

# Establishment and reliability test of a "Vertigo Council Diagnosis Questionnaire" for patients with chronic vestibular dysfunction: preliminary study

Kronik vestibüler disfonksiyonu olan hastalar için bir "Vertigo Konseyi Tanı Anketi"nin oluşturulması ve güvenilirlik testi: Ön çalışma

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## ABSTRACT

**Objectives:** This study aims to establish a "Vertigo Council Diagnosis Questionnaire" for patients with chronic vestibular dysfunction and show the reliability of this questionnaire.

**Materials and Methods:** A "Vertigo Council Diagnosis Questionnaire" consisting of 10 questions was prepared by 15 specialist physicians and analyzed for reliability using the "translation-back-translation" method.

**Results:** When all the items of our questionnaire were evaluated, the content validity ratio ranged from 0.6 to 0.87, and the content validity index was 0.676. The conformity ratio between the real diagnosis and the diagnosis based on the questionnaire was 63.19%, and the kappa was 0.441 (moderate). No significant difference was found between the first and second responses to any of the questions ( $p>0.05$ ). There was no significant difference between question conformity (conformity between the first and second responses) and diagnostic conformity (conformity between the real diagnosis and the diagnosis based on the questionnaire) ( $p>0.05$ ) in any of the questions. No relationship was found between diagnostic conformity and sociodemographic data (age, sex, education, occupation) ( $p>0.05$ ).

**Conclusion:** Our study results suggest that, in Turkish patients, diagnosis of vertigo should be based on face-to-face interviews, and clinical and laboratory evaluations rather than a questionnaire.

**Keywords:** Reliability; scale; vertigo.

## ÖZ

**Amaç:** Bu çalışmada kronik vestibüler disfonksiyonu olan hastalar için bir "Vertigo Konseyi Tanı Anketi" oluşturuldu ve bu anketin güvenilirliği gösterildi.

**Gereç ve Yöntemler:** On beş uzman hekim tarafından 10 sorudan oluşan bir "Vertigo Konseyi Tanı Anketi" oluşturuldu ve "çeviri-geri çeviri" yöntemi kullanılarak güvenilirlik açısından analiz edildi.

**Bulgular:** Anketimizin tüm maddeleri değerlendirildiğinde, kapsam geçerlilik oranı 0.6-0.87 arasında değişmekte ve kapsam geçerlilik indeksi 0.676 idi. Gerçek tanı ile ankete dayandırılan tanı arasındaki uyum oranı %63.19 ve kappa 0.441 (orta) idi. Her bir soru için birinci ve ikinci cevaplar arasında anlamlı farklılık saptanmadı ( $p>0.05$ ). Her bir soru için soru uyumu (birinci ve ikinci cevaplar arasındaki uyum) ile tanıl uyum (gerçek tanı ve ankete dayandırılan tanı arasındaki uyum) arasında anlamlı farklılık yoktu ( $p>0.05$ ). Tanıl uyum ve sosyodemografik veriler (yaş, cinsiyet, eğitim, meslek) arasında ilişki saptanmadı ( $p>0.05$ ).

**Sonuç:** Çalışma bulgularımız Türk hastalarda vertigo tanısının bir anketten ziyade yüz yüze görüşmeler ve klinik ve laboratuvar değerlendirmelere dayandırılması gerektiğine işaret etmektedir.

**Anahtar Sözcükler:** Güvenirlik; ölçek; vertigo.



Vertigo and dizziness are common symptoms in daily clinical practice, and the lifetime prevalence is estimated to be 20-30%.<sup>[1]</sup> The most frequent diagnoses for the causes of vertigo and dizziness are benign paroxysmal positional vertigo, Meniere's disease, vestibular migraine, and phobic postural vertigo; these four diagnoses cover about 54% of all patients with dizziness.<sup>[1]</sup> Generating a differential diagnosis of these conditions that are frequently encountered in clinical practice is very important in terms of having scientific data on both the treatment and the prognosis of the disease.

Although laboratory methods such as tonal audiometry, electronystagmography, and caloric tests are used for this purpose, there is a need for less expensive and readily applicable methods in clinical practice, such as scales administered to the patient. The subjective perception of vertigo and dizziness is important in finding the diagnosis. However, it has been reported that subjective perception is poorly correlated with objective assessment.<sup>[2-4]</sup> In this context, the patient's perspective appears to be essential; therefore, it would be useful to have a relevant and valid questionnaire that could be used both in everyday practice and for therapeutic strategy assessment. In addition, vertigo and dizziness are a considerable burden to the economy and health care.<sup>[5]</sup>

Unfortunately, as far as we know, there is no questionnaire that can be used for the differential diagnosis of the vestibular system diseases that are frequently seen in Turkey. Therefore, we investigated whether a screening tool could be developed that could easily be filled out by patients suffering from vertigo and dizziness while in the waiting room. In this respect, it would be useful to develop an easily applicable and inexpensive method, such as the "Vertigo Council Diagnosis Questionnaire," to be used for the differential diagnosis of patients with chronic vestibular dysfunction and to explore its reliability by repeating it during checkups and comparing it to the results of laboratory methods. Thus, the purpose of our study was to establish a "Vertigo Council Diagnosis Questionnaire" for patients with chronic vestibular dysfunction and to determine its reliability.

## MATERIALS AND METHODS

Thirty patients with chronic vestibular dysfunction were included in the study. A questionnaire was prepared by two otolaryngologists, two neurologists, and one physiatrist, all of whom were experienced in vertigo. The questions in this scale were examined by 15 specialist physicians who gave their opinions about the appropriateness of each question. The questionnaire was then revised in line with the opinions obtained and its content validity ratio (CVR) and content reliability ratio were calculated. Questions that were not appropriate according to their CVR and content reliability ratio were revised and submitted again to the 15 specialist physicians for their opinion. The resulting new form, with 10 questions, was administered to the 30 patients. In order to confirm its reliability, the form was filled out again by the patients one day and one week after the initial assessment. The demographic and clinical data (age, gender, education, occupation, caloric test, and hearing test) of the patients were also recorded.

Approval from the ethics committee of our institution was obtained for our study, and all the patients gave their written informed consent for this procedure.

### Statistical analysis

Statistical Package for the Social Sciences (SPSS) for Windows version 20.0 (IBM Corporation, Armonk, NY, USA) was used for data entry. The content validity index and CVR of the questionnaire were calculated 6; p-values below 0.05 were considered statistically significant. Descriptive statistics were used to characterize the sample. Kappa analysis was used to assess item-specific test-retest reliability between the real diagnosis and the questionnaire-based diagnosis. All the questions were designed to be conforming and non-conforming. Both the conformity between the questions and the relationship between diagnostic conformity and question conformity were assessed with the Fisher's exact test. The relationship between diagnosis and sociodemographic data was evaluated using the Kruskal-Wallis test and the Mann-Whitney U test.

## RESULTS

The lowest CVR that had to be at the significance level of 0.05 was determined to be 0.49, and the

CVR range in our questionnaire was 0.6-0.87 when all the items were evaluated. Similarly, while the content validity index was expected to be at least 0.67, it was found to be 0.676 in our questionnaire. The demographic characteristics of the patients are shown in Table 1.

The conformity between the real diagnosis and the diagnosis made based on the questionnaire was found to be 63.19%; kappa was 0.441 (moderate).

No significant difference was found between the first response and the second response in any of the questions ( $p>0.05$ ). The kappa values in test-retest repetition of each question are shown in Table 2.

There was no significant difference between question conformity (conformity between the first and second responses) and diagnostic conformity (conformity between the real diagnosis and the questionnaire-based diagnosis) ( $p>0.05$ ). In addition, no relationship was found between diagnostic conformity and sociodemographic data (age, sex, education, occupation) ( $p>0.05$ ).

## DISCUSSION

In our study, we explored the reliability of a questionnaire that was prepared with the intent that it would be helpful to use when assessing patients with vestibular disease in clinical practice in our country. We found that although the questions in the questionnaire were suitable for making a diagnosis, their reliability was poor to moderate. In addition, the responses to the questionnaire were found to be independent of socioeconomic level (age, occupation, education, etc.).

Scales such as the Dizziness Handicap Inventory; Vertigo Handicap Questionnaire; European Evaluation of Vertigo; Dizziness

Imbalance Questionnaire; Vertigo Symptom Scale; and Vestibular Disorders Activities of Daily Living Scale are used for diagnosing vertigo and planning its treatment accordingly.<sup>[7]</sup> An important goal of a scale is to create a tool to aid researchers and clinicians alike in quickly, quantitatively, and reliably assessing vertigo. While these instruments offer many options, it is not feasible to use translated instruments developed in other languages, due to cultural dependence.<sup>[8]</sup> For that reason, the kappa value of our short questionnaire, which we prepared while considering the questions contained in these scales, was fair to good (0.51-0.93). The patients seemed to respond to the questionnaire independently of their socioeconomic levels, which we presumed was because the patients did not care about the questionnaire and read it haphazardly. Therefore, we think it would be appropriate to prepare a physician-administered questionnaire that evaluates only the clinical symptoms of the vestibular syndrome and helps monitor its course without taking into account the patient's emotional status or subjective handicap.

The fact that there was no significant difference between the patients' responses to the first assessment and their responses to the second assessment in our study showed that they answered the questions in the same way in both assessments. Question conformity did not affect the diagnosis, indicating that the patients filled out the questionnaires in an inattentive manner in both assessments.

This pilot test of the "Vertigo Council Diagnosis Questionnaire" included a small sample of

**Table 1.** Demographic and clinical data of patients (n=30)

	n	%	Mean±SD
Age (years)			40.47±16.88
Gender			
Male	11	36.7	
Female	19	63.3	
Education (primary school)	10	35.7	
Occupation (unemployed)	20	67.9	

SD: Standard deviation.

**Table 2.** Kappa values of the Vertigo Council Diagnosis Questionnaire

Questions	Kappa
Question 1	0.56
Question 2	0.68
Question 3	0.51
Question 4	0.77
Question 5	0.93
Question 6	0.58
Question 7	0.68
Question 8	0.76
Question 9	0.65
Question 10	0.71

30 participants. Given this small sample size, no subgroup analyses were conducted. The kappa values of the questionnaire might have turned out to be low because we had a small number of patients. Further testing with larger samples is needed. Inter- or intra-rater reliability of the "Vertigo Council Diagnosis Questionnaire" still needs to be determined.

A detailed interview, a good physical examination, and a comprehensive neurologic examination are the most important parts of a diagnostic evaluation. Using a specific questionnaire helps physicians focus on relevant symptoms and signs that help them make diagnoses more easily. Although the questions in our study were diagnosis-oriented questions prepared by physicians who were specialists in vertigo, the patients did not seem to answer these specific questions properly. Nevertheless, our study was a preliminary one, and we think the newly formed questionnaire should be administered to a larger population of patients for each of the diagnoses to produce better results.

We aimed to build a questionnaire to differentiate patients with vertigo because conventional tests are not appropriate to demonstrate the psychological interference, clinical symptoms or suffering of patients with dizziness. In order to use a questionnaire in another culture it is not enough to obtain original version, since it will not retain the same level reliability.<sup>[9,10]</sup> But it is important to recognize vertigo, as it causes disability, handicap and limitations in activity of daily life.

In conclusion, this study showed that it would be better to diagnose vertigo in Turkish patients after a face-to-face interview and a detailed neuro-otological examination than by giving them a questionnaire. Administering this preliminary study to a larger patient group would contribute to our results.

### Declaration of conflicting interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

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