

Validation of Symptom-Based Benign Paroxysmal Positional Vertigo Questionnaire

Duke

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INTRODUCTION

- The American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNSF) clinical guideline recommendations for Benign Paroxysmal Positional Vertigo (BPPV) recommend against the use of vestibular testing.¹
- Despite this recommendation, many patients with suspected BPPV continue to receive comprehensive vestibular testing^{2,3}, because implementing evidence-based triage remains a challenge.
- In 2020, Kim and colleagues⁴ reported on a symptoms-based BPPV questionnaire and noted excellent sensitivity and specificity
- The purpose of this study to validate a translated version of the self-administered symptom-based BPPV questionnaire by examining diagnostic accuracy in detection of BPPV.

STUDY DESIGN & STATISTICAL METHODS

- This study was approved by the Duke University Institutional Review Board.

Study Design: Retrospective chart review of 470 patients seen at the Duke University Hospital Vestibular Clinic between January 1, 2021 to April 28, 2022

- Participants completed the 6-item questionnaire without provider assistance or instruction and underwent full vestibular testing.
- A 'Yes' answer to questions 1-3 on the screening questionnaire indicated that a participant screened positive for BPPV
- Statistical Analysis:** Descriptive statistics were performed to summarize the cohort and clinical encounters. Diagnostic accuracy was assessed.

Table 1. English translated version of 6-item BPPV Questionnaire from Kim et. al 2020

English Translation of 6-item BPPV Questionnaire*

Question 1	Do you have spinning or a whirling sensation of the surroundings or yourself? Yes / No
Question 2	Do you feel dizzy mostly when your head is moved? Yes / No
Question 3	Does the dizziness last < 3 minutes? Yes / No
Question 4**	Which positional changes makes you feel more dizzy? (1) Lying down or getting out of bed? (2) Turning your head (or body) while lying down?
Question 5	Which makes you more dizzy? (1) Turning your head to the right? (2) Turning your head to the left?
Question 6	How long does the dizziness induced by head turning last (1) < 1 minute? (2) > 1 minute?

* Adapted from Kim et. al 2020⁴
** If participants answered 'No' to any question from 1-3, they were directed to stop the survey as that indicated they did not have BPPV

RESULTS

Table 2. Demographic information of study cohort

	Study Cohort (n = 470)
Age, mean years (standard deviation)	56.8 (17.1)
Sex n (%)	
Female	296 (63.0%)
Male	174 (37.0%)
Race n (%)	
White	330 (70.2%)
Black	78 (16.6%)
Asian	11 (2.3%)
Native Hawaiian/Pacific Islander	1 (0.2%)
American Indian or Alaskan Native	3 (0.6%)
Other (including 2 or more races)	5 (1.1%)
Not Documented/Not Reported	42 (8.9%)
Ethnicity n (%)	
Not Hispanic/Latino	418 (88.9%)
Hispanic/Latino	19 (4.0%)
Not Documented/Unknown	33 (7.0%)

BPPV Results

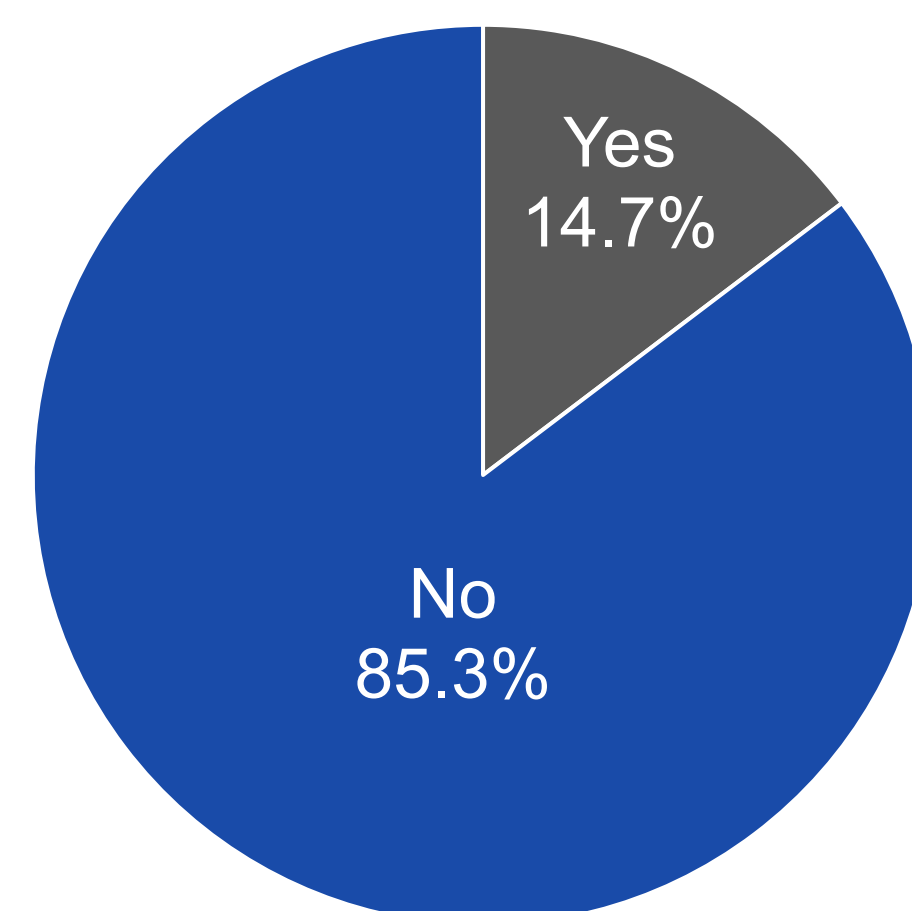


Figure 1. Results of BPPV classification after gold-standard techniques (Dix-Hallpike &

Side of BPPV Involved

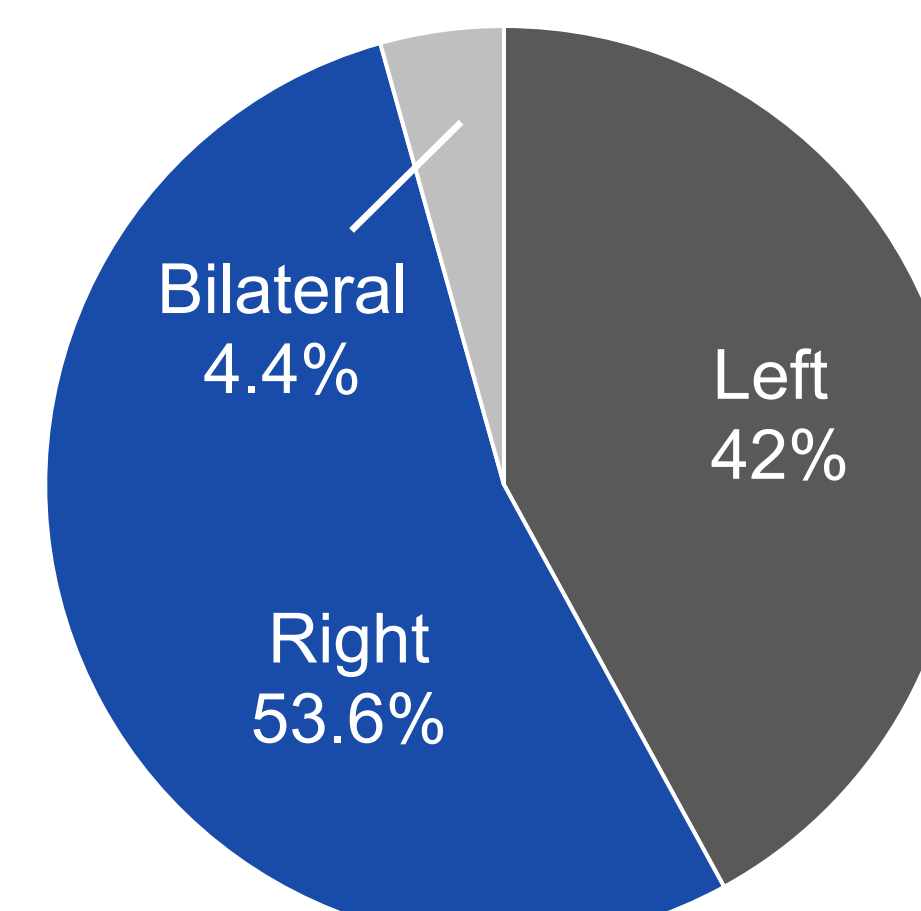


Figure 2. For participants with BPPV, the side involved was also identified

BPPV Semicircular Canal (SCC) Involved

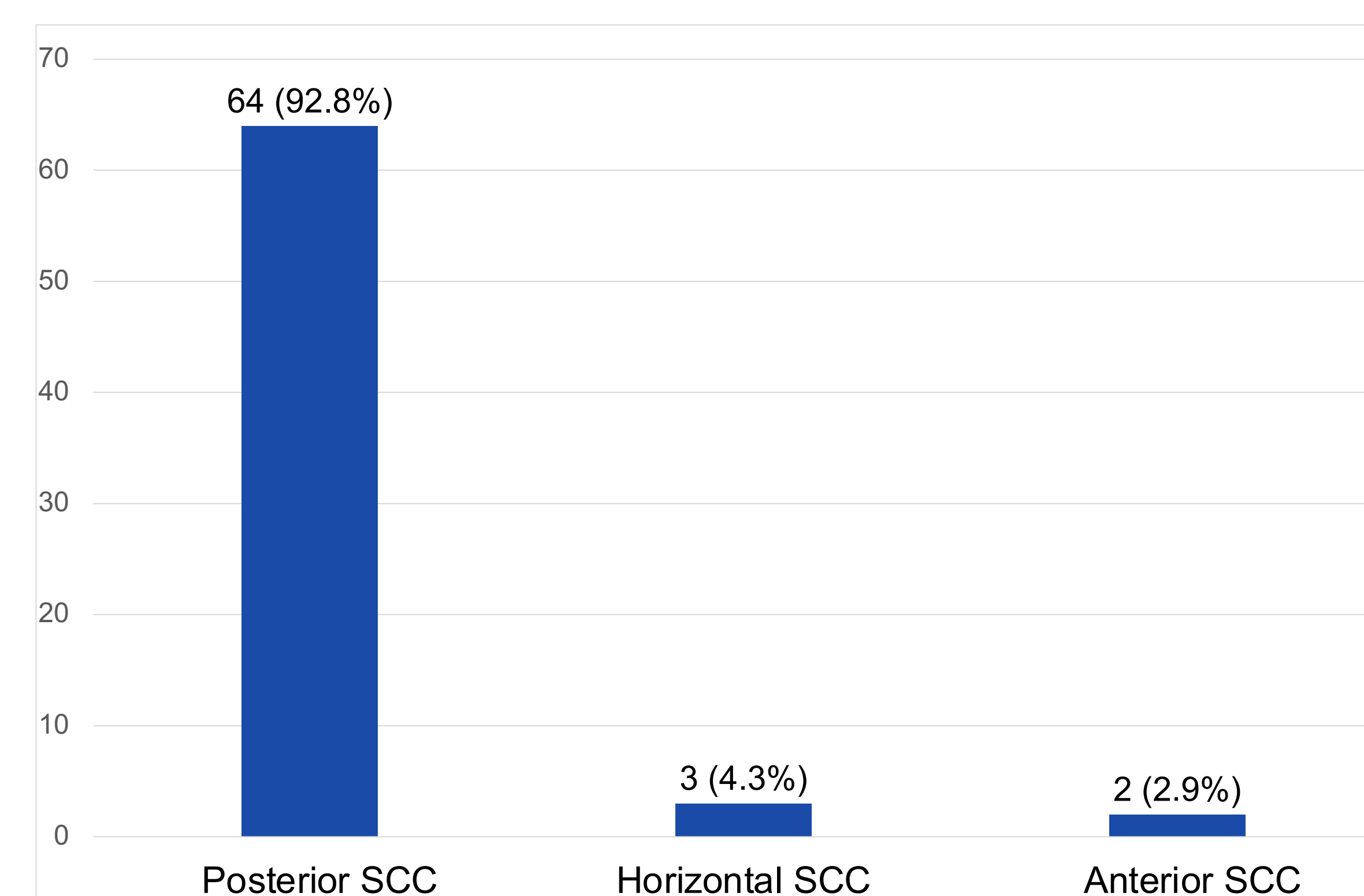


Figure 3. For patients with BPPV, the semicircular canal involved was also identified.

Table 3. Diagnostic Accuracy. Results of classification of 470 patients by the gold standard measure (Dix-Hallpike maneuver and Supine Roll Test versus the Index Measure (self-reported questionnaire))

		Gold Standard: Dix-Hallpike & Supine Roll Test Results	
		BPPV	Not BPPV
Index Measure: Questionnaire Results	BPPV	44 (TP)	104 (FP)
	Not BPPV	25 (FN)	297 (TN)

When compared to gold standard maneuvers, sensitivity and specificity were 63.7% and 74.1% respectively. The positive predictive value was found to be 29.7% and the negative predictive value 92.2%.

Table 4. Diagnostic Accuracy among patients less than 65 years of age. Results of classification of 291 patients by the gold standard measure (Dix-Hallpike maneuver and Supine Roll Test versus the Index Measure (self-reported questionnaire))

		Gold Standard: Dix-Hallpike & Supine Roll Test Results	
		BPPV	Not BPPV
Index Measure: Questionnaire Results	BPPV	20 (TP)	72 (FP)
	Not BPPV	6 (FN)	193 (TN)

When restricting for age less than 65 years, the the diagnostic, sensitivity, specificity, positive predictive value, and negative predictive value were 73.2%, 76.0%, 72.8%, 20.9%, and 97.0%, respectively.

CONCLUSIONS

- Although our sensitivity and specificity were slightly poorer than those reported by Kim et al., the translated self-administered questionnaire still demonstrates reasonable and promising diagnostic accuracy.
- Of the 470 patients, the first three items of the questionnaire accurately characterized the patient's BPPV status in 341 cases resulting in an overall accuracy of 72.6%. This measure may be useful to help identify likely cases of BPPV for clinical triage.
- Overall, additional research is needed to determine implementation strategy and cost-effectiveness of such a triage system in practice.

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