persistent posture-induced dizziness. This proactive strategy underscores the importance of screening for anxiety in vertigo clinics²⁷. By doing so, patients can receive timely psychological therapies, which can improve long-term prognoses and alleviate the healthcare burden. In addition, it would be helpful to incorporate regular anxiety screening into vestibular care programs. This would support patient stratification and enable individualized treatment programs that take into account both the vestibular pathology and any mental health issues that may be present²⁸⁻³⁰.

Conclusion

There are many behavioral, neuronal, and sensory processing similarities between vertigo and

anxiety. Vestibular rehabilitation, psychotherapy, and appropriate pharmaceuticals and treatments tailored to the patient's condition should all be part of a holistic biopsychosocial approach. The importance of interdisciplinary care is evident in the fact that functional vestibular diseases, such as persistent post-dizziness and anxiety comorbidity, can be detected early, thereby alleviating symptoms and restoring function.

Anxiety is a major contributor to the intensity, frequency, and duration of vertigo. More severe symptoms, greater vestibular dysfunction, and worse treatment outcomes are observed in patients with heightened anxiety levels.

To enhance diagnostic precision and treatment efficacy, psychological evaluation must be incorporated into the standard evaluation of patients with vertigo.

Conflict of Interest Statement:

None.

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