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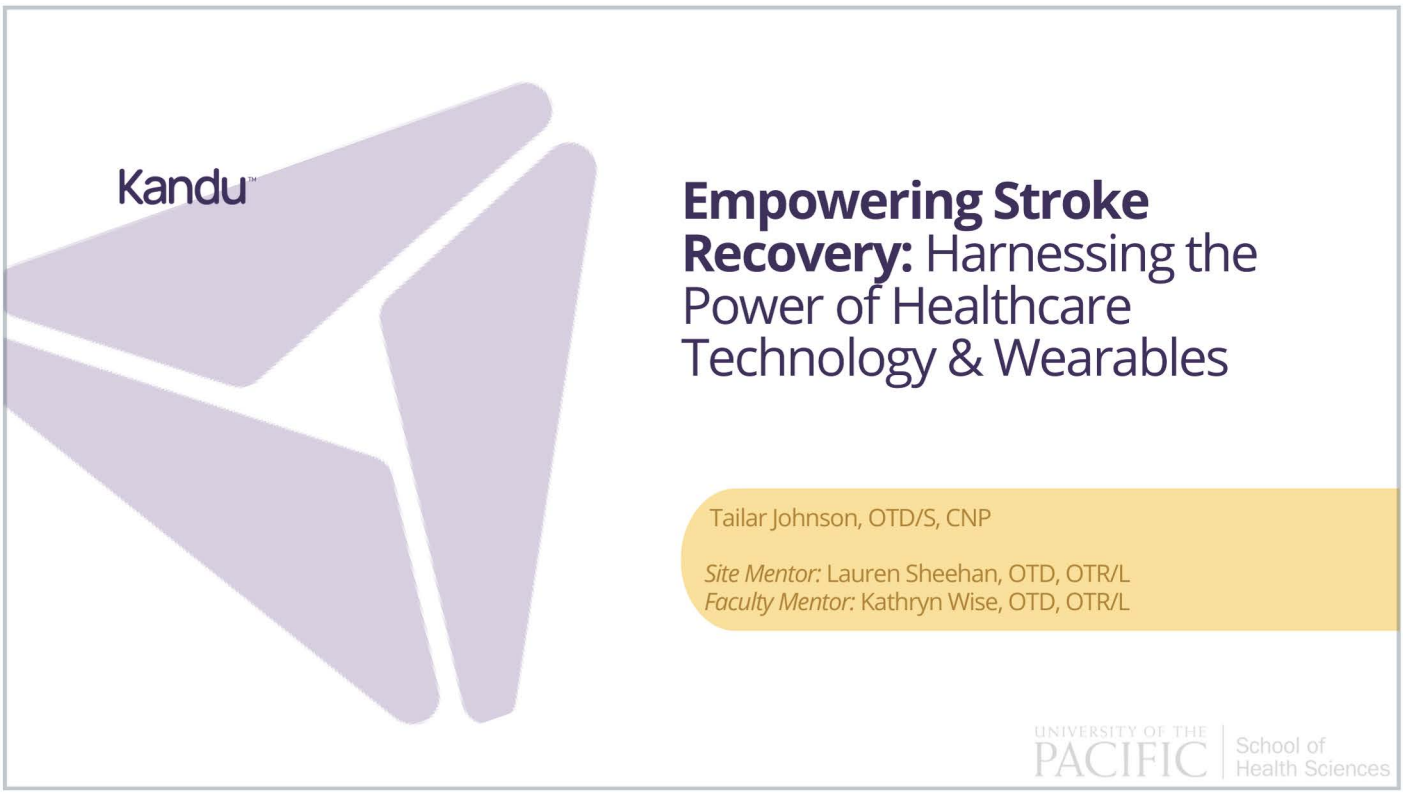
Empowering Stroke Recovery: Harnessing the Power of Healthcare Technology & Wearables

Tailar Johnson
University of the Pacific



My name is Tailar Johnson and my Capstone project is empowering stroke recovery, harnessing the power of healthcare technology and wearable devices.

To let you know why wearable technology was an interest to me, I want to tell you a quick story.

I have a loved one that had a condition called pericarditis (inflammation around the heart), which causes arrythmia (or weird heart rhythm) a dangerous condition that can lead to stroke and other heart related emergencies. This loved one found out he was in arrythmia for over a month from his fitbit. He sent the information to his doctor who said - talk me when you get an apple watch.

This experience and some research left me convinced that we do not know how to adequately or appropriately utilize wearable technology in a healthcare setting. My mission with this capstone project was to explore how we could change this

Background

- Kandu Health in Campbell, California
- Digital health startup filling the gap in stroke recovery
- Provides free virtual services to stroke survivors & care partners
- Research grade wearable device in process of finding product market fit

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I did my Capstone project with Kandu health, a digital health startup which aims to fill the gap in stroke recovery. Currently, stroke survivors

Objectives

1.Investigate the role of occupational therapy in a healthcare technology setting

2.Conduct qualitative research to improve research aggregation, synthesis, and dissemination skills

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Roles & Responsibilities

Clinical Services

- **Kandu focus groups**
- **Outreach liaison testing**
- Navigator training collateral
- 22 Navigator Summaries on various subjects

Qualitative Research

- Recruitment & communication with participants
- IRB changes
- 30- 60 minute interviews
- Data storage & organization
- Coding, theming, & analysis

Discovery

- **Quantitative data collection**
- 10 Literature Reviews on:
  - Acute post-stroke changes
  - Blood pressure
  - Sepsis
  - Urinary tract infections
  - Core temperature
  - Meds & Vital signs

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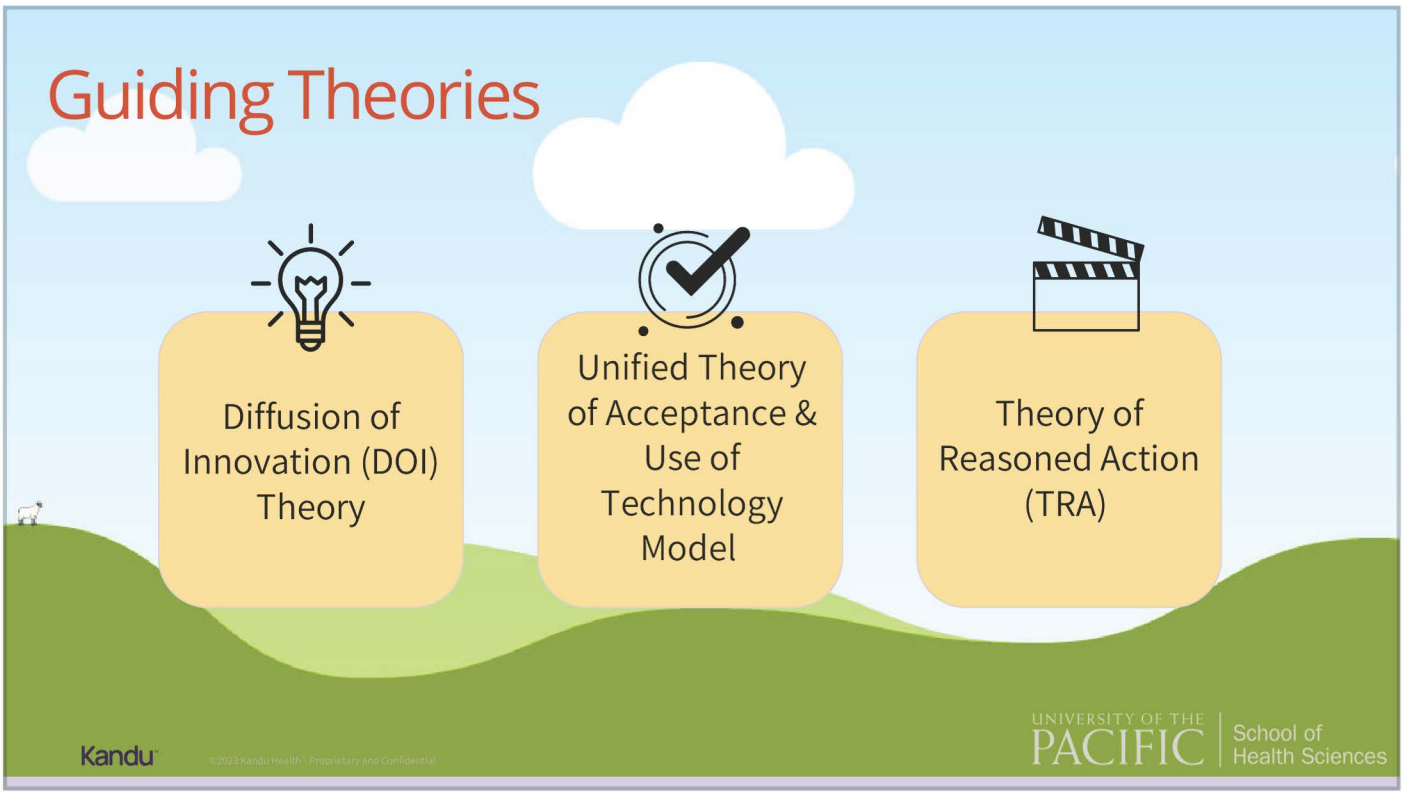
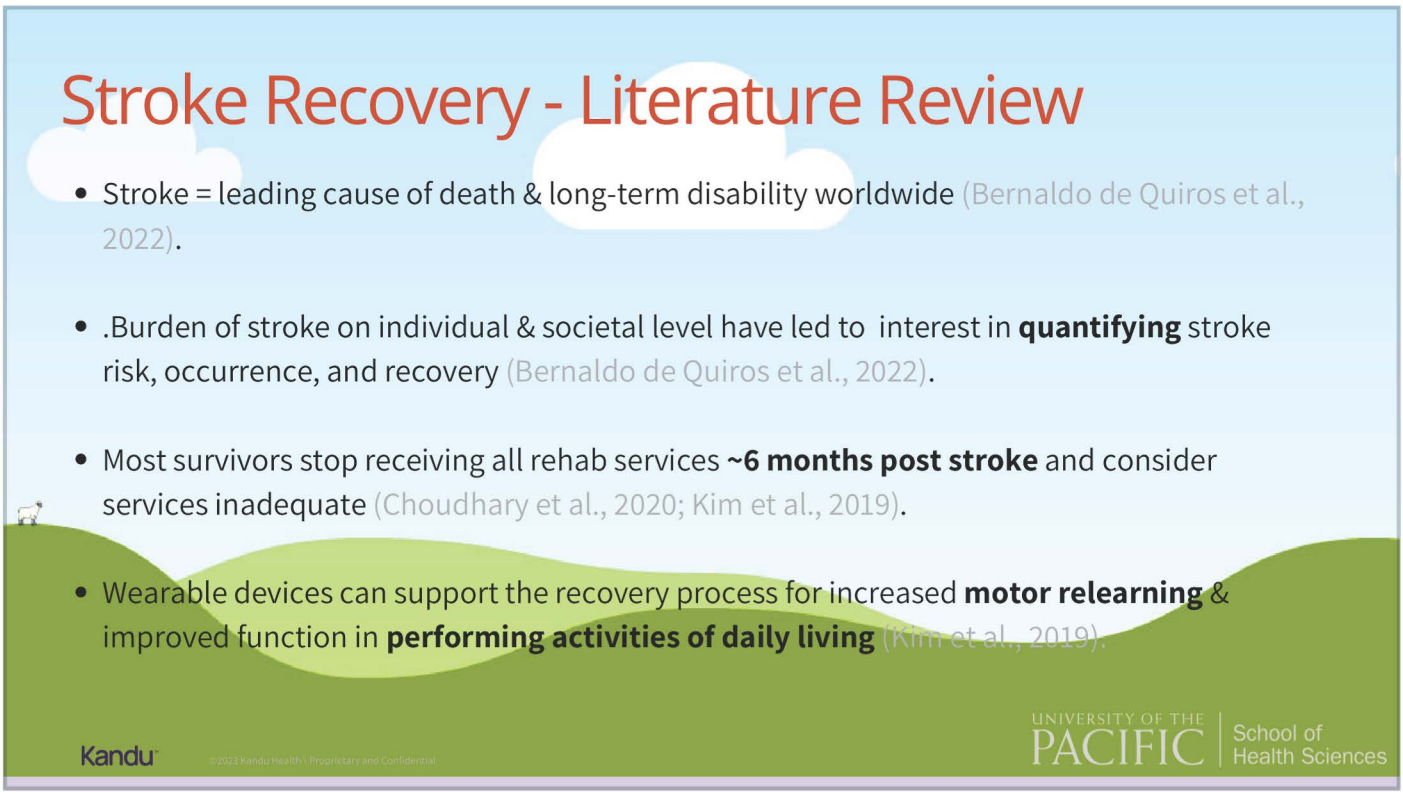


Diffuse of innovation theory gets at this idea that technological adoption happens on a curve - very few people adopt a technology early on, which increases and then drops back off

UTAUT is the idea that actual use of technology is determined by behavioural intention. The likelihood of adopting the technology is dependent on the direct effect of four key constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions

Theory of reasoned action is the idea that norms and attitudes shape behavior



80% survival rate with an impact on QOL especially physically, cognitively, emotionally, and socially (De Quiros et al., 2022).

Barriers to Wearables in Stroke Recovery - Literature Review

Healthcare Clinicians

- 80% of therapists not using wearable devices in practice recognize the value (Braakhuis et al., 2021; Signal et al., 2020).
- Lack of clinically applicable evidence contributes to a lag time in implementation (Braakhuis et al., 2021; Signal et al., 2020).

Stroke Survivors

- Limited data on wearable usability for stroke survivors (Rast & Labruyère, 2020).
- Lack of involvement in the design process leads to a lack of relevance and potential for device misuse (Poogondi et al., 2020).

Care partners - limited to no literature

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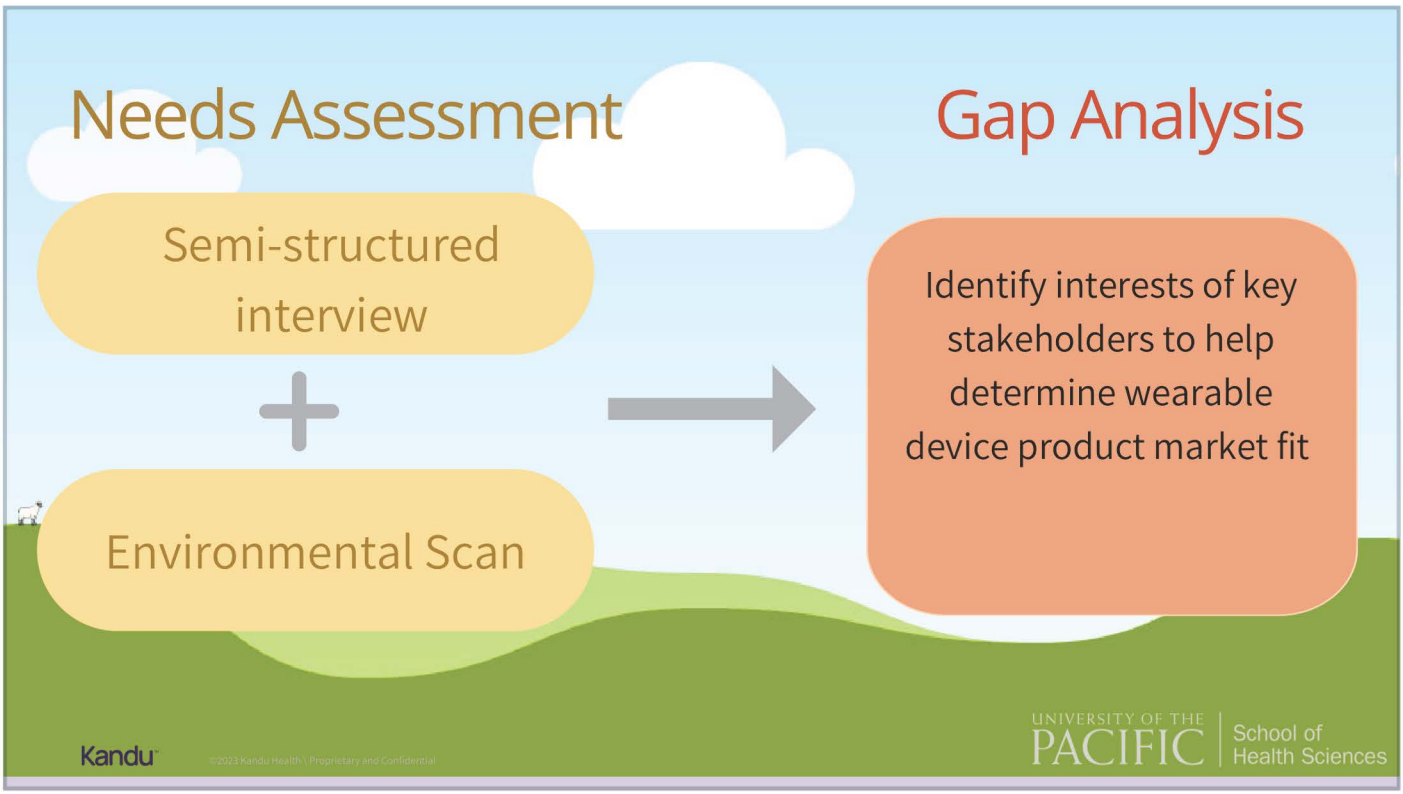
Needs Assessment
Semi-structured interview
Environmental Scan
Gap Analysis
Identify interests of key stakeholders to help determine wearable device product market fit
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Research Question

- What types of **wearable devices** would be useful to support better outcomes in stroke rehabilitation?

Methods

- **3 groups:** stroke survivors, care partners, healthcare clinicians
- Conveniently sampled
- Semi-structured interviews to understand:
  - Stroke recovery
  - Resource accessibility
  - Technological use patterns
  - Useful technology for post-acute stroke
- May 2023 - July 2023 via **Zoom** or by **phone**

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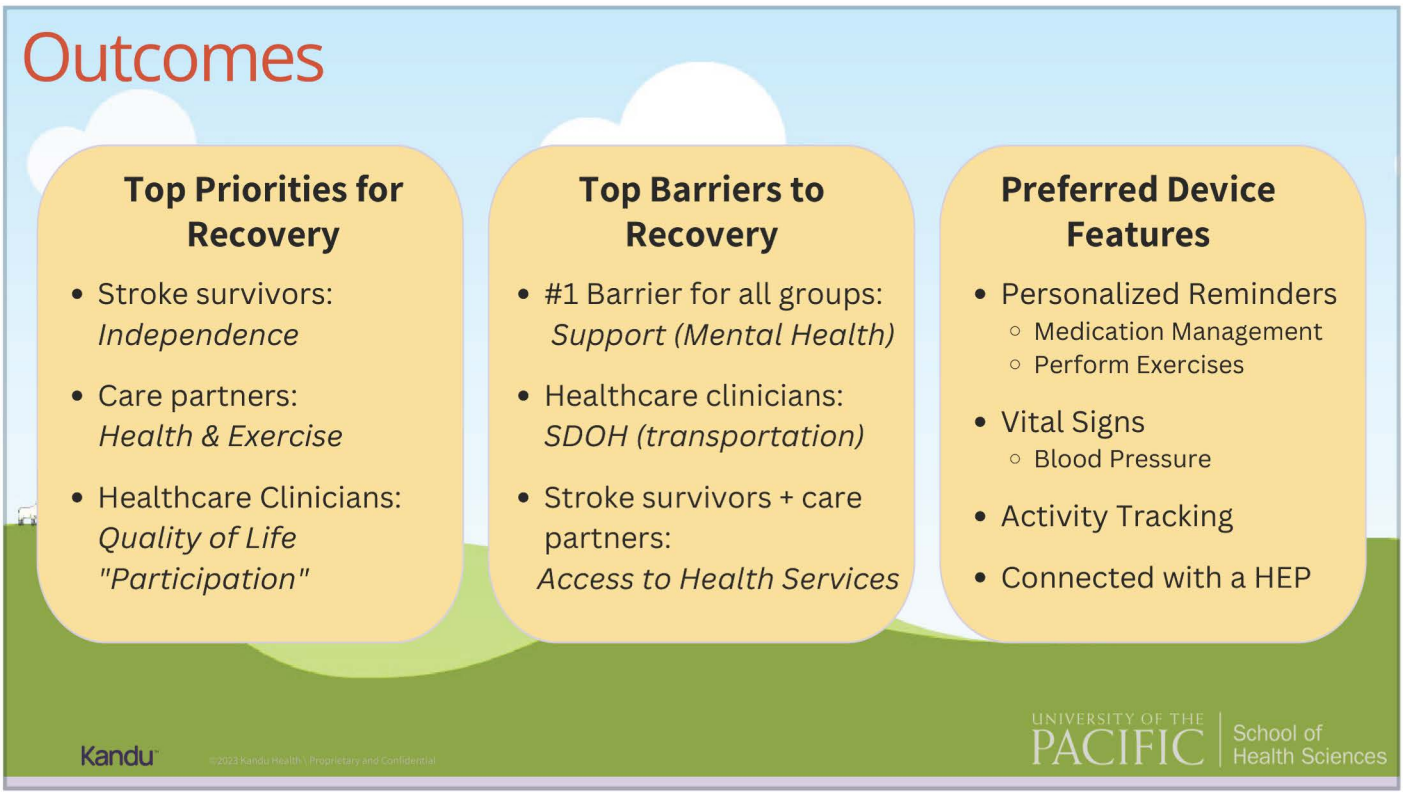
Outcomes
Top Priorities for Recovery
Stroke survivors: Independence
Care partners: Health & Exercise
Healthcare Clinicians: Quality of Life "Participation"
Top Barriers to Recovery
#1 Barrier for all groups: Support (Mental Health)
Healthcare clinicians: SDOH (transportation)
Stroke survivors + care partners: Access to Health Services
Preferred Device Features
Personalized Reminders
Medication Management
Perform Exercises
Vital Signs
Blood Pressure
Activity Tracking
Connected with a HEP
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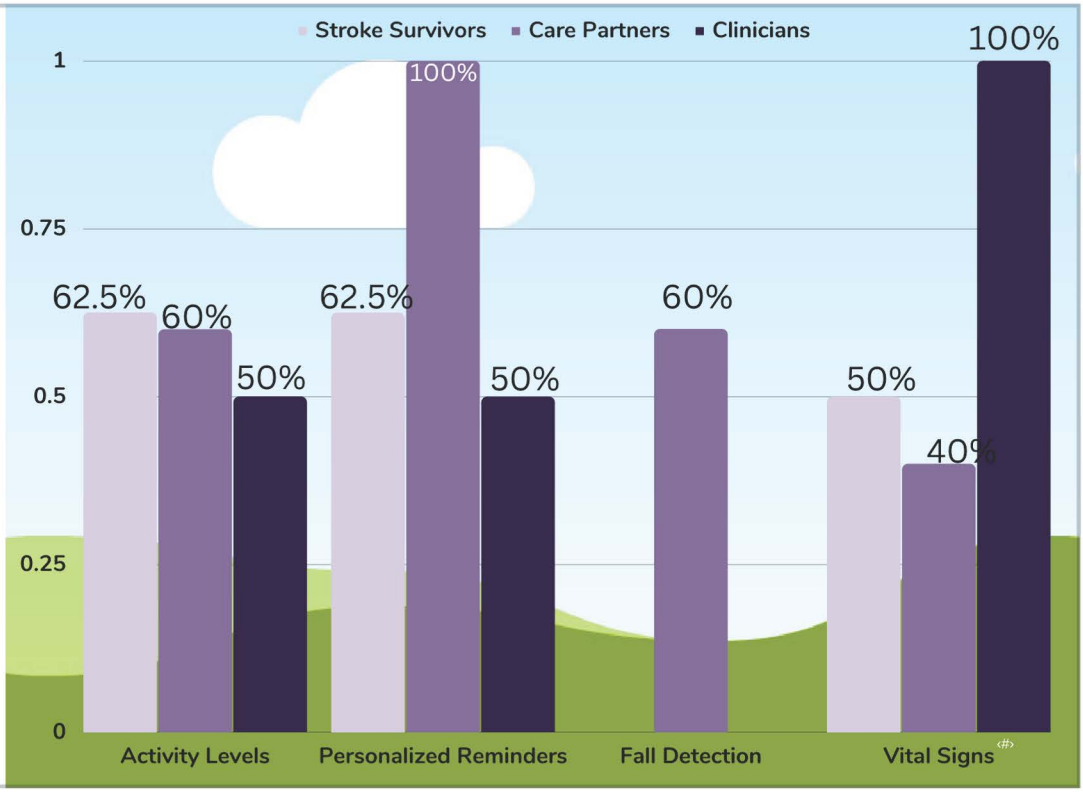
Preferred Device Features



Discussion

- **Tech Knowledge Gap**
  - 1/2 of clinicians never thought about integrating with current practice
  - Lack of awareness in all groups of pre-existing device features
  - High interest in using/ accessing technology if set up
- **Independence versus participation - important or semantic difference?**
- **Potential Biases**
  - Female skew
  - Age
  - Technological literacy & state relationship
- **Areas for Future Research**
  - Preferred design and feature usability

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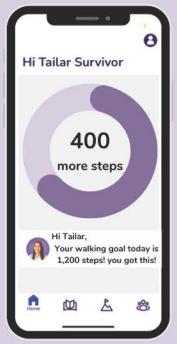
Impact on the Organization

Education on Smartwatch Features

Step Count



Fitness Goals

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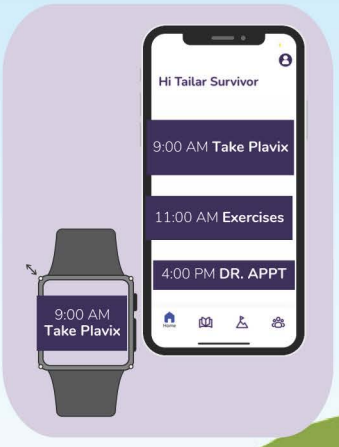
Impact on the Organization

Continuous Blood Pressure Device

Home Exercise Program Integration



Personalized Reminders Integration

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Product management - works between engineers, the needs of the end user, and the business team to drive the direction of the product

Acknowledgements

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