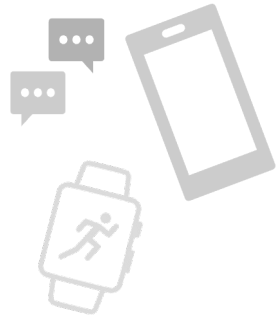


# Exploring Supportive Technologies for Caregiving and Aging in Place

Oleg Zaslavsky, PhD, MHA, RN, FAAN, FGSA  
Director, Digital Health Innovation Hub  
Aljoya Endowed Associate Professor in Aging

**W** SCHOOL OF NURSING  
UNIVERSITY of WASHINGTON



# UW SoN Digital Health Innovation Hub

Bridging the gap between **nursing** and **digital health innovation**

Addressing the **underrepresentation of nurses in digital health**

Aiming to **unleash nurses' potential** in digital innovation



# Digital Health Innovation Hub **Vision & Mission**



**Create a collaborative ecosystem** for nurse-led digital innovation

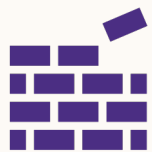


**Integrate nursing insights** with digital advancements



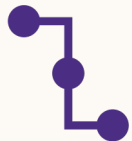
**Improve patient care** through wellness technology

# Digital Health Innovation Hub Strategic Focus Areas



## Infrastructure

Our infrastructure comprises physical space, shared resources for design and usability testing, and digital health staff experts.



## Connections

The UW Digital Health Innovation Hub connects experts to collaborate on shared digital health innovations, from idea, to concept testing to moving innovations into the communities that need them.



## Education

The UW Digital Health Innovation Hub is a multi-level educational approach that includes staff and faculty workshops

# Hub for students, faculty and community partners



Jennifer Sonney, PhD, ARNP, PPCNP-BC, FAANP, FAAN

Dr. Sonney's program of research is dedicated to improving the health of children with chronic conditions, with a particular emphasis on children with asthma. She is developing and testing family-centered health technologies to support parent-child shared asthma management.



Jenny Tsai, PhD, ARNP, PMHCNS-BC

Dr. Tsai's primary research focuses on sociocultural determinants of mental and physical health of Asian immigrants with the goal to design effective theory-driven, community interventions to promote a healthy US Asian immigrant workforce.



Allison Webel, RN, PhD, FAAN

Dr. Webel's clinical research laboratory focuses on generating high-quality evidence to help people with HIV live and age well, with an emphasis on diet and exercise. Her HEALTH study is currently testing a digital physical activity adherence application to maintain the benefits of short-term supervised exercise among older adults with HIV.



Weichao Yuwen, PhD, RN

Dr. Yuwen teaches and conducts research in developing, testing, and disseminating technology-enabled health solutions for people with chronic conditions and their family caregivers.



Oleg Zaslavsky, PhD, MHA, RN, FAAN

Dr. Zaslavsky has a clinical background in gerontological nursing with specific training and expertise in digital interventions for older and vulnerable populations.

AgeTech Collaborative™  
FROM AARP

About AgeTech



## ACCELERATING INNOVATION

We invest in people and partnerships to move ideas forward by supporting scientists and researchers who advance life-changing innovations, and we work closely with the institutions that underpin this work.

### Leading the charge toward the future of AgeTech

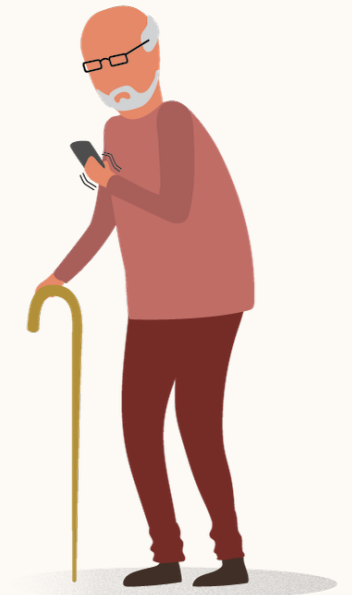
The AgeTech Collaborative™ from AARP® brings together a one-of-a-kind ecosystem of key stakeholders, united in their mission to improve people's lives as they age. Through our startup accelerator program, expert guidance, pilot testing, and connection opportunities, every part of the collaborative is designed to help participants achieve their goals.

# My Research Focus

Digital Behavioral Intervention in Older and Vulnerable Populations



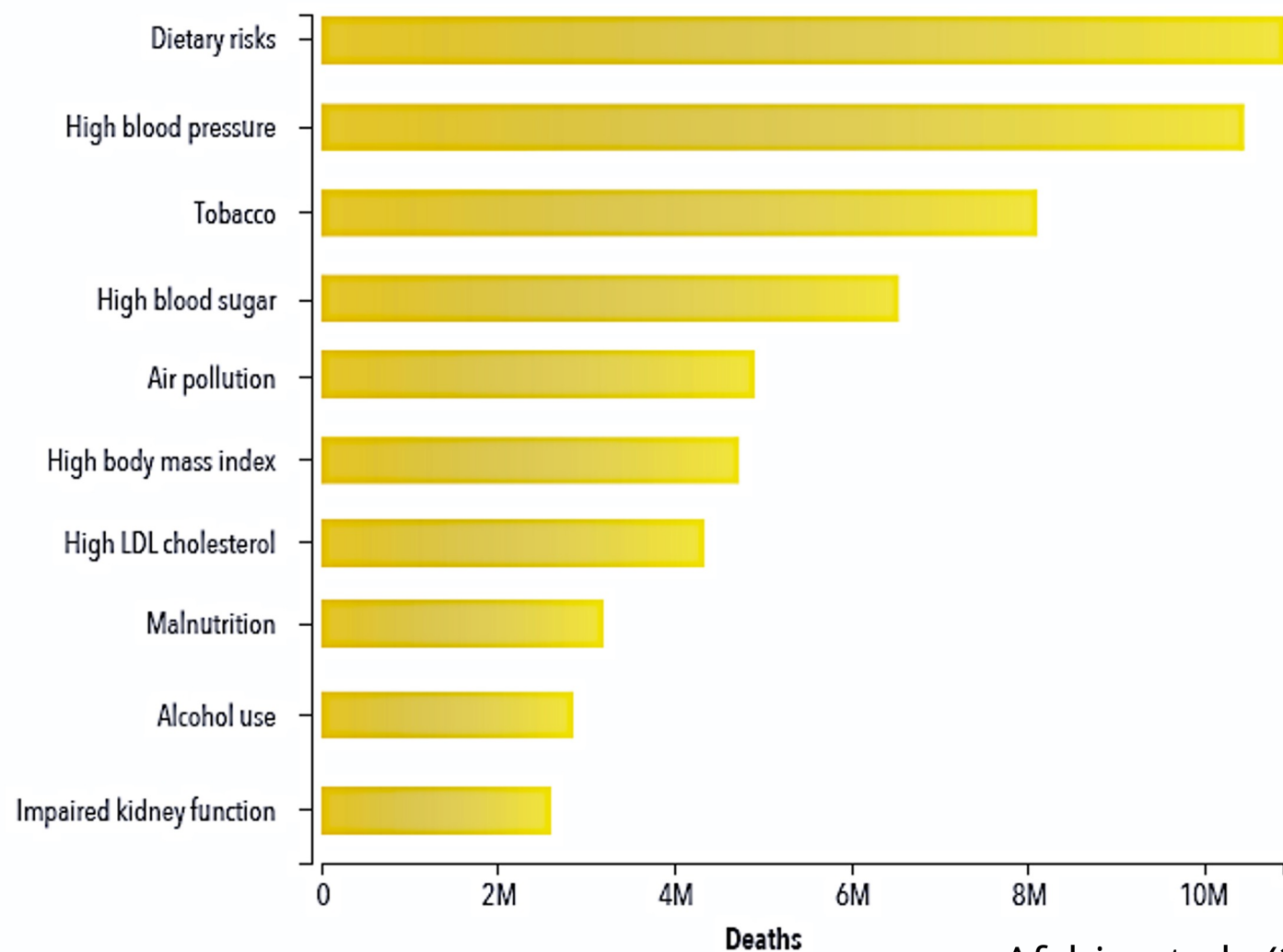
# Mobile Intervention to Support Healthy Eating in Persons with Age-Related Changes



# Poor diet causes more deaths than any other risk factor.

THE LANCET

## TOP 10 RISK FACTORS FOR DEATH, GLOBALLY, IN 2017

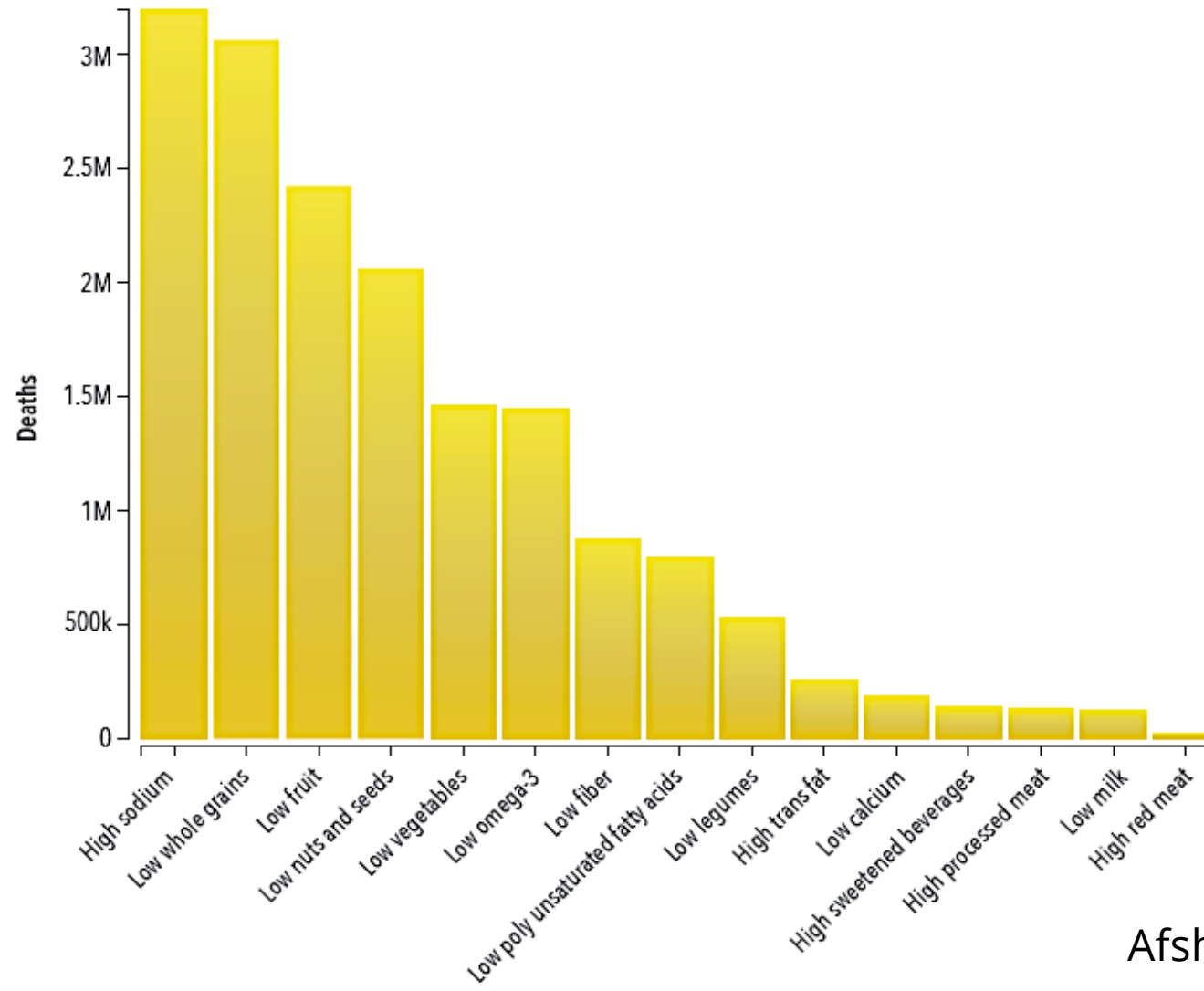


Afshin et al., (2019) Lancet



Most diet-related deaths are caused by eating too much sodium and not enough whole grains and fruit.

DIETARY RISK FACTORS RANKED BY NUMBER OF DEATHS, GLOBALLY, IN 2017



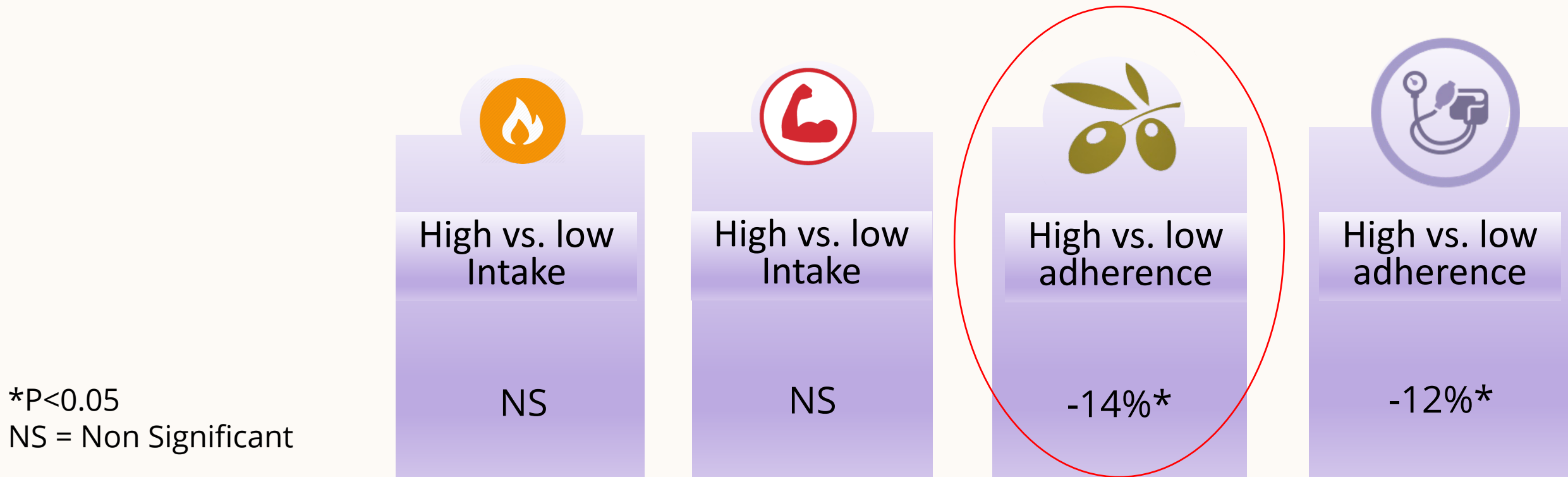


# The American Journal of CLINICAL NUTRITION

Biomarker-calibrated nutrient intake and healthy diet index associations with mortality risks among older and frail women from the Women's Health Initiative<sup>1,2</sup>

Oleg Zaslavsky,<sup>3\*</sup> Shira Zelber-Sagi,<sup>5</sup> James R Hebert,<sup>6</sup> Susan E Steck,<sup>6</sup> Nitin Shivappa,<sup>6</sup> Fred K Tabung,<sup>7</sup> Michael D Wirth,<sup>6</sup> Yunqi Bu,<sup>4</sup> James M Shikany,<sup>8</sup> Tonya Orchard,<sup>9</sup> Robert B Wallace,<sup>10</sup> Linda Snetselaar,<sup>10</sup> and Lesley F Tinker<sup>11</sup>

*Am J Clin Nutr* 2017;105:1399–407. Printed in USA. © 2017 American Society for Nutrition



\*P<0.05

NS = Non Significant



## Anatomy of the Mediterranean Diet and Mortality Among Older Women with Frailty

Oleg Zaslavsky, Shira Zelber-Sagi, James M. Shikany, Tonya Orchard, Robert Wallace, Linda Snetselaar & Lesley Tinker

To cite this article: Oleg Zaslavsky, Shira Zelber-Sagi, James M. Shikany, Tonya Orchard, Robert Wallace, Linda Snetselaar & Lesley Tinker (2018): Anatomy of the Mediterranean Diet and Mortality Among Older Women with Frailty, Journal of Nutrition in Gerontology and Geriatrics, DOI: [10.1080/21551197.2018.1496217](https://doi.org/10.1080/21551197.2018.1496217)





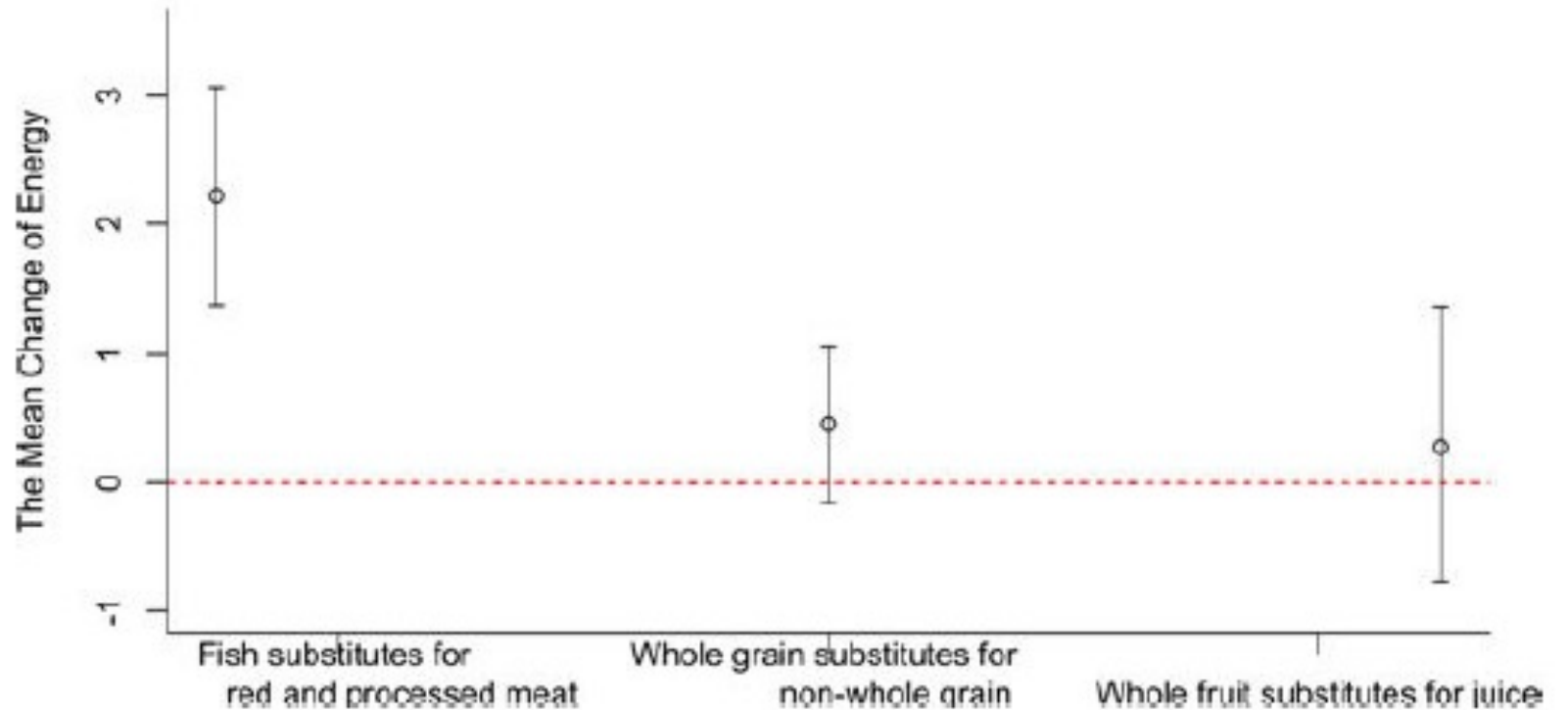
## Mediterranean Diet and Fatigue among Community-Dwelling Postmenopausal Women

Yan Su, Barbara B. Cochrane, Kerry Reding, Jerald R. Herting, Lesley F. Tinker & Oleg Zaslavsky

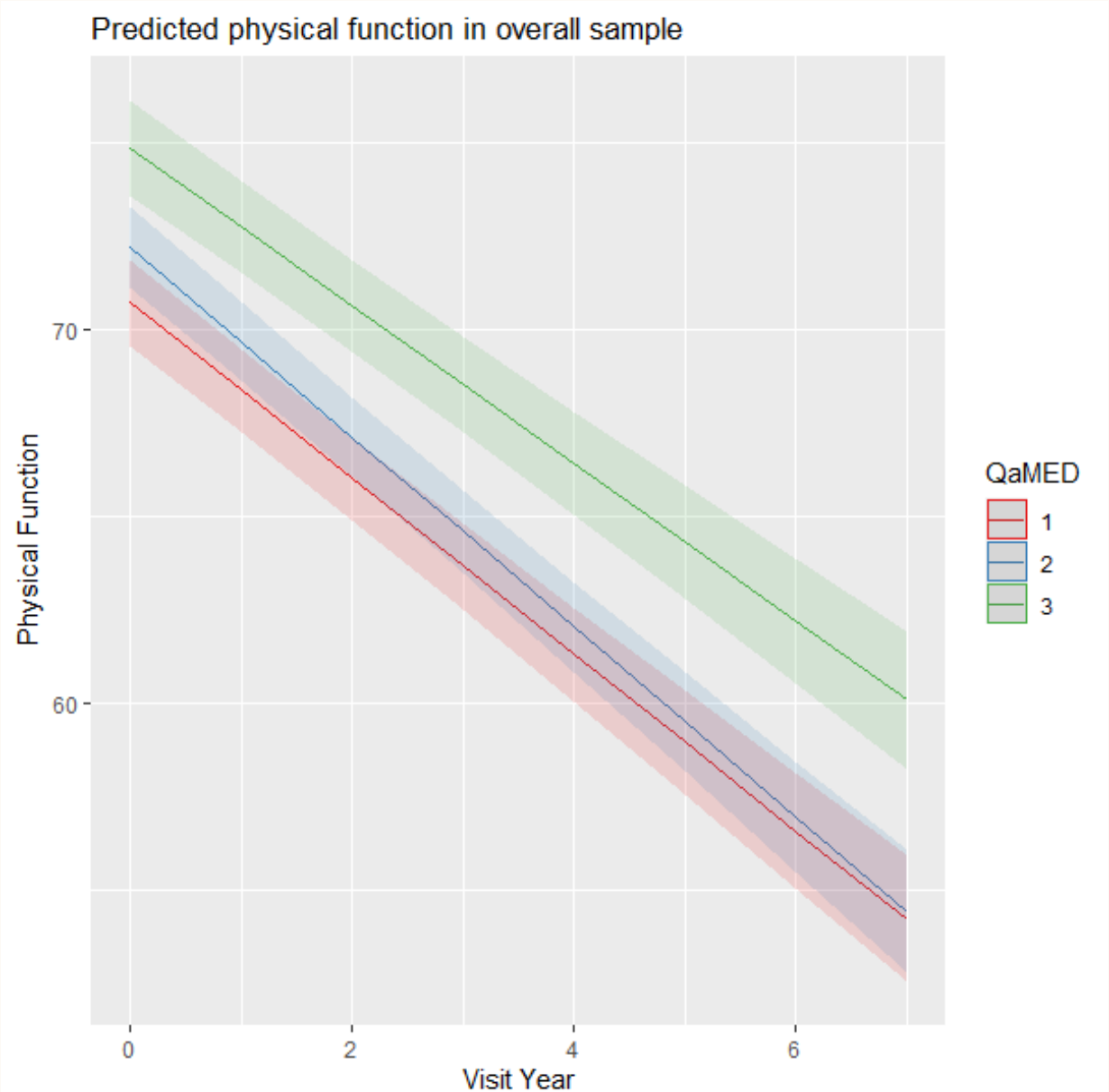
To cite this article: Yan Su, Barbara B. Cochrane, Tinker & Oleg Zaslavsky (2022) Mediterranean Diet : Postmenopausal Women, Journal of Nutrition in Gerontology and Geriatrics, 10.1080/21551197.2022.2025972

To link to this article: <https://doi.org/10.1080/21551197.2022.2025972>

### Substituting Among Foods and Mean Change in Energy



# Mediterranean Diet and Physical Decline Among n=4516 Women Average Age 78 (SD=6.6)

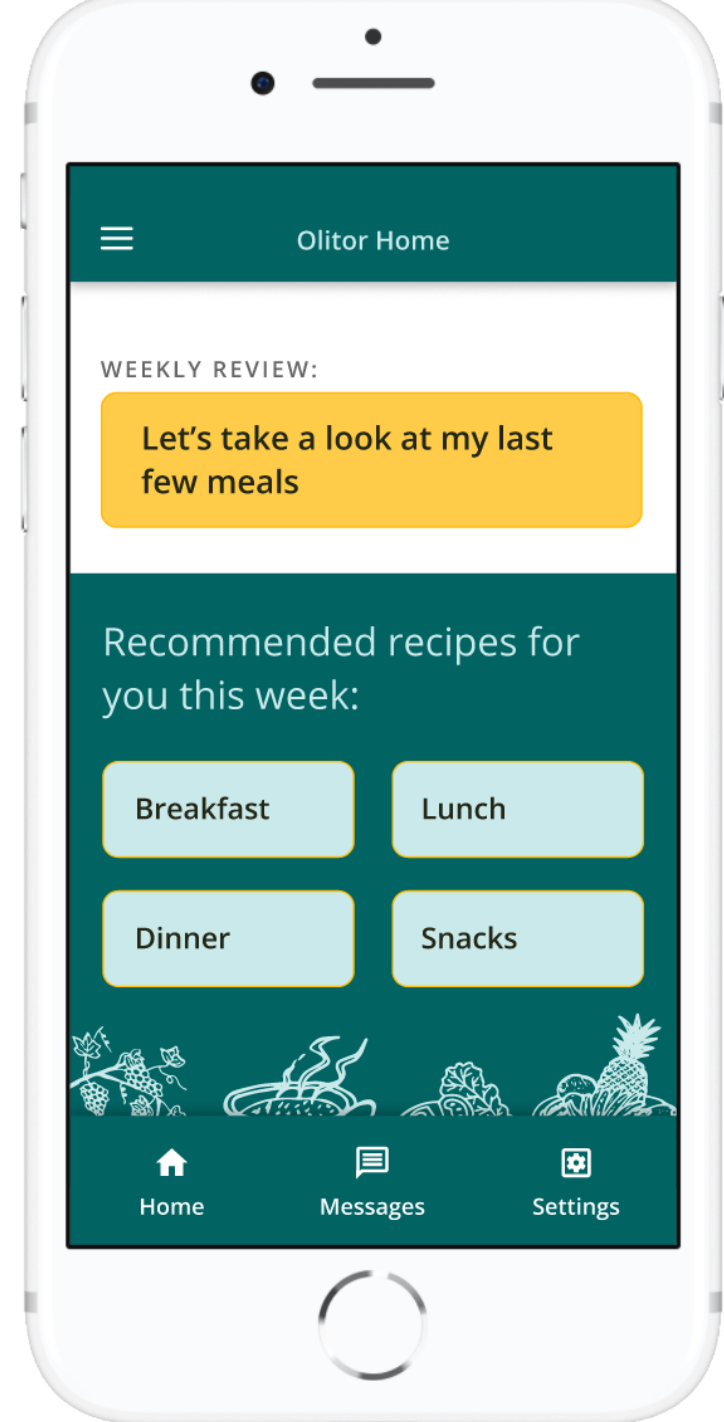




Development and Evaluation of a  
Mobile Health Intervention to Support  
Healthful Dietary Choices in  
Older Persons with Age-Related Changes

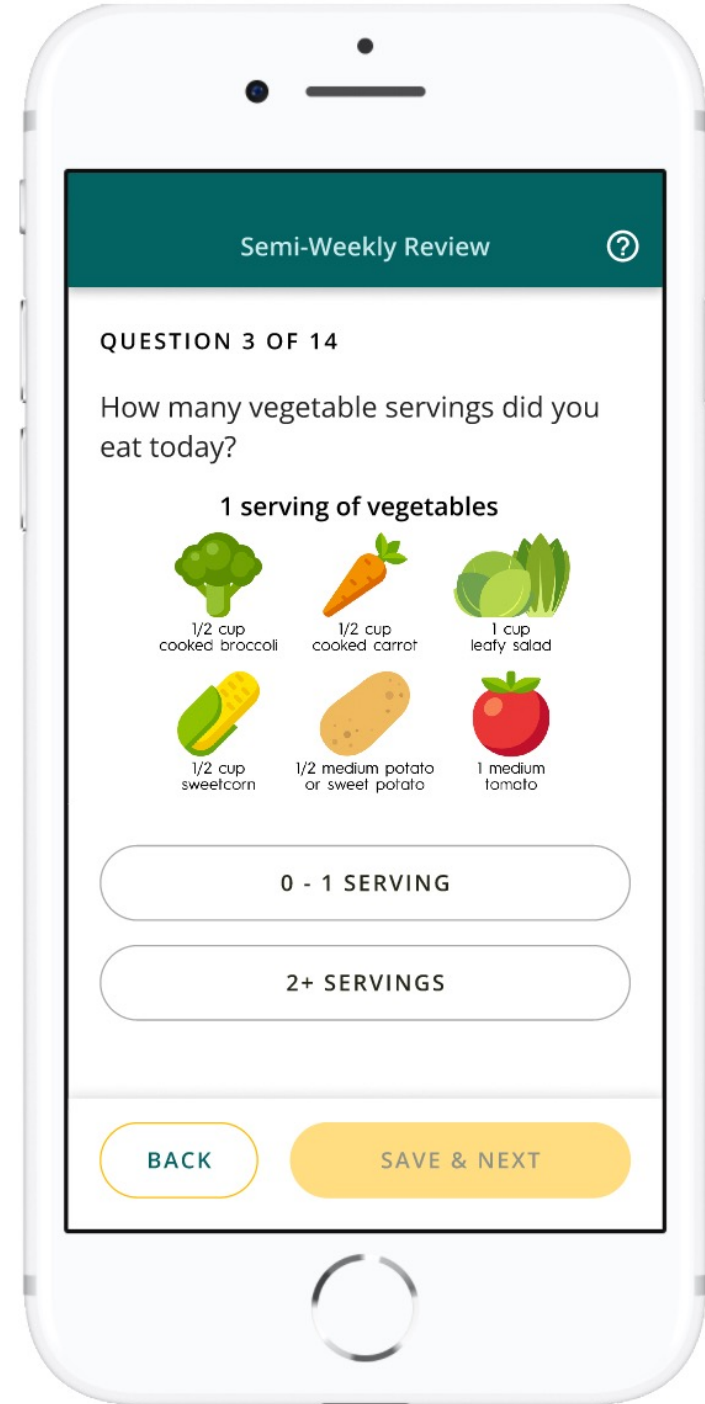


# Olitor





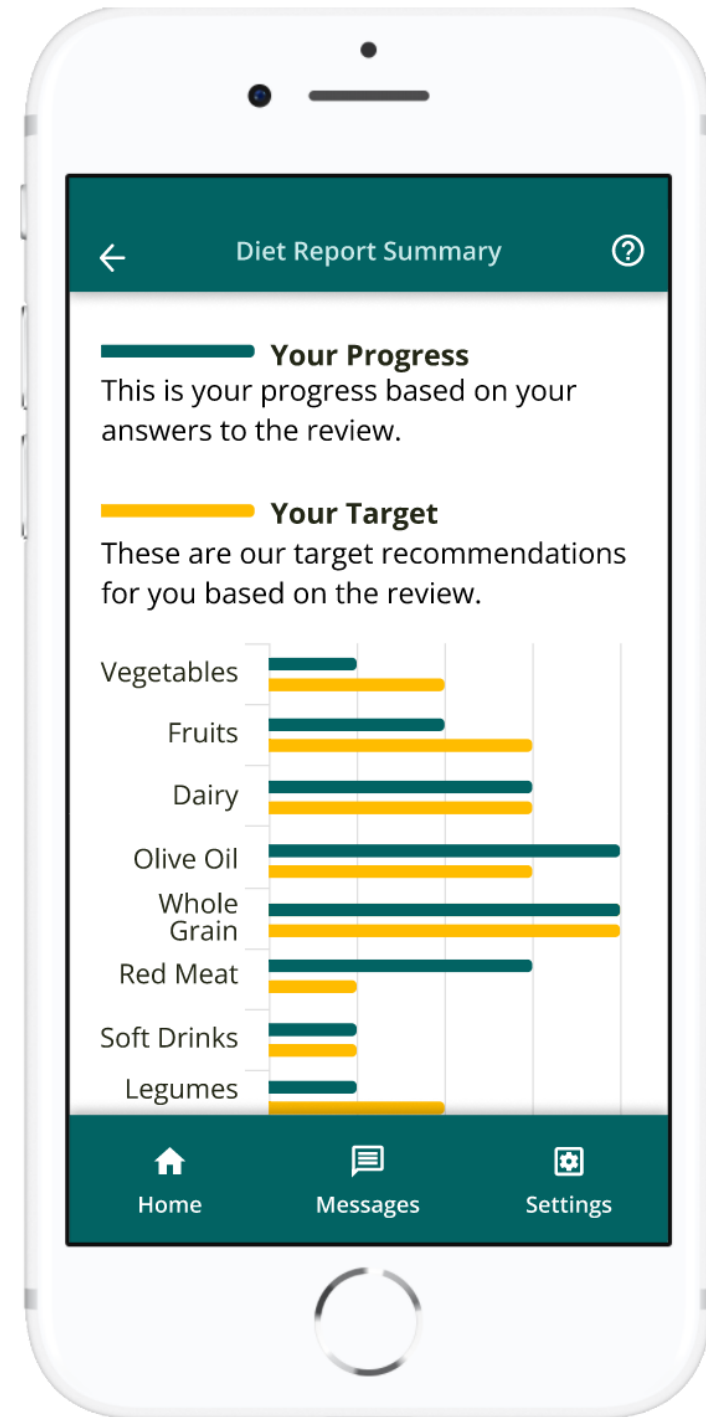
# Olitor





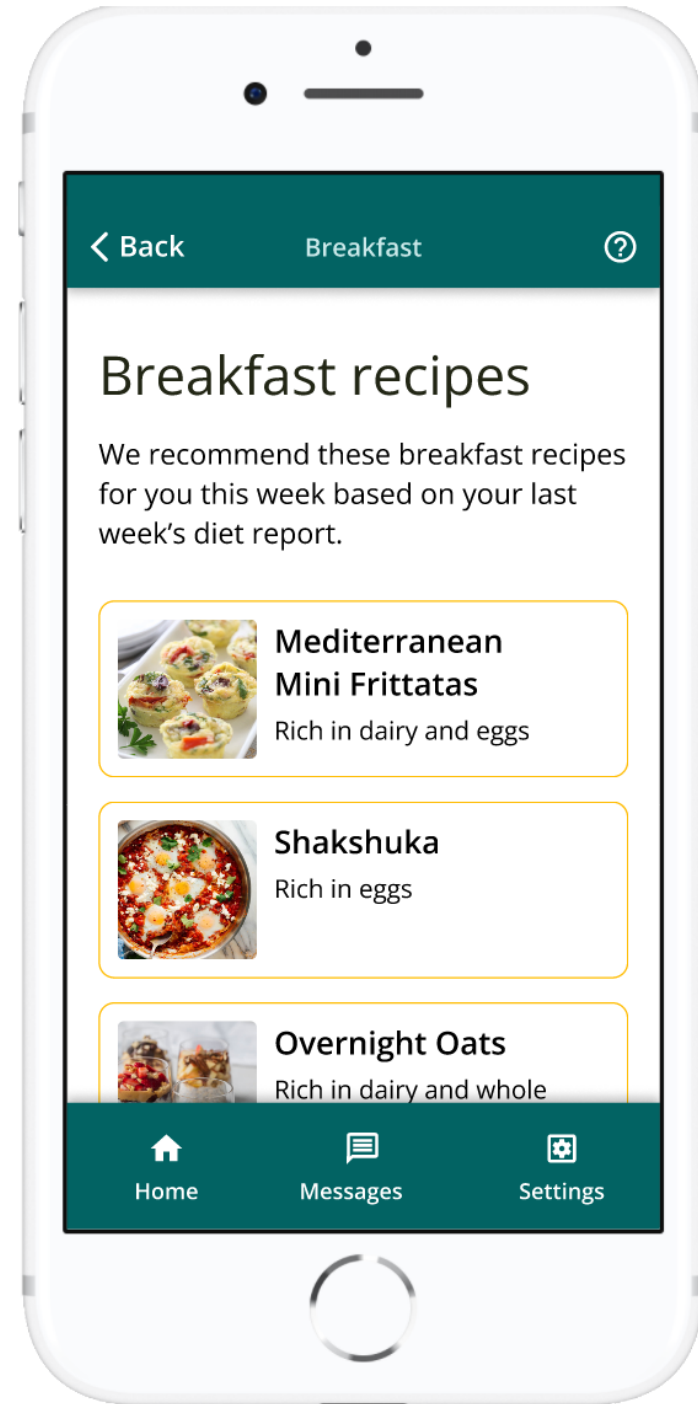


# Olitor



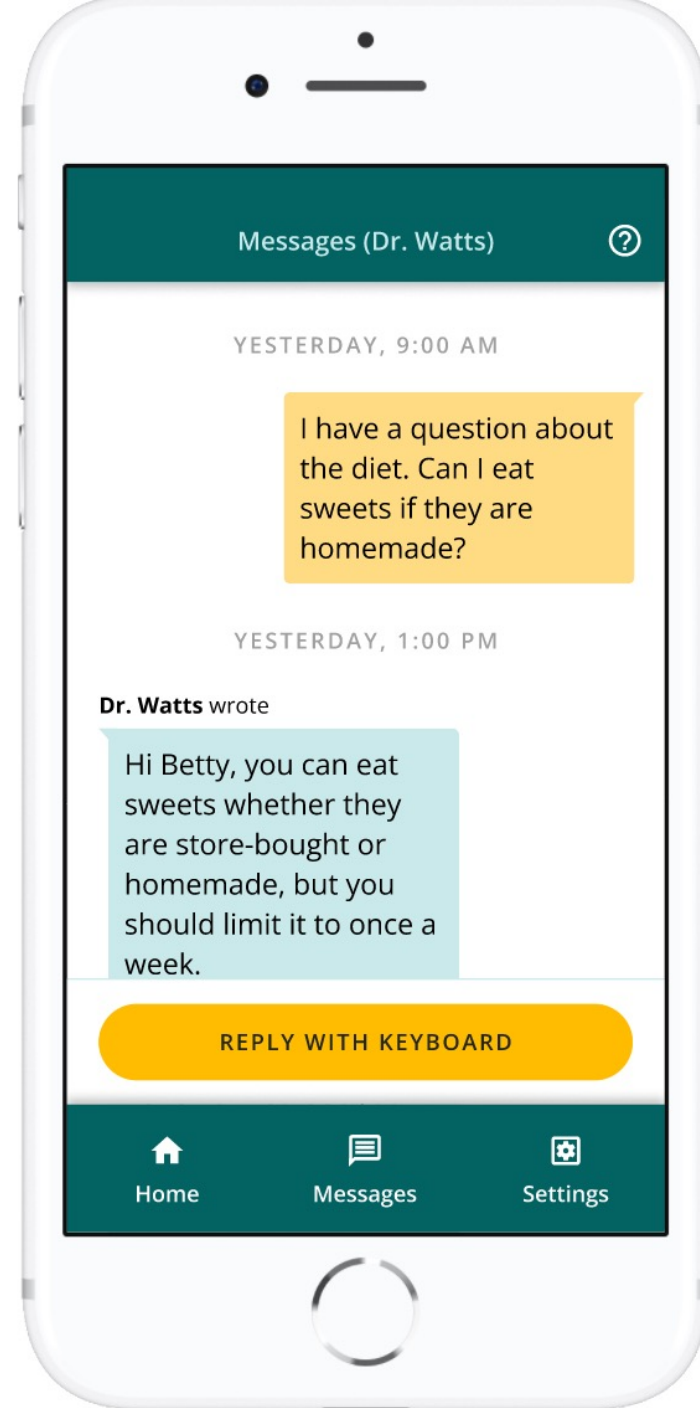


# Olitor





# Olitor





## Survey Manager (04/05-04/12)

### Survey Completion Trend

Past 4 Weeks ▾



### Survey Completion

↑ 25 %

Total 54 patients



### Achieved Goal

↑ 10 %

All completed surveys



### Surveys Not Completed

Sort

<input type="checkbox"/>	Name	Last Completed Survey
<input type="checkbox"/>	Bessie Russell	03/30 - 04/04
<input type="checkbox"/>	Serenity Warren	03/30 - 04/04
<input type="checkbox"/>	Jorge Henry	03/30 - 04/04
<input type="checkbox"/>	Dianne Hawkins	03/30 - 04/04
<input type="checkbox"/>	Ricardo Howard	03/30 - 04/04
<input type="checkbox"/>	Judith Fisher	03/30 - 04/04

Remind

### Meet and Exceed Goal

Sort

<input type="checkbox"/>	Name	Score	Trend
<input type="checkbox"/>	Cameron Bell	13	↑
<input type="checkbox"/>	Arlene Mccoy	13	↑
<input type="checkbox"/>	Cameron Bell	13	↑
<input type="checkbox"/>	Kathryn Cooper	10	↓
<input type="checkbox"/>	Gloria Williamson	9	↑
<input type="checkbox"/>	Jane Flores	9	↑

Encourage

### Below Goal

Sort

<input type="checkbox"/>	Name	Score	Trend
<input type="checkbox"/>	Bernard Pena	5	↓
<input type="checkbox"/>	Arthur Miles	5	↓
<input type="checkbox"/>	Evan Edwards	6	↑
<input type="checkbox"/>	Nathan Alexander	7	↑
<input type="checkbox"/>	Lee Richards	7	↓
<input type="checkbox"/>	Savannah Wilson	8	↓

Send Message

View in Patient Portal

# Chat with Participants

## ep\_08

Hi...a bit of an update: this diet is working well beyond feeling good with more energy. Prior to diet I was to take meds for hypothyroid condition. Before starting med, recently had some blood work. Though only a slight raise, I am now normal and do not need to start on medication...

Thank you for the update. We are happy to hear the diet is working well as far as you feeling better and keeping thyroid condition under control. Eating healthier has marvelous effects on health and well-being

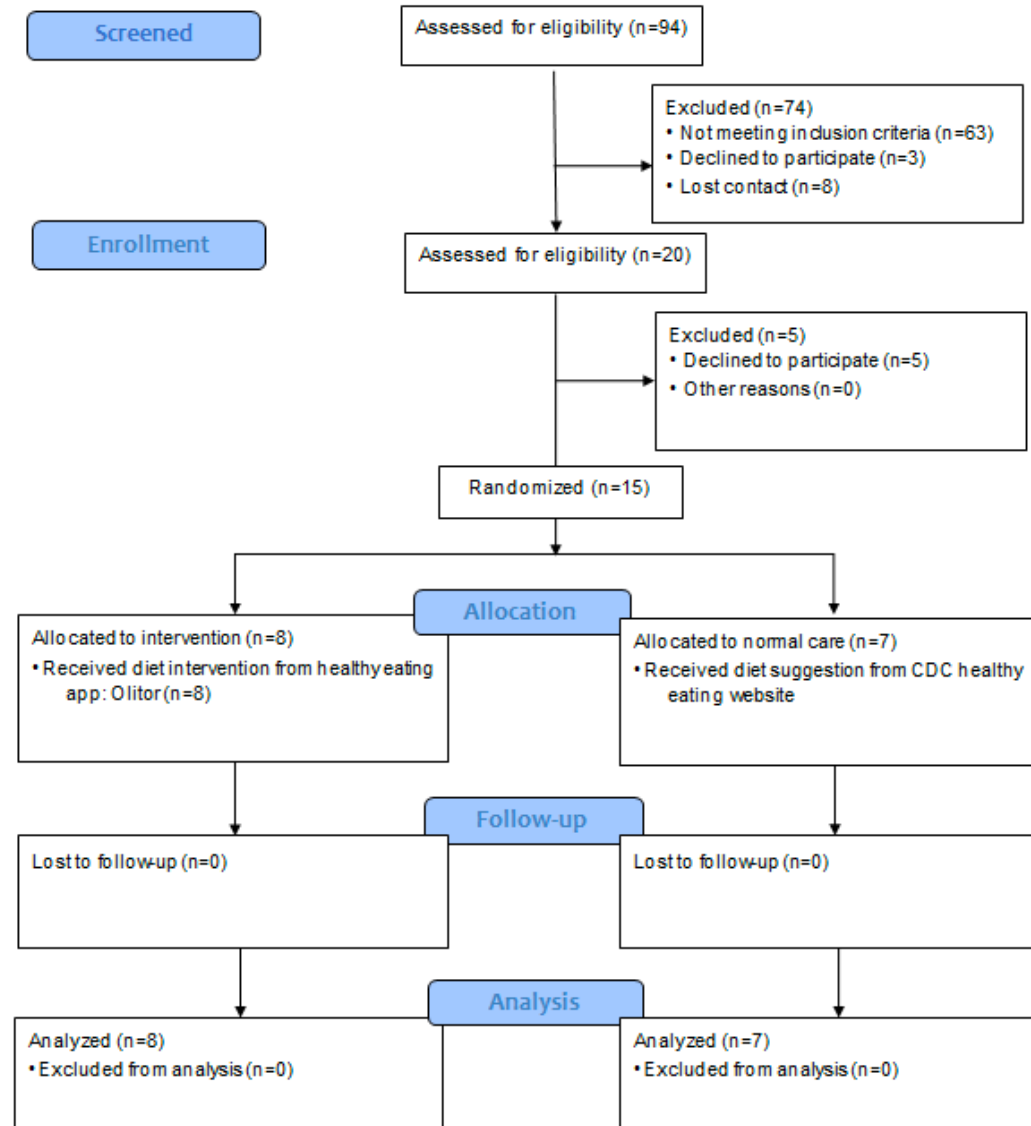
## ep\_02

I am finding the app fun and easy to use. I don't usually eat dairy products because they give me constipation. I don't eat bread and rice because I tend to gain weight when I do. Is that Ok?

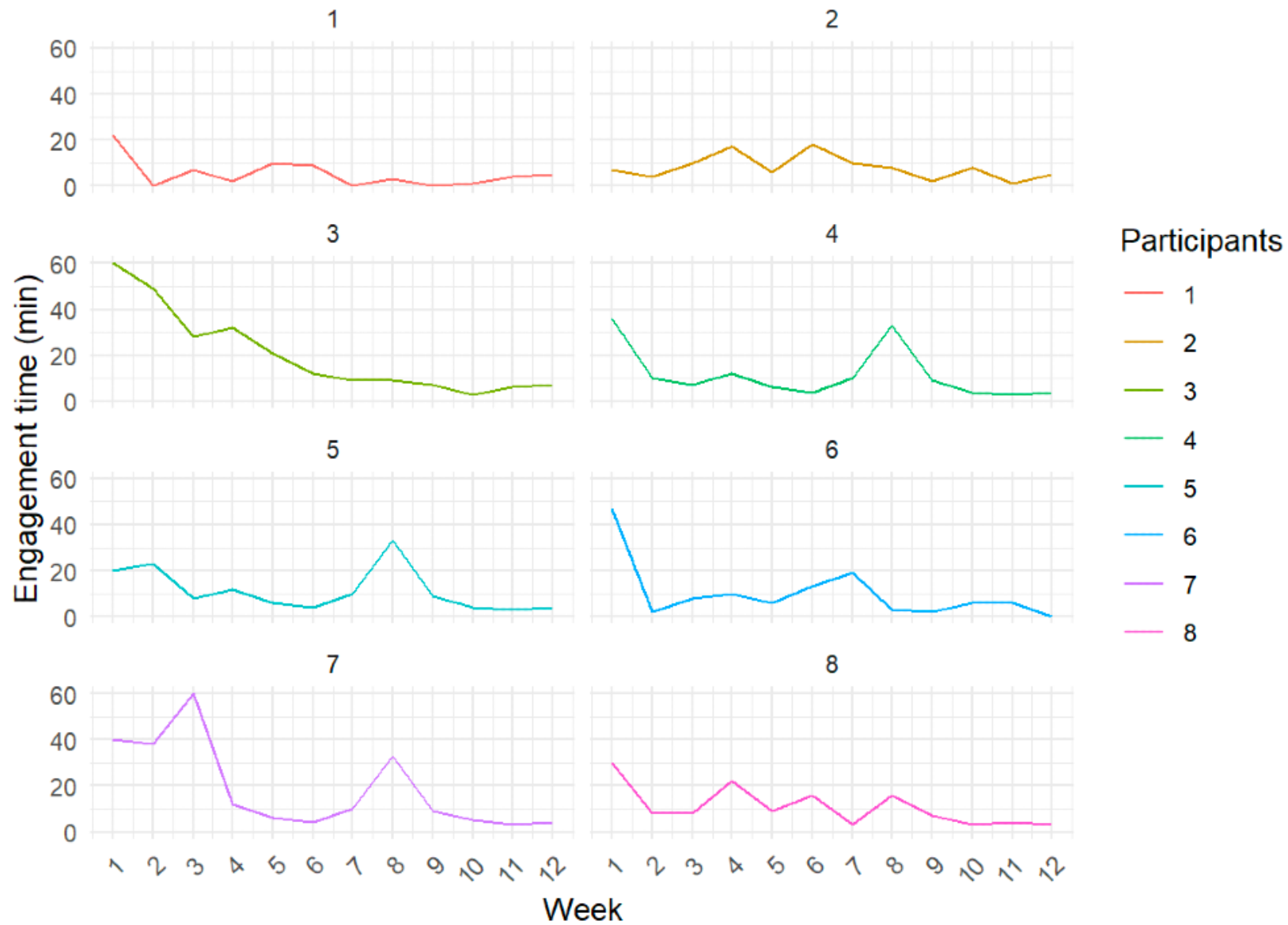
## Kuan-Ching Wu

It's fine! They're just recommendation in healthy diet! Feel free to keep your current diet and tailor the recommendation to your needs!

# CONSORT Diagram



# Engagement



# Results

## Outcomes Hedges'g (95%CI)

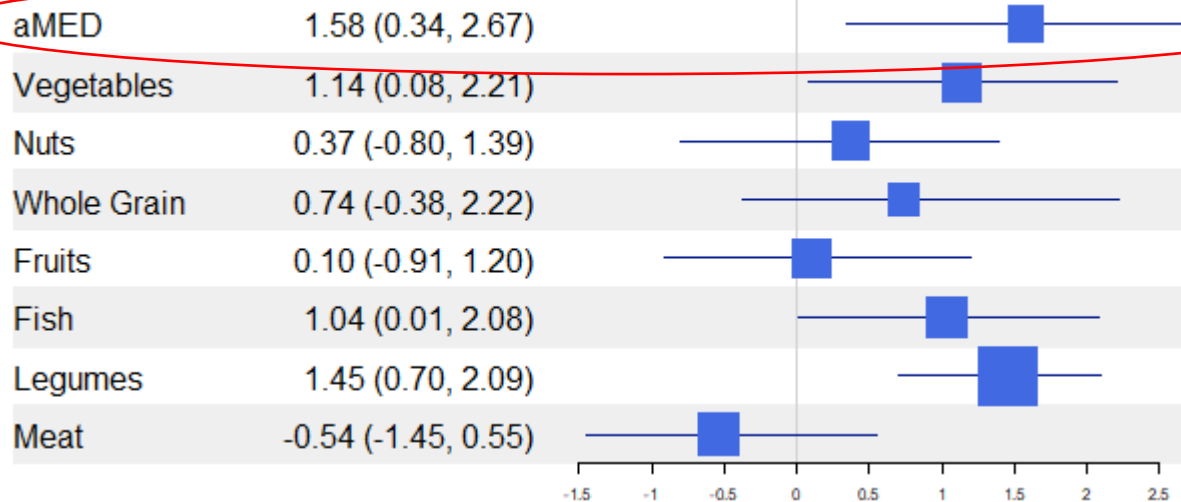
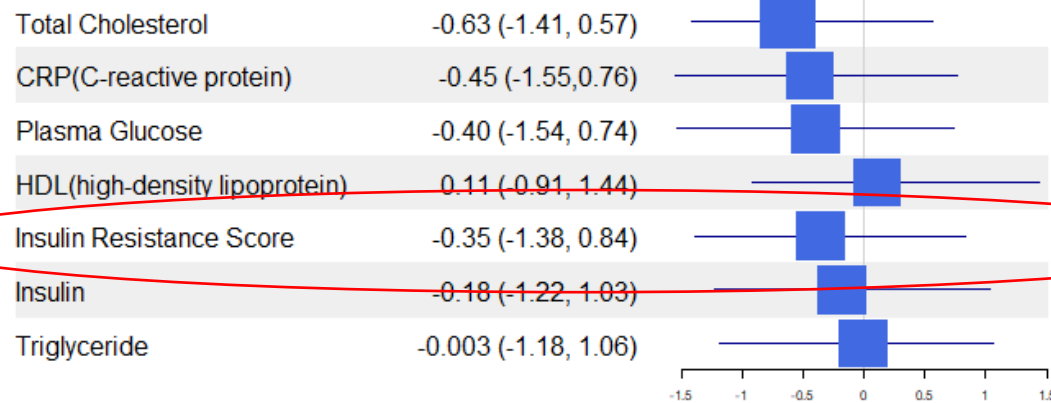


Figure 2: Effect sizes of metabolic outcomes

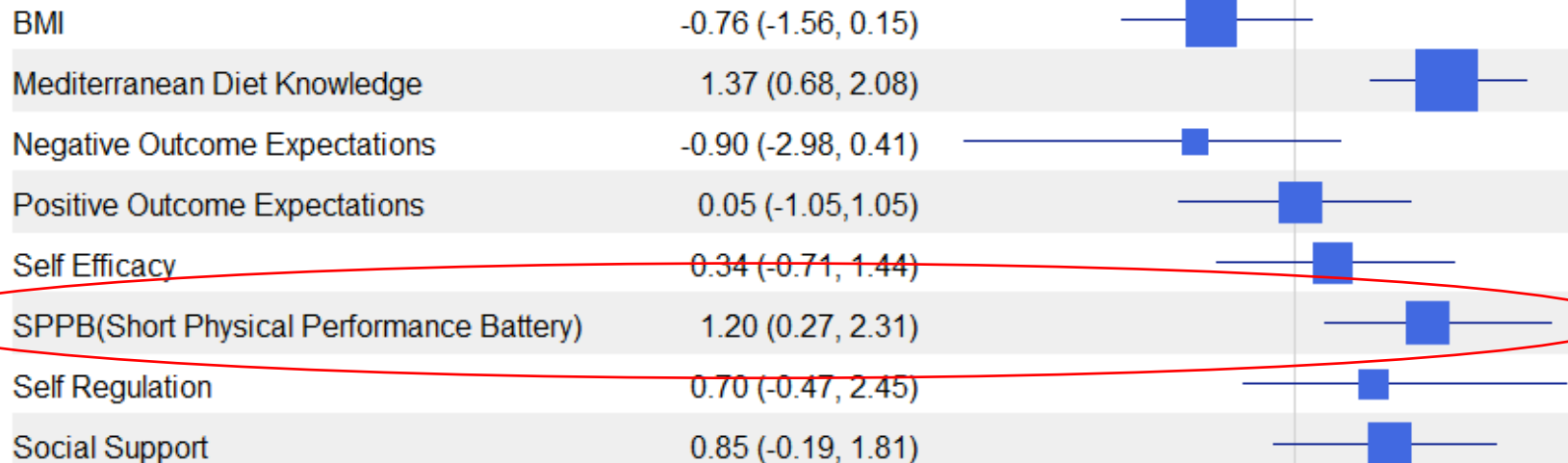
## Outcomes

## Hedges'g (95%CI)



## Outcomes

## Hedges'g (95%CI)





# Conclusion

- **Olitor App:** Demonstrates potential in promoting healthy eating among older adults with frailty.
- **Retention & Adherence:** High retention rates and a notable improvement in Mediterranean diet adherence
- **Usability & Knowledge Growth:** The app is user-friendly, with positive changes in knowledge about the Mediterranean diet.
- **Positive Trends:** Observed in performance measures and behavioral change mechanisms.

**Virtual Intervention for  
Caregivers of Persons Living  
with Lewy Body Dementia**

# Introduction

- **Lewy Body Dementia (LBD)**
  - Second most common dementia type
  - Causes disruptive behaviors and caregiving challenges
- **Caregiver Impact**
  - High stress and depression, exacerbated by pandemic
  - Only 30% receive adequate support
- **Support Gaps**
  - Few tech interventions target LBD-specific needs
  - Lack of fully remote, on-demand solutions

# VOCALE

<b>PART I:</b>	<b>ICE</b>	<b>BREAKERS</b>	<b>AND INTRODUCTIONS</b>
		July 26- August 1	<a href="#">Ice Breaker #0</a>
		August 2-8	<a href="#">Ice Breaker #1</a>
		August 9-15	<a href="#">Ice Breaker #2</a>
<b>PART II:</b>	<b>GENERAL</b>	<b>HEALTH</b>	<b>DISCUSSIONS</b>
	1	August 16-22	<a href="#">Self-Care</a>
	2	August 23-29	<a href="#">Sleep Problems</a>
	3	August 30- September 5	<a href="#">Hallucinations and Delusions</a>  This week, we are also going to be providing you with a questionnaire known as The Problem Solving Inventory (PSI), which allows you to better understand the extent of your problem-solving abilities. This can help you identify where you need improvement and can help others improve. Afterward, we hope you will be better equipped to follow along next week as we learn more about problem-solving skills and how these skills can help you identify and manage future problems, both big and small. Please check your email (from Frances) for a link to the questionnaire.
<b>PART III:</b>	<b>PROBLEM</b>	<b>SOLVING</b>	

Zaslavsky O, Kaneshiro J, Chu F, Teng A, Domoto-Reilly K, Chen AT  
Virtual Intervention for Caregivers of Persons With Lewy Body Dementia: Pilot Quasi-Experimental Single-Arm Study  
JMIR Form Res  
2022;6(7):e37108  
doi: [10.2196/37108](https://doi.org/10.2196/37108)

# VOCALE LBD

[← Click here to go back to the discussion board](#)



Good morning! Please read the prompt below and respond by clicking the 'Reply' button. As a reminder, we ask that all participants comment **at least twice a week** for full participation. Thank you so much and we look forward to a fruitful discussion!

This week, we are going to talk about hallucinations and delusions, which are common among people with LBD.

Many people with LBD experience visual hallucinations, meaning that they see things that aren't there. For example, someone may think they are seeing an intruder trying to come into the house. Non-visual hallucinations (perhaps involving hearing or smell) are less common but can also occur.

Delusions, which are misguided thoughts or opinions not grounded in reality, are also common with LBD. An example of a delusion is that a relative or caregiver has been replaced by an impostor - this is known as Capgras syndrome.

Both hallucinations and delusions can start off as misperceptions, such as seeing shapes or figures in complex patterns on a rug, or in a pile of leaves. Does your loved one experience either or both of these? Let's discuss. Here are some questions to consider:

- Can you describe some of the hallucinations and/or delusions? How often do they happen?
- What do you do when your loved one experiences hallucinations and/or delusions?
- How have they affected your loved one and yourself?
- Do you have any questions about hallucinations and delusions and what to do about them?
- Is there anything that you wish you knew about how to manage them better?

Click 'Reply' and please comment on your experiences below and respond to other participants.

▼ (1) Pam and Jim (click to expand)

In this scenario, we are going to try and help Pam, a person who is a caregiver for Jim. Jim has Lewy Body Dementia (LBD). We will help Pam with problem-solving. First, let's focus on helping Pam define her problems and her goals. Then, we'll help her solve them.

## Pam and Jim



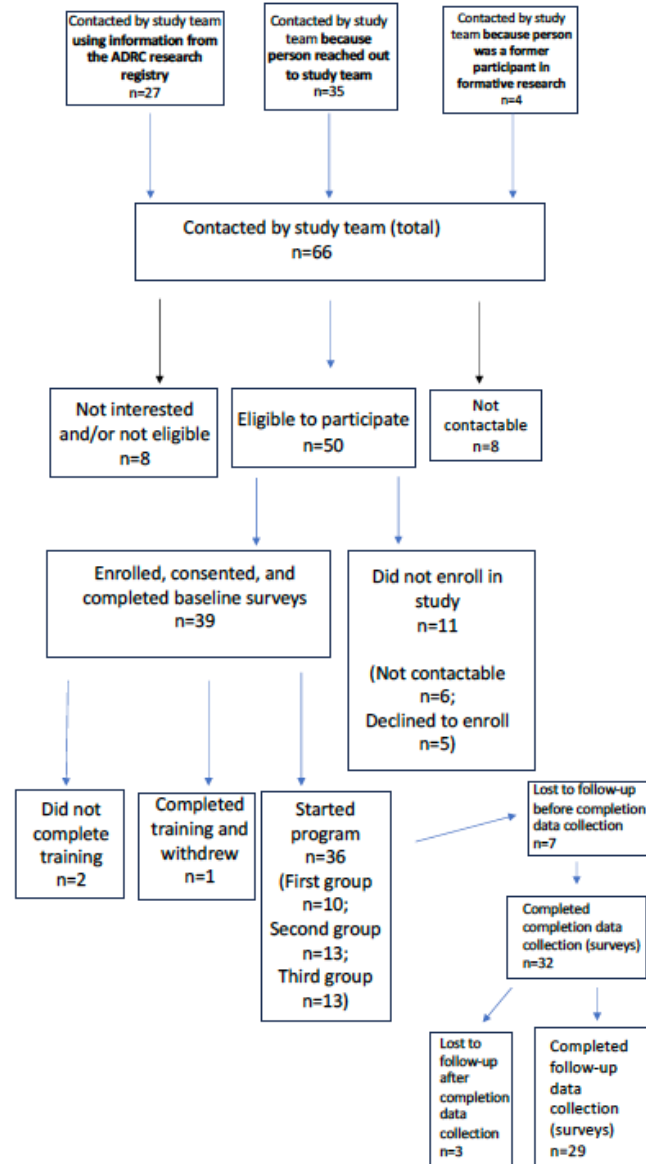
Pam is 69 years old and is a caregiver for her husband Jim, who is 70 years old. Jim needs help all the time. Their adult son, Steve, lives a few minutes away and helps with caregiving too. Pam tries her best to provide good care to Jim, who has a diagnosis of Lewy Body Dementia (LBD) and is experiencing symptoms including memory loss, trouble communicating, visual hallucinations, tremors, and sleep changes. Jim also has high blood pressure and diabetes.

Because of Jim's symptoms, Pam has to be by his side almost all the time during the day. Pam also often has to help Jim overnight. Recently, Pam started to experience pain in her back and joints. This affects her ability to take care of Jim. Pam is a bit frustrated about this. Even though life has become more difficult for Pam, she tries not to tell their children about her concerns because she does not want to be a burden.

### Details about Pam:

- **Support community:** Husband, adult son
- **Personality:** Not very social
- **Location of residence:** House in a town in WA state
- **Health symptoms:** Joint and back pain, trouble sleeping
- **Technology access:** Uses a computer every day to play solitaire
- **Sources of health information:** TV, healthcare providers
- **Goals:** Improve ability to take care of Jim and manage her own health

# CONSORT Diagram



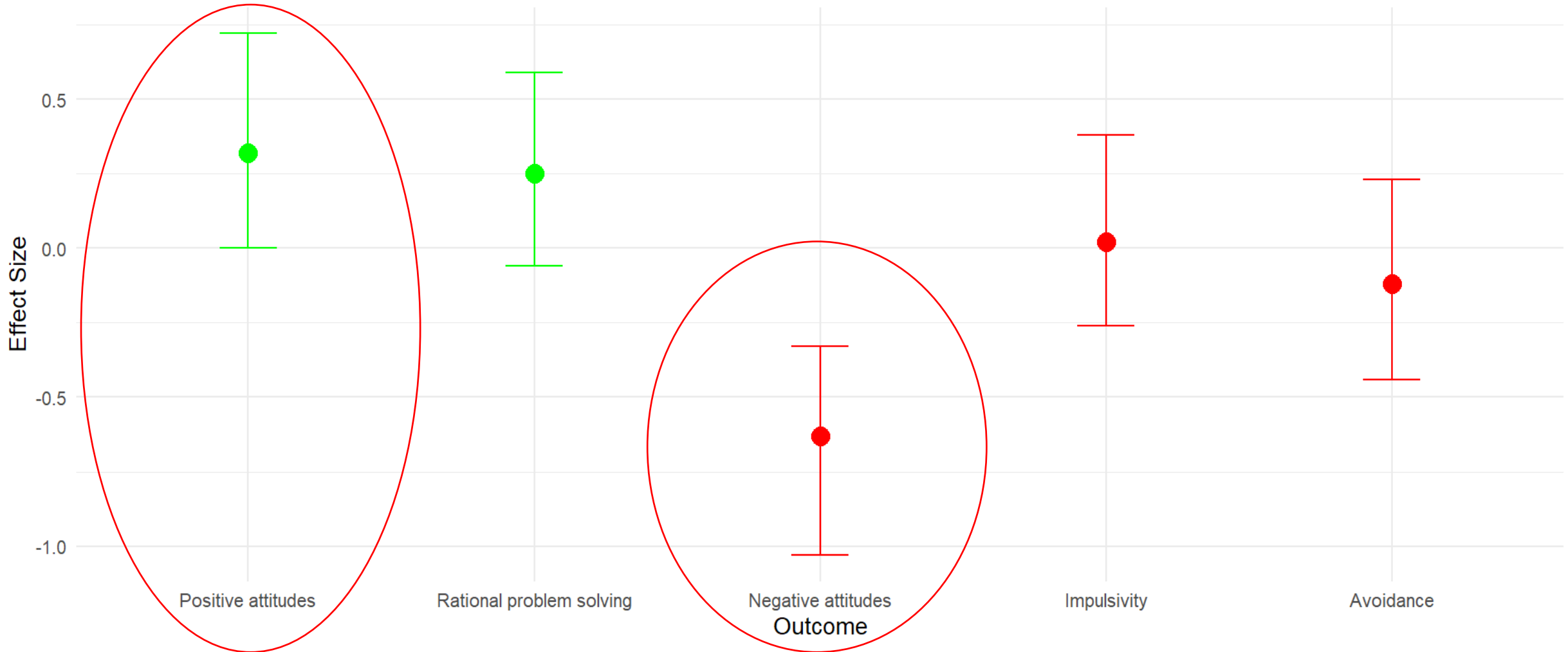
# Results

Effect Sizes with Bootstrapped 95% Confidence Interval (CI)

	Baseline (Pre) (n=54)	Post-intervention (n=44)	Follow up (n=29)	Pre-post effect size (n=44)	Pre-follow-up effect size (n=29)
Variable	Mean (SD)	Mean (SD)	Mean (SD)	Cohen's d	Cohen's d
Depressive Symptoms <sup>1</sup>	13.94 (9.18)	10.48 (6.97)	9.10 (5.63)	-0.35 (-0.65, - 0.06)	-0.54 (-0.86, - 0.23)
Perceived stress <sup>2</sup>	17.04 (6.65)	14.18 (6.36)	13.72 (5.41)	-0.32 (-0.61, - 0.03)	-0.45 (-0.88, - 0.07)
Social support <sup>3</sup>	31.33 (8.14)	34.34 (6.98)	35.90 (6.38)	0.31 (0.08, 0.57)	0.46 (0.10, 0.85)
Caregiving Burden <sup>4</sup>	20.63 (7.64)	17.86 (8.48)	18.21 (8.05)	-0.26 (-0.48, - 0.04)	-0.26 (-0.61, 0.04)

# Results

Effect Size and Bootstrap Confidence Intervals for Five Outcomes (green: higher more positive; red: higher, more negative)





# Conclusion

- **Intervention Impact**

- Depression improvement: Effect size 0.54

- **Enhanced Over Time**

- Depression Reduction: +52%
- Social support: +48%
- Stress reduction: +41%

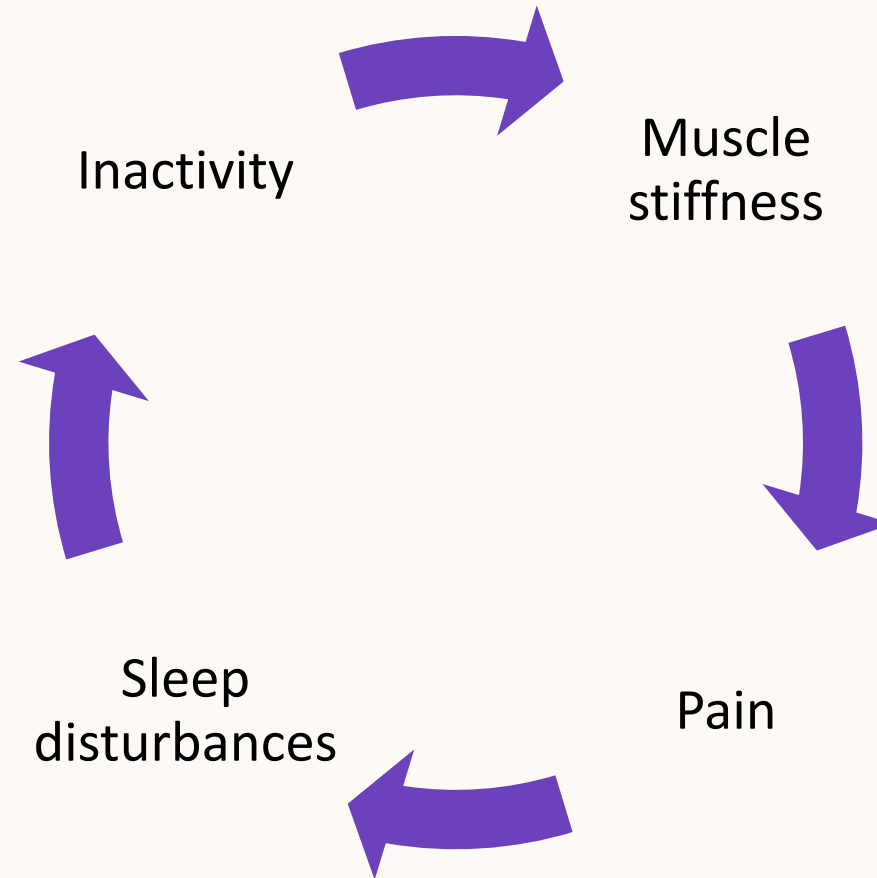
- **Long-Term Benefits**

- Improved problem-solving
- Sustained skill retention



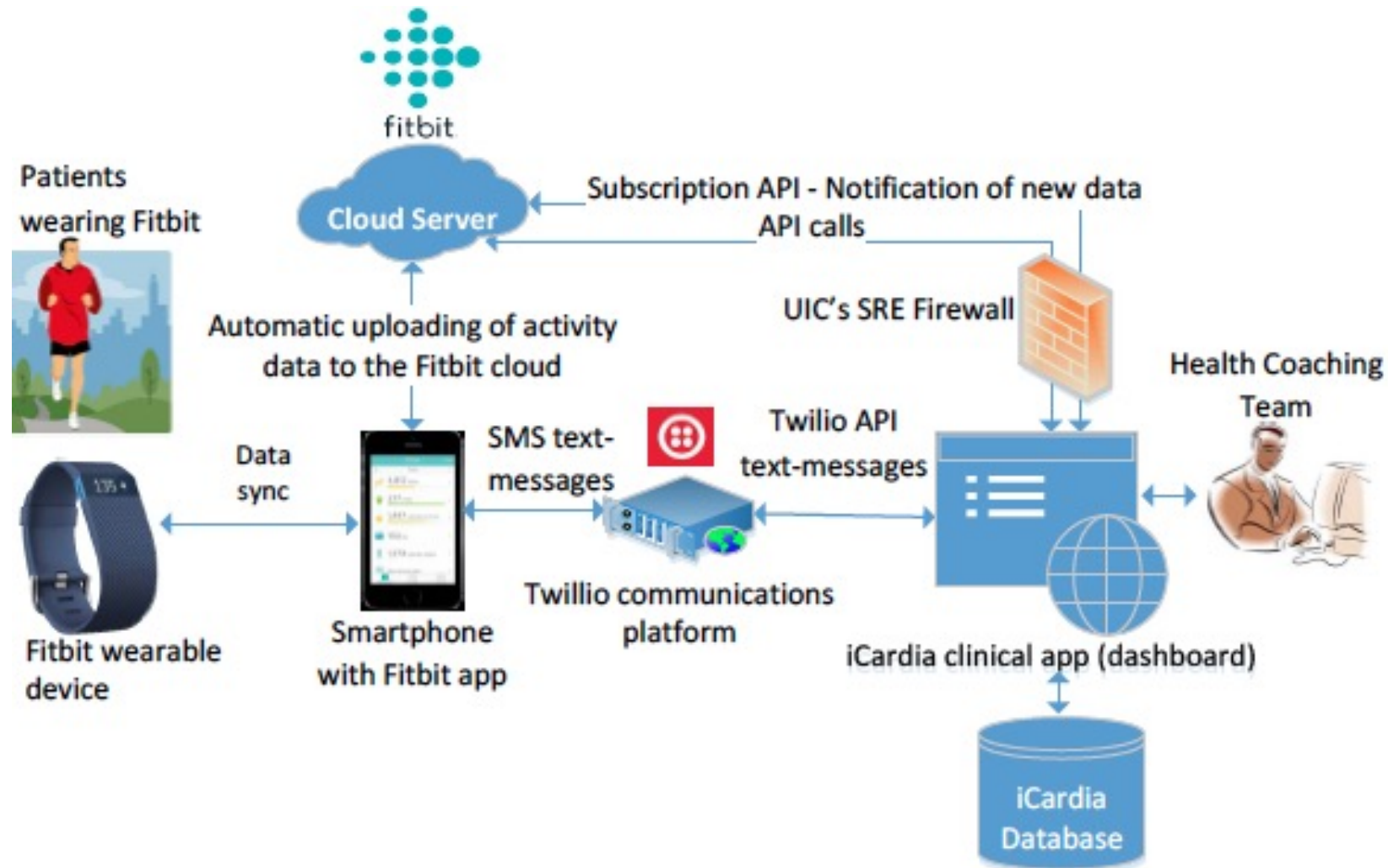
# Behavioral Activation Using Wearables in Adults 65+ with Chronic Conditions

# Introduction



Zaslavsky O, Thompson HJ, McCurry SM, Landis CA, Kitsiou S, Ward TM, Heitkemper MM, Demiris G. Use of a Wearable Technology and Motivational Interviews to Improve Sleep in Older Persons with Osteoarthritis and Sleep Disturbance: Pilot Study. *Res Gerontol Nurs.* 2019 Jul 1;12(4):167-173. doi: 10.3928/19404921-20190319-02.

# IT Architecture



Measure	Baseline (n=24)	Week 14 (n=23)	Week 19 (n=22)	Estimate (95% CI)	P value
Wear Time, hr/day	20.4 (2.2)	20.9 (2.3)	20.9 (2.4)	0.4 (-0.4 ; 1.1)	0.3
Step Count, step/days	5016 (2524)	5286 (2381)	5262 (2470)	44 (-321 ; 410)	0.8
Total Sleep Time, min	422.7 (72.8)	418.0 (76.1)	414.2 (65.8)	-4.5 (-13.4; 4.4)	0.32
<u>Insomnia Severity Index</u>	14.6 (5.7)	12.2 (6.7)	11.8 (6.3)	-1.24 (-2.4 ; -0.1)	<b>0.04</b>
Acceptance of Sleep Difficulties	24.0 (8.3)	30.4 (7.7)	28.9 (6.8)	2.49 (0.9 ; 4.1)	<b>0.002</b>
Sleep Efficiency, %	78.3 (9.9)	81.6 (8.6)	81.0 (9.8)	1.7 (-0.1; 3.4)	0.06
Sleep Quality	5.4 (1.2)	5.5 (1.3)	6 (1.2)	0.3 (0.1; 0.6)	<b>0.04</b>

# Conclusion

- High retention (96%) and Fitbit use
- Personalized communication boosted engagement
- Minor increase in physical activity
- Notable benefits in sleep and insomnia

# Summary and Key Takeaways

## 1. Mobile Intervention for Mediterranean-Style Eating

**Outcome:** Significant improvements in eating habits and physical well-being.

## 2. Web-Based Virtual Community

**Outcome:** Enabled a supportive community, healthier living strategies, and better psychological health and problem-solving skills for age-related issues.

## 3. Wearable Fitness Device

**Outcome:** Increased physical activity, more walking, and improved sleep in older adults with chronic joint disease.

Special thanks to our academic  
and community partners





# Questions?

Contact: [ozasl@uw.edu](mailto:ozasl@uw.edu)