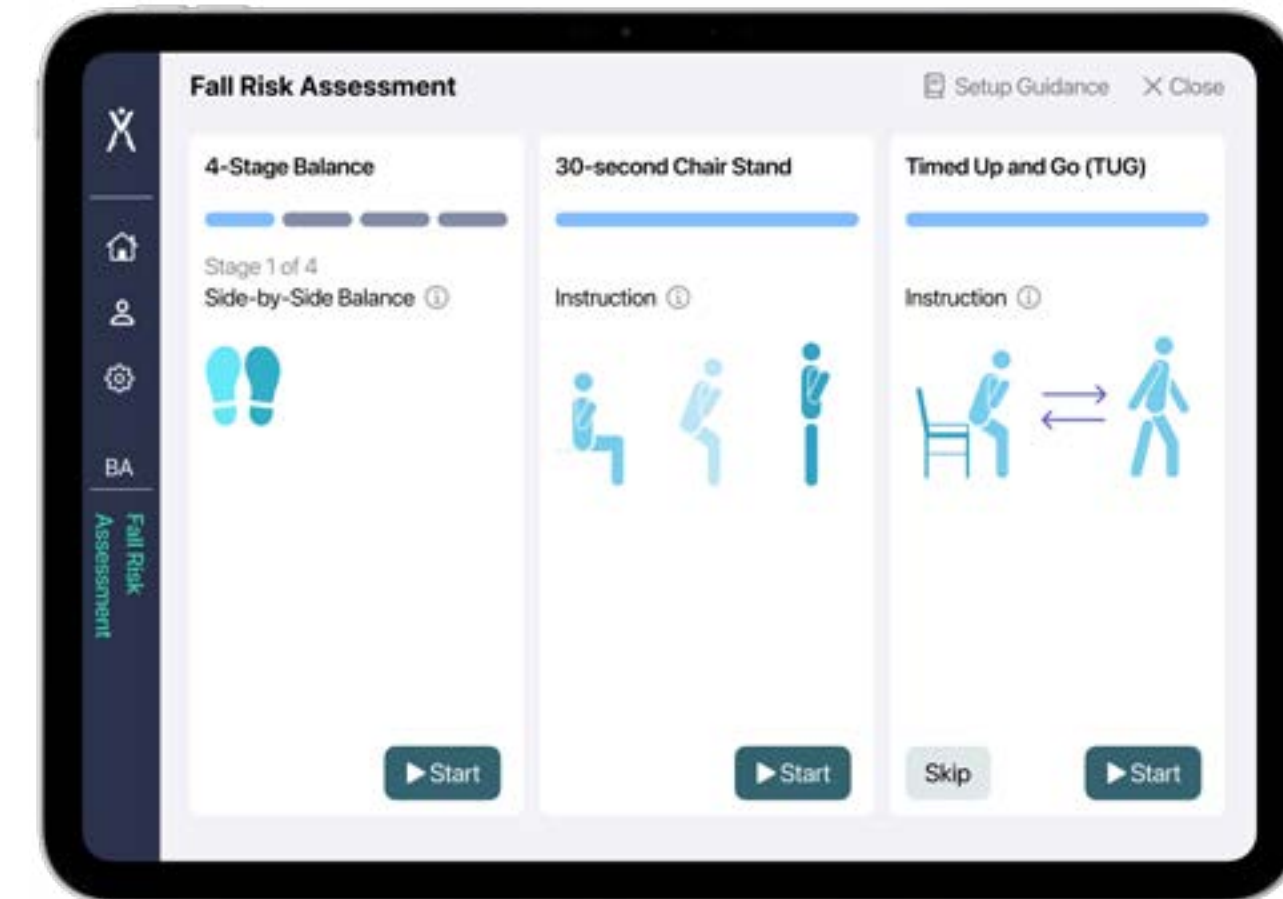




AI-Based Visual Assessment App for At-Home Monitoring of Older Parkinson's Disease Patients

Dr. Hamed Tabkhi, Dr, Mona Azarbayjani
MassAITC Aging Focus Pilot Core



OBJECTIVES AND GOALS

AIM ONE:

USER-CENTERED CUSTOMIZATION OF AVA

- Formative User Research
- AI Enhancement
- Comprehensive Front-End Redesign
- Goals: Achieve >75% MAUQ score, /80% task success, and complete assessments in under 10 minutes.

AIM TWO: CONTROLLED- ENVIRONMENT TESTING

- **Training:** Train patients and caregivers in clinical settings.
- **Feasibility:** Test at-home assessments without supervision.
- **Goals:** Reach >80% MAUQ score, Net Promoter Score (NPS) >90%, and a dropout rate <10%.

BACKGROUND

- PD patients in rural or underserved areas often lack specialist care.
- Motor symptoms can vary, making regular monitoring important.
- Home-based tracking helps monitor symptoms without frequent clinic visits.

MOTIVATION

- Quick, accurate symptom checks lead to better treatment.
- Existing tools often need extra devices and often violate personal privacy.
- Caregivers need a simple way to track PD symptoms at home.

PRODUCT

- AVA Mobile App: Uses iPad camera to assess motor function.
- On-Device AI: Processes data on the phone to keep your privacy intact.
- Easy and Reliable: Uses advanced AI to monitor gait and posture without clinical supervision.

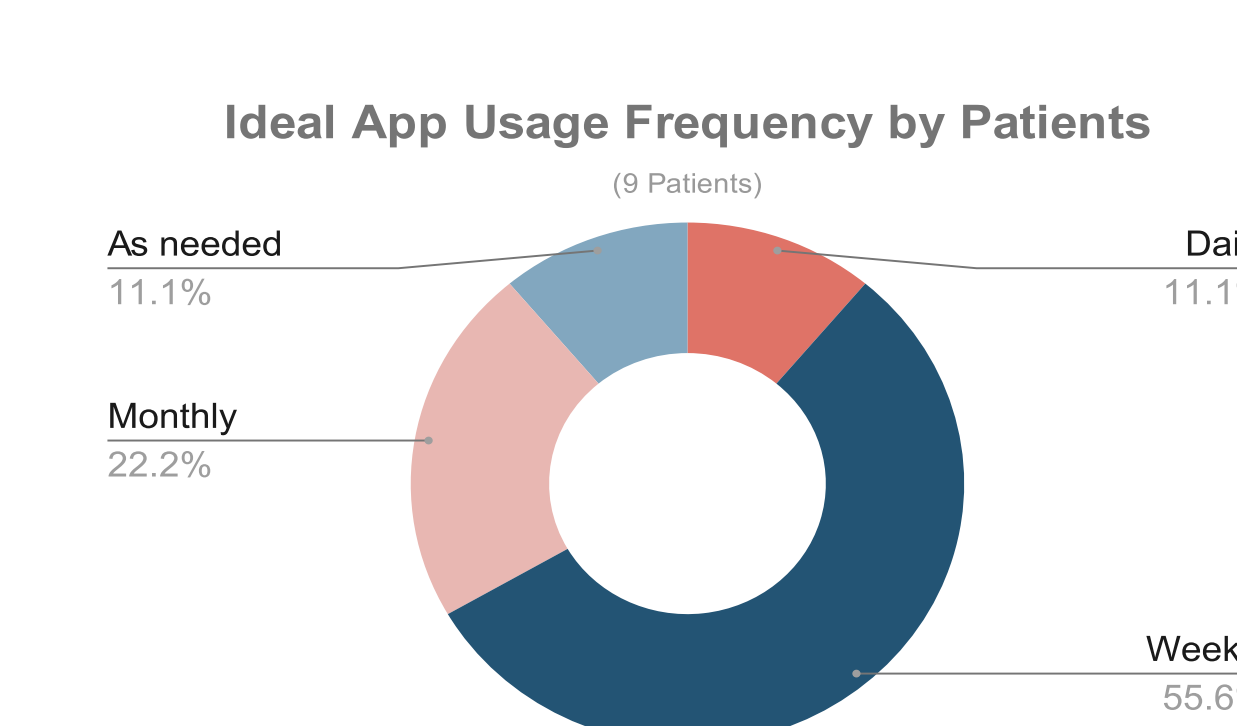
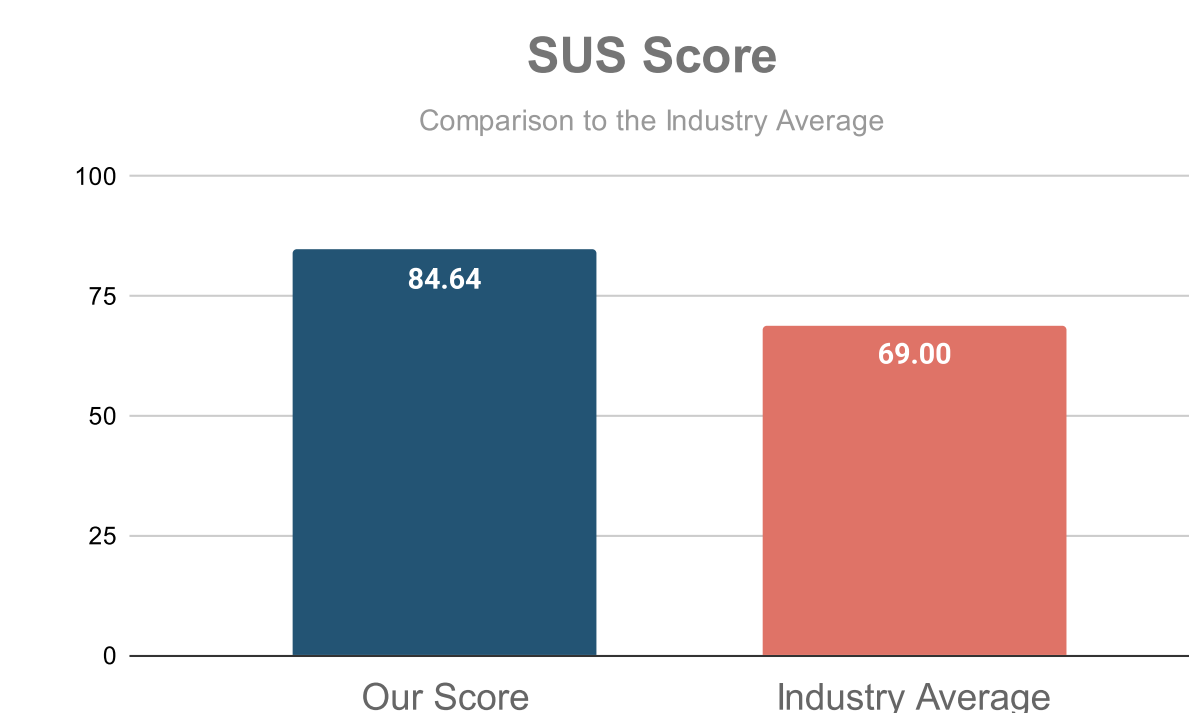
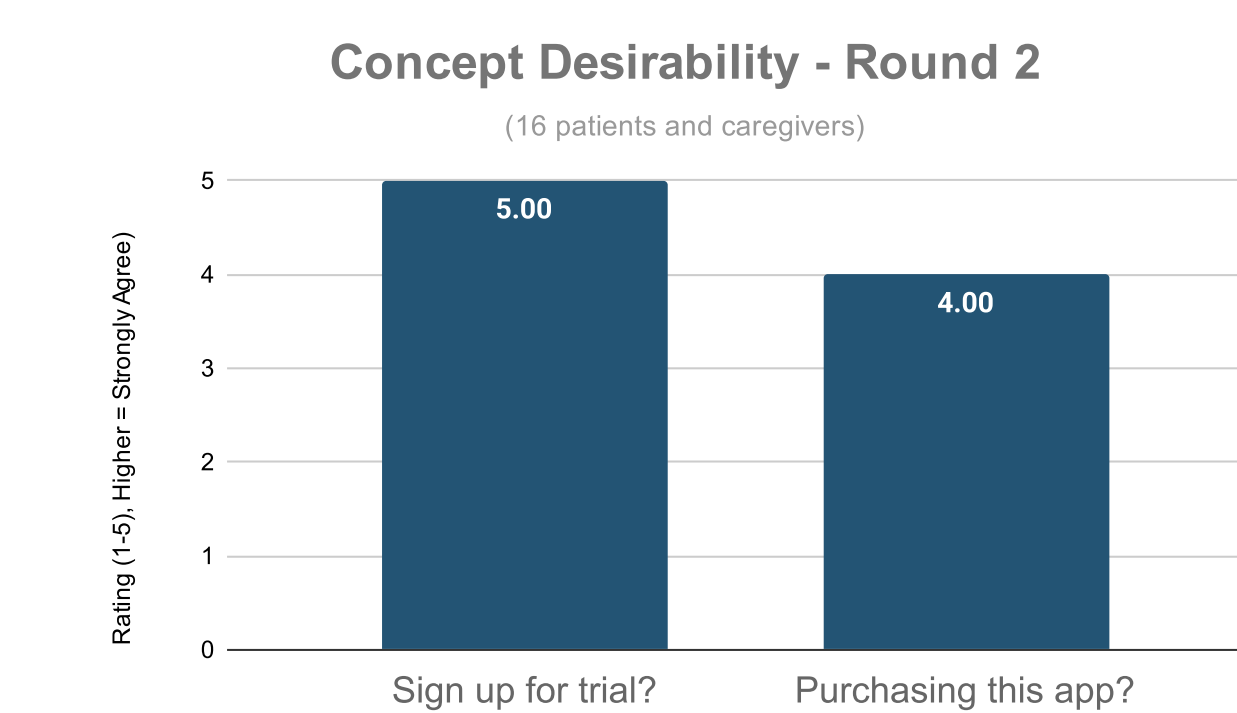
PILOT STUDY PROCESS AND FINDINGS

Pre- STUDY -Focus group with Neurologist

- Doctors affirmed that home monitoring could improve care quality and reduce unnecessary visits.
- Engaged 5 neurologists and physical therapists specializing in PD.
- Identified clinical needs: tracking hand tremors, fine motor control, gait, balance and medication adherence.
- Ensured data integration into existing clinical workflows for meaningful symptom monitoring.

STUDY TWO -Usability Testing

- Patients and caregivers separately tested the prototype in a controlled setting.
- Feedback shaped interface improvements, including personalized alerts.
- Caregivers emphasized the need for a monitoring dashboard with critical alerts.

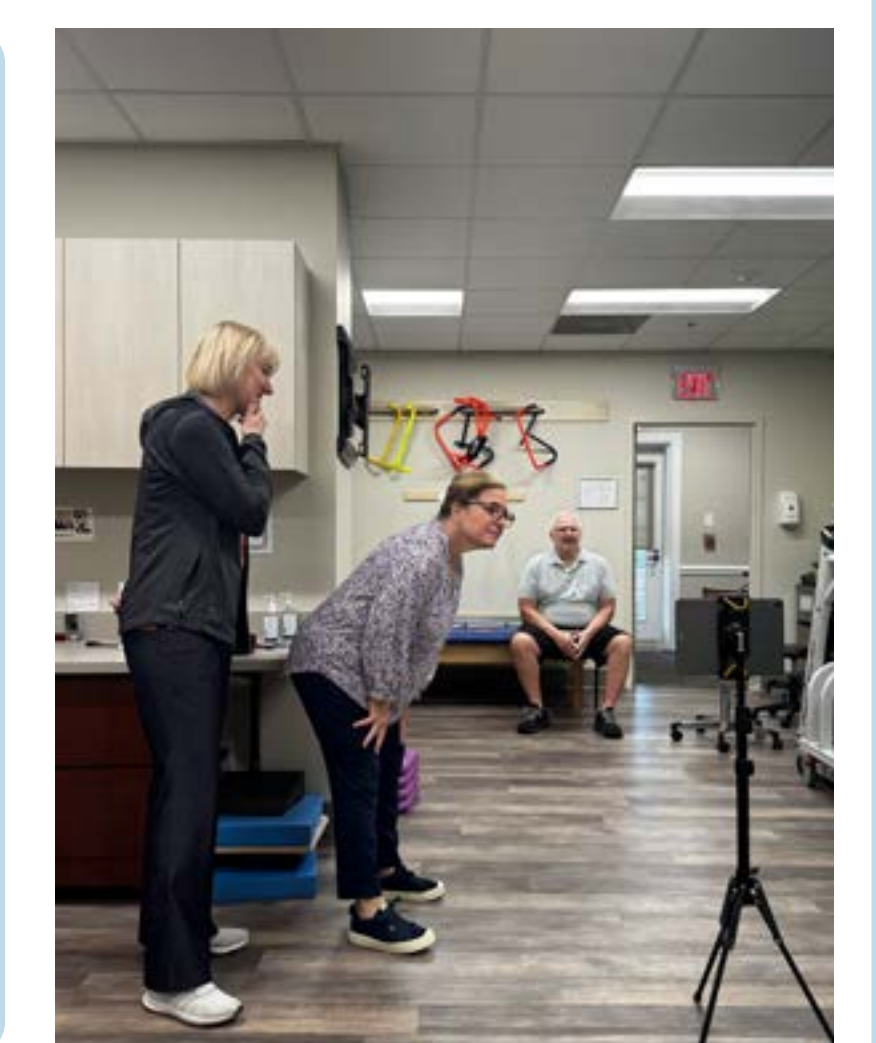
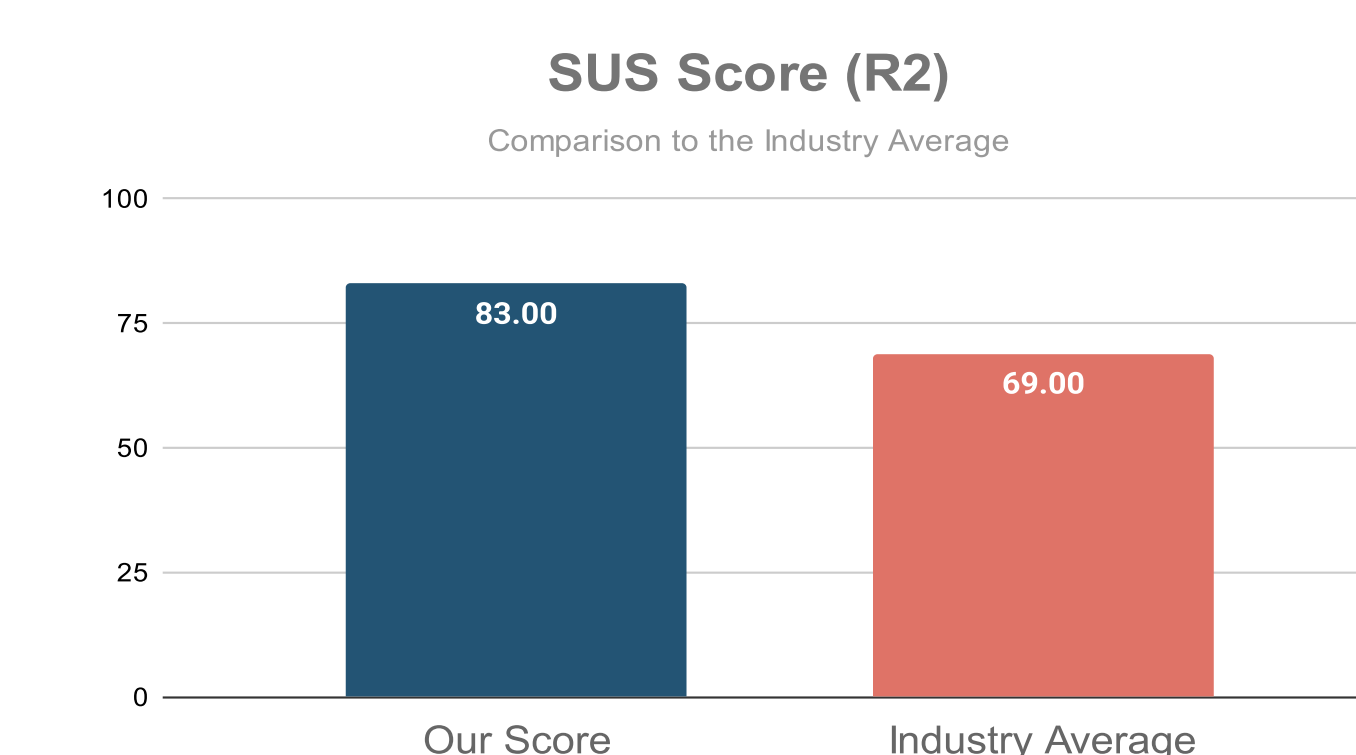
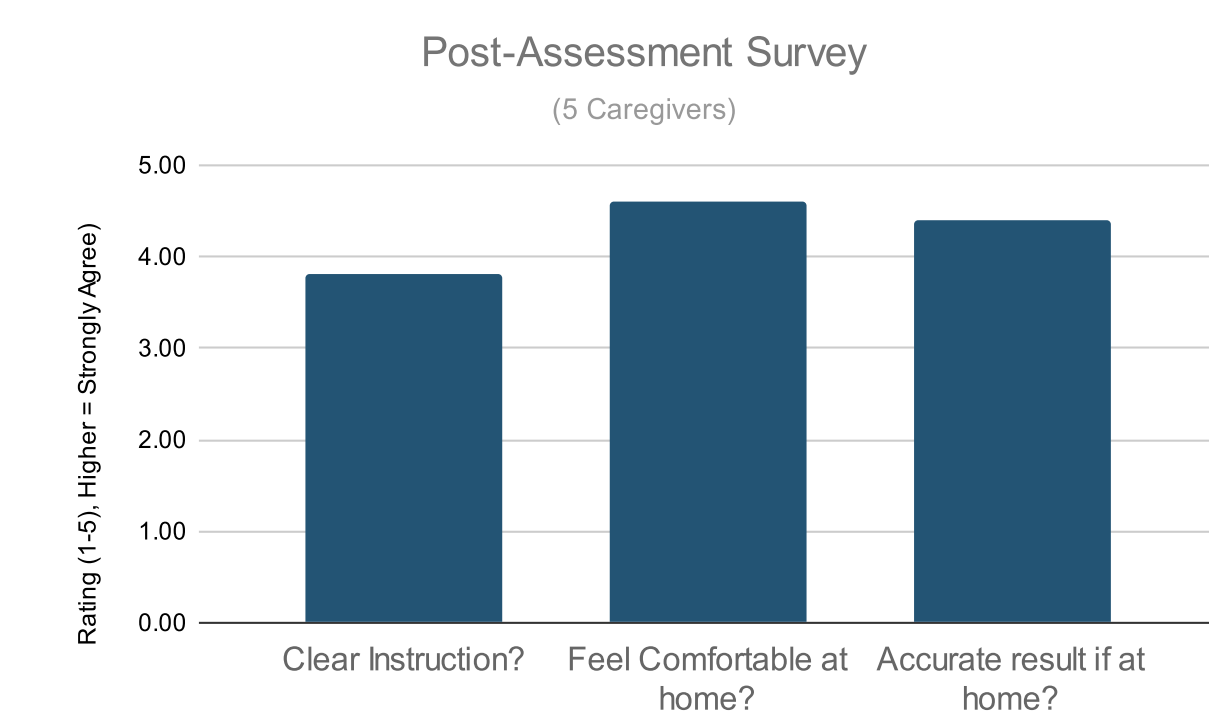
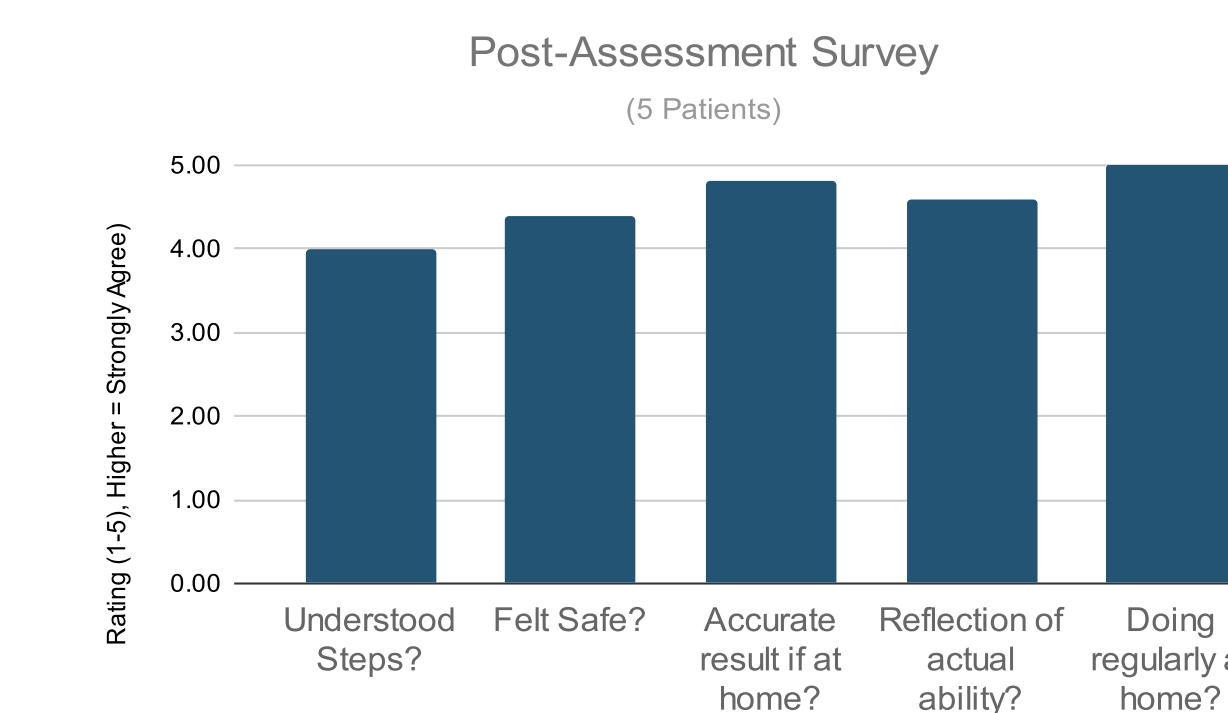


STUDY ONE -Focus group with PD patients and Caregivers

- Patients and caregivers introduced to AVA.
- Interviewed 13 older adults PD patients to understand daily challenges.
- Key pain points: medication management, mobility tracking, and communication gaps.
- Insights led to features like automated reminders and intuitive mobility assessment.

STUDY THREE -Independent Use controlled Environment

- pilot for independent home-based assessments.
- 80% of participants completed tasks successfully without assistance.
- Validated the app's ease of use, reliability, and role in symptom tracking.



Achievements

- AVA is a user-friendly AI app for home-based assessment -> **available at AppStore!**
- Pilot study confirms usability and scalability in underserved communities -> pending NIH SBIR-Phase I proposal submitted in Jan 25.

IMPLICATIONS

- AVA can improve access to PD care in rural and undeserved areas.
- Stakeholder feedback incorporated.
- Positioned for broader implementation in PD care, bridging gaps in home monitoring.

TAKE AWAYS

- Caregivers feel confident using AVA independently.
- PD specialists recognize its potential to bridge critical care gaps.

NEXT STEPS

- Future work includes expanding assessments (e.g., hand and finger tapping), comprehensive UPDRS Part-III and scaling to larger communities.
- Engaging broader older adults PD patients and neurologists.