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The effects of the affected semicircular canal and nystagmus characteristics on the sensation of vertigo in benign paroxysmal positional vertigo

Benign paroksismal pozisyonel vertigoda etkilenen semisirküler kanalın ve nistagmus özelliklerinin baş dönmesi hissine etkileri

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ABSTRACT

Objectives: This study aims to evaluate the relationship between the affected semicircular canal and nystagmus characteristics with the perception of dizziness in individuals diagnosed with posterior canal (P-BPPV) or lateral canal (L-BPPV) benign paroxysmal positional vertigo.

Patients and Methods: In this prospective study, a total of 56 individuals (37 females, 19 males; mean age: 55.5±10.0 years; range, 32 to 78 years) diagnosed with BPPV according to the Bárány Society criteria were evaluated using videonystagmography between March 2025 and July 2025. Forty of these patients had P-BPPV, while 16 had L-BPPV. The duration, latency, and intensity of nystagmus were recorded. The severity of dizziness was assessed using the Visual Analog Scale (VAS), and dizziness-related quality of life was evaluated using the Turkish version of the Dizziness Handicap Inventory (DHI).

Results: Left ear involvement was significantly more common in the L-BPPV group compared to the P-BPPV group ($p<0.05$). Nystagmus duration was significantly longer in the L-BPPV group ($p<0.05$). No significant differences were found between the groups in terms of other nystagmus parameters, the number of maneuvers and attacks, or VAS and DHI scores ($p>0.05$). In the P-BPPV group, a weak but significant positive correlation was observed between nystagmus duration and VAS score ($p<0.05$).

Conclusion: These findings suggest that nystagmus characteristics may not fully reflect the clinical experience of the disease, and symptom perception may vary individually and be influenced by multiple factors.

Keywords: Benign paroxysmal positional vertigo, dizziness, latency, nystagmus, vertigo.

ÖZ

Amaç: Bu çalışmada, posterior kanal (P-BPPV) veya lateral kanal (L-BPPV) benign paroksismal pozisyonel vertigo tanısı almış bireylerde etkilenen semisirküler kanalın ve nistagmus özellikleri ile baş dönmesi algısı arasındaki ilişki değerlendirildi.

Hastalar ve Yöntemler: Bu prospektif çalışmada, Mart 2025 - Temmuz 2025 tarihleri arasında Bárány kriterlerine göre BPPV tanısı konulan 56 birey (37 kadın, 19 erkek; ort. yaş: 55.5±10.0 yıl; dağılım, 32-78 yıl) videonistagmografi ile incelendi. Bu hastaların 40'ında P-BPPV, 16'sında L-BPPV vardı. Nistagmusun süresi, latansı ve şiddeti kaydedildi. Baş dönmesi şiddeti Görsel Analog Skala (VAS) ile, baş dönmesine bağlı yaşam kalitesi ise Baş Dönmesi Engellilik Envanterinin (DHI) Türkçe versiyonu ile değerlendirildi.

Bulgular: Sol kulak tutulumu L-BPPV grubunda P-BPPV grubuna kıyasla anlamlı derecede daha yaygındı ($p<0.05$). Nistagmus süresi L-BPPV grubunda daha uzundu ($p<0.05$). Diğer nistagmus parametreleri, manevra ve atak sayısı veya VAS ve DHI puanları açısından gruplar arasında anlamlı fark saptanmadı ($p>0.05$). Posterior kanal BPPV grubunda nistagmus süresi ile VAS puanı arasında pozitif yönlü, düşük düzeyde ancak anlamlı bir ilişki bulundu ($p<0.05$).

Sonuç: Bu sonuçlar, nistagmus özelliklerinin hastalığın klinik deneyimini tam olarak yansıtmayabileceğini, semptom algısının bireysel olarak değişken olduğunu ve birçok faktörden etkilenebildiğini göstermektedir.

Anahtar sözcükler: Benign paroksismal pozisyonel vertigo, dizziness, latans, nistagmus, vertigo.

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Benign paroxysmal positional vertigo (BPPV) is a peripheral vestibular disorder characterized by sudden and brief episodes of vertigo triggered by changes in head position.[1] The pathophysiology of BPPV is explained by the displacement of degenerated otoconia originating from the utricle into the posterior semicircular canals (SCCs), and less commonly into the lateral or anterior canals. These otoconia alter endolymph flow in response to head movements, thereby modifying the mechanical stimulation of the cupula and leading to the generation of abnormal vestibular signals.[2] Clinically, BPPV is the most common subtype of peripheral vertigo and accounts for a substantial proportion of patients presenting with vestibular symptoms. In centers where vestibular assessments are conducted, approximately 20 to 30% of patients presenting with dizziness are diagnosed with BPPV.[3]

Benign paroxysmal positional vertigo is diagnosed based on characteristic patient history and typical nystagmus responses observed during positional provocation tests. Among the most commonly used diagnostic maneuvers are the Dix-Hallpike (DH) maneuver and supine roll test (SRT), during which the direction, duration, and latency of the elicited nystagmus guide the clinician in identifying the affected SCC.[4]

Although patients clinically diagnosed with posterior canal BPPV (P-BPPV) and lateral canal BPPV (L-BPPV) are differentiated based on characteristics such as the direction and duration of nystagmus and their response to maneuvers, it remains unclear whether differences in nystagmus latency, duration, and intensity lead to meaningful variations in the perception of dizziness by the patient. A multicenter prospective study demonstrated that patients with L-BPPV exhibited greater dizziness-related disability, as indicated by higher Dizziness Handicap Inventory (DHI) scores, along with longer symptom duration and lower levels of 25-hydroxyvitamin D.[5] However, this study found no association between the intensity of nystagmus and DHI scores; the evaluation was based solely on the type of affected canal. These findings suggest that BPPV subtypes may differ in terms of symptom perception and treatment management. In the present study, the effects of both the type of the affected canal and specific nystagmus characteristics, such as latency, duration, and intensity, on the perception of dizziness were examined in greater detail. Accordingly, the aim of this study was to evaluate the impact of the affected SCC and nystagmus features on the perception of dizziness in individuals diagnosed with P-BPPV and L-BPPV.

PATIENTS AND METHODS

In this prospective observational study, individuals presenting to the ear, nose, and throat (ENT) outpatient clinic of the Gülhane Training and Research Hospital with complaints of dizziness between March 2025 and July 2025 underwent a comprehensive examination by an ENT specialist. Following clinical evaluation, all participants underwent videonystagmography (ICS Chart 200; GN Otometrics, Taastrup, Denmark), which included assessments of spontaneous nystagmus, gaze-evoked nystagmus, oculomotor tests, the DH maneuver, and head roll test. A total of 56 individuals (37 females, 19 males; mean age: 55.5±10.0 years; range, 32 to 78 years) who met the BPPV diagnostic criteria of the Bárány Society,[6] were included in the study. Of these, 40 (27 females, 13 males; mean age: 56.4±13.1 years) were diagnosed with P-BPPV and 16 (10 females, 6 males; mean age: 53.3±12.9 years) with L-BPPV. The exclusion criteria for the study included restricted head movements, congenital nystagmus, multicanal BPPV, anterior canal BPPV, and the presence of central vestibular pathologies. Written informed consent was obtained from all participants prior to their inclusion in the study. The study protocol was approved by the University of Health Sciences Gülhane Training and Research Hospital Ethics Committee (Date: 06.03.2025, No: 2025/46). The study was conducted in accordance with the principles of the Declaration of Helsinki.

During the diagnostic evaluation process, eye movements of all individuals diagnosed with P-BPPV and L-BPPV were recorded using video Frenzel goggles integrated into the videonystagmography system. In individuals diagnosed with L-BPPV, the maximum slow-phase velocity (degrees/second), latency, and duration of the horizontal nystagmus observed on the affected side were analyzed. In individuals diagnosed with P-BPPV, the maximum slow-phase velocity, latency, and duration of vertical nystagmus were evaluated. Following diagnosis, all participants were assessed using the DHI and Visual Analog Scale (VAS). All individuals were recalled for follow-up on the second day after diagnosis, and positional tests were repeated. Participants who exhibited no nystagmus or vertigo during these tests were classified as "recovered." Repositioning maneuvers were readministered to those with persistent symptoms.

Table 1
Demographic characteristics of the participants

	P-BPPV (n=40)			L-BPPV (n=16)			Total (n=56)			Significance		
	n	%	Mean±SD	n	%	Mean±SD	n	%	Mean±SD	t	χ^2	*p*
Age (year)			56.35±13.13			53.31±12.92			55.48±10.02	0.786		0.435
≤64	26	65.0		11	68.8		37	66.1			0.072	0.789
≥65	14	35.0		5	31.3		19	33.9				
Sex											0.127	0.721
Female	27	67.5		10	62.5		37	66.1				
Male	13	32.5		6	37.5		19	33.9				
Trauma history											0.075	0.785
No	36	90.0		14	87.5		50	89.3				
Yes	4	10.0		2	12.5		6	10.7				
Affected ear											4.835	**0.028**
Right	23	57.5		4	25.0		27	48.2				
Left	17	42.5		12	75.0		29	51.8				
Diagnosis											-	-
P-BPPV	-	-		-	-		40	71.4				
L-BPPV	-	-		-	-		16	28.6				

P-BPPV: Posterior canal benign paroxysmal positional vertigo; L-BPPV: Lateral canal benign paroxysmal positional vertigo; SD: Standard deviation; t: Independent samples t-test; χ^2: Chi-square analysis.

To assess the impact of dizziness on individuals, the Turkish version of the DHI, which has established validity and reliability, was used.[7] The DHI consists of a total of 25 items designed to assess the impact of dizziness across physical, emotional, and functional dimensions. The scale includes seven items in the physical subdimension, nine items in the emotional, and nine items in the functional subdimension. Participants responded to each item with “no” (0 points), “sometimes” (2 points), or “always” (4 points). The total possible score ranges from 0 to 100, with higher scores indicating a greater impact of dizziness on the individual’s daily life.

The VAS was used to subjectively assess the severity of dizziness. Participants were asked to mark the intensity of their perceived dizziness on a straight line measuring 10 cm in length. The 0-cm point represented “no dizziness,” while the 10-cm point indicated “the most severe dizziness.” This method provides a quantitative evaluation of the individual’s perception of dizziness.[8]

Statistical analysis

The data from the study were analyzed using IBM SPSS version 22.0 software (IBM Corp., Armonk, NY, USA). Descriptive statistics included frequencies, percentages, minimum and maximum values, means, and standard deviations. The chi-square test and the independent samples t-test were used to compare demographic variables between groups. To compare horizontal nystagmus grade, vertical nystagmus grade, nystagmus duration (seconds), number of maneuvers performed, and number of BPPV attacks by diagnosis, the Mann-Whitney U test and the independent samples t-test were employed. In addition, the independent samples t-test was used to evaluate between-group differences in the VAS dizziness score, as well as DHI functional, physical, emotional, and total scores. To examine the relationships among variables within the dataset, either Pearson correlation analysis or Spearman rank correlation analysis was conducted, depending on the normality of the distribution. The assumption of normality was evaluated based on whether the skewness and kurtosis coefficients fell within the ±2 range. A p-value <0.05 was considered statistically significant.

RESULTS

In the P-BPPV group, 90% had no history of trauma, and the right ear was affected in 57.5% of cases. Among the participants in the L-BPPV group, 87.5% had no history of trauma, and the left ear was affected in 75% of cases. Overall, 89.3% of individuals had no history of trauma, the left ear was affected in 51.8%, and 71.4% were diagnosed with P-BPPV, while 28.6% were diagnosed with L-BPPV. The groups showed a statistically significant difference in terms of the affected ear ($p<0.05$), with left ear involvement being more prevalent in L-BPPV. No statistically significant differences were observed for the other variables ($p>0.05$; Table 1).

Among the participants, the mean horizontal nystagmus intensity was 31.25±22.42°/sec, and the mean vertical nystagmus intensity was 25.85±17.43°/sec. The mean latency was 4.18±3.24 sec, the mean nystagmus duration was 27.36±15.06 sec, the mean number of maneuvers performed was 1.48±0.69, and the mean number of BPPV attacks was 1.54±0.81 (Table 2).

The nystagmus duration observed in the L-BPPV group was significantly longer compared to the P-BPPV group ($p<0.05$). However, no statistically significant differences were found between the groups in terms of latency, number of maneuvers performed, or number of BPPV attacks ($p>0.05$; Table 3).

No statistically significant differences were found between the groups in VAS dizziness scores, DHI

Table 2
Findings related to participants’ nystagmus characteristics, number of performed maneuvers, and number of BPPV attacks

Variables	n	Mean±SD	Median	Min-Max
Degree of horizontal nystagmus	16	31.25±22.42	25.50	5-91
Degree of vertical nystagmus	40	25.85±17.43	23.50	5-70
Latency	56	4.18±3.24	3.00	1-16
Duration of nystagmus (sec)	56	27.36±15.06	25.00	7-80
Number of performed maneuvers	56	1.48±0.69	1.00	1-3
Number of BPPV attacks	56	1.54±0.81	1.00	1-5

BPPV: Benign paroxysmal positional vertigo; SD: Standard deviation.

Table 3
Comparison of nystagmus characteristics, number of maneuvers, and number of attacks between groups

	n	Mean±SD	Test	*p*
Degree of horizontal nystagmus				
P-BPPV	0	-	-	-
L-BPPV	16	31.25±22.42		
Degree of vertical nystagmus				
P-BPPV	40	25.85±17.43	-	-
L-BPPV	0	-		
Latency				
P-BPPV	40	4.40±3.51	U=302.500	0.747
L-BPPV	16	3.63±2.45		
Duration of nystagmus (sec)				
P-BPPV	40	23.73±12.92	U=144.500	**0.001**
L-BPPV	16	36.44±16.57		
Number of performed maneuvers				
P-BPPV	40	1.38±0.59	t=−1.608	0.123
L-BPPV	16	1.75±0.86		
Number of BPPV attacks				
P-BPPV	40	1.63±0.90	U=269.000	0.286
L-BPPV	16	1.31±0.48		

SD: Standard deviation; P-BPPV: Posterior canal benign paroxysmal positional vertigo; L-BPPV: Lateral canal benign paroxysmal positional vertigo; U: Mann–Whitney U test; t: Independent samples t-test.

Table 4
Comparison of VAS and DHI subscale scores between groups

	n	Mean±SD	Test	*p*
VAS vertigo score				
P-BPPV	40	7.33±1.47	t=−0.108	0.914
L-BPPV	16	7.38±1.78		
DHI functional				
P-BPPV	40	25.40±11.72	t=−0.401	0.690
L-BPPV	16	26.75±10.50		
DHI physical				
P-BPPV	40	15.65±5.76	t=−0.723	0.474
L-BPPV	16	16.63±3.98		
DHI emotional				
P-BPPV	40	14.00±8.34	t=0.612	0.543
L-BPPV	16	12.50±8.15		
DHI total				
P-BPPV	40	55.05±22.71	t=−0.128	0.899
L-BPPV	16	55.88±19.15		

VAS: Visual Analog Scale; DHI: Dizziness Handicap Inventory; SD: Standard deviation; P-BPPV: Posterior canal benign paroxysmal positional vertigo; L-BPPV: Lateral canal benign paroxysmal positional vertigo; t: Independent samples t-test.

functional, DHI physical, and DHI emotional subscale scores, or in the DHI total score (p>0.05; Table 4).

In the P-BPPV group, a statistically significant, positive, and low-level correlation was found between nystagmus duration and VAS dizziness score (p<0.05). No statistically significant correlations were observed between any other parameters and the VAS or DHI scores (p>0.05; Table 5).

In the P-BPPV group, no statistically significant differences were observed between age groups in terms of VAS dizziness score, or the functional, physical, emotional, and total subscales of the DHI (p>0.05).

Table 5
Examination of the relationship between nystagmus characteristics, number of performed maneuvers, number of BPPV attacks, and scale scores

			VAS dizziness score	DHI functional	DHI physical	DHI emotional	DHI total
P-BPPV	Degree of vertical nystagmus*	r	0.241	−0.008	0.150	0.120	0.078
		p	0.134	0.961	0.355	0.460	0.632
		n	40	40	40	40	40
	Latency**	r	0.126	−0.148	−0.080	−0.031	−0.142
		p	0.438	0.363	0.622	0.850	0.383
		n	40	40	40	40	40
	Duration of nystagmus**	r	0.407	0.097	0.115	−0.047	0.030
		p	**0.009**	0.554	0.481	0.772	0.854
		n	40	40	40	40	40
	Number of performed maneuvers*	r	0.271	0.235	0.237	0.179	0.247
		p	0.091	0.144	0.140	0.270	0.124
		n	40	40	40	40	40
	Number of BPPV attacks**	r	−0.185	−0.080	−0.116	−0.103	−0.133
		p	0.253	0.625	0.477	0.528	0.414
		n	40	40	40	40	40
L-BPPV	Degree of horizontal nystagmus*	r	0.439	0.234	0.032	−0.074	0.103
		p	0.089	0.383	0.905	0.784	0.703
		n	16	16	16	16	16
	Latency**	r	−0.021	0.243	−0.124	0.297	0.193
		p	0.938	0.364	0.646	0.264	0.473
		n	16	16	16	16	16
	Duration of nystagmus**	r	0.011	−0.153	−0.053	−0.207	−0.203
		p	0.967	0.572	0.846	0.441	0.451
		n	16	16	16	16	16
	Number of performed maneuvers*	r	−0.196	0.022	−0.029	0.019	0.014
		p	0.466	0.935	0.914	0.944	0.958
		n	16	16	16	16	16
	Number of BPPV attacks**	r	0.015	−0.133	−0.255	−0.283	−0.279
		p	0.956	0.624	0.341	0.289	0.296
		n	16	16	16	16	16

BPPV: Benign paroxysmal positional vertigo; VAS: Visual Analog Scale; DHI: Dizziness handicap inventory; P-BPPV: Posterior canal benign paroxysmal positional vertigo; L-BPPV: Lateral canal benign paroxysmal positional vertigo; * Pearson correlation analysis; ** Spearman correlation analysis.

Similarly, in the L-BPPV group, comparisons between age groups revealed no statistically significant differences in VAS dizziness score or in any of the DHI subscale and total scores ($p>0.05$). When the total sample was analyzed, age-related differences in VAS dizziness score and DHI functional, physical, emotional, and total scores were not statistically significant ($p>0.05$; Table 6).

Table 6
Comparison of VAS dizziness scores and DHI scores according to age groups

	Years	n	Mean±SD	Test	*p*
P-BPPV					
VAS Dizziness score	≤64	26	7.31±1.52	t=−0.100	0.921
	≥65	14	7.36±1.45		
DHI Functional	≤64	26	27.38±9.78	t=1.324	0.201
	≥65	14	21.71±14.33		
DHI Physical	≤64	26	15.85±5.30	t=0.290	0.773
	≥65	14	15.29±6.73		
DHI Emotional	≤64	26	14.92±8.04	t=0.953	0.347
	≥65	14	12.29±8.91		
DHI Total	≤64	26	58.15±19.6	t=1.184	0.244
	≥65	14	49.29±27.4		
L-BPPV					
VAS Dizziness score	≤64	11	7.64±1.80	t=0.862	0.403
	≥65	5	6.80±1.79		
DHI Functional	≤64	11	28.91±6.83	t=0.928	0.399
	≥65	5	22.00±16.00		
DHI Physical	≤64	11	16.55±3.70	t=−0.115	0.910
	≥65	5	16.80±5.02		
DHI Emotional	≤64	11	13.45±6.33	t=0.683	0.506
	≥65	5	10.40±11.87		
DHI Total	≤64	11	58.91±11.00	t=0.671	0.382
	≥65	5	49.20±31.48		
Total sample					
VAS Dizziness score	≤64	37	7.41±1.59	t=0.442	0.661
	≥65	19	7.21±1.51		
DHI Functional	≤64	37	27.84±8.94	t=1.680	0.105
	≥65	19	21.79±14.33		
DHI Physical	≤64	37	16.05±4.84	t=0.245	0.807
	≥65	19	15.68±6.23		
DHI Emotional	≤64	37	14.49±7.52	t=1.164	0.250
	≥65	19	11.79±9.45		
DHI Total	≤64	37	58.38±17.35	t=1.311	0.202
	≥65	19	49.26±27.64		

SD: Standard deviation; VAS: Visual Analog Scale; DHI: Dizziness Handicap Inventory; P-BPPV: Posterior canal benign paroxysmal positional vertigo, L-BPPV: Lateral canal benign paroxysmal positional vertigo; t: Independent samples t-test.

DISCUSSION

The present study investigated the effects of nystagmus characteristics on the perception of dizziness and dizziness-related quality of life in individuals with P-BPPV and L-BPPV. According to our findings, individuals with L-BPPV exhibited significantly longer nystagmus duration compared to those with P-BPPV; however, no significant differences were observed between the groups in terms of dizziness severity (VAS) or quality of life (DHI). Additionally, a low-level positive correlation between nystagmus duration and dizziness severity was observed only in the P-BPPV group. These findings suggest that objective nystagmus characteristics in BPPV may not always reflect patients' subjective experience of dizziness and support the multifactorial nature of symptom perception.

Martens et al.[5] compared nystagmus intensity, symptom duration, and vitamin D levels with the perception of dizziness in individuals diagnosed with P-BPPV and L-BPPV. In their study, no significant association was found between the intensity of positional nystagmus and DHI scores. However, individuals with L-BPPV were reported to have longer symptom duration, higher DHI scores, and lower vitamin D levels compared to the P-BPPV group. Although the present study differs methodologically, it aligns with previous research in evaluating the relationship between nystagmus intensity and DHI scores. Consistent with those findings, our results also revealed no significant association between nystagmus parameters (latency, intensity, and duration) and DHI scores. These findings indicate that in BPPV, there may not always be a direct and strong correlation between the objective clinical parameters of nystagmus and patients' perception of symptoms. Additionally, in our study, the nystagmus duration observed in the L-BPPV group was found to be significantly longer than in the P-BPPV group. This finding is consistent with the results reported by Martens et al.,[5] who noted that L-BPPV may present with more prolonged and severe symptoms.

In our study, individuals in the L-BPPV group obtained higher scores than those in the P-BPPV group across all DHI subscales (except for the emotional subscale), as well as in the total DHI score and VAS dizziness score. However, these differences were not statistically significant. In the literature, the DHI is widely used to assess quality of life in patients with vestibular disorders and following cochlear implantation.[9,10] Kale et al.[11] reported a mean DHI score of 64.2±19.7 in individuals diagnosed with L-BPPV. Similarly, D'Silva et al.[12] reported a mean DHI score of 41.5±18.5 in individuals with P-BPPV. Kim et al.[13] reported a mean DHI score of 31.5 for P-BPPV and 48.2 for L-BPPV. In our study, the mean DHI score was calculated as 55.05 in the P-BPPV group and 55.88 in the L-BPPV group. The variability in DHI scores reported across different studies may be attributed to both methodological differences and individual factors within patient groups, such as age, sex, and the number of previous attacks. Nevertheless, a consistent finding is that dizziness has a markedly negative impact on individuals' quality of life.

Another finding of our study was that the nystagmus duration observed in the L-BPPV group was significantly longer than in the P-BPPV group. However, no significant differences were found between the groups in terms of nystagmus latency, number of maneuvers performed, or number of BPPV attacks. To the best of our knowledge, the current literature includes only one study that has examined the relationship between nystagmus intensity and DHI scores.[5] However, no study to date has comprehensively evaluated the relationship between various nystagmus characteristics (intensity, latency, and duration), the number of maneuvers performed, and history of attacks in relation to DHI scores. The longer nystagmus duration observed in the L-BPPV group theoretically suggests that these individuals may experience a more pronounced impact of dizziness on their daily lives. However, the present study did not reveal any significant relationship between these parameters and DHI scores. Similarly, Martens et al.[5] addressed the assumption that individuals with greater nystagmus intensity would exhibit a higher perception of dizziness; however, they emphasized that objective findings at the time of diagnosis may not fully reflect the entire course of the disease. Indeed, the observation that some patients exhibit a high subjective perception of dizziness despite experiencing brief or low-intensity nystagmus supports this perspective. This finding indicates that dizziness is not merely a mechanical response to vestibular stimulation but is influenced by multifaceted factors such as individual variability, the level of central compensation, and psychological state. Therefore, it should be considered that the objective characteristics of nystagmus may not reflect the perception of dizziness uniformly across individuals.

Zhou et al.[14] reported that elderly patients with BPPV (aged 60 to 80 years) exhibited higher DHI scores and increased fall rates compared to middle-aged patients (aged 50 to 59 years). In contrast, in our study, no significant differences in DHI or VAS scores were observed between participants aged below and above 65 years in either the P-BPPV or L-BPPV groups. This discrepancy may be attributed to the narrower and more specific age range analyzed in the study by Zhou et al.[14]

One of the major limitations of this study was the exclusion of other BPPV subtypes from the evaluation. Additionally, all participants were subjected to only a short-term follow-up period after diagnosis, which prevented assessment of the long-term course of symptoms and treatment responses.

In conclusion, the present study contributes to the limited body of research evaluating the effects of the affected SCC and nystagmus characteristics on the perception of dizziness in BPPV. The findings demonstrated that nystagmus duration is longer in L-BPPV compared to P-BPPV; however, this difference does not have a significant impact on dizziness perception or quality of life. These results indicate that nystagmus characteristics may not fully reflect the disease experience and that symptom perception is individual and multidimensional.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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