The Reliability and Validity of the Turkish Version of the European Evaluation of Vertigo Scale ORİJİNAL ARAŞTIRMA

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The Reliability and Validity of the Turkish Version of the European Evaluation of Vertigo Scale

Avrupa Vertigo Değerlendirme Ölçeği Türkçe Versiyonunun Geçerlilik ve Güvenilirliği

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This study was presented as an oral presentation at the 42nd Turkish National Otorhinolaryngology and Head-Neck Surgery Congress on November 3-6, 2021.

ABSTRACT Objective: The aim of this study is to make validity and reliability analysis with the Turkish adaptation of the European Evaluation of Vertigo Scale (EEV-TR). **Material and Methods:** Patients who applied to the otorhinolaryngology department with vestibular complaints were included in the study (n=100). EEV scale was adapted into Turkish from the original language. EEV-TR questionnaire and Vertigo Symptom Scale-TR (VSS-TR) assessments of the patients were performed twice, at baseline and on the 4th week. **Results:** One hundred participants (65 women, 35 men) with a mean age of 50.87±14.94 were enrolled in the research. The mean age of 35 (35%) male patients was 55.51±12.41, and the mean age of 65 (65%) female patients was 48.5±15.75. Seventy seven patients were diagnosed with BPPV, 18 patients with Meniere's disease, and 5 patients with vestibular neuronitis. The Cronbach's alpha value of the EEV-TR was calculated as 0.712 in the baseline measurement and 0.864 at the 4th-week measurement. The intraclass correlation coefficient of the EEV-TR was 0.835. A significant correlation was found between EEV-TR and VSS-TR baseline measurements (r=.411, p=0.001) and between 4th-week measurements (r=.649, p<0.001). EEV-TR factorial accumulation was consistent with the original scale. The BPPV discriminative power of the EEV-TR scale was medium to high (p<0.01). **Conclusion:** EEV-TR is a valid and reliable scale that can be used in the evaluation and follow-up of patients with vestibular complaints.

Keywords: Vertigo; symptom assessment; reliability and validity; Turkish Version of the European Evaluation of Vertigo Scale

ÖZET Amaç: Bu çalışmanın amacı, Avrupa Vertigo Değerlendirme Ölçeği'nin [European Evaluation of Vertigo (EEV-TR)] Türkçeye uyarlanması ile geçerlik ve güvenirlik analizlerinin yapılmasıdır. **Gereç ve Yöntemler:** EEV Ölçeği, orijinal dilinden Türkçeye uyarlandı. Kulak burun boğaz polikliniğine vestibuler yakınmalarla başvuran 100 hasta çalışmaya dâhil edildi. Hastaların EEV Ölçeği'nin Türkçe versiyonu ve Vertigo Semptom Skalasının Türkçe versiyonu değerlendirmeleri ilk muayenede ve 4. haftada olmak üzere 2 kez yapıldı. **Bulgular:** Yaş ortalaması 50,87±14,94 olan 100 katılımcı (35 erkek, 65 kadın) çalışmaya alındı. Otuz beş (%35) erkek katılımcının yaş ortalamasının 55,51±12,41, 65 (%65) kadın katılımcının yaş ortalamasının ise 48,5±15,75 olduğu belirlendi. Yetmiş yedi hasta benign paroksismal pozisyonel vertigo, 18 hasta Meniere hastalığı, 5 hasta ise vestibüler nörinit tanısı aldı. EEV Ölçeği'nin Türkçe versiyonunun Cronbach alfa değeri ilk muayenede 0,712, 4. hafta ölçümünde 0,864 olarak hesaplandı. EEV-TR'nin sınıf içi korelasyon katsayısı 0,835 idi. EEV-TR ve Vertigo Semptom Skalası'nın Türkçe versiyonu başlangıç ölçümleri (r=.411, p=0,001) ve 4. hafta ölçümleri (r=.649, p<0,001) arasında anlamlı bir ilişki bulundu. EEV Ölçeği'nin Türkçe versiyonunun faktöriyel dağılımı orijinal ölçekle uyumluydu. EEV-TR Ölçeği'nin benign paroksismal pozisyonel vertigoyu ayırt edici gücü orta-yüksek seviyedeydi (p<0,01). **Sonuç:** EEV Ölçeği'nin Türkçe versiyonu, vestibüler şikâyetleri olan hastaların değerlendirilmesinde ve takibinde kullanılabilecek geçerli ve güvenilir bir ölçektir.

Anahtar Kelimeler: Vertigo; semptom değerlendirmesi; geçerlilik ve güvenilirlik; Avrupa Vertigo Değerlendirme Ölçeği Türkçe Versiyonu

Vertigo or dizziness is among the leading complaints of adults, and the underlying causes vary significantly. Accurate diagnosis is the main step for managing a dizzy patient and recording the detailed anamnesis is the key point. For this reason, many questionnaires are designed to define the severity of complaints or disease, to detect the influence on the patient, planning the treatment or follow-up the treatment success. Various vertigo-specific scales have been developed for the assessment of vestibular symptoms and

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related quality of life.[1,2] Adapting these scales to different cultures or languages and conducting validity-reliability analyzes enable them to be used in much wider populations and to analyze their adequacy.

Complaints after vestibular pathology are affected by patient (age, gender, personality, role, daily activity level) and disease-related factors (anxiety caused by unpredictable recurrent attacks, accompanying symptoms, unpredictable prognosis of vestibular disease, etc.). Patients' complaints and their effects on health-related quality of life correlate moderately with laboratory vestibular test findings because natural living conditions cannot be fully simulated by vestibular tests. For this reason, symptom and quality of life scales should be a part of the vestibular assessment protocol.[1,2]

Most of the vestibular scales were designed as patient-reported but European Evaluation of Vertigo (EEV) Scale evaluates the vestibular symptoms and designed as clinician-reported.[3] The EEV scale was used in a few studies conducted in Türkiye before but the reliability and validity analyses of the EEV scale in the Turkish have not been done yet.[4-6] For this reason, it is aimed to translate the EEV scale into Turkish (EEV-TR) and to analyze its validity and reliability.

MATERIAL AND METHODS

This study was designed as a prospective study and conducted in otorhinolaryngology department between February 20, 2021 and May 20, 2021. Following the approval of the ethics committee (date: February 24, 2021, decision no: 2021/0151), the EEV scale was adapted from its original language, French, to Turkish, in accordance with the cross-cultural adaptation guideline.[7]

In the first stage, the advanced translation stage, the original French EEV scale was translated into Turkish separately by 2 professional bilingual translators who speak native Turkish and are proficient in French. Expert committee members (2 otorhinolaryngologists and 1 audiologist) checked both the compatibility of the scale with Turkish and its intelligibility by the clinicians. In the second stage, the same expert committee made changes on the Turkish versions. Although the word "illusion" used in the French version is rarely used in Turkish as well, the expression "vertigo" was used instead. Similarly, the word "intolerance" was changed to "discomfort from movement." The words "neurovegetative" and "vertiginous" were replaced by the words "nausea-vomiting" and "related to vertigo", respectively. In the third phase, the EEV was translated into French by 2 native French translators. The original EEV was compared to the re-translated version. In the fourth stage, the scale was re-evaluated in terms of concept and language. In the 5th stage, a draft was created to be used in the preliminary study. In the final stage, a pilot evaluation was conducted with 20 Turkish-speaking otorhinolaryngologists regarding the intelligibility and applicability of the EEV-TR scale. It was determined that the intelligibility of the scale was excellent. In this study, the scale used in the pilot evaluation was used without any changes (Appendix).

The EEV-TR scale was administered to 100 consecutive patients who applied to the outpatient clinic with the complaint of vertigo, dizziness or imbalance, by the otorhinolaryngologist using the paper-pencil method. Written informed consent was obtained from the patients who agreed to take part in the study. Inclusion criteria of the patients are determined as patients aged 18 and over, with vestibular complaints for at least 2 months, in mental and psychological condition suitable for scale assessment, cooperative and willing to participate in the study. Patients with cardiovascular, neurological and psychiatric etiologies are excluded from the study.

For test repetition reliability, the scale was re-administered to the patients 4 weeks later, since it was stated that the strongest correlation coefficients were found in the 4th week in the original study.[3] The scale evaluates the presence of "vertigo", "duration of the vertigo", "discomfort from movement", "nausea-vomiting" complaints and instability in the last week, and each question is scored between 0-4 by the physician. The overall score is equal to the sum of the scores of the 5 item, and as the total score increases, the severity of the symptoms also increases.

In addition to the EEV-TR, the Turkish version of the Vertigo Symptom Scale (VSS-TR) was also

APPENDIX: Turkish version of the European Evaluation of Vertigo Scale (EEV-TR).Turkish version of the European Evaluation of Vertigo Scale (EEV-TR).

BAŞ DÖNMESİ HİSSİ*	
0	Baş dönmesi hissi yok
1	…….....
2	Sağa-sola veya yukarı-aşağı sallanma/dalgalanma, sersemlik, yalpalama, yuvarlanma hissi
3	……...
4	Kendisinin veya çevresindeki nesnelerin dönmesi hissi
BAŞ DÖNMESİ HİSSİNİN SÜRESİ	
0	Yok
1	1 dakikadan az
2	1 dakikadan 1 saate
3	1 saatten 3 saate
4	3 saatten 24 saate
HAREKET ETMEKTEN RAHATSIZ OLMA	
0	Hareket etmekten rahatsız olmuyor
1	Nadiren veya az
2	Ara sıra veya orta sıklıkla
3	Sık sık veya çok
4	Her zaman veya yoğun olarak
BULANTI-KUSMA YAKINMALARI	
0	Bulantı-kusma yok
1	Baş dönmesi atağıyla ilişkisiz mide bulantısı
2	Baş dönmesi atağıyla ilişkili mide bulantısı
3	1 veya 2 kez kusmaya neden olan mide bulantısı
4	Çok sık kusma
DENGESİZLİK (baş dönmesi sırasında olanlar da dâhil)	
0	Dengesizlik yok
1	Düşmeye neden olmayan ve günlük hayatta rahatsızlığa sebebiyet vermeyen dengesizlik
2	Düşmeye neden olmayan ama günlük hayatta rahatsızlığa sebebiyet veren dengesizlik
3	Ayaktayken ya da yürüme esnasında, ara sıra düşmeye neden olan dengesizlik
4	Ayağa kalkamayacak kadar şiddetli dengesizlik

*Klinisyen, "baş dönmesi hissi" maddesi için hastanın durumu "0" ve "2" arasında bir yerde ise "1" değerini, "2" ve "4" arasında bir yerde ise "3" değerini seçebilir.

applied to the patients to investigate the correlation.[8,9] VSS-TR is a scale consisting of 15 questions, in which each question is scored on a Likert-type scale between 0-4. The sum of the scores of the 15 questions constitutes the total score, and as the total score increases, the frequency and severity of symptoms increase. Patients completed the VSS-TR scale by themselves.

STATISTICAL ANALYSIS

The statistical analysis of the research was carried out by SPSS for Macv25.0 (SPSS Inc, Chicago, IL, USA). All variables were presented with mean, standard deviation or percentages. Kolmogorov-Smirnov or Shapiro-Wilk test was conducted to check the normality of the data. Quantitative variables were analyzed for probable ceiling or floor effect. Statistical significance level and confidence interval was accepted as 0.01 and 95%, respectively.

RELIABILITY

Internal consistency of the EEV-TR was analyzed with the Cronbach's alpha coefficient. Alpha value was calculated for all items and the total score of the EEV-TR. Alpha values greater than 0.70 and less than 0.95 are considered acceptable.[10] Test-retest reliability of the EEV-TR was checked with "intraclass correlation coefficient with 95 per cent confidence interval (ICC, 95% CI)". "Two-way random-effect model" and single-measure reliability analysis was conducted according to the "Shrout and Fleiss" classifications. ICC score greater than 0.8 shows excellent reliability.[11] "The minimal detectable change (MDC95)" was determined to prove the critical value of difference. "The standard error of measurement (SEM_{95})" and MDC_{95} values for the items and total score of the EEV-TR were calculated according to these formula.[12]

$$Formula\ of\ the\ MDC_{95} \rightarrow 1.96*SEM*\sqrt{2}$$

$$Formula\ of\ the\ SEM_{95} \rightarrow SD*\sqrt{(1-ICC)}$$

VALIDITY

The Spearman correlation coefficients were used to reveal the construct validity. The correlation between EEV-TR and VSS was analyzed for baseline and the 2nd assessment in patients with BPPV, separately. A high correlation coefficient was presumed in terms of convergent validity calculation. A correlation value greater than 0.5 shows excellent, between 0.5 and 0.35 represents moderate, and less than 0.35 presents low construct validity.[13] Principal component factor

analyses were carried out to reveal the explanatory factor structure of the EEV-TR. Varimax rotation with the Kaiser-Meyer-Olkin normalization was chosen to analyze the factor analysis. In addition, known-group validity was conducted according to the diagnosis of the patients (benign paroxysmal positional vertigo-BPPV or not).

ETHICAL STATEMENT

This study was approved by the local ethics committee (S.B. İstanbul Medeniyet University Göztepe Training and Research Hospital Clinical Research Ethics Committee, date: February 24, 2021, no: 2021/0151) and the authors strongly followed the ethical principles of the Declaration of Helsinki.

RESULTS

One hundred (65 women, 35 men) participants with a mean age of 50.87±14.94 were enrolled in the research. The mean age of 35 (35%) male patients was 55.51±12.41, and the mean age of 65 (65%) female patients was 48.5±15.75. Seventy seven patients were diagnosed with BPPV, 18 patients with Meniere's disease, and 5 patients with vestibular neuronitis. Sixty one randomly selected patients were enrolled into the retest analysis. The individual characteristics and clinical absolute values of the patients are presented in Table 1. A vast majority (77%) of the patients were diagnosed with BPPV. In addition, most of the patients (66%) were not an employee. The mean baseline scores of the EEV-TR and VSS-TR were 10.5±3.3 and 22.0±12.3, respectively (Table 1).

TABLE 1: The individual characteristics and clinical absolute values of the patients.

n=100	Total
Age (years, mean±SD)	50.8±14.9
Gender (n, %)	
Women	65 (65.0)
Men	35 (35.0)
Employment status (n, %)	
Employee	44 (44.0)
Retired	25 (25.0)
Housewife	31 (31.0)
Diagnosis (n, %)	
Benign paroxysmal positional vertigo	77 (77.0)
Meniere's disease	18 (18.0)
Vestibular neuronitis	5 (5.0)
EEV (mean±SD)	10.57±3.3
EEV retest (mean±SD)	9.11±3.79
VSS (mean±SD)	22.09±12.37
VSS retest (mean±SD)	17.21±12.48

SD: Standard deviation; n: Number of patients;
EEV: European Evaluation of Vertigo Scale; VSS: Vertigo Symptom Scale.

RELIABILITY

The test-retest reliability for the total score of the EEV-TR was excellent (ICC: 0.835; CI: 0.72-0.90). The internal consistency of the EEV-TR total score was in an acceptable range (α: 0.712). The SEM_{95} values for the items of EEV-TR was ranged between 0.36 and 0.50. Total score's SEM_{95} was 1.34. Besides, MDC_{95} scores of the items and total score of the EEV-TR were 0.99-1.38 and 3.71, respectively (Table 2).

TABLE 2: Test-retest reliability, internal consistency, SEM and MDC values of the EEV.

	Test (Mean±SD)	Retest (Mean±SD)	ICC (95% CI)	α	SEM_{95}	MDC_{95}
Item 1	2.85±0.93	2.49±1.24	0.710 (0.51-0.82)	0.666	0.50	1.38
Item 2	1.77±0.90	1.49±0.95	0.858 (0.76-0.91)	0.659	0.36	0.99
Item 3	2.10±1.00	2.00±1.12	0.819 (0.69-0.89)	0.683	0.42	1.16
Item 4	1.89±1.15	1.39±1.00	0.807 (0.67-0.88)	0.651	0.50	1.38
Item 5	1.96±0.81	1.77±0.86	0.742 (0.57-0.84)	0.659	0.41	1.13
EEV total	10.57±3.30	9.11±3.79	0.835 (0.72-0.90)	0.712	1.34	3.71

n: Number of patients; ICC: Intra-class correlation coefficient; CI: Confidence interval; α: Cronbach's alpha; SEM95: Standard error of measurement;
MDC95: Minimal detectable change; EEV: European Evaluation of Vertigo Scale.

VALIDITY

The baseline correlation between the EEV-TR and VSS-TR was moderate (r=0.411, p<0.01). At 4th week, EEV-TR and VSS-TR correlation value was moderate to high (r=0.679, p<0.01). The construct validity of the EEV-TR was acceptable with moderate to high r values (Table 3). A one-factor structure was observed for the EEV-TR in principal component analysis as expected. Firstly, sample adequacy was checked. Bartlett's test of sphericity and Kaiser-Meyer-Olkin Measure of Sampling Adequacy values were less than 0.001 and 0.783, respectively. Factor loadings of the EEV-TR was moderate to high, ranged between 0.635 to 0.719 (Table 4). In addition, EEV-TR was shown to have a discriminative power in patients with or without BPPV, in terms of known group validity (p<0.01, z: -2.696) (Table 5).

TABLE 3: Correlation between EEV and VSS in patients with benign paroxysmal positional vertigo.

n=77	r
EEV (baseline)-VSS (baseline)	0.411*
EEV (4th week)-VSS (4th week)	0.679*

*p<0.01, n: Number of patients; r: Spearman's correlation coefficient; EEV: European Evaluation of Vertigo Scale; VSS: Vertigo Symptom Scale.

TABLE 4: Principal component factor analysis.

n=100	Factor 1
Item 1	0.677
Item 2	0.692
Item 3	0.635
Item 4	0.719
Item 5	0.700

n: Number of patients; rotation method: Varimax rotation with Kaiser normalization.

DISCUSSION

Patients with vestibular complaints often have difficulty in describing and grading their symptoms. The perception of symptoms is different from patient to patient, and the course of the disease may vary. As time passes over the onset of symptoms, the definition of symptom type and severity may also change. The relationship between vestibular complaints and clinical vestibular tests is moderate.[1,9] Describing a standard for the evaluation of patients' symptoms in clinics may also standardize the reporting of examinations or treatment success at different times or in different centers.

EEV is a questionnaire designed to evaluate the symptoms caused by vestibular diseases and examines the effect of clinical staging and treatment by questioning the severity of vestibular complaints. On the other hand, EEV does not evaluate how patients perceive their vestibular complaints, the limitations caused by the complaints or the decrease in quality of life. Questionnaire scores the parameters of vertigo, duration of vertigo, discomfort with movement, neuro-vegetative symptoms, and instability on a scale of 0-4 and evaluates the last 8 days, including the day of evaluation. The EEV scale is the first hetero questionnaire that can only be filled by the clinician, assessing vertigo, and associated vestibular symptoms and allowing monitoring of its development. As far as we recognize from the current literature, the EEV scale has not been adapted to any language other than its original language, French, but it has been used in a few studies in the world as well as in our country.[14-16] After this research, it is estimated that the validity and reliability analyzes of the EEV scale in different languages will be made.

TABLE 5: Known-groups validity for the EEV in patients with or without benign paroxysmal positional vertigo.

		n (%)	EEV median	p value	z
Diagnosis	With BPPV	77 (77.0)	10	0.007[a]	-2.696
	Without BPPV	23 (23.0)	12		

p<0.01; n: Number of patients; a: Mann-Whitney U test; EEV: European Evaluation of Vertigo Scale; BPPV: Benign paroxysmal positional vertigo.

In this study, it was aimed to bring the EEV-TR questionnaire to the literature to standardize the symptomatic evaluations of patients who applied to otorhinolaryngology clinics and audiology departments in Türkiye. As a result of the analyzes performed, the Cronbach's alpha value of the EEV-TR was calculated as .712 in the first evaluation and 0.864 in the first-month evaluation, at an acceptable level. The baseline total score of the original scale was 7.22±0.29, and on the 4th week it was determined as 2.08±0.29. In our study, the baseline total score was 10.57±3.3, and the 4th week total score was 9.11±3.79. It was determined that the 4th week score showed a significant decrease. Intraclass correlation values of the original EEV scale were obtained as 0.91 for item 1, 0.58 for question 2, 0.9 for question 3, 0.97 for question 4, 0.87 for question 5, and 0.93 for the total score. Test-retest correlation of question 2 got the lowest value; this item questions the duration of the feeling of dizziness and it was concluded that the significant decrease in the complaints affected the duration change the most. In our study, the intraclass correlation values of the EEV-TR were found to be 0.71, 0.858, 0.819, 0.807, 0.742 and 0.835, respectively. In our study, the item with the weakest intra-class correlation, that is, test-retest correlation, was the first item, and this item questions whether there is a feeling of dizziness. It is estimated that the reason why the test-retest correlation values differed between our study and the original study was that it was applied to a close number of patients with different vestibular pathologies in the original study, whereas in our study it was mainly applied to BPPV patients.

In the original study, EEV total score showed a significant correlation with patients' daily symptom records, American Academy of Otolaryngology-Head and Neck Surgery functional scale, Direction de la Pharmacie et du Médicament and Short-Form 36 scales.[3,17,18] This relationship reached its highest values at the 4th week evaluation. In our study, EEV-TR showed a significant relationship with VSS-TR both with the baseline and the 4th week values, and this relationship was much higher at 4 weeks than the baseline value.

In the original article, factor analysis was not performed, that is, the construct validity was not evaluated, but the factor loading of the EEV-TR showed a structure consistent with the single-factor structure of the original scale, and the EEV-TR version showed a factor loading. In the original study, the discriminative power of the EEV scale from BPPV was not evaluated, but in our study, the discriminative power of the EEV-TR scale from BPPV was found to be high. This scale is thought to be helpful in the diagnosis of BPPV.

In this study, the major limitation is that limited number of other peripheral pathologies are included in this study. Coinciding with the coronavirus disease-2019 period of the study has created changes in the patient population coming to the clinic. It is estimated that only patients with severe complaints apply to the clinic. Further studies for other peripheral pathologies are needed to describe.

CONCLUSION

In conclusion, EEV-TR is a valid and reliable scale that can be used in the evaluation and follow-up of patients with vestibular complaints. It also has the feature that it can be used as a BPPV discriminating scale.

MAIN POINTS

1. Accurate diagnosis is the main step for the managing a dizzy patient and patient history which includes the complaints is the key point.

2. EEV-TR is a valid and reliable scale that can be used in the evaluation and follow-up of patients with vestibular complaints.

3. EEV-TR also has the feature that it can be used as a BPPV discriminating scale.

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rials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Başak Mutlu, Ahmet Mutlu;* ***Design:*** *Başak Mutlu, Ahmet Mutlu;* ***Control/Supervision:*** *Başak Mutlu, Ahmet Mutlu;* ***Data Collection and/or Processing:*** *Başak Mutlu, Ahmet Mutlu, Burcu Bakıcı;* ***Analysis and/or Interpretation:*** *Başak Mutlu;* ***Literature Review:*** *Başak Mutlu, Ahmet Mutlu, Burcu Bakıcı;* ***Writing the Article:*** *Başak Mutlu, Ahmet Mutlu;* ***Critical Review:*** *Başak Mutlu, Ahmet Mutlu;* ***References and Fundings:*** *Ahmet Mutlu;* ***Materials:*** *Ahmet Mutlu, Burcu Bakıcı.*

REFERENCES

1. Duracinsky M, Mosnier I, Bouccara D, Sterkers O, Chassany O; Working Group of the Société Française d'Oto-Rhino-Laryngologie (ORL). Literature review of questionnaires assessing vertigo and dizziness, and their impact on patients' quality of life. Value Health. 2007;10(4):273-84. [Crossref] [PubMed]
2. Viergever K, Kraak JT, Bruinewoud EM, Ket JCF, Kramer SE, Merkus P. Questionnaires in otology: a systematic mapping review. Syst Rev. 2021;10(1):119. [Crossref] [PubMed] [PMC]
3. Mègnigbêto CA, Sauvage JP, Launois R. [The European Evaluation of Vertigo (EEV) scale: a clinical validation study]. Rev Laryngol Otol Rhinol (Bord). 2001;122(2):95-102. [PubMed]
4. Guneri EA, Kustutan O. The effects of betahistine in addition to epley maneuver in posterior canal benign paroxysmal positional vertigo. Otolaryngol Head Neck Surg. 2012;146(1):104-8. [Crossref] [PubMed]
5. Eryaman E, Gökcan G, Parmaksız E, Acar NO, Ozlüoğlu LN. Are thiazides effective on hypertensive vertigo? A preliminary study. Kulak Burun Bogaz Ihtis Derg. 2012;22(4):219-24. [Crossref] [PubMed]
6. Tan M, Cengiz DU, Demir İ, Demirel S, Çolak SC, Karakaş O, et al. Effects of Covid-19 on the audio-vestibular system (published online ahead of print, 2021 Aug 10). Am J Otolaryngol. 2021;43(1):103173. [Crossref] [PubMed] [PMC]
7. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine (Phila Pa 1976). 2000;25(24):3186-91. [Crossref] [PubMed]
8. Yanik B, Külcü DG, Kurtais Y, Boynukalin S, Kurtarah H, Gökmen D. The reliability and validity of the Vertigo Symptom Scale and the Vertigo Dizziness Imbalance Questionnaires in a Turkish patient population with benign paroxysmal positional vertigo. J Vestib Res. 2008;18(2-3):159-70. [Crossref] [PubMed]
9. Yardley L, Masson E, Verschuur C, Haacke N, Luxon L. Symptoms, anxiety and handicap in dizzy patients: development of the vertigo symptom scale. J Psychosom Res. 1992;36(8):731-41. [Crossref] [PubMed]
10. Terwee CB, Bot SD, de Boer MR, van der Windt DA, Knol DL, Dekker J, et al. Quality criteria were proposed for measurement properties of health status questionnaires. J Clin Epidemiol. 2007;60(1):34-42. [Crossref] [PubMed]
11. Baumgartner TA, Chung H. Confidence limits for intraclass reliability coefficients. Meas Phys Educ Exerc Sci. 2001;5(3):179-88. [Crossref]
12. Portney LG, Watkins MP. Foundations of Clinical Research: Applications to Practice. 3rd ed. Upper Saddle River, NJ: Pearson/Prentice Hall; 2009.
13. Juniper EF, Guyatt GH, Jaeschke R. How to develop and validate a new health-related quality of life instrument. In: Spilker B, ed. Quality of Life and Pharmacoeconomics in Clinical Trials. 2nd ed. Philadelphia: Lippincott-Raven Publishers; 1996. p.49-56.
14. Adamec I, Skorić MK, Handžić J, Barušić AK, Bach I, Gabelić T, et al. The role of cervical and ocular vestibular-evoked myogenic potentials in the follow-up of vestibular neuritis. Clin EEG Neurosci. 2014;45(2):129-36. [Crossref] [PubMed]
15. Patel M, Williamsom RA, Dorevitch S, Buchanan S. Pilot study investigating the effect of the static magnetic field from a 9.4-T MRI on the vestibular system. J Occup Environ Med. 2008;50(5):576-83. [Crossref] [PubMed]
16. Venail F, Attali P, Wersinger E, Gomeni R, Poli S, Schmerber S. Safety, tolerability, pharmacokinetics and pharmacokinetic-pharmacodynamic modelling of the novel H4 receptor inhibitor SENS-111 using a modified caloric test in healthy subjects. Br J Clin Pharmacol. 2018;84(12):2836-48. [Crossref] [PubMed] [PMC]
17. Monsell EM. New and revised reporting guidelines from the Committee on Hearing and Equilibrium. American Academy of Otolaryngology-Head and Neck Surgery Foundation, Inc. Otolaryngol Head Neck Surg. 1995;113(3):176-8. [Crossref] [PubMed]
18. John E. Ware, Jr. The SF-36 health survey. In: Spilker B, ed. Quality of Life and Pharmacoeconomics in Clinical Trials. 2nd ed. Philadelphia: Lippincott-Raven Publishers; 1996. p.337-45.