

—  
THE **TeleBehavioral Health Summit**  
—

Welcome!

Title: Find the mobile health needle in a haystack: Putting mHealth to use for you and your clients

Speaker: Justin Tauscher, PhD LMHC

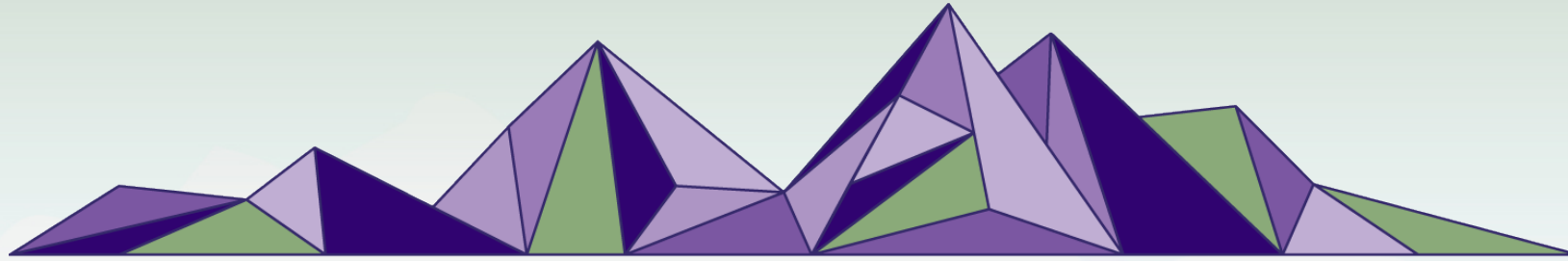


## A few notes.....

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- ✓ Today's talk is purely for informational purposes; and is not to be regarded as legal advice. Please consult with legal counsel, as well as current legislative and regulatory sources, for accurate and up-to-date information.
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  - ✓ WHOVA chat for logistics questions and technical support.
- ✓ Evaluation → Certificate of Attendance and/or CME credits.

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# THE **TeleBehavioral Health Summit**

Finding a mobile health needle in a  
haystack: Putting mHealth to use for you  
and your clients

Justin Tauscher, PhD LMHC

BRiTE Center, Department of Psychiatry and Behavioral Sciences

University of Washington

**UW Medicine**  
HARBORVIEW  
MEDICAL CENTER  
BEHAVIORAL HEALTH INSTITUTE



Washington State  
**Health Care Authority**

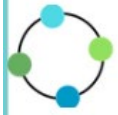
# Learning Objectives

1. Identify methods for locating behavioral health focused mobile health applications
2. Articulate strategies for evaluating behavioral health mobile applications
3. Describe approaches for integrating mobile health approaches into care

# BRiTE Center



[www.brite.uw.edu](http://www.brite.uw.edu)



## Programs of Research

mHealth for Mental Health Program

Technology Assisted Addiction Recovery

Natural Language Processing (NLP) & Training Providers

Automated Analysis of Speech and Language

mHealth in Low and Middle Income Countries

mHealth for the Elderly

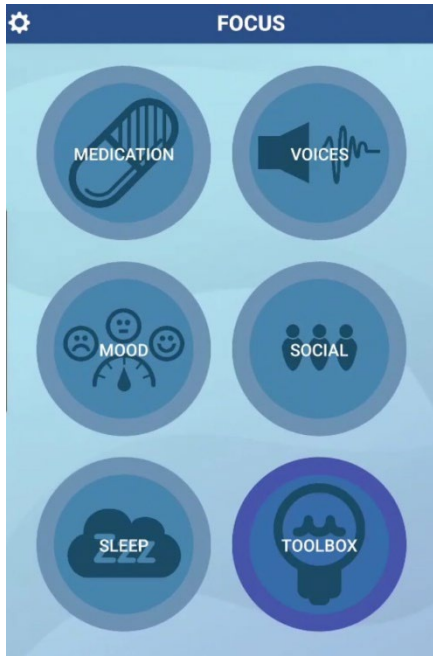
Behavioral Sensing

mHealth for First Episode Psychosis

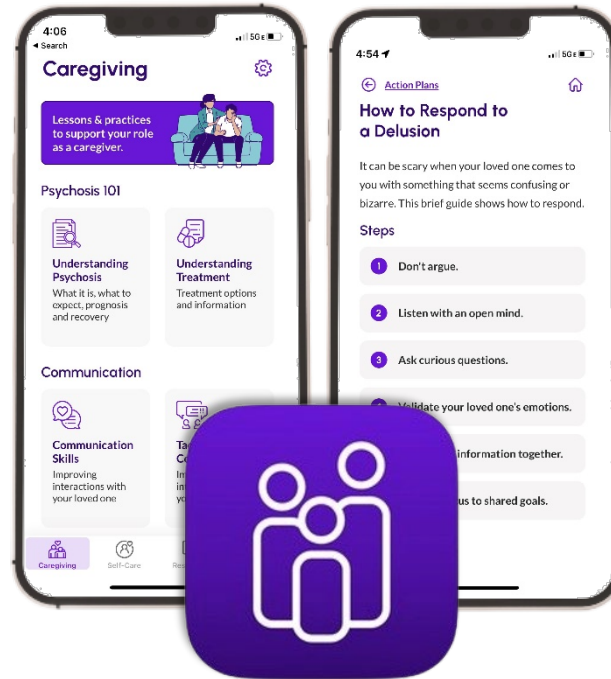
Professional to Plain Language Neural Translation







... fall asleep last night until 1am. And this  
 ... almost like I was going to pass out. I passed  
 ... now I felt right before and that is how I felt this  
 ... I don't think I'm doing to do much today.  
 ... desperate. Idk if I can handle my money or tackle  
 ... better decisions for myself, and not let people use  
 ... the way I wanted to.



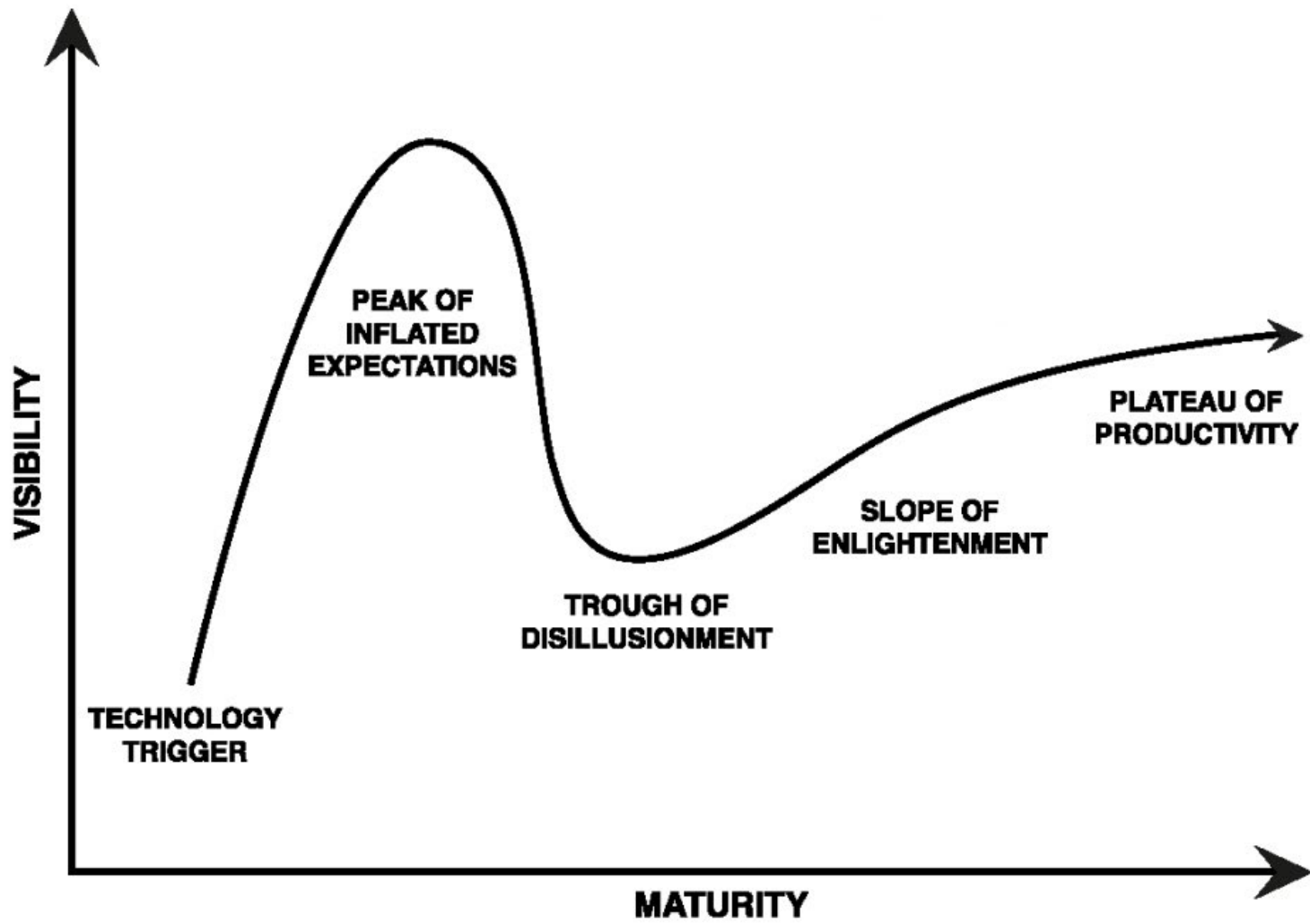
# mHealth: What is it?





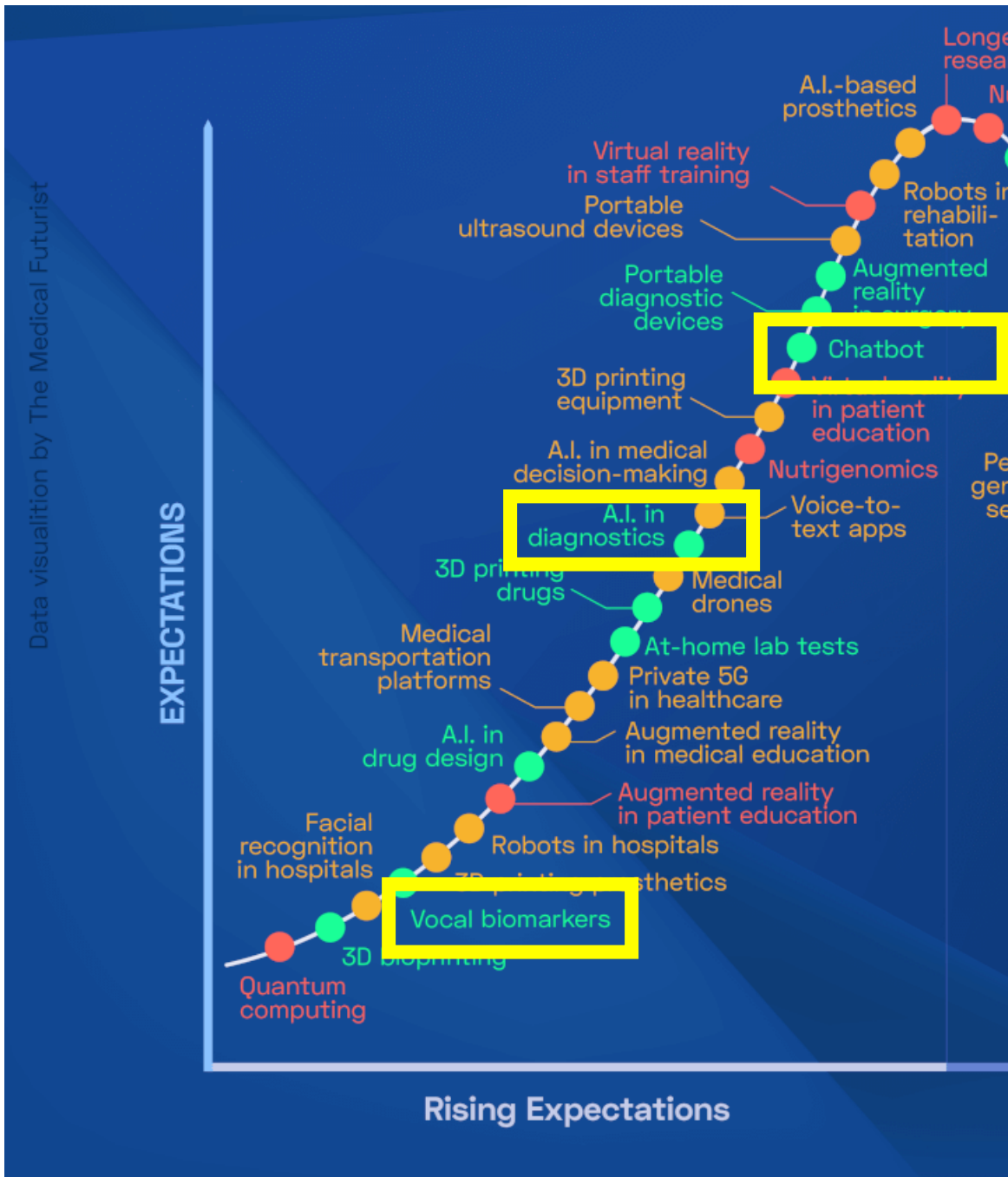
**mHealth** (Mobile Health) is a medical, behavioral health, or public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, and other wireless devices.





# Hype Cycle Of The Top 50 Emerging Digital Health Trends



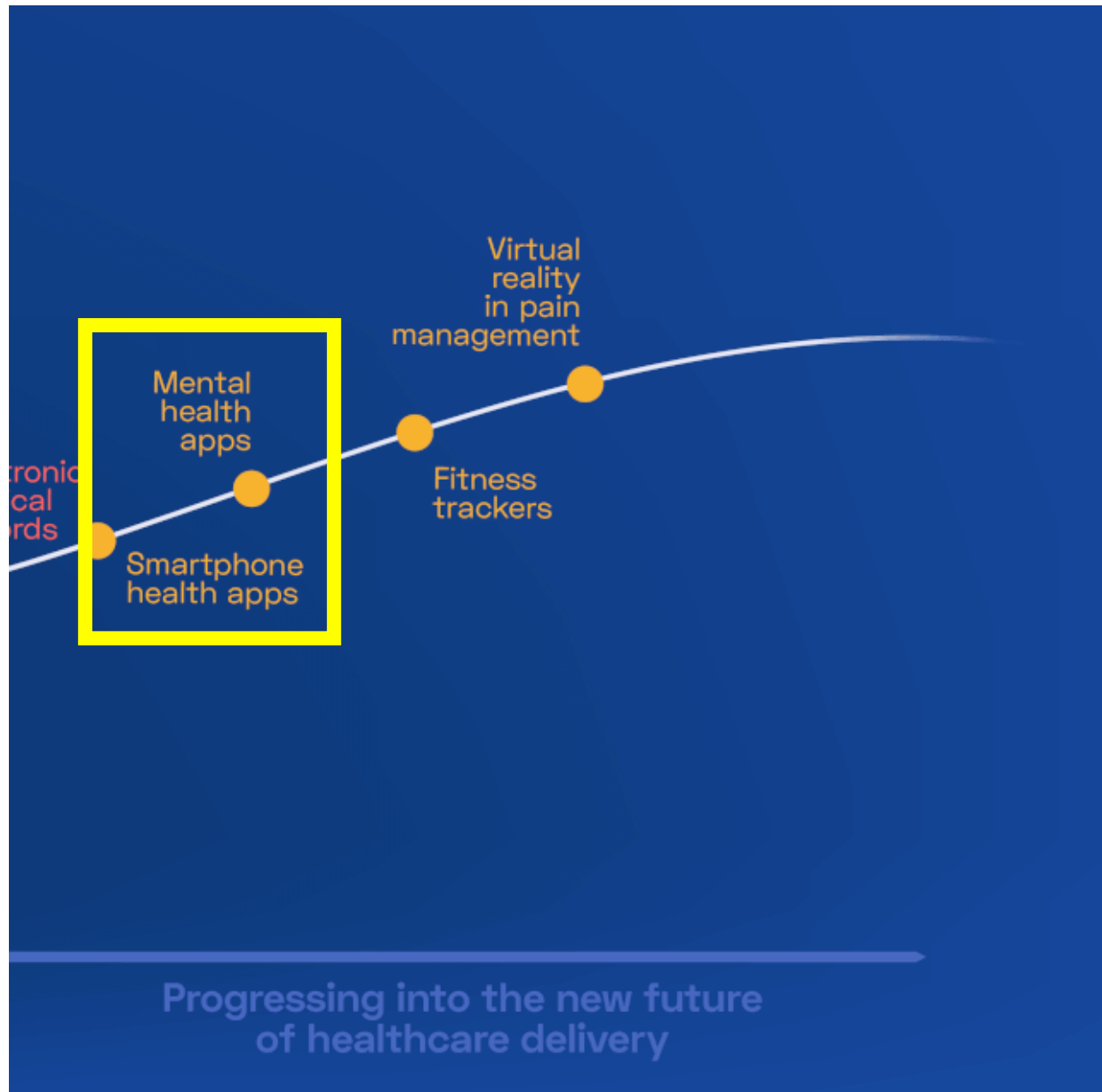


Rising toward the peak of expectations





Cruising through the trough of disillusionment

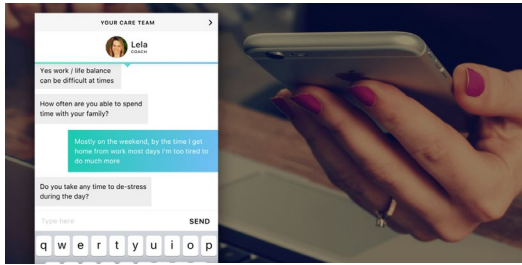


Finding practical application through the slope of enlightenment and plateau of productivity

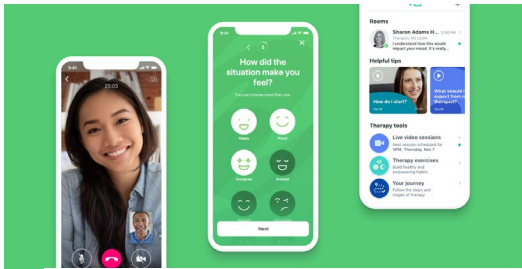


# Examples of mHealth in Mental Health

## Video Therapy / Text

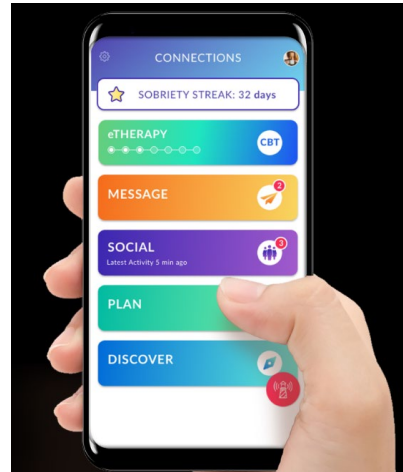


ginger



talkspace

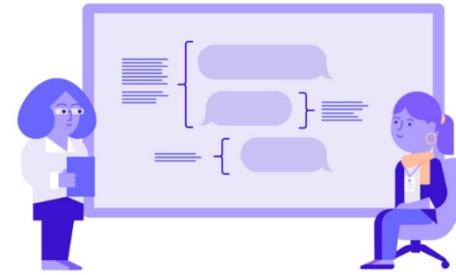
## Monitoring / Assessment



CHESHEALTH  
Real Evidence. Real Recovery.

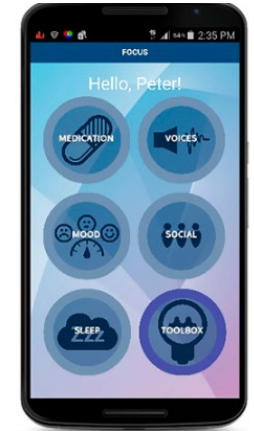


## Clinician Training



LYSSN

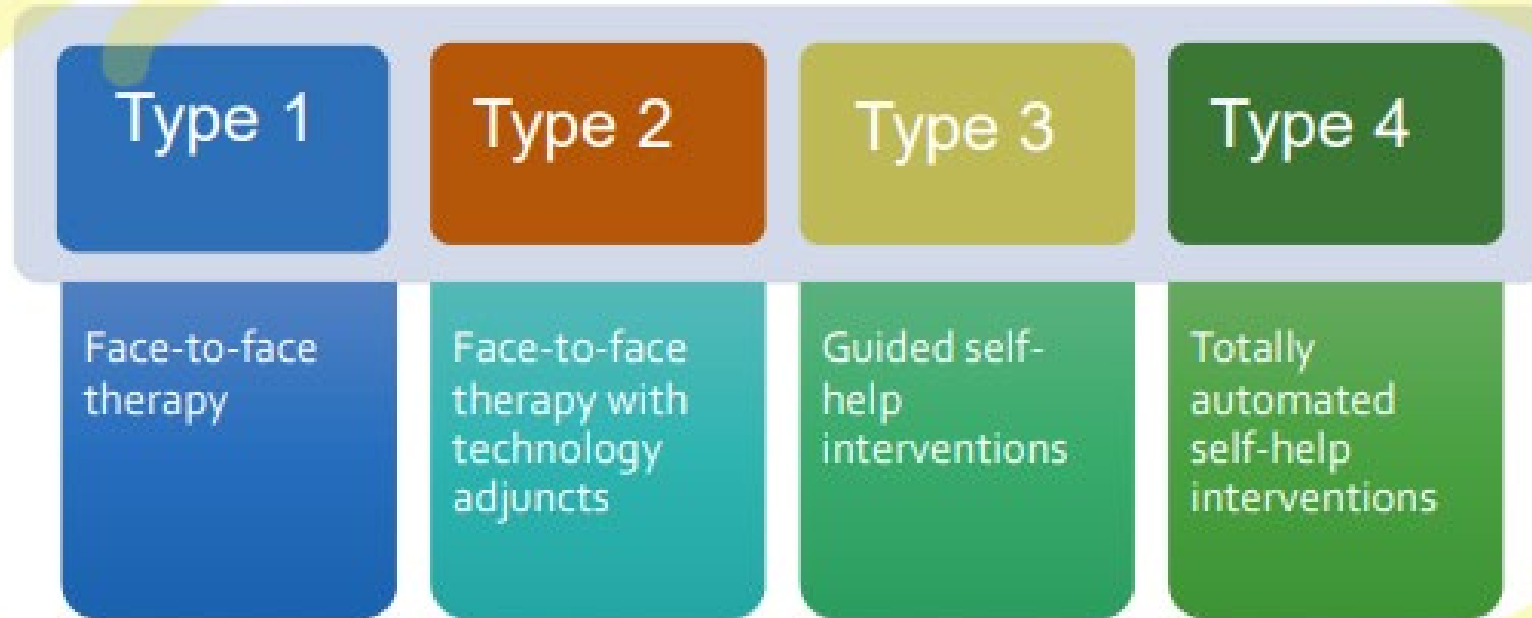
## Self Management



FOCUS



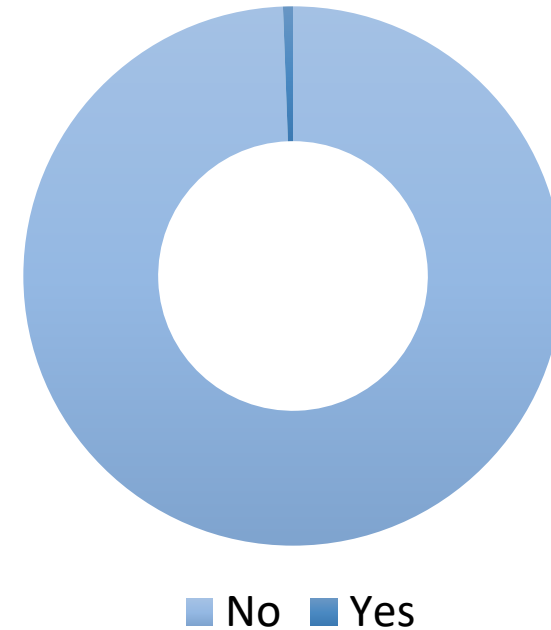
## A Taxonomy of Interventions



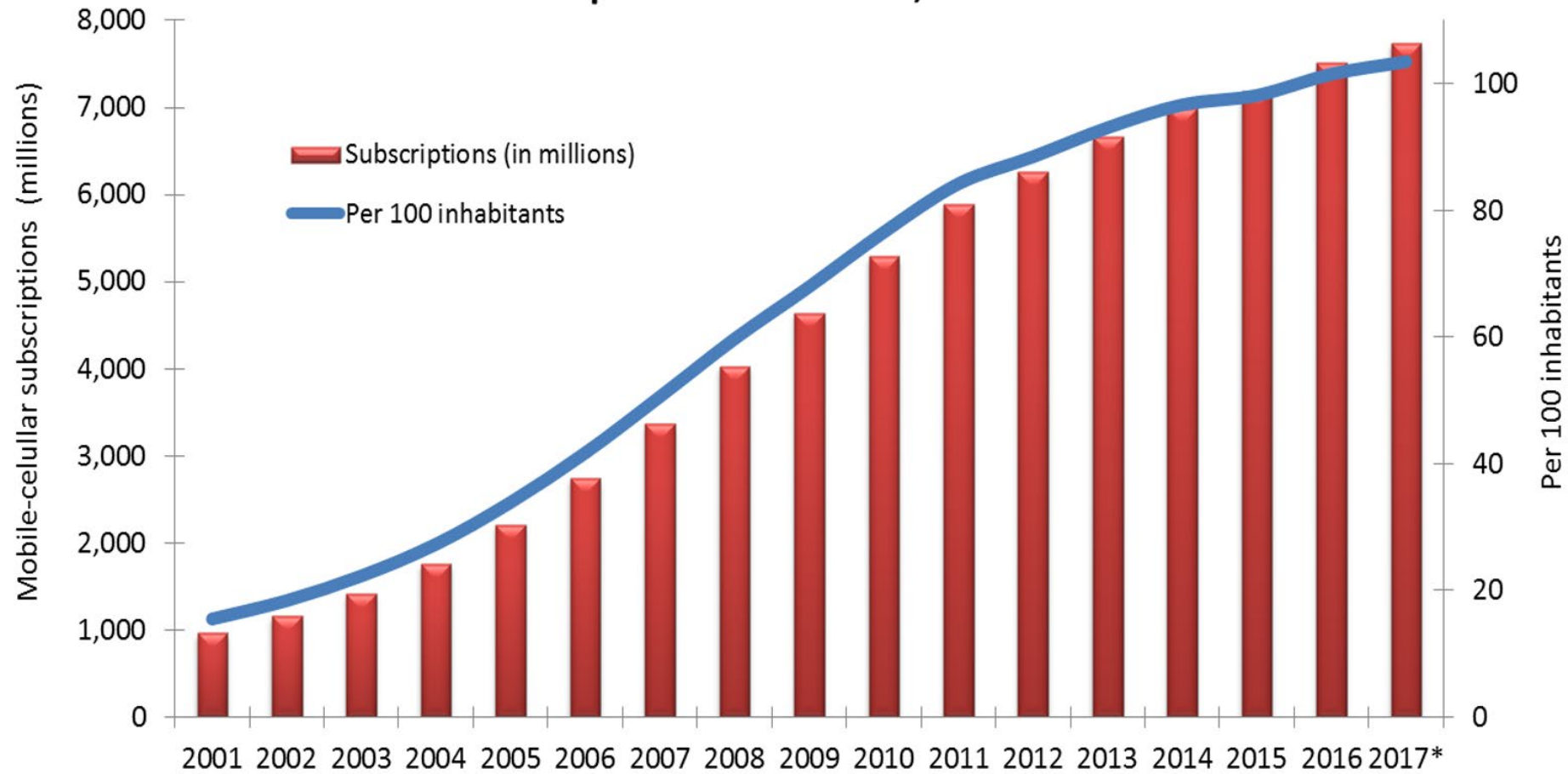
# Why mobile health?

A weekly therapy session amounts of 1/168 (0.6%) of the hours in a week

Few patients with serious mental illness receive weekly therapy.



## Global mobile-cellular subscriptions, total and per 100 inhabitants, 2001-2017\*



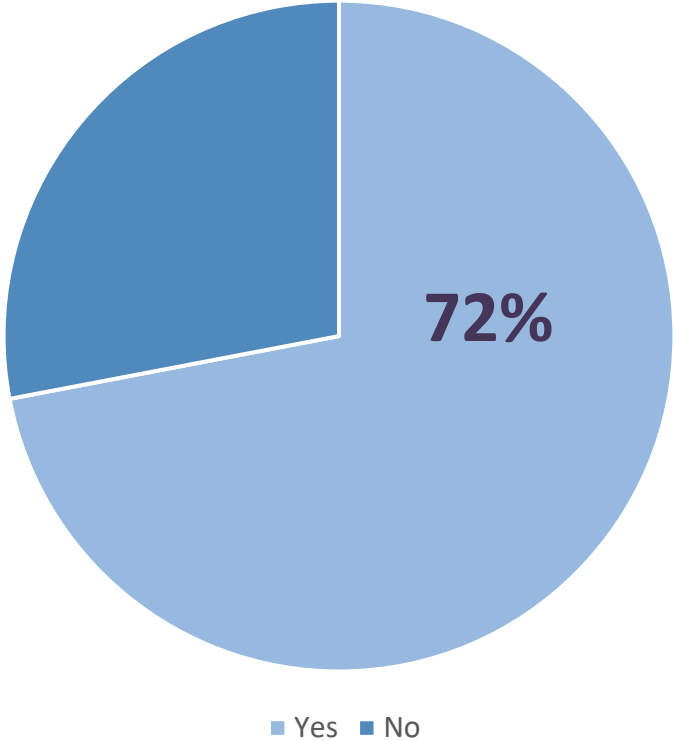
Note: \* Estimate

Source: ITU World Telecommunication /ICT Indicators database



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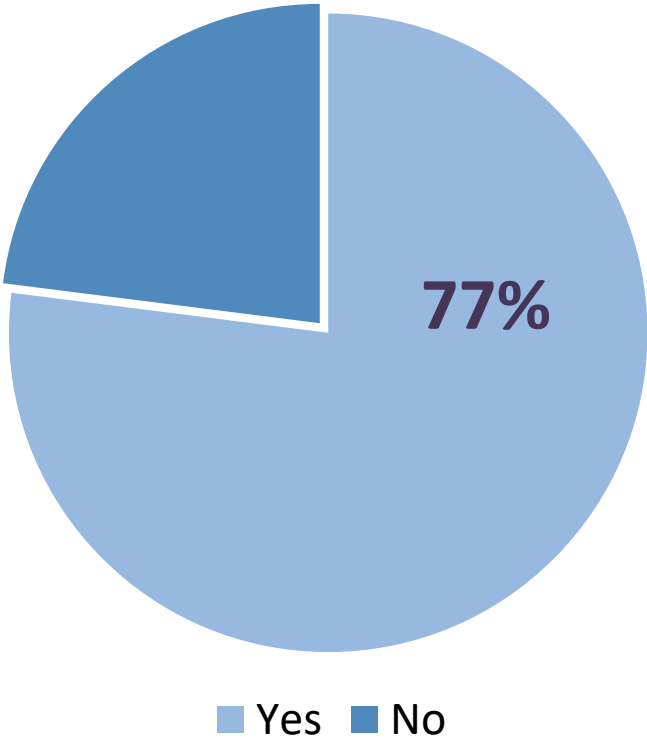
# Mobile phone ownership among people with serious mental illnesses



Ben-Zeev et al., 2012



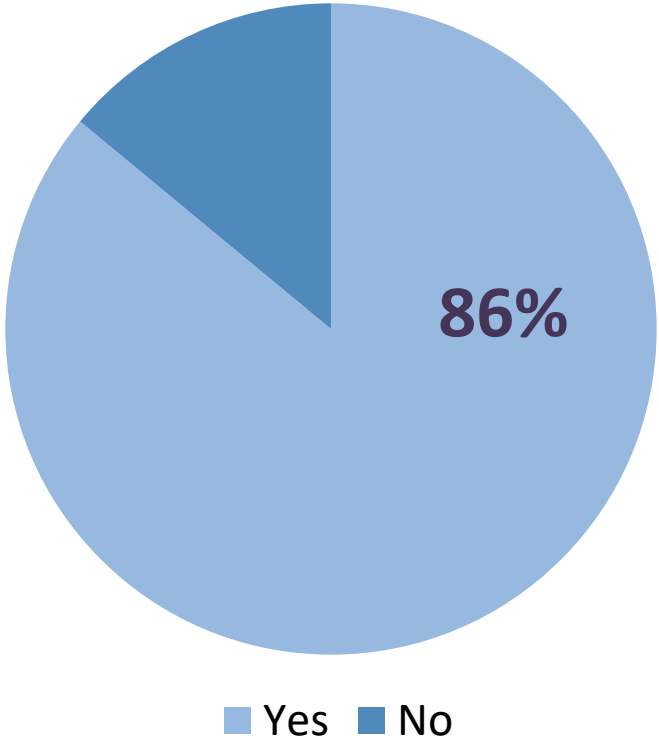
# Mobile phone ownership among people with serious mental illnesses



Campbell et al., 2013



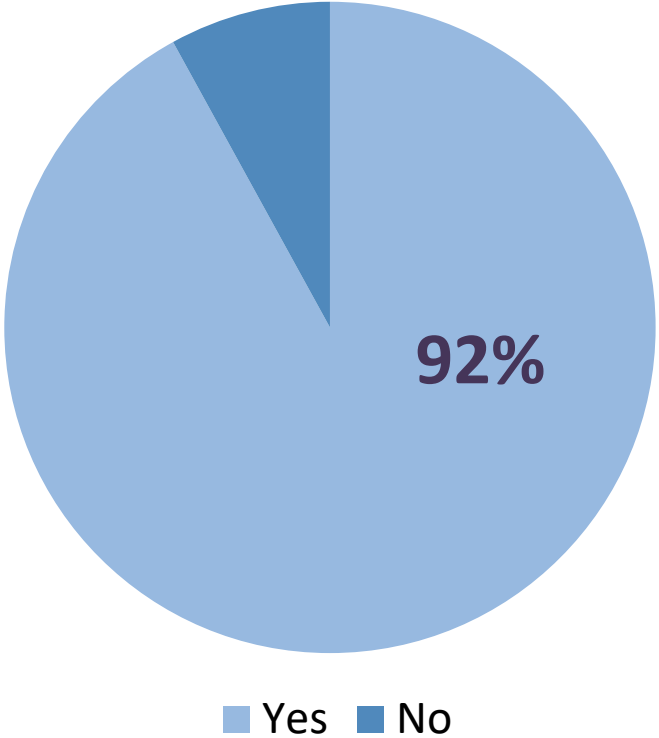
# Mobile phone ownership among people with serious mental illnesses



Carras et al., 2014



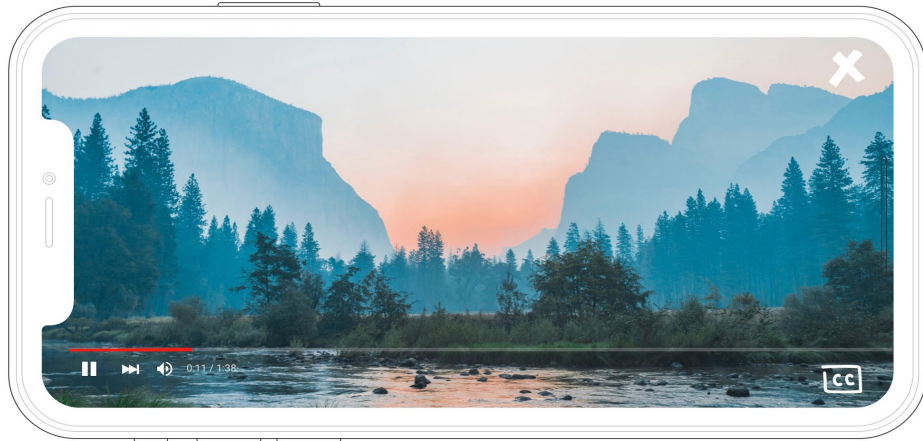
# Mobile phone ownership among people with serious mental illnesses



Noel et al., 2019



# Mobile phone ownership among people with serious mental illnesses



mHealth for mental health is popular

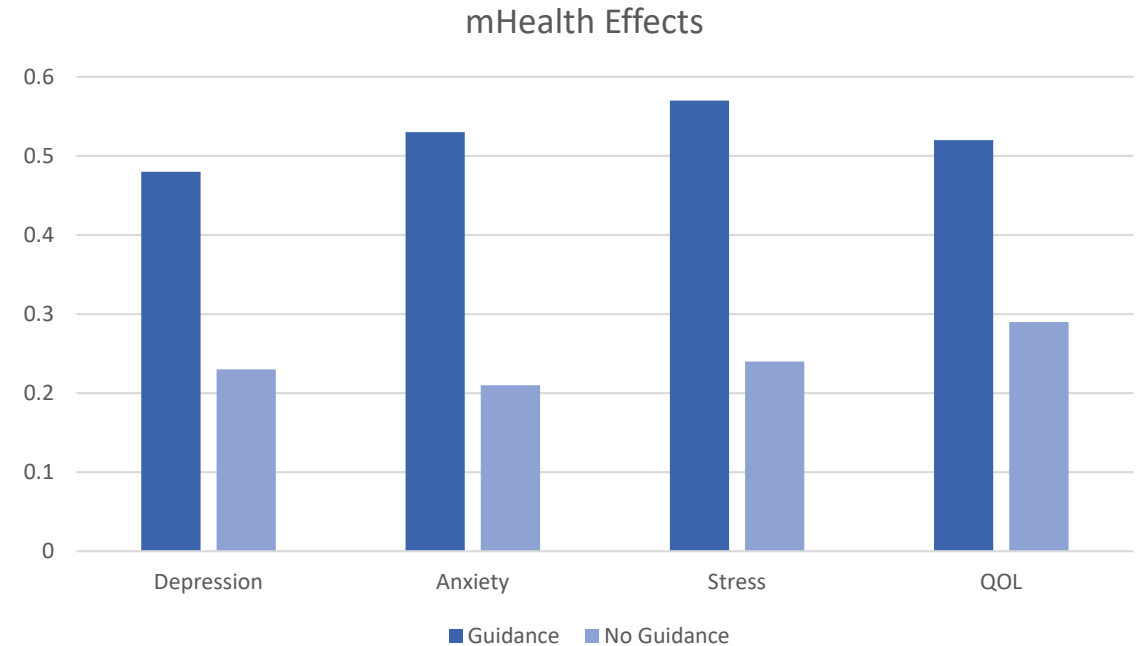
- >5 billion people own phones worldwide
- Cell phone is primary way of accessing internet
- 62% use phone to consistently look up health information
- 58% already using phone to track health
- Phone ownership in people with SMI and SUDs nearly mirrors levels of general population
- Large # of easily accessible mental health apps in commercial stores
- People with SMI and SUDs WANT to use phones for care

# mHealth for mental health: does it help?

# Do mHealth apps help mental health?

mHealth is effective for...

- Depression
- Generalized anxiety
- Social anxiety
- Stress
- Psychiatric distress
- Quality of life
- Positive emotions



**Especially when used with guidance**

Lindardon, Cuikpers, Carlbring, Messer, Fuller-Tyszkiewicz (2019). *World Psychiatry*.



# FOCUS

Treatment Targets: voices, mood, sleep, social functioning, medication use

3 Daily prompts

24/7 “on-demand” resources

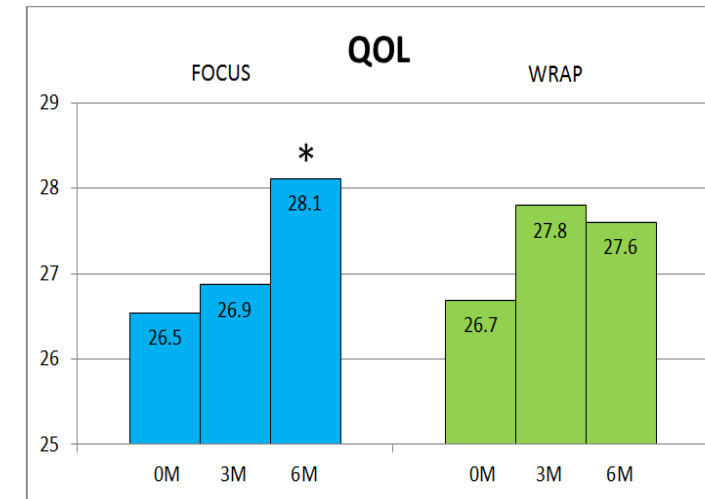
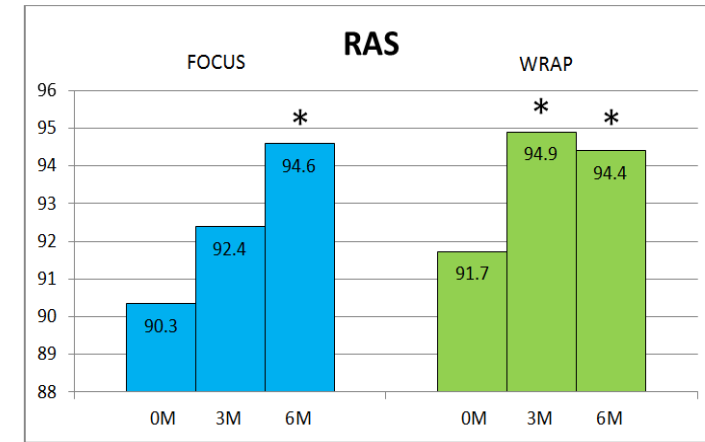
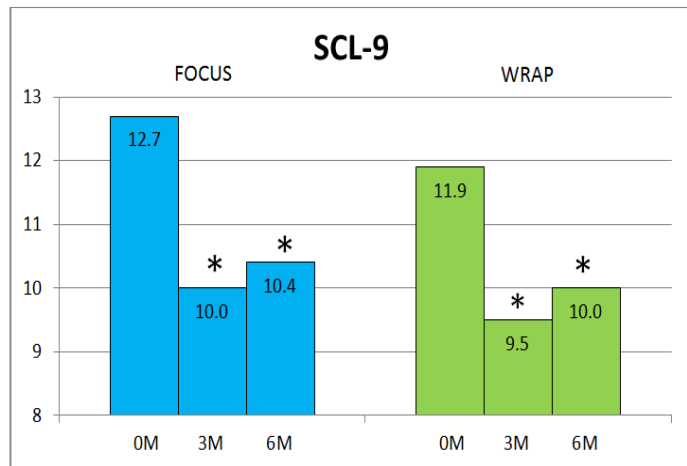
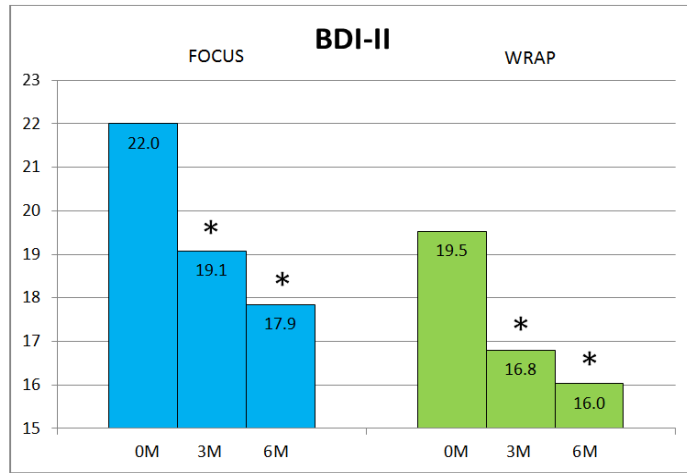
Web based clinician dashboard

**mHealth support specialist**



Ben-Zeev, Kaiser, Brenner, Begale, Duffecy, & Mohr (2013). *Psychiatric Rehabilitation Journal*.

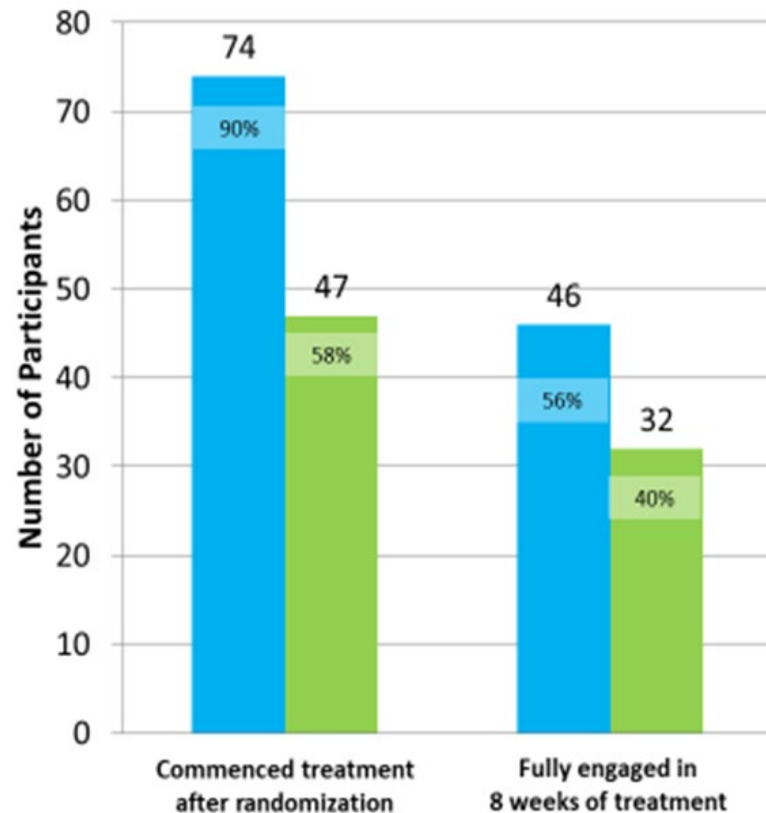
# FOCUS: Comparative Effectiveness Trial (12 Week RCT)



Ben-Zeev et al. (2018)  
*Psychiatric Services.*



# FOCUS: Engagement & cost over time



Ben-Zeev et al. (2018) *Psychiatric Services*.

## Cost of mHealth Versus Clinic-Based Care for Serious Mental Illness: Same Effects, Half the Price Tag

Dror Ben-Zeev, Ph.D., Lisa A. Razzano, Ph.D., Nicole J. Pashka, M.S., L.C.P.C., Carol E. Levin, Ph.D.

**Objective:** This study compared the costs of implementing a smartphone-delivered mobile health (mHealth) intervention (called FOCUS) with the costs of implementing a clinic-based group intervention (Wellness Recovery Action Planning [WRAP]) for serious mental illness. Treatments were delivered in parallel in a randomized controlled trial and produced comparable clinical outcomes.

**Methods:** Retrospective cost data were collected by using mixed-methods, top-down expenditure analysis with microcosting procedures. Costs were organized by input categories, including personnel, supplies, equipment, overhead, and indirect costs. All estimates are reported in US\$.

**Results:** The average annual cost to providers was \$78,212 for WRAP and \$40,439 for FOCUS. In both groups, labor accounted for the largest cost, followed by indirect costs and overhead costs. When indirect costs were excluded, WRAP cost \$520 per client per month, compared with \$256 for FOCUS.

**Conclusions:** mHealth produced the same patient outcomes as clinic-based group treatment at approximately half the cost.

*Psychiatric Services* 2021; 72:448–451; doi: 10.1176/appi.ps.202000349

Ben-Zeev et al. (2021) *Psychiatric Services*.

# mHealth opportunity: it helps, its affordable, & people like it

Psychiatric Rehabilitation Journal  
2013, Vol. 36, No. 4, 289-296

© 2013 American Psychological Association  
1089-1502/13/\$12.00 DOI: 10.1037/prj000009

### Development and Usability Testing of FOCUS: A Smartphone System for Self-Management of Schizophrenia

Dror Ben-Zeev  
Dartmouth College

Susan M. Kaiser and Christopher J. Brenner  
Thoresbalds-Dartmouth Research Center, Chicago, Illinois

Mark Begale, Jennifer Duffeey, and David C. Mohr  
Northwestern University

Schizophrenia Bulletin vol. 40 no. 6 pp. 1244-1253, 2014  
doi:10.1093/schbul/sbt033  
Advance Access publication March 8, 2014

### Feasibility, Acceptability, and Preliminary Efficacy of a Smartphone Intervention for Schizophrenia

Dror Ben-Zeev<sup>1,2</sup>, Christopher J. Brenner<sup>2</sup>, Mark Begale<sup>1</sup>, Jennifer Duffeey<sup>1</sup>, David C. Mohr<sup>1</sup>, and Kim T. Mueser<sup>1,4</sup>

JMIR MENTAL HEALTH  
Ben-Zeev et al

Original Paper

### mHealth for Schizophrenia: Patient Engagement With a Mobile Phone Intervention Following Hospital Discharge

Dror Ben-Zeev<sup>1</sup>, PhD; Emily A Scherer<sup>1</sup>, PhD; Jennifer D Gottlieb<sup>1</sup>, PhD; Armando J Rotondi<sup>1,4</sup>, PhD; Mary F Brunette<sup>1</sup>, MD; Eric D Achtyes<sup>1,5</sup>, MD; Kim T Mueser<sup>1</sup>, PhD; Susan Gingerich<sup>1</sup>, MSW; Christopher J Brenner<sup>2</sup>, MPH; Mark Begale<sup>1</sup>; David C Mohr<sup>1</sup>, PhD; Nina Schooler<sup>1,10</sup>, PhD; Patricia Marcy<sup>10</sup>; Delbert G Robinson<sup>10,11</sup>, MD; John M Kane<sup>10,11</sup>, MD

Psychiatric Rehabilitation Journal

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1089-1502/14/\$12.00 http://dx.doi.org/10.1037/prj0000107

### Health Technology Intervention After Hospitalization for Schizophrenia: Service Utilization and User Satisfaction

Amit Baumei, Ph.D., Christoph U. Correll, M.D., Marta Hauser, Ph.D., Mary Brunette, M.D., Armando Rotondi, Ph.D., Dror Ben-Zeev, Ph.D., Jennifer D. Gottlieb, Ph.D., Kim T. Mueser, Ph.D., Eric D. Achtyes, M.D., Nina R. Schooler, Ph.D., Delbert G. Robinson, M.D., Susan Gingerich, M.S.W., Patricia Marcy, B.S.N., Piper Meyer-Kalos, Ph.D., John M. Kane, M.D.

Psychiatric Rehabilitation Journal

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1089-1502/14/\$12.00 http://dx.doi.org/10.1037/prj0000107

### Video-Based Mobile Health Interventions for People With Schizophrenia: Bringing the "Pocket Therapist" to Life

Dror Ben-Zeev, Rachel M. Brian, Kelly A. Aschbrenner, and Geneva Jonathan  
Dartmouth College

Sandra Steingard  
The Howard Center, Burlington, Vermont

Contents lists available at ScienceDirect

Schizophrenia Research

journal homepage: www.elsevier.com/locate/schres

ELSEVIER

Off-hours use of a smartphone intervention to extend support for individuals with schizophrenia spectrum disorders recently discharged from a psychiatric hospital

Eric D. Achtyes<sup>1,2,3,4</sup>, Dror Ben-Zeev<sup>1,2</sup>, Zhehui Luo<sup>1</sup>, Heather Mayle<sup>1</sup>, Brandi Burke<sup>1,2</sup>, Armando J. Rotondi<sup>1,4</sup>, Jennifer D. Gottlieb<sup>1,2,3</sup>, Mary F. Brunette<sup>1</sup>, Kim T. Mueser<sup>1,2,3</sup>, Susan Gingerich<sup>1</sup>, Piper S. Meyer-Kalos<sup>1</sup>, Patricia Marcy<sup>1</sup>, Nina R. Schooler<sup>1,2,3</sup>, Delbert G. Robinson<sup>1,2,3,4</sup>, John M. Kane<sup>1,2,3,4</sup>

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### Mobile Health (mHealth) Versus Clinic-Based Group Intervention for People With Serious Mental Illness: A Randomized Controlled Trial

Dror Ben-Zeev, Ph.D., Rachel M. Brian, M.P.H., Geneva Jonathan, B.A., Lisa Razzano, Ph.D., C.P.R.P., Nicole Pashka, M.S., Elizabeth Carpenter-Song, Ph.D., Robert E. Drake, M.D., Emily A. Scherer, Ph.D.

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### Life With FOCUS: A Qualitative Evaluation of the Impact of a Smartphone Intervention on People With Serious Mental Illness

Geneva Jonathan  
Northwestern University Feinberg School of Medicine

Elizabeth A. Carpenter-Song  
Dartmouth College

Rachel M. Brian and Dror Ben-Zeev  
University of Washington

Perspectives on Mobile Health Versus Clinic-Based Group Interventions for People With Serious Mental Illnesses: A Qualitative Study

Elizabeth Carpenter-Song, Ph.D., Geneva Jonathan, B.A., Rachel Brian, M.P.H., Dror Ben-Zeev, Ph.D.

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Ben-Zeev et al

Original Paper

### Effect of Mobile Health on In-person Service Use Among People With Serious Mental Illness

Dror Ben-Zeev, Ph.D., Benjamin Buck, Ph.D., Kevin Hallgren, Ph.D., Robert E. Drake, M.D., Ph.D.

JMIR MENTAL HEALTH  
Ben-Zeev et al

Original Paper

### Transdiagnostic Mobile Health: Smartphone Intervention Reduces Depressive Symptoms in People With Mood and Psychotic Disorders

Dror Ben-Zeev<sup>1</sup>, PhD; Benjamin Buck<sup>1,2,3</sup>, PhD; Phuonguyen Vu Chu<sup>1</sup>, BA; Lisa Razzano<sup>1,4</sup>, CPRP, PhD; Nicole Pashka<sup>1</sup>, MS, CRC, CPRP, LCPC; Kevin A Hallgren<sup>1</sup>, PhD

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Ben-Zeev et al

Original Paper

### Cost of mHealth Versus Clinic-Based Care for Serious Mental Illness: Same Effects, Half the Price Tag

Dror Ben-Zeev, Ph.D., Lisa A. Razzano, Ph.D., Nicole J. Pashka, M.S., L.C.P.C., Carol E. Levin, Ph.D.



# mHealth for mental health: Navigating a cluttered landscape

# The mHealth big picture

Mental health apps generated \$587.9 million, and are expected to generate up to \$3.9 billion (563% increase) by 2027

Between 100,000 and 400,000 health and wellness apps available, with at least 10,000 related to mental health

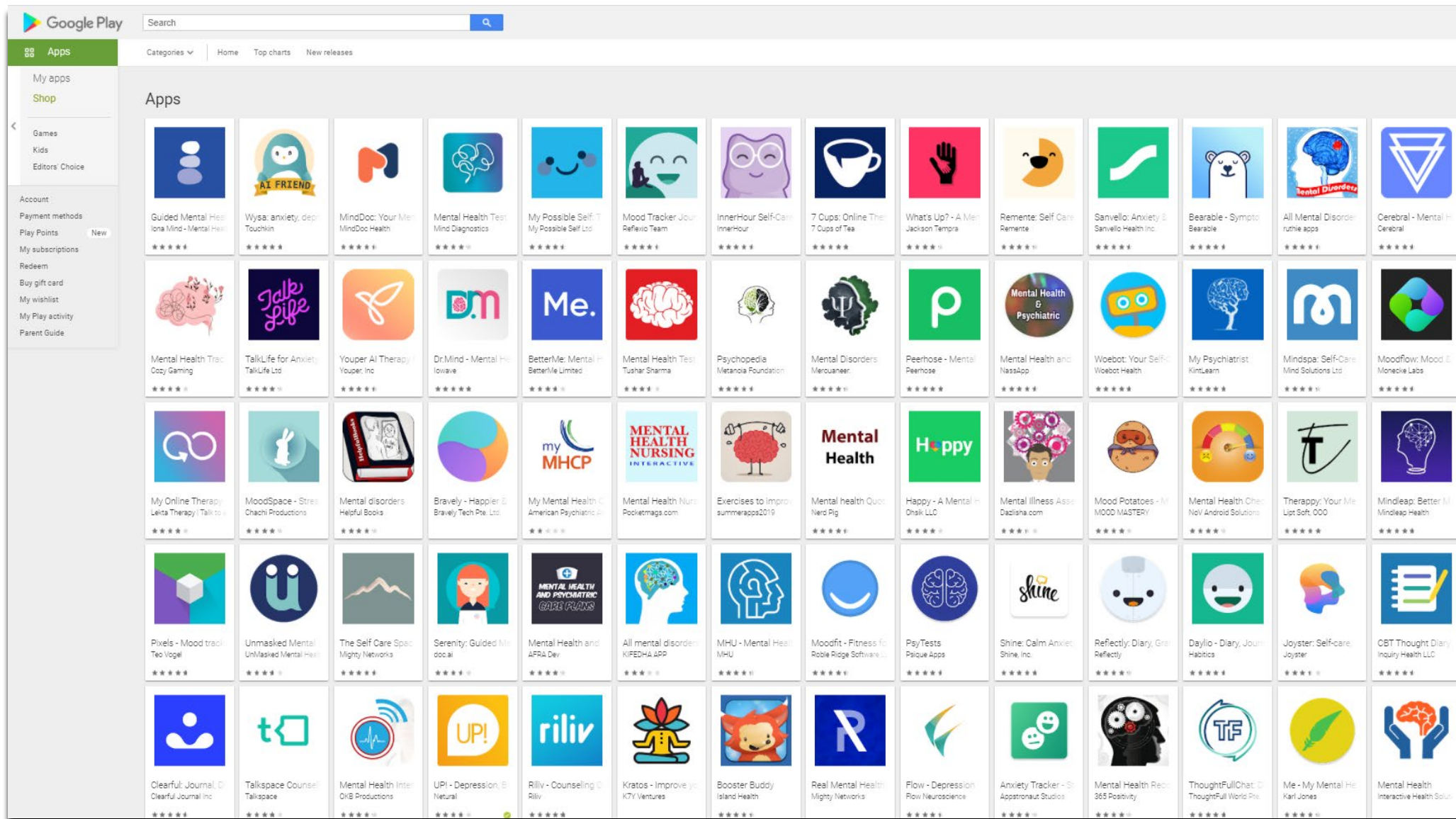
Leading apps (e.g. Lumosity, Calm, Headspace) have over 1M monthly active users

Nguyen, S., Fitzgerald, B., Richter, B., Brookman, J. (2021). Peace of mind: Evaluating the privacy policies of mental health apps. *Consumer Reports Digital Lab*.

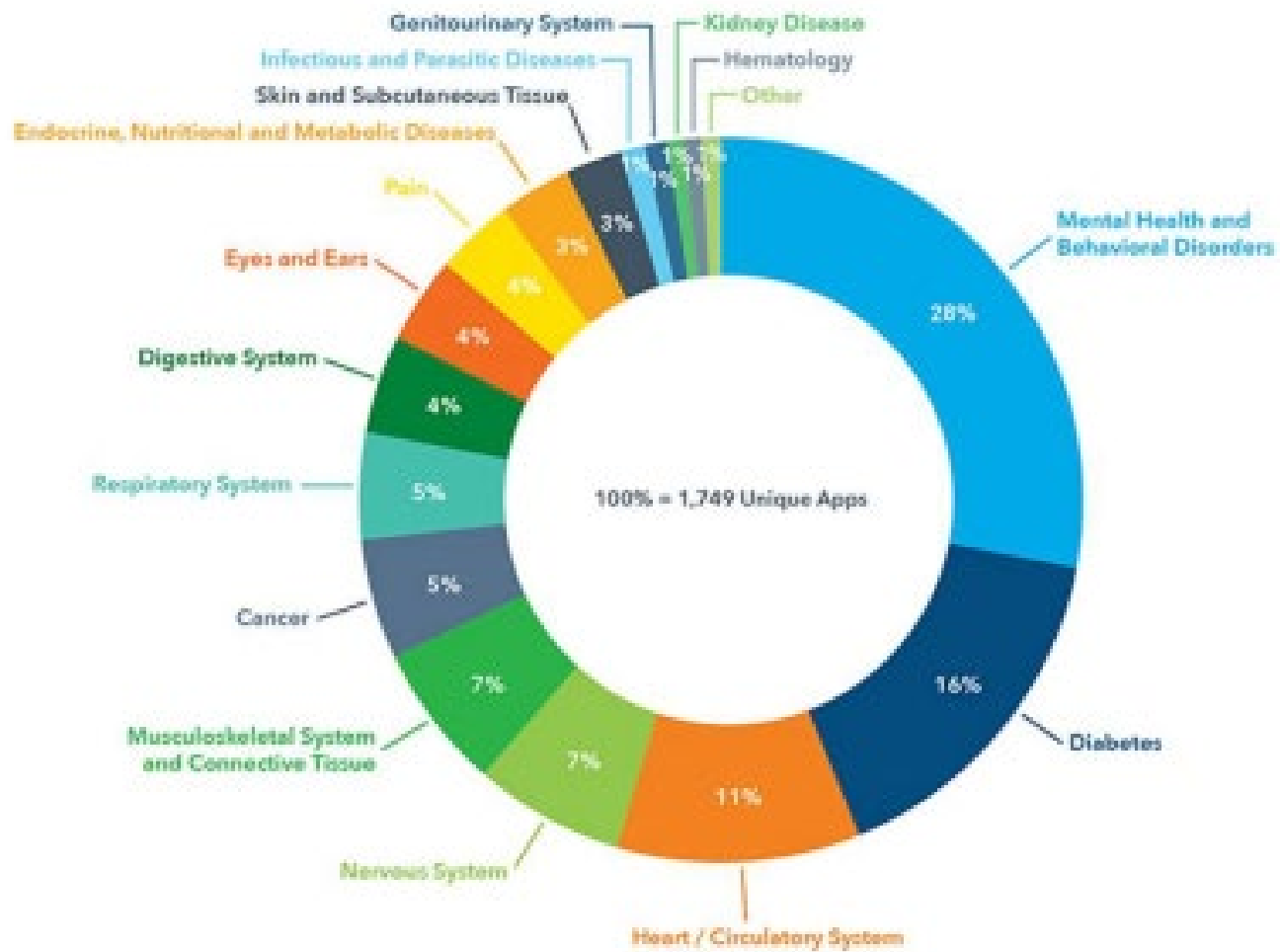
Carlo, A., Ghomi, R., Renn, B.R., Arian, P.A. (2019). By the numbers: ratings and utilization of behavioral health mobile applications











Sources: 42 Matters, Jul 2017; IQVIA AppScript Database, Jul 2017; IQVIA Institute, Jul 2017  
 Report: The Growing Value of Digital Health, IQVIA Institute for Human Data Science, Nov 2017



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# Evidence-based apps?

(Neary and Schueller, 2018; *Cognitive and Behavioral Practice*)

While mHealth apps have significant potential, very few that are available have been rigorously evaluated

One review (Sucala et al., 2017) suggested that among popular apps, most lacked published evidence (2 of 52, 3.8%)

Nicholas et al. (2015) review of evidence on apps bipolar disorder apps revealed several suggesting providing misinformation or suggesting damaging actions

Nicholas, J., Larsen, M. E., Proudfoot, J., & Christensen, H. (2015) Mobile apps for bipolar disorder: A systematic review of features and content quality. *Journal of Medical Internet Research*, 17(8), e198.

Kertz, S. J., Kelly, J. M., Stevens, K. T., Schrock, M., & Danitz, S. B. (2017). A review of free iPhone applications designed to target anxiety and worry. *Journal of Technology in Behavioral Science*, 2(2), 61–70.

Sucala, M., Cuijpers, P., Muench, F., Cardoso, R., Soflau, R., Dobrea, A., . . . David, D. (2017). Anxiety: There is an app for that. A systematic review of anxiety apps. *Depression and Anxiety*, 34(6), 518–525.



# Regulation of Mental Health Apps

2017: First app cleared by FDA for a behavioral condition

- reSET by Pear Therapeutics
- Others have followed: reSET-O (2018), EndeavorRX (2020), Somryst (2020), Nightware (2020), Woebot for PPD (2021), Wysa (2022)

Many apps fall outside focus of FDA regulation and FDA has exercised enforcement discretion

- Help people self-manage conditions without providing specific treatments or treatment suggestions
- Provide people with simple tools to track health information

FDA relaxed regulation in 2020 due to COVID



# How do I find the best mHealth interventions for my work?

- Systematic Reviews
  - In depth reviews of apps available for specific presenting issues/populations
  - Difficult to access, limited review criteria
- Clearinghouses
  - Online resources with defined rating criteria
  - Apps reviewed with rating criteria that is relevant to end-users
  - Difficult to update, often out of date

JMIR MHEALTH AND UHEALTH

Firth & Torous

[Original Paper](#)

## Smartphone Apps for Schizophrenia: A Systematic Review

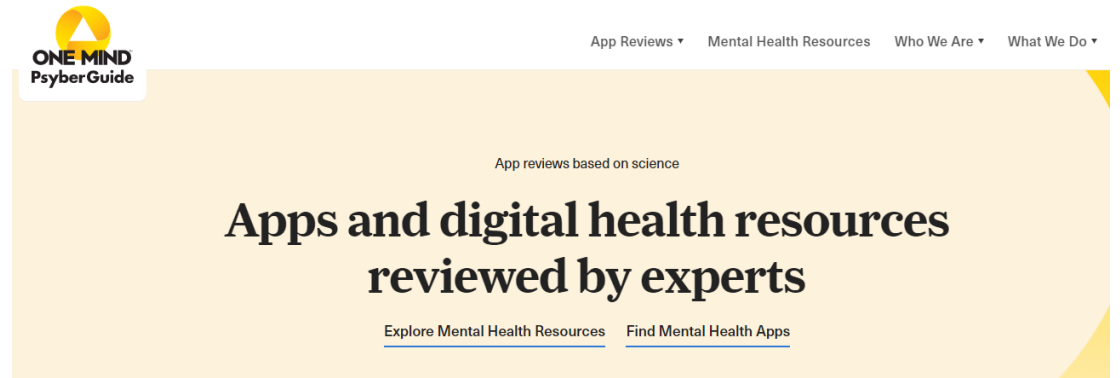
Joseph Firth<sup>1\*</sup>, PhD; John Torous<sup>2,3\*</sup>, MD

<sup>1</sup>Institute of Brain, Behaviour and Mental Health, University of Manchester, Manchester, United Kingdom

<sup>2</sup>Brigham and Women's Hospital, Department of Psychiatry, Harvard Medical School, Boston, MA, United States

<sup>3</sup>Beth Israel Deaconess Medical Center, Department of Psychiatry, Harvard Medical School, Boston, MA, United States

\*all authors contributed equally



ONE MIND  
PsyberGuide

App Reviews ▾ Mental Health Resources Who We Are ▾ What We Do ▾

App reviews based on science

## Apps and digital health resources reviewed by experts

[Explore Mental Health Resources](#) [Find Mental Health Apps](#)

# How do I find the best mHealth interventions for my work?



App Reviews ▾ Mental Health Resources ▾ Who I

App reviews based on science

## Apps and digital health resources reviewed by experts

[Explore Mental Health Resources](#) [Find Mental Health Apps](#)

### Are **Stress and Anxiety** pulling you down?

We've got 231 apps for you



# How we evaluate

We review apps against rating criteria developed by experts in the field. Some of those criteria are:

How likely is it that this app will work for me?



## Credibility

We look at the research supporting the technology and the credibility of the development process.

What happens the data I enter into this app?



## Transparency

We review privacy policies to see if key pieces of information about what happens with entered data are addressed.



## User Experience

We explore how fun, functional, easy-to-use, engaging, and interesting the technology is.



## Professional Reviews

A professional in a relevant field downloads and uses the technology and writes a narrative review, highlighting pros & cons and some recommendations for use.

How likely is it that I will actually use this app?

What do the professionals say?

[Learn More About Our Criteria](#)





# APP ADVISOR

An American Psychiatric Association Initiative



## Breathe, Think, Do

Problem solving & self-control for kids

[VIEW EVAL →](#)



## Betterhelp

24/7 Professional Therapy

[VIEW EVAL →](#)



## Breathe2Relax

Portable stress management tool

[VIEW EVAL →](#)



## Daylio

Private journaling without typing

[VIEW EVAL →](#)



## Woebot

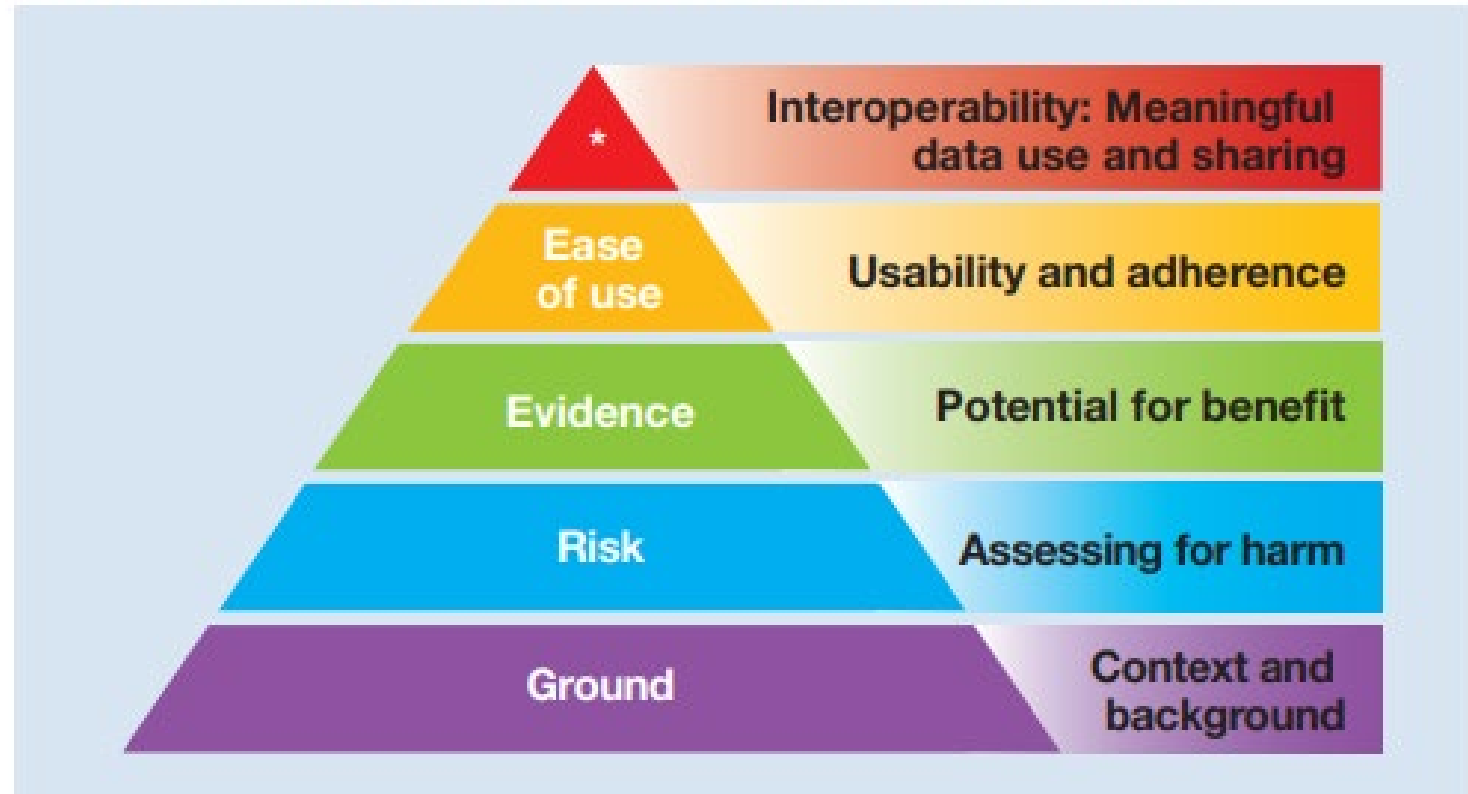
CBT, DBT & mindfulness skills

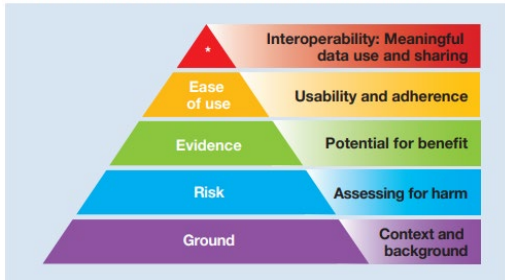
[VIEW EVAL →](#)

[psychiatry.org/psychiatrists/practice/mental-health-apps](https://psychiatry.org/psychiatrists/practice/mental-health-apps)

Selecting an intervention

## The American Psychiatric Association App Evaluation Model





## Breaking Down the App Evaluation Model



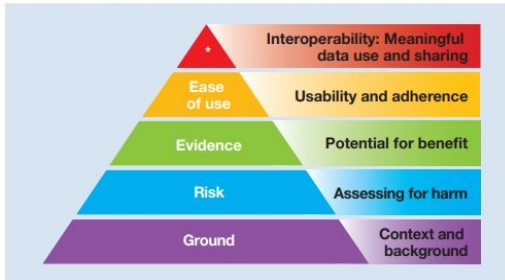
Where does the app come from, is it up to date, what platforms does it work on?



Is there a privacy statement, how is data controlled, is there an ability to provide support during a crisis?



Does the app do what it claims, is the content relevant, is there evidence of the app being used in situations similar to yours?



## Breaking Down the App Evaluation Model

Ease  
of use

**Usability and adherence**

Does the app have a clear function, is it easy to use, does it have the ability to be customized to your needs?

\*

**Interoperability: Meaningful  
data use and sharing**

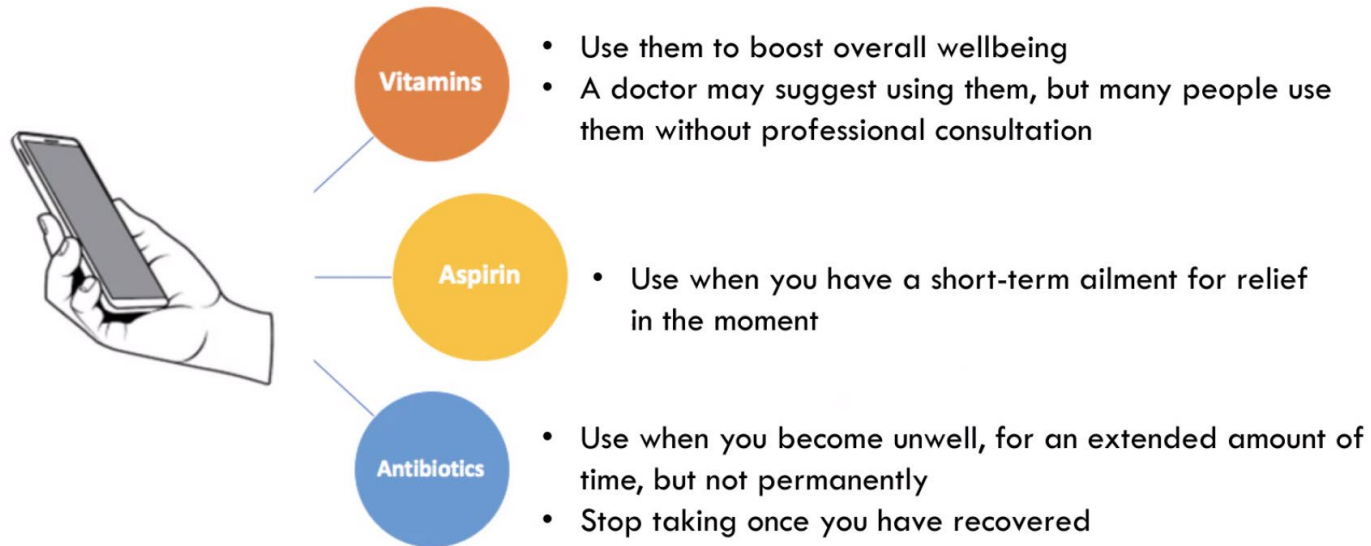
Do you own your data, is data easy to view and use for your benefit, is data meant to be used with a provider or only by an individual?

Putting mHealth to use:  
What do we know about successful mHealth implementation?



# Set your expectations accordingly...

## People might use apps differently

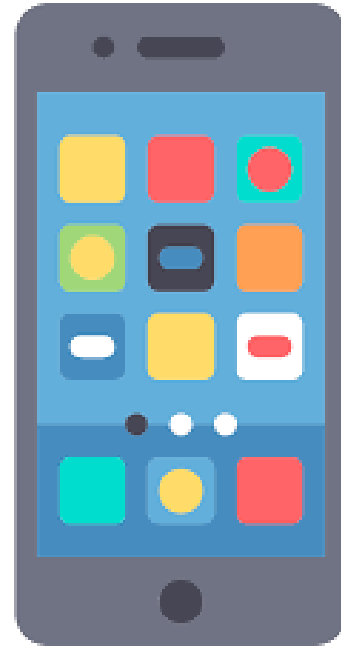


Schueller (2021) *BRiTE Center Speaker Series*.

# What makes mHealth work?



Client-based constructs



Intervention features



Environmental factors



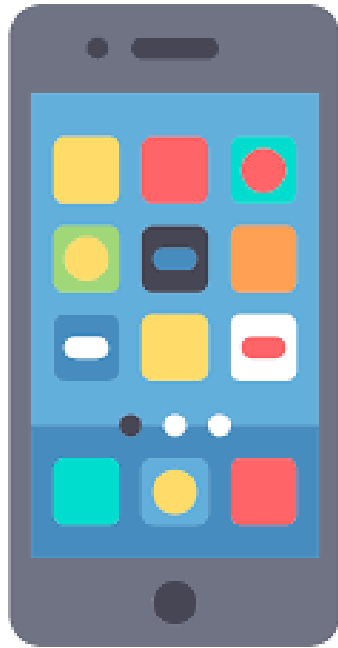
# What makes mHealth work?



Client-based constructs

- Demographics
- Personality traits
- Mental health status

# What makes mHealth work?



Intervention features

- Expectations vs. reality
- Ease of use
- Customization
- Connection to others

# What makes mHealth work?



Environmental factors

- Technology access
- No hidden costs
- **Recommendation style**
- **Education & integration**

Viewpoint

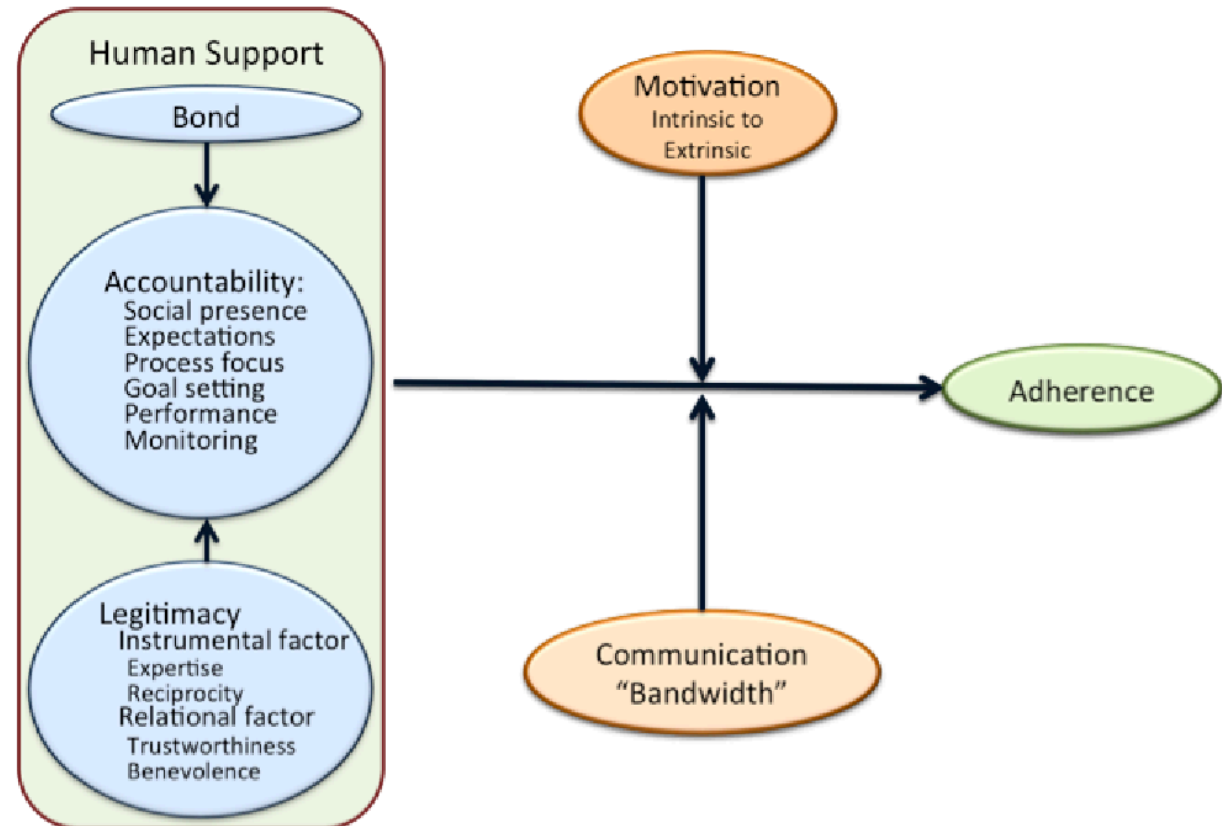
# Supportive Accountability: A Model for Providing Human Support to Enhance Adherence to eHealth Interventions

David C Mohr<sup>1</sup>, PhD; Pim Cuijpers<sup>2\*</sup>, PhD; Kenneth Lehman<sup>1\*</sup>, PhD

<sup>1</sup>Department of Preventive Medicine, Northwestern University, Chicago, IL, United States

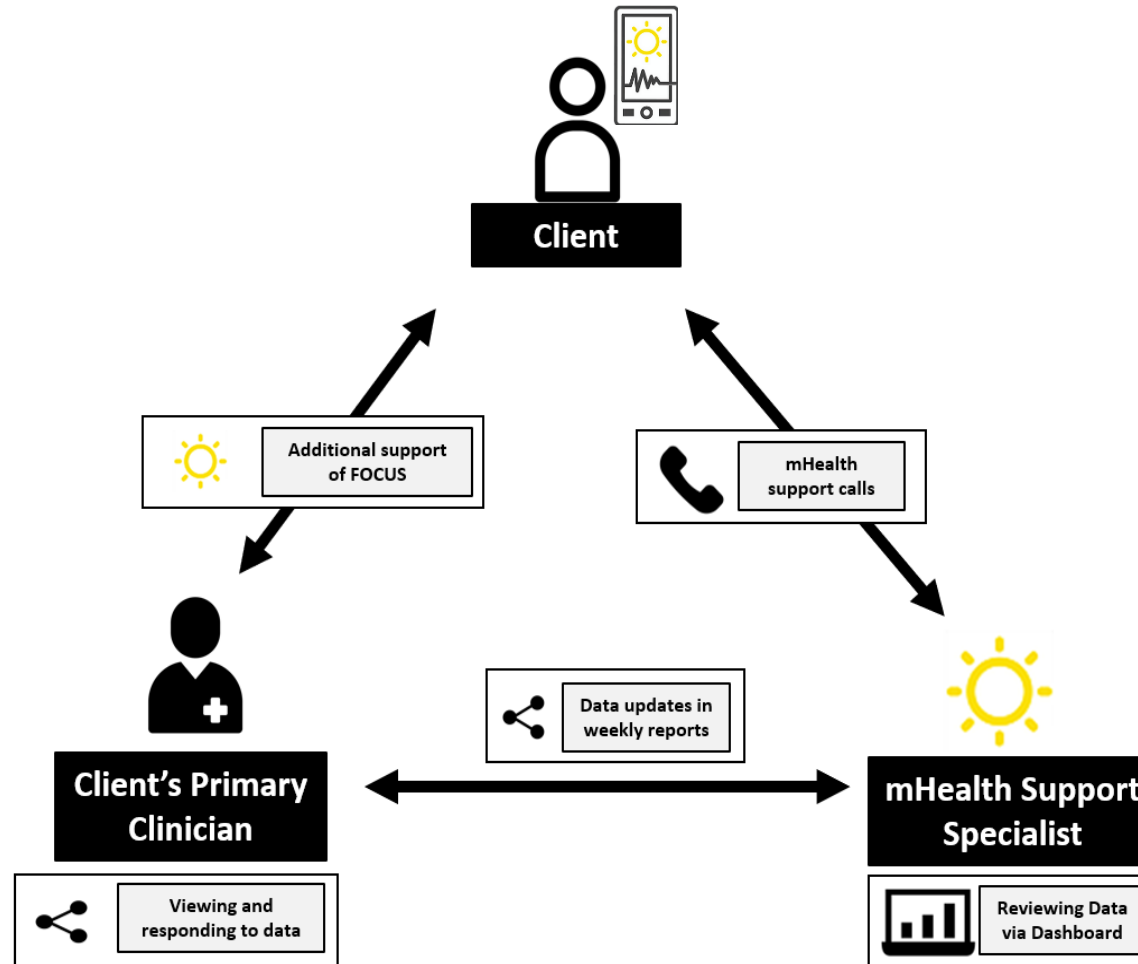
<sup>2</sup>Department of Psychology, Vrije Universiteit, Amsterdam, Netherlands

\*these authors contributed equally



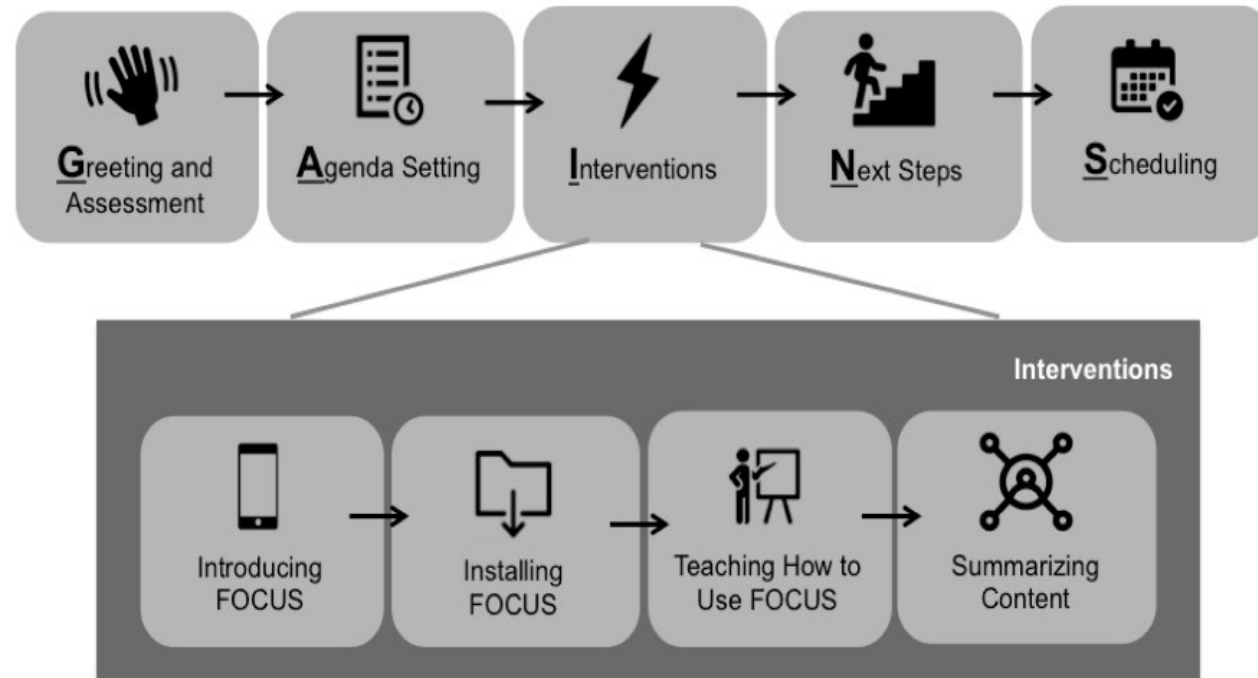
# Supportive Accountability in Practice: FOCUS





# mHealth Support Specialist Coaching

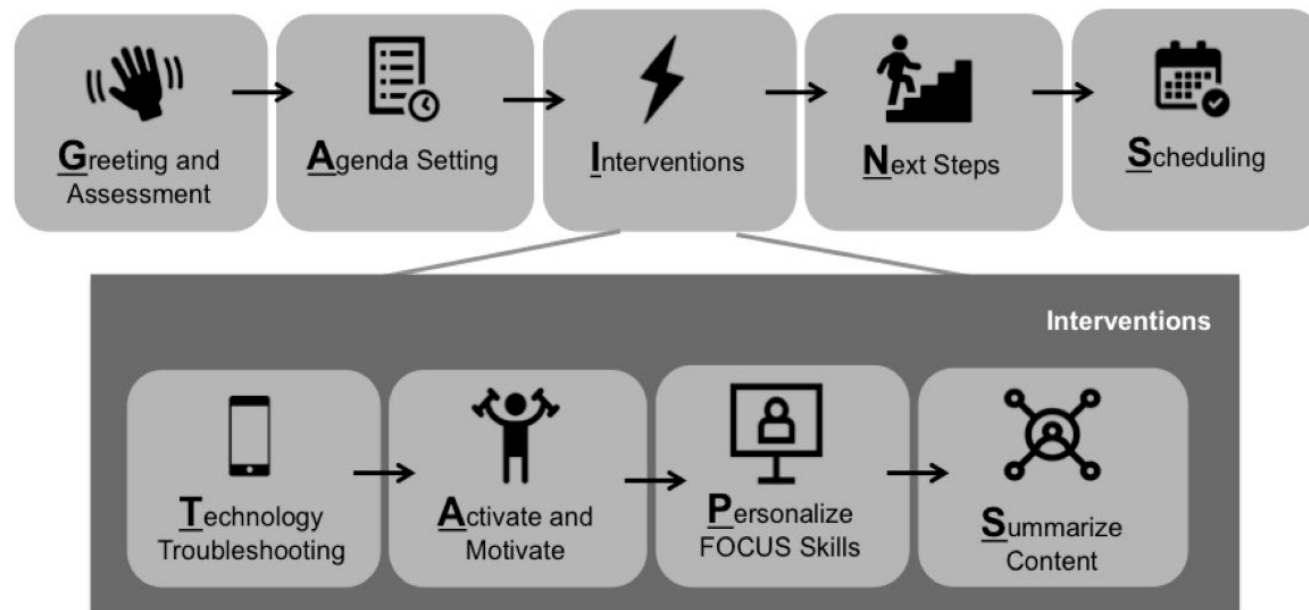
## Installation Support (30 mins)



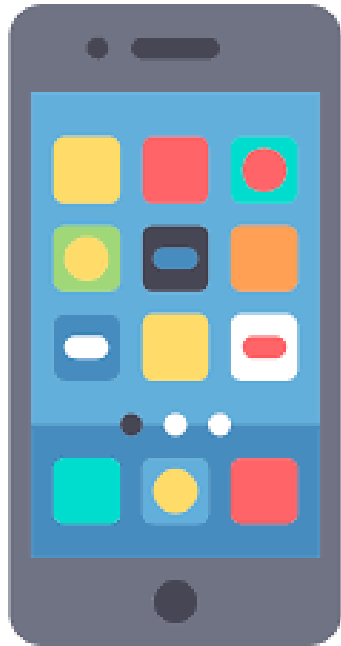


# Weekly Coaching Interactions (5-15 mins)

## mHealth Support Specialist Coaching



# Takeaways



- mHealth for mental health is growing and likely here to stay
- Tools are effective, but come with red flags that clinicians need to be aware of
- Strategies exist that can help you and your patients identify tools and critically evaluate before use
- What you do as a provider when integrating mHealth matters
  - Supportive accountability works
  - It doesn't have to be a huge time investment
  - Consistency is key

Thank you!

Have additional questions?

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[www.brite.uw.edu](http://www.brite.uw.edu)