

Comparing the Peek Acuity and Vula Vision mobile apps for visual acuity test accuracy, fail rate and test duration

William Mapham, MBChB DipOphthal FCOphth | *Scientific advisor for vision, hearX Group, Pretoria, South Africa*

De Wet Swanepoel, PhD | *Scientific advisor, hearX Group, Pretoria, South Africa*

INTRODUCTION

Peek Acuity is a smartphone-based vision check app developed by eye experts to allow anyone to check visual acuity using only an Android smartphone. Peek Acuity helps screen and identify people who need further examination and has been proven to be as accurate as conventional vision tests in peer-reviewed research. Another visual acuity screening app developed by Vula Mobile was launched in 2014 and since then this award-winning system, which uses apps to connect health workers with specialists, has been used to test the vision of over 30,000 people across South Africa. Table 1 provides a comparison between the Peek Acuity and Vula Vision acuity tests.

Table 1. Comparison between Peek Acuity and Vula Vision mobile apps

	Vula Vision	Peek Acuity
Test Method	Tumbling 'E' test	Tumbling 'E' test
Test Procedure and Instructions	Test one eye at a time. Patient is 2m from the facilitator. Cover opposite eye loosely with one hand.	Test one eye at a time. Patient is 2m from the facilitator. Cover opposite eye loosely with one hand.
Test Execution	'E' presented at various sizes and pointing in randomised directions of up, down, left or right.	'E' presented at various sizes and pointing in randomised directions of up, down, left or right.
Test Responses	Patient responds by pointing with their free hand the direction the 'E' is pointing. If the 'E' is not visible the patient responds by saying the 'E' is not visible.	Patient responds by pointing with their free hand the direction the 'E' is pointing. If the 'E' is not visible the patient responds by saying the 'E' is not visible.
Test Duration	Less than 2 minutes for both eyes.	Less than 2 minutes for both eyes.
Capturing of test results interface for facilitator	Swipe on the tablet screen in the direction the patient is pointing OR Use the YES/NO buttons on the screen. Select YES if the patient indicated the direction correctly or NO if the patient indicated the direction incorrectly or is unable to see the 'E'.	Swipe on the tablet screen in the direction the patient is pointing. Shake the device if the patient can't see the 'E'.
App Operating Systems	Android and iOS	Android
Test Results	LogMar and Snellen scores	LogMar and Snellen scores
Refer Criteria	Adjustable. Set up by the facilitator via the app settings.	Adjustable. Set up by the facilitator via the app settings.
Protocols	Clinical threshold seeking. Test distance of 2m.	Clinical threshold seeking. Adjustable test distance of 2m or 3m.

OBJECTIVES

To compare the Vula Vision visual acuity app to the Peek Acuity app in terms of:

- i. LogMar acuity score;
- ii. Fail rate correspondence using identical cut-off logMar scores; and
- iii. Test duration.

METHOD

A sample of 134 subjects was recruited, of which 5 subjects were younger than 18 years. Age ranged from 7 - 76 years with an average age of 37 years.

A within-subject design was used to determine the visual acuity with the two test methods (Peek Acuity and Vula Vision) with a counterbalanced design.

Equipment

Data collection was conducted in various office, optometry clinics and old-age home settings. All rooms were fitted with a chair with a backrest for the test subjects to be seated for the duration of testing. A measuring tape was used to measure a 2 meter distance from the test subject's eyes. Marking tape was placed on the floor of each room to indicate the position of the chair's front legs as well as the position of the test facilitator's feet. Good lighting was ensured at all times by making use of natural, as well as ceiling lights in the testing rooms.

