Role of Emotional Distress in Prolongation of Dizziness: A Cross-Sectional Study

Kyung Jin Roh[1,2], Min Ki Kim[1], Ji Hyung Kim[1], and Eun Jin Son[1]

[1]Department of Otorhinolaryngology, Gangnam Severance Hospital, Yonsei University College of Medicine, Seoul,
[2]Department of Otorhinolaryngology, Inje University College of Medicine, Seoul Paik Hospital, Seoul, Korea

Background and Objectives: Dizziness is a common condition in outpatient clinics. Comorbid conditions such as anxiety and/or depression often complicate a patient's ability to cope with dizziness. The purpose of the present study was to explore the extent of psychiatric distress using the Hospital Anxiety and Depression Scale (HADS) and to compare the results with the subjective severity of dizziness. **Subjects and Methods**: The cross-sectional study included a total of 456 consecutive patients presenting with acute (n=327) and chronic (n=127) dizziness symptoms. The HADS was used to estimate emotional distress and compare between patients with acute and chronic dizziness symptoms. Also, we calculated correlations between subjective dizziness handicap scores and emotional distress using the total and subscale scores of the Dizziness Handicap Inventory (DHI), Disability Scale (DS), and HADS. **Results**: The HADS total and subscale scores were significantly increased in patients with chronic dizziness (*p*<0.01) compared with those with acute symptoms. In patients with symptoms of both acute and chronic dizziness, moderate correlations were evident between the DHI and HADS total scores. When we compared DHI subscale scores with the HADS scores, the emotional DHI subscale scores correlated more highly with the HADS total scores and the scores on the anxiety and depression subscales, than did the functional or physical DHI subscale scores. **Conclusions**: Increased levels of distress measured using the HADS in patients with chronic symptoms suggest that emotional status of the patients may contribute to prolongation of dizziness symptoms from the acute phase.

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KEY WORDS: Dizziness · Emotional stress · Anxiety · Depression · Self-report.

Introduction

Vertigo and dizziness are among the most common symptoms encountered in outpatient clinics, and negatively impact the ability to perform the activities of daily life and quality-of-life. Even after the acute symptoms have diminished, patients often remain concerned about any residual dizziness or repeat episodes of symptom aggravation, particularly when partaking in certain activities. Some patients become preoccupied with activities that they believe will cause dizziness, avoiding such activities, thus compromising timely compensation.

Therefore, co-morbidity of psychiatric conditions is not uncommon in those patients [1]. Although pre-existing psychiatric conditions may cause dizziness, other explanations for comorbid dizziness and a psychiatric disturbance are possible. Acute vertiginous attacks are often unpredictable and severe, causing fear, disability, and psychological distress [2]. Furthermore, psychiatric comorbidity has been associated with an increased risk of chronic symptom progression [3,4].

Routine interviews and examinations of the patients presenting with dizziness usually do not include psychological evaluations [5]. It is likely that both physicians and patients are reluctant to suggest that psychological conditions contribute to dizziness; this might insinuate that a patient's distress is not being taken seriously [2]. Incorporation of a screening measure assessing the psychiatric condition during routine

evaluation of patients with dizziness would be useful when choosing appropriate referrals. The Hospital Anxiety and Depression Scale (HADS) is a widely used self-report instrument screening for anxiety and depression in medical outpatient settings [6,7]. The reliability and validity of the HADS have been confirmed in various patient groups, including patients with dizziness [7-13]. However, all studies to date have focused on patients with chronic symptom of dizziness, or were limited to patients of certain ages or with particular diagnoses. It can be postulated that the emotional/psychiatric distress experienced during the acute stage of peripheral dizziness would escalate during the chronic phase, and that a tendency toward psychiatric stress might hinder recovery, thus in fact prolonging the duration and escalate the severity of the symptom. Thus, we hypothesized that the psychiatric distress associated with dizziness would be associated particularly with chronic dizziness. The aims of the present study were to explore the extent of psychiatric distress using the HADS and to identify significant association between dizziness handicap and psychosocial effect in patients suffering from dizziness.

Subjects and Methods

We included 456 consecutive patients (mean age 55.8 ± 17.0 years; 146 males and 310 females) presenting to the dizziness clinic of Yonsei University Gangnam Severance Hospital from June 2013 to June 2014. Thorough history review and physical examination were performed during the initial interview. Patients were classified as acute dizziness group when the dizziness symptoms occurred abruptly within 4 weeks prior to visit, and as chronic dizziness group when the symptoms lasted longer. During the initial visit, self-report surveys including the Dizziness Handicap Inventory (DHI), Visual Analog Scale (VAS), Disability Scale (DS), and HADS were completed manually. We retrospectively reviewed the survey results.

Subjective measures of dizziness

Subjective perceptions of dizziness were measured using self-reports. Dizziness-related effects on daily activities were assessed using the Korean version of the 25-item DHI, which explores self-perceived functional, emotional, and physical handicaps associated with dizziness [14]. Scores range from 0 (no handicap) to 100 (maximum handicap). The DHI scores are subcategorized as functional [functional handicap due to dizziness (subscale of the DHI), 36 points], emotional [emotional handicap due to dizziness (subscale of the DHI) (DHI-E), 36 points], and physical [physical handicap due to dizziness (subscale of the DHI), 28 points]. Self-perceived dizziness

handicaps were grouped by reference to the DHI scores, and were classified as mild (0−30), moderate (31−60), and severe symptoms (≥61). Also, all patients indicated their extents of dizziness on a vertigo VAS, ranging from 0 (no dizziness) to 10 (maximum dizziness). In addition, patient perceptions of the disabilities caused by dizziness were recorded on the DS, a six-point scale ranging from 0 (no disability) to 5 (long-term disability) [15].

Hospital Anxiety and Depression Scale

Emotional/psychiatric distress was measured using the HADS, designed to screen for depression and anxiety disorders in nonpsychiatric patients in the hospital outpatient setting [6]. The HADS consists of two subscales, anxiety subscale of HADS (HADS-A) and depression subscale of HADS (HADS-D), measuring anxiety and depression, respectively. Each item is rated from 0 to 3 points yielding summed scores of 0 to 42, and higher scores are related to increased likelihood that the patient could be classified as anxious or depressed. The scale does not aim to confirm a diagnosis of anxiety or depression. The cut-off values of 11 or greater as a total score, or 8 or greater for each subscale were used.

Data analysis

All data were analyzed using SPSS ver. 22.0 (IBM Corp., Armonk, NY, USA) software. Means with standard deviation, and frequencies with percentages are presented. Differences between groups in demographics, underlying conditions, vestibular/psychiatric diagnoses were examined using student's t-tests or chi-square tests. Pearson's two-tailed correlation coefficients were calculated to explore correlations among the total and subscale scores of the HADS, DHI, VAS and DS; all variables were continuous and normally distributed. Statistical significance was confirmed using crosstabs, the t-test, and one-way analysis of variance. A p-value <0.05 was considered statistically significant. An exploratory principal component analysis was performed using factors with eigenvalues >1.

Ethical considerations

The Institutional Review Board of our tertiary-referral university hospital (Gangnam Severance Hospital) approved the study (IRB #3-2015-0312). This study was a retrospective review and did not require prior consent.

Results

Patient characteristics

The clinical characteristics of all patients and those with acute and chronic dizziness are shown in Table 1. According

to the duration of dizziness, acute and chronic groups were distinguished based on 1 month. 327 patients with acute symptoms and 127 with chronic symptoms were recruited in this study. No significant between-group difference was evident in terms of gender or age. Among underlying conditions, Meniere's disease and vestibular migraine were more prevalent among patients with chronic symptoms. On the other hand, benign paroxysmal positional vertigo (BPPV) was more prevalent in the acute dizziness group. There was no significant difference between acute and chronic groups according to underlying psychiatric conditions such as anxiety or panic disorders. Similarly, the total and subscale scores (F, E, and P) of

Table 1. Summary of clinical characteristics of patients with acute or chronic dizziness symptoms

	All patients (n=456)	Patients with acute dizziness (n=327)	Patients with chronic dizziness (n=127)	p-values
Age (mean±SD) (years)	55.80±16.97	56.25±17.09	54.79±16.70	0.410
M:F	146:310	111:216	35:92	0.191
Underlying conditions (%)				
Hypertension	102 (22.4)	76 (23.2)	26 (20.5)	0.516
Diabetes	34 (7.5)	26 (8.0)	8 (6.3)	0.548
Vestibular hypofunction	79 (17.3)	52 (15.9)	29 (22.8)	0.176
Meniere's disease	46 (10.1)	21 (6.4)	25 (19.7)	<0.001
BPPV	232 (50)	201 (59.5)	31 (24.6)	<0.001
Vestibular migraine	24 (5.2)	10 (3.0)	14 (6.5)	<0.001
Psychiatric conditions (%)				
Depression	7 (1.5)	3 (0.9)	4 (3.2)	0.072
Anxiety	4 (0.9)	1 (0.3)	3 (2.4)	0.063
Panic disorder	5 (1.1)	4 (1.2)	1 (0.8)	1.000
Total HADS scores	14.76±8.170	14.02±7.876	16.65±8.644	0.002
HADS-A subscale	7.13±4.406	6.74±4.240	8.10±4.693	0.003
HADS-D subscale	7.59±4.295	7.24±4.208	8.48±4.414	0.006
Total DHI scores	33.14±24.344	33.01±24.340	33.81±24.444	0.753
DHI-P subscale	10.66±7.168	10.76±7.088	10.52±7.377	0.745
DHI-E subscale	10.36±9.123	10.19±9.231	10.86±8.882	0.487
DHI-F subscale	12.15±9.841	12.07±9.818	12.49±9.942	0.683
VAS	5.82±2.543	5.70±2.598	6.14±2.388	0.104
DS	2.02±1.076	2.03±1.060	2.00±1.120	0.816

Student's t-test for continuous data. chi-square test for categorical data. BPPV: benign paroxysmal positional vertigo, HADS: Hospital Anxiety and Depression Scale, HADS-A: anxiety subscale of HADS, HADS-D: depression subscale of HADS, DHI: Dizziness Handicap Inventory, DHI-P: physical handicap due to dizziness (subscale of the DHI), DHI-E: emotional handicap due to dizziness (subscale of the DHI), DHI-F: functional handicap due to dizziness (subscale of the DHI), VAS: Visual Analogue Scale, DS: Disability Scale, SD: standard deviation

Table 2. Bivariate correlations between HADS scores and subjective measures of dizziness in patients with acute symptoms

	Total HADS	HADS-A	HADS-D	DHI-total	DHI-P	DHI-E	DHI-F	VAS	DS
Total HADS	1								
HADS-A	0.923**	1							
HADS-D	0.936**	0.733**	1						
DHI-total	0.521**	0.454**	0.513**	1					
DHI-P	0.411**	0.345**	0.424**	0.884**	1				
DHI-E	0.554**	0.504**	0.526**	0.934**	0.723**	1			
DHI-F	0.452**	0.383**	0.462**	0.959**	0.795**	0.861**	1		
VAS	0.283**	0.222**	0.298**	0.485**	0.416**	0.450**	0.480**	1	
DS	0.271**	0.229**	0.276**	0.624**	0.510**	0.596**	0.633**	0.633**	1

*p<0.05, **p<0.01. HADS: Hospital Anxiety and Depression Scale, HADS-A: anxiety subscale of HADS, HADS-D: depression subscale of HADS, DHI: Dizziness Handicap Inventory, DHI-P: physical handicap due to dizziness (subscale of the DHI), DHI-E: emotional handicap due to dizziness (subscale of the DHI), DHI-F: functional handicap due to dizziness (subscale of the DHI), VAS: Visual Analogue Scale, DS: Disability Scale

Table 3. Bivariate correlations between HADS scores and subjective measures of dizziness in patients with chronic symptoms

	Total HADS	HADS-A	HADS-D	DHI-total	DHI-P	DHI-E	DHI-F	VAS	DS
Total HADS	1								
HADS-A	0.931**	1							
HADS-D	0.948**	0.788**	1						
DHI-total	0.533**	0.484**	0.545**	1					
DHI-P	0.423**	0.368**	0.447**	0.880**	1				
DHI-E	0.580**	0.542**	0.576**	0.941**	0.737**	1			
DHI-F	0.484**	0.438**	0.500**	0.955**	0.763**	0.867**	1		
VAS	0.229**	0.241**	0.214**	0.418**	0.371**	0.382**	0.390**	1	
DS	0.305**	0.281**	0.318**	0.564**	0.419**	0.547**	0.572**	0.563**	1

*$p<0.05$, **$p<0.01$. HADS: Hospital Anxiety and Depression Scale, HADS-A: anxiety subscale of HADS, HADS-D: depression subscale of HADS, DHI: Dizziness Handicap Inventory, DHI-P: physical handicap due to dizziness (subscale of the DHI), DHI-E: emotional handicap due to dizziness (subscale of the DHI), DHI-F: functional handicap due to dizziness (subscale of the DHI), VAS: Visual Analogue Scale, DS: Disability Scale

Table 4. Comparison of HADS results among three groups of dizziness severity classified by DHI scores in patients with acute symptoms (n=327)

	DHI levels			
	Mild (n=172)	Moderate (n=101)	Severe (n=44)	p-values
HADS-A (%)				<0.001
Normal	125 (67.9)	47 (25.5)	12 (6.5)	
Abnormal	47 (35.3)	54 (40.6)	32 (24.1)	
HADS-D (%)				<0.001
Normal	125 (73.1)	33 (19.3)	13 (7.6)	
Abnormal	47 (32.2)	68 (46.6)	31 (21.2)	
Total HADS (%)				<0.001
Normal	97 (75.8)	25 (19.8)	6 (4.3)	
Abnormal	75 (39.7)	76 (40.2)	38 (20.1)	

HADS: Hospital Anxiety and Depression Scale, DHI: Dizziness Handicap Inventory, HADS-A: anxiety subscale of HADS, HADS-D: depression subscale of HADS

Table 5. Comparison of HADS results among three groups of dizziness severity classified by DHI scores in patients with chronic symptoms (n=126)

	DHI levels			
	Mild (n=68)	Moderate (n=40)	Severe (n=18)	p-values
HADS-A (%)				0.004
Normal	41 (63.1)	21 (32.3)	3 (4.6)	
Abnormal	27 (44.3)	19 (31.1)	15 (24.6)	
HADS- D (%)				0.001
Normal	41 (71.9)	12 (21.1)	4 (7.0)	
Abnormal	27 (39.1)	28 (40.6)	14 (20.3)	
Total HADS (%)				0.009
Normal	27 (77.1)	6 (17.1)	2 (5.7)	
Abnormal	41 (45.1)	34 (37.4)	16 (17.6)	

HADS: Hospital Anxiety and Depression Scale, DHI: Dizziness Handicap Inventory, HADS-A: anxiety subscale of HADS, HADS-D: depression subscale of HADS

the DHI, VAS, and DS did not differ significantly between the groups. However, the patients experiencing chronic dizziness symptoms scored higher for the total HADS and subscales HADS-A and HADS-D compared to the patients with acute dizziness symptoms, suggesting increased emotional distress compared to patients with acute dizziness symptoms.

Correlation between HADS scores and subjective measures of dizziness

To explore whether the emotional stress correlated with severity of dizziness, we compared the HADS scores and subjective measures of dizziness in each group of patients (Table 2, 3). In patients with acute dizziness, the Pearson correlation coefficients between the total and subscale HADS scores, and the total and subscale DHI scores, showed moderate correlations (range: r=0.345−0.554) (Table 2). The correlations between the total and subscale HADS scores, and the VAS and

DS scores, were weaker (range: r=0.222−0.298) (Table 2). Similar results were evident in patients with chronic dizziness (Table 3). The Pearson correlation coefficients of the total and subscale HADS scores, and the total and subscale DHI scores, were again moderate (range: r=0.368−0.580) (Table 3). Correlations between the total and subscale HADS scores, and the total and subscale DHI scores, were weaker for patients with chronic dizziness (range: r=0.214−0.318) (Table 3).

Next, patients with acute and chronic dizziness were subdivided by the severity of dizziness symptoms using the total DHI scores: mild (0−30), moderate (31−60), and severe (≥61). In patients with acute dizziness, the total and subscale HADS scores were significantly higher in patients with severe symptoms (Table 4), and results were similar in patients with chronic dizziness (Table 5).

Table 6. Factor loadings of HADS items

HADS item	Acute		Chronic	
	Factor 1	Factor 2	Factor 1	Factor 2
(1) I feel tense or wound up.	0.576*	0.210	0.714*	-0.058
(3) I get a sort of frightened feeling as if something awful is about to happen.	0.672*	0.035	0.758*	-0.033
(5) Worrying thoughts go through my mind.	0.784*	0.012	0.824*	-0.187
(7) I can sit at ease and feel relaxed.	0.434*	0.414*	0.737*	0.122
(9) I get a sort of frightened feeling like 'butterflies' in the stomach.	0.794*	0.070	0.868*	-0.070
(11) I feel restless as if I have to be on the move.	0.839*	-0.067	0.768*	0.040
(13) I get sudden feelings of panic.	0.922*	-0.123	0.766*	0.021
(2) I still enjoy the things I used to enjoy.	0.063	0.658*	0.639*	0.195
(4) I can laugh and see the funny side of things.	-0.161	0.868*	0.456*	0.418*
(6) I feel cheerful.	0.058	0.748*	0.612*	0.248
(8) I feel as if I am slowed down.	0.526*	0.146	0.777*	-0.485*
(10) I have lost interest in my appearance.	0.232	0.537*	0.595*	0.202
(12) I look forward with enjoyment to things.	0.258	0.563*	0.659*	0.251
(14) I can enjoy a good book or radio or television program.	0.017	0.650*	0.275	0.713*
Eigenvalues	6.834	1.073	7.070	1.025

*the factor item loading is ≥0.3. HADS: Hospital Anxiety and Depression Scale

Exploratory factor analysis

The Kaiser-Meyer-Olkin (KMO) measure was evaluated and the Bartlett test of sphericity conducted to assess the adequacy of exploratory factor analysis. The KMO index was 0.943 and the Bartlett test of sphericity was highly significant (<0.001). Following extraction and oblimin rotation, two factors with eigenvalues >1 were observed, and cumulatively accounted for 57.0% of the total variance. The factor loadings of the 14 HADS items in patients with acute and chronic dizziness are shown in Table 6. In patients with acute dizziness, anxiety item 7 ("I can sit at ease and feel relaxed") loaded similarly to factors 1 and 2. Among factor 2 (depression) items, item 8 ("I feel as if I am slowed down") did not load to factor 2, but rather to factor 1. In patients with chronic dizziness, among items assessing depression, item 2 ("I still enjoy the things I used to enjoy"), item 6 ("I feel cheerful"), item 10 ("I have lost interest in my appearance"), and item 12 ("I look forward with enjoyment to things") loaded to factor 1 (anxiety). Item 4 ("I can laugh and see the funny side of things") loaded similarly to factors 1 and 2. Only item 14 ("I can enjoy a good book or radio or television program") loaded to factor 2 (depression) in patients with chronic dizziness.

Discussion

Various psychometric tools can be used to assess psychiatric conditions in patients with dizziness. Ideally, comprehensive psychiatric interviews should be performed and psychiatric disorders diagnosed by reference to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and the criteria of the International Statistical Classification of Diseases and Related Health Problems (ICD-10). However, in non-psychiatric clinics, various self-rated measures are used to screen for psychiatric conditions and guide the necessary referrals. Ketola, et al. [16] reported higher prevalence of psychiatric conditions and personality disorders among vertiginous patients who completed the Beck Depression Inventory, underwent DSM-IV evaluation, and also completed the ICD-10 Personality Questionnaire and the Zung Anxiety Scale. Best, et al. [3] showed that patients with vestibular migraines had significantly higher rates of psychiatric disorders compared to those with other causes of dizziness such as BPPV, vestibular neuritis, and Meniere's disease. The cited authors used the structured clinical interview for DSM-IV axis I and axis II disorders (SCID-I−II), which evaluates not only DSM-IV-defined conditions, but also distinguishes between current and lifetime disease episodes. Eckhardt-Henn, et al. [4] performed SCID-I evaluation, and applied a test battery including the Symptom Check List 90, the HADS, and the Vertigo Handicap Questionnaire, to evaluate patients with distinct vestibular diagnoses. In a non-psychiatric clinic, it is often difficult to perform formal psychiatric interviews or administer lengthy self-report questionnaires, partly due to time constraint during evaluation of dizziness patients. Perhaps more importantly, patients may be upset if they think that only psychiatric conditions are being considered when the physician seeks to diagnose dizziness, feeling that their problems are not being taken seriously. Thus, it may be more prudent to utilize relatively simple measures such as the HADS to screen patients at risk of comorbid psychiatric conditions that may in-

terfere with recovery from dizziness, and to follow with appropriate referrals for formal psychiatric evaluation.

The HADS has been commonly used to assess emotional distress in various clinical settings, and several studies have utilized this self-report measure to explore the relationships between dizziness and psychiatric symptoms. Grunfeld, et al. [12] employed the HADS to find that the rates of depression and anxiety in dizziness patients were higher than normal. The HADS was used in conjunction with the Self-Rating Depression Score to identify psychiatric comorbidities in patients with dizziness and Meniere's disease [17]. Cheng, et al. [11] used the HADS to explore correlations among dizziness handicaps, depression, and quality-of-life in elderly patients with chronic dizziness, and found a high correlation between the DHI and HADS scores. In the present study, we sought correlations between subjective dizziness symptoms and psychological conditions and compare between patients with acute or chronic dizziness symptoms. Overall, 61.6% of all patients (57.8% of acute and 71.7% of those with chronic dizziness) were under significant emotional distress as measured by the HADS scores, which were higher than those of healthy control subjects (2−5%). Previous studies performed in neuro-oto-logic clinics reported higher HADS scores similar to our results, highlighting the importance of probing into emotional distress in patients with dizziness symptoms [1,12]. Also, we found moderate correlations between the DHI and the HADS scores (total and subscales) in patients with either acute or chronic dizziness, comparable to the results of previous studies. [12,13] Interestingly, the DHI-E subscale data correlated slightly better with the HADS data than did the scores of the other subscales, again emphasizing that subjective symptom of dizziness is associated with emotional distress.

The patients' psychological reactions to initial episodes of dizziness affect the succeeding recovery process [2,18]. Anxiety and panic augment the autonomic symptoms caused by vestibular disorders, and fear and the avoidance of activities that the patients believe provoke dizziness interfere with compensation and prolong the dizziness symptoms. In our previous study of patients in the acute stages of vestibulopathy, the DHI scores correlated with other subjective measures of dizziness, but not with the vestibular function test results, suggesting that emotional status also contributes to dizziness symptoms even during the acute phase [19]. However, it remains unclear to what extent emotional distress affects patients' subjective symptoms during the acute and chronic stages of dizziness, since most studies exploring the roles played by psychiatric conditions in dizziness included patients with only chronic dizziness or did not examine symptom chronicity. Here, we examined emotional distress experienced by patients with

acute and chronic dizziness symptoms to compare how psychiatric conditions affected these groups differently. In contrast to our hypothesis that the depression and anxiety levels would be increased in patients with chronic dizziness, the HADS scores were comparable between the groups, as were the correlations between the HADS and DHI scores. In other words, the extent of emotional distress caused by dizziness seems similar during the acute and chronic phases. Thus, prolonged symptom duration does not necessarily imply heightened negative reactions. However, as we conducted only a cross-sectional intergroup comparison, it would be interesting to explore possible changes in the psychiatric burden during progression from an acute vestibular insult to either symptom resolution or chronic debilitating dizziness in the same subjects.

The HADS has been widely used, and is both reliable and valid [7-9,20]. However, the HADS might be insufficient to differentiate between depression and anxiety as recent studies suggest [9,13,20-22]. A systemic review of the latent HADS structure emphasized the heterogeneity thereof, influenced not only by large variances among and within different populations, but also the statistical methodology utilized [20]. The total HADS score might be a better measure of general emotional distress, rather than either anxiety or depression [20,22]. Here, we employed a bifactorial structure for analysis; we compared the factor loadings for each HADS item between patients with acute and chronic dizziness. Among items exploring factor 1 (anxiety), item 7 ("I can sit at ease and feel relaxed") loaded similarly to factors 1 and 2 in patients with acute dizziness. Among factor 2 (depression) items, item 8 ("I feel as if I am slowed down") did not in fact load to factor 2, but rather to factor 1, in both the acute and chronic dizziness groups. Similar findings for item 8 have been reported in stroke patients [23] and those with traumatic brain injuries [24]. It has been suggested that a feeling of "slowing down" might be related to general unsteadiness and dizziness in such patient populations, rather than depression. It is interesting that only item 14 ("I can enjoy a good book or radio or television program") loaded onto factor 2 (depression), as expected, in patients with chronic dizziness. Our results suggest that the HADS does not distinguish between anxiety and depression in patients with acute and chronic dizziness, supporting previous arguments that the latent HADS structure remains inconclusive. Moreover, our results suggest that the HADS structure may differ among distinct patient populations, such as those with acute and chronic dizziness.

One of the limitations of our study is that anxiety and depression-related symptoms were screened using self-report questionnaires, rather than via clinical interviews following appropriate diagnostic procedures. Another limitation is that

the patients with dizziness are likely to be burdened by concurrent health problems other than dizziness, and their contribution in emotional distress could not be differentiated with the self-report measures. Again, comprehensive psychiatric interviews would provide more information to help identify relationship between dizziness symptoms and other medical conditions. As previously noted, since our study was a cross-sectional approach, follow-up studies on patients with acute-onset dizziness who progress to chronic debilitating dizziness would yield insights into whether individual characteristics or psychological tendencies increased emotional stress levels, prolonging dizziness symptoms. Lastly, it is noteworthy that the dizziness symptoms can result from various otologic pathologies and caused by different mechanisms. Also, diverse factors would influence how the dizziness symptoms resolve or progress in various diseases. Since our study population included several disease entities, the relationship between emotional distress and symptom chronicity in specific conditions remains to be explored in future studies.

In conclusion, our study showed that the emotional distress measured using HADS were increased in patients with chronic dizziness compared with those with acute symptoms, while the subjective perception of dizziness severity was similar as measured by the DHI, VAS, and DS scores. The results suggest that the emotional status of the patients with dizziness symptoms might be related to chronicity of dizziness symptoms. Increased emotional distress from dizziness may affect prolonged disease course, so it should be considered to screen them in a timely manner.

Conflicts of interest

The authors have no financial conflicts of interest.

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