UCI University of California, Irvine


# Integrating Digital Mental Health in the Behavioral Health Continuum of Care

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Addressing Workforce Challenges Across the Behavioral Health Continuum of Care: A Workshop

NATIONAL ACADEMIES Sciences Engineering Medicine

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# Overview

1. State of the evidence for digital mental health
2. Evaluation considerations of digital mental health
3. Integrating digital mental health into care pathways

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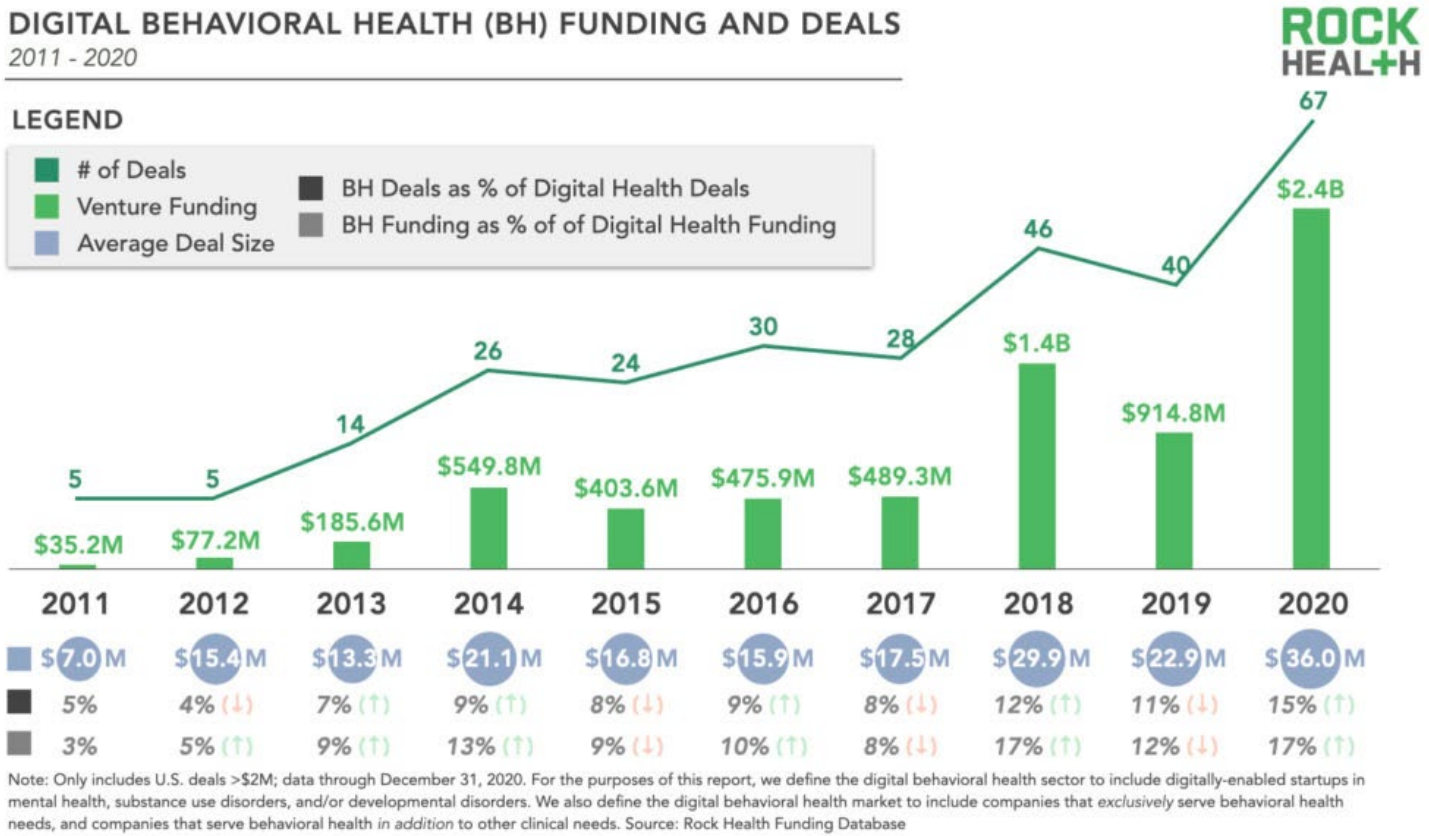
# Digital Mental Health is Here




Note: Only includes U.S. deals >$2M; data through December 31, 2020. For the purposes of this report, we define the digital behavioral health sector to include digitally-enabled startups in mental health, substance use disorders, and/or developmental disorders. We also define the digital behavioral health market to include companies that *exclusively* serve behavioral health needs, and companies that serve behavioral health *in addition* to other clinical needs. Source: Rock Health Funding Database

THE TIMES

Friday May 20 2022 | thetimes.co.uk | No 73788

£2.20 £1.45 to subscribers

Best places to live by the sea

Stars return to Cannes
A week of glitz and glamour

Gray report on lockdown parties frustrated by police secrecy

Doctors to give sleep app rather than pills

Digital therapy more effective and cheaper

Tom Cruise, star of Top Gun: Maverick, gave the Duchess of Cambridge a helping hand as they climbed the steps into the film's British premiere in Leicester Square, London, last night. Prince William also attended the screening

Co-op deliveries reverse march of time

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# Internet- and mobile-based digital mental health interventions have clear and consistent RCT evidence!

| Condition | # of RCTs | Effects | Meta-Analysis |
|---|---|---|---|
| Depression | 83 | *g* = 0.52 | Moshe, Psych Bull 2021: 147; 749-786 |
| Anxiety | 47 | *g* = 0.80 | Pauley, Psych Med 2023: 53; 567-579 |
| Posttraumatic Stress Disorder (PTSD) | 33 | *g* = 0.36 | Steubl, Eur J Psychotraumato 2201: 12; 1879551 |
| Sleep | 54 | *d* = 0.39 (ISI) | Hasan, Sleep Med Rev 2022: 61; 101567 |
| Schizophrenia (as an adjunct to care) | 58 | *g*s = 0.13-0.32 | Morales-Pillado, Psych Med 2022: 53; 6304-6315 |

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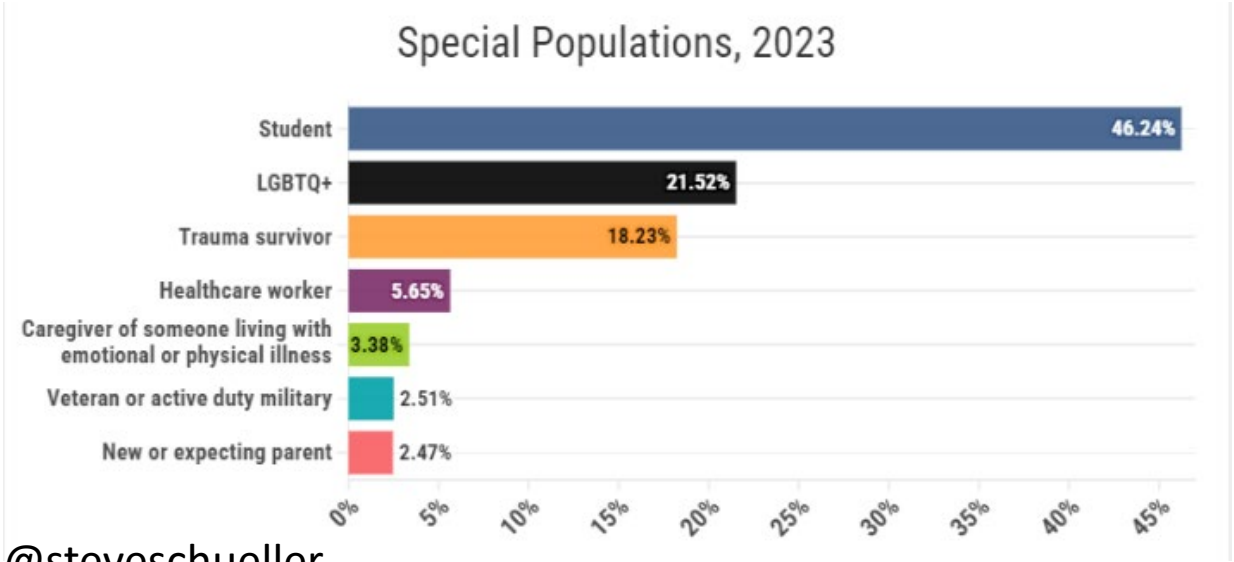
# Digital opportunities diversify access

| Age Range | Percentage | Number |
|---|---|---|
| 8-10 | 0.95% | N = 19,057 |
| 11-17 | 37.6% | N = 801,908 |
| 18-24 | 25.29% | N = 506,353 |
| 25-54 | 32.59% | N = 652,350 |
| 55+ | 3.86% | N = 70,103 |




- **Information** about mental health — **48.55%**
- **Use at home** - worksheets or coping skills to — **46.16%**
- **Online or mobile program** that can help you track or manage your symptoms — **45.25%**
- **Referrals** to those that can help — **18.80%**
- **Phone** number for immediate support — **13.74%**

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Mental Health America

# Banbury Forum Recommendations

1. Guided digital mental health intervention should be frontline interventions for depression, anxiety, and posttraumatic stress disorder
2. Digital mental health interventions should be reimbursable
3. An evidence standards framework should be created to support digital formularies and decision making



Mohr, ..., Areán, & on behalf of the Banbury Forum on Digital Mental Health, 2021

# Technology-Enabled Services

Mohr, Weingardt, Reddy, & Schueller, 2017

- Most effective digital interventions include some blend of technology features + human support
- Might be most impactful for those most in need

Table 2. Case Examples of Individual Patient Response to Guided vs Unguided iCBT vs TAU

| Case[a] | PHQ-9 BL | Age, y | Relationship status | Sex | Employment status | MD (95% CrI)[b] | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Guided vs unguided | Guided vs TAU | Unguided vs TAU |
| 1 | 25 | 35 | Not in relationship | F | Unemployed | −2.2 (−3.6 to −0.8) | −3.3 (−4.8 to −1.8) | −1.1 (−2.2 to −0.1) |
| 2 | 14 | 41 | Not in relationship | F | Employed | −0.9 (−1.7 to −0.1) | −1.9 (−2.7 to −1.0) | −0.9 (−1.7 to −0.2) |
| 3 | 10 | 55 | In relationship | M | Employed | −0.2 (−1.2 to 0.7) | −1.3 (−2.3 to −0.4) | −1.1 (−1.9 to −0.3) |
| 4 | 8 | 65 | In relationship | M | Other | 0.2 (−1.1 to 1.5) | −1.0 (−2.3 to 0.3) | −1.2 (−2.4 to −0.1) |

Abbreviations: BL, baseline; CrI, credible intervals; MD, mean difference; PHQ-9, Patient Health Questionnaire-9 score; TAU, treatment as usual.

[a] These are case examples of fictitious patients.

[b] An MD less than 0 for the comparison of A vs B favors treatment A.

Karyotaki, Efthimiou, Miguel, Mass Genannt Bermphol, Cuijpers, & IPDMA-DE Collaboration, 2021

# The Good, The Bad, The Many

- Roughly 325,000 digital health interventions, ~15,000-20,000 for mental health
- Only a small number of digital mental health interventions have rigorous evidence demonstrating efficacy - maybe 150 out of the ~15-20,000
- Others are evidence-informed and have indirect evidence

- The vast majority of digital mental health interventions don’t have efficacy data – some of these may at best be ineffective, and at worst damaging
- This makes finding the right app a challenge (but not impossible!)

# Evaluation Dimensions from One Mind PsyberGuide

Credibility

User Experience

Data Security and Privacy

# Why three dimensions?

- No “magic number” for digital mental health interventions
- Different things will work for different people
- Different factors are important for different people

# Why these dimensions?

- Although multiple efforts exist, considerable agreement on need for
  - Evidence-base (credibility)
  - User experience and engagement (user experience)
  - Data security and privacy
- Focus on the quality of the product rather than the features
  - Interoperability, accessibility, technical features

# Evaluation of Mental Mobile Applications

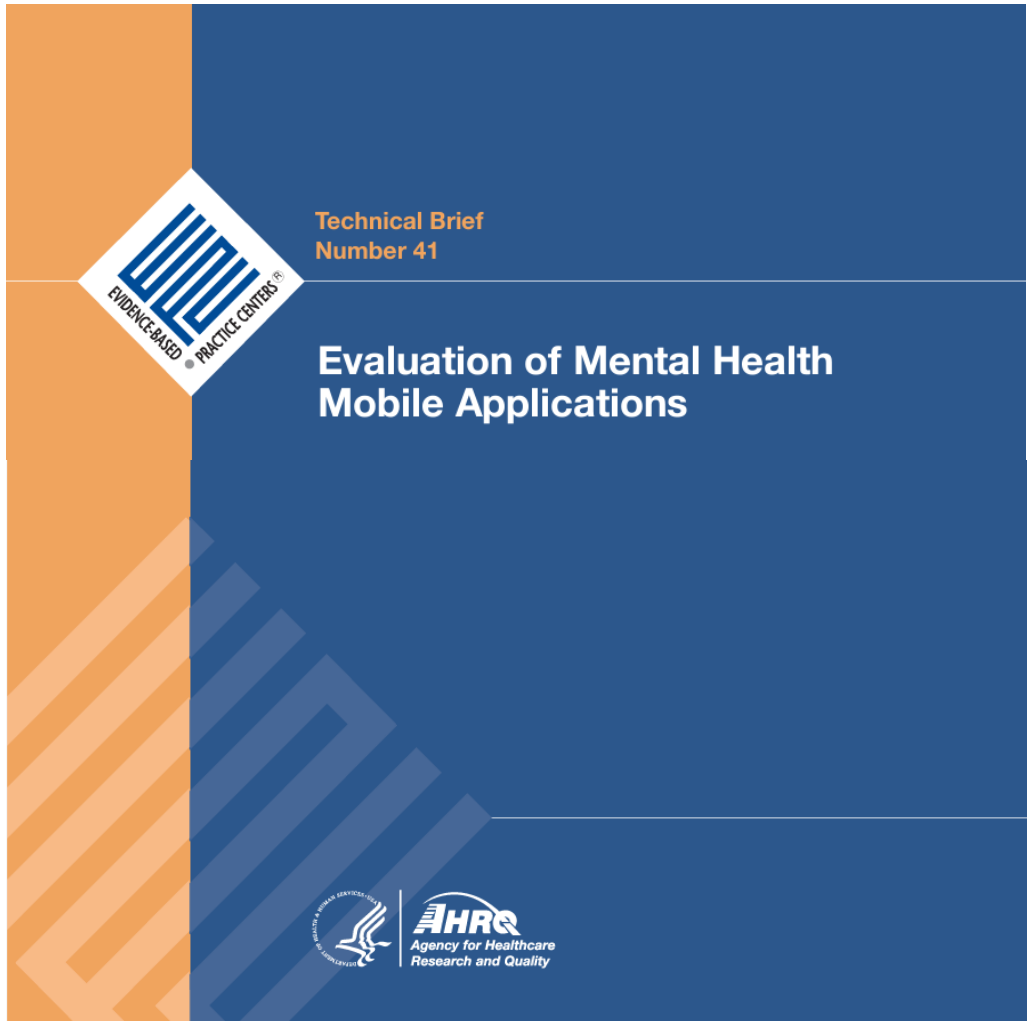


**Figure 3. Framework to Assist Stakeholders in Technology Evaluation for Recovery (FASTER) to Mental Health and H**

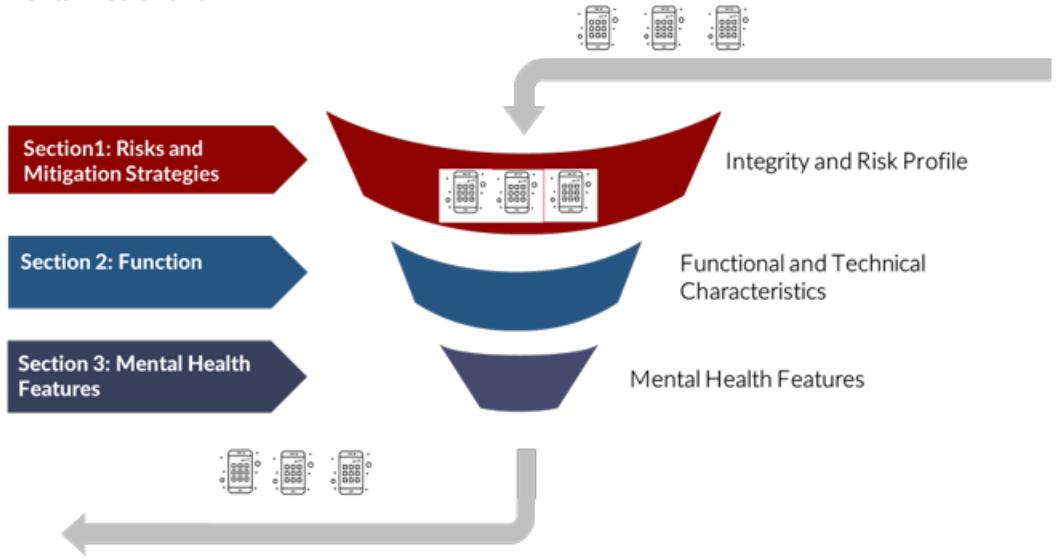


**Figure 4. Categories of questions in each section**

| | | | | | | |
|---|---|---|---|---|---|---|
| | Risks and Mitigation Strategies | App Integrity | Risk Assessment | Evidence | Linkage to Care | Access to Crisis Resources |
| | Function | Accessibility Features | App Info | Costs | Organizational Credibility | Evidence & Clinical Foundation |
| | | Privacy & Security | Informed Consent | Cultural Competence | Usability | Remote Monitoring |
| | | Access to Crisis Resources | Artificial Intelligence (AI) | | | |
| | Mental Health Features | Mental Health Features (e.g., facilitating social interaction, motivation enhancement, planning/alternative strategies/planning for high-risk situations, screening, self-help, skill building, safety planning, and promoting sleep hygiene) | | | | |

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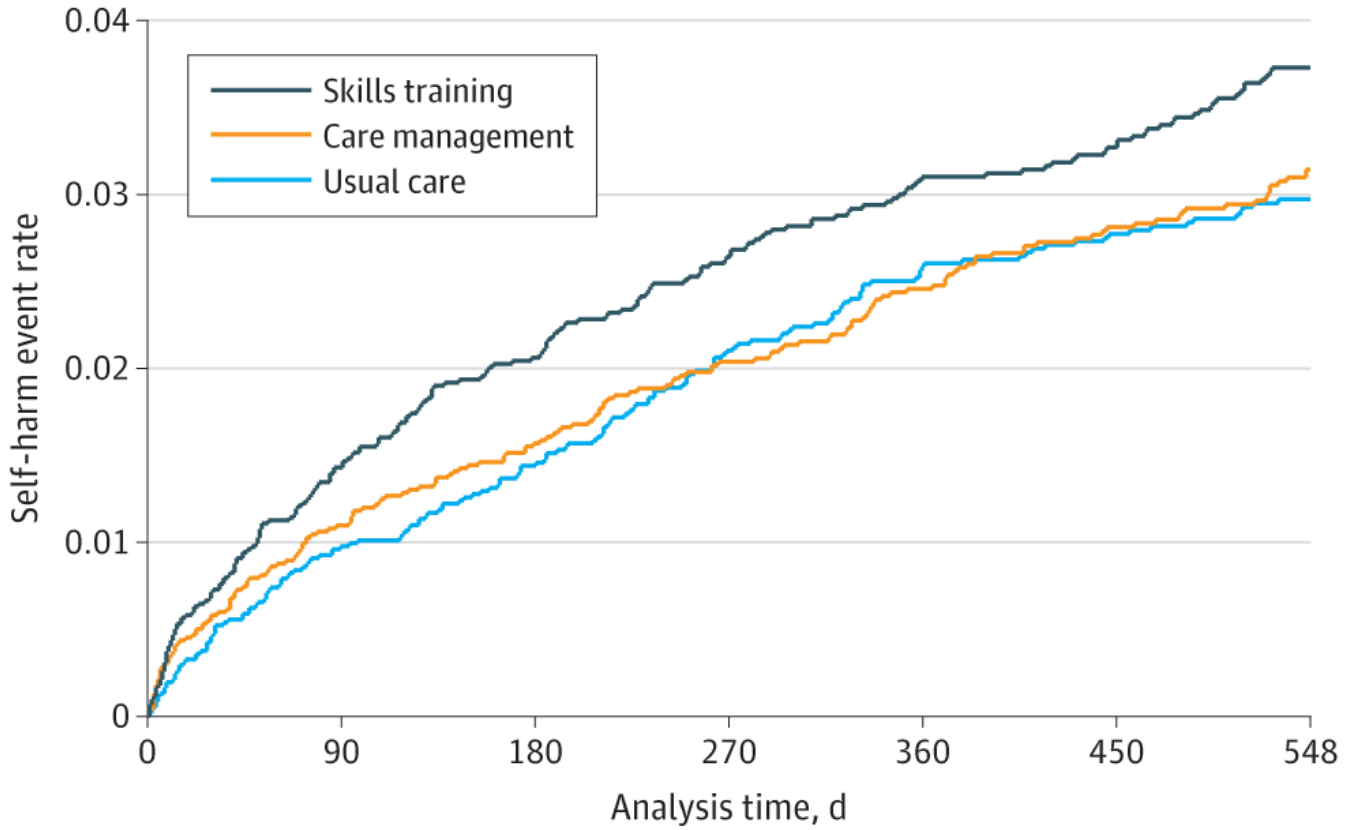
# But digital mental health interventions are not harmless




No. at risk

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Skills training | 6227 | 5773 | 5395 | 5043 | 4759 | 4543 | 4298 |
| Care management | 6230 | 5833 | 5422 | 5081 | 4788 | 4555 | 4302 |
| Usual care | 6187 | 5799 | 5388 | 5043 | 4763 | 4546 | 4294 |

| | Months 1-3 |
|---|---|
| Mindfulness Module | |
| Any Visit | 901 (14%) |
| Beyond Introduction[a] | 550 (9%) |
| Homework[b] | 150 (2%) |
| Mindfulness of Current Emotion Module | |
| Any Visit | 419 (7%) |
| Beyond Introduction[a] | 247 (4%) |
| Homework[b] | 83 (1%) |
| Opposite Action Module | |
| Any Visit | 439 (7%) |
| Beyond Introduction[a] | 262 (4%) |
| Homework[b] | 72 (1%) |
| Paced Breathing Module | |
| Any Visit | 296 (5%) |
| Beyond Introduction[a] | 151 (2%) |
| Homework[b] | 58 (1%) |

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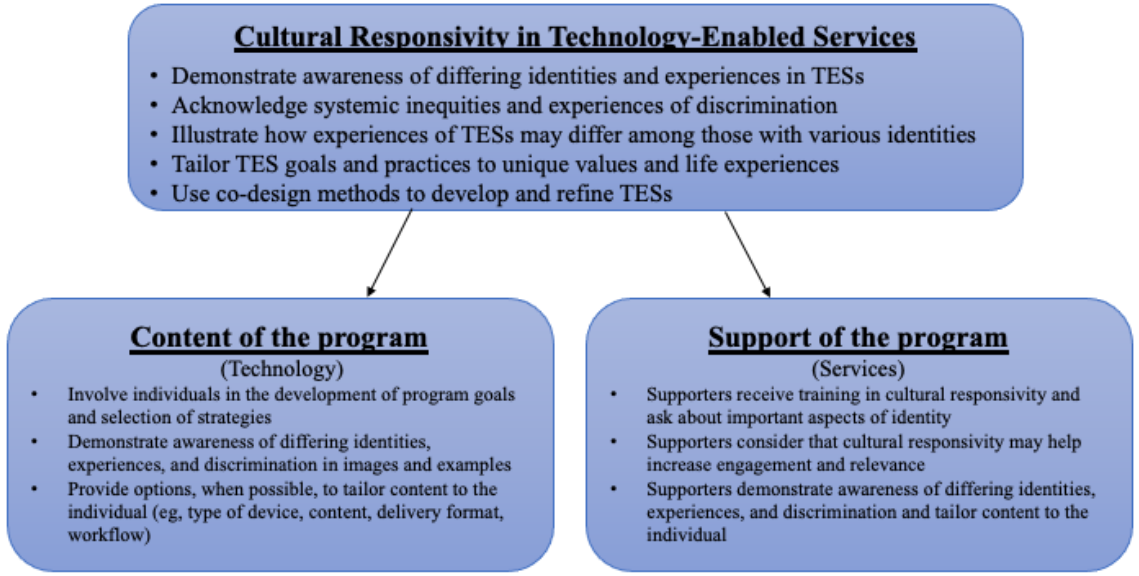
# Unmet Promise of Digital Mental Health Interventions to Increase Access and Accessibility

"As it stands, DMH interventions still hold a lot of potential to help diverse groups, but now, that potential needs to be translated into reality and action."

-Schueller, Hunter, Figueroa, and Aguilera, 2019

| | Characteristic | n | % |
|---|---|---|---|
| | Number of Apps | 32 | 100% |
| Platforms | iOS | 31 | 96.9% |
| | Android | 27 | 84.4% |
| | Companion website for App | 8 | 25.0% |
| Supported conditions | Stress & anxiety | 16 | 50.0% |
| | Mood disorders | 14 | 43.8% |
| | Sleep | 9 | 28.1% |
| | Phobias | 6 | 18.8% |
| | Eating disorders | 6 | 18.8% |
| | OCD | 5 | 15.6% |
| | Personality disorders | 5 | 15.6% |
| | Schizophrenia | 4 | 12.5% |
| Engagement | Audio/music/scripts | 16 | 50.0% |
| | Gamification | 14 | 43.8% |
| | Videos | 9 | 28.1% |
| Connection to other services | Link to formal care/coaching | 10 | 31.3% |
| | Crisis management feature | 8 | 25.0% |

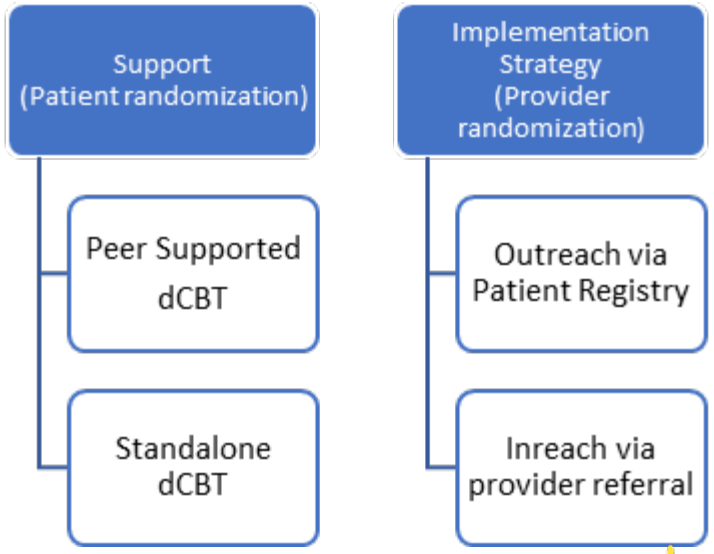
Muñoz, Camacho, & Torous, 2021




Eustis, LoPresti, Aguilera, & Schueller, 2023

# SUPERA: Supporting Peer Interactions to Expand Access (R01 MH126664, MPI: Schueller, Aguilera)

- Aim 1: Evaluate patient-level randomization on effectiveness of digital cognitive-behavioral therapy (dCBT)
  - Depression, anxiety, engagement
- Aim 2: Evaluate provider-level randomization on the effectiveness of implementation strategies
  - Reach, adoption, cost
- Aim 3: Evaluate putative mechanisms of change
  - Mixed-methods: surveys, interviews, and focus groups
  - Attitude towards intervention, implementation climate, clinical readiness, potential for sustainability




SUPERA

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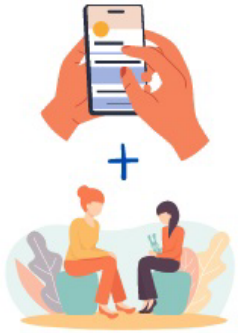
Aguilera, Avalos, Rosales, Reyes, Hernandez-Ramos, Ramos, Garcia, Hoang, Ochoa-Frongia, Fortuna, & Schueller, 2024

# Technology-enabled services (and continuums of care)

| Self-Help Tools | Therapy Extenders | Virtual Care Platforms |
| --- | --- | --- |
|  |  |  |
| **Self-help** tools that youth can use on their own | **Therapy extenders** that can support youth receiving therapy | **Virtual care platforms** provide access to therapists through technologies |
| **Technology** | **Technology + Therapy** | **Therapy through Technology** |
| Non-consumable | Consumable | Consumable |

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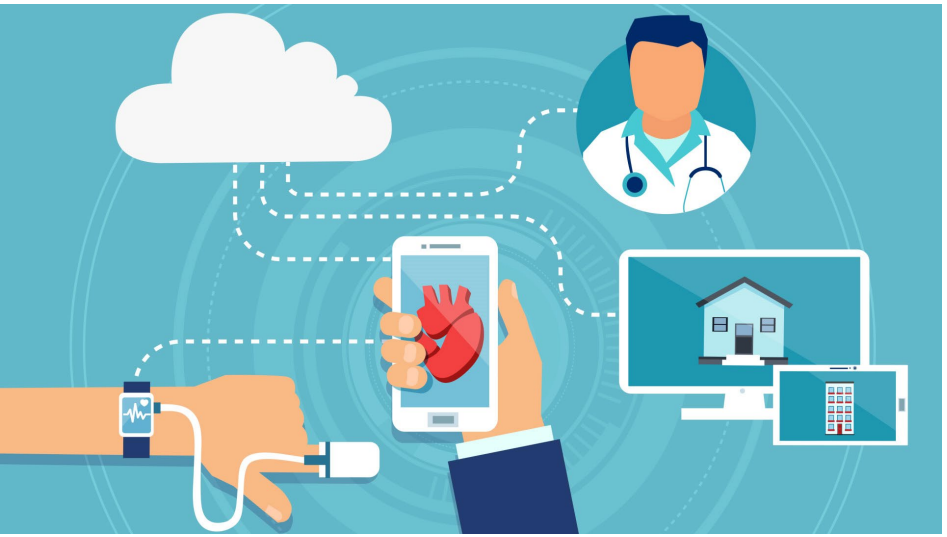
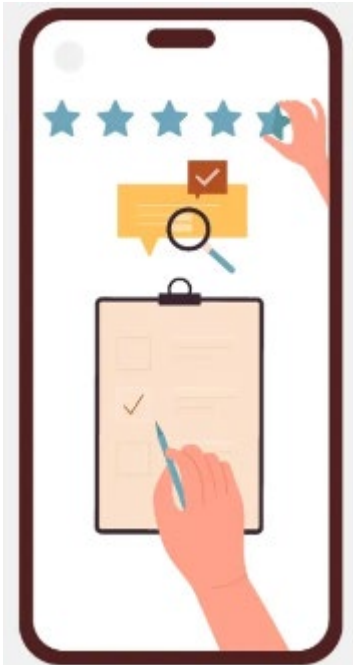
From Schueller & Histon, 2023

# Reimbursement – What do we pay for? (And how?)



Remote Patient Monitoring



Onboarding:
Digital Literacy,
Patient Navigator

Technology:
Digital
Therapeutic

Human Support:
Coaches, Peers,
Therapists

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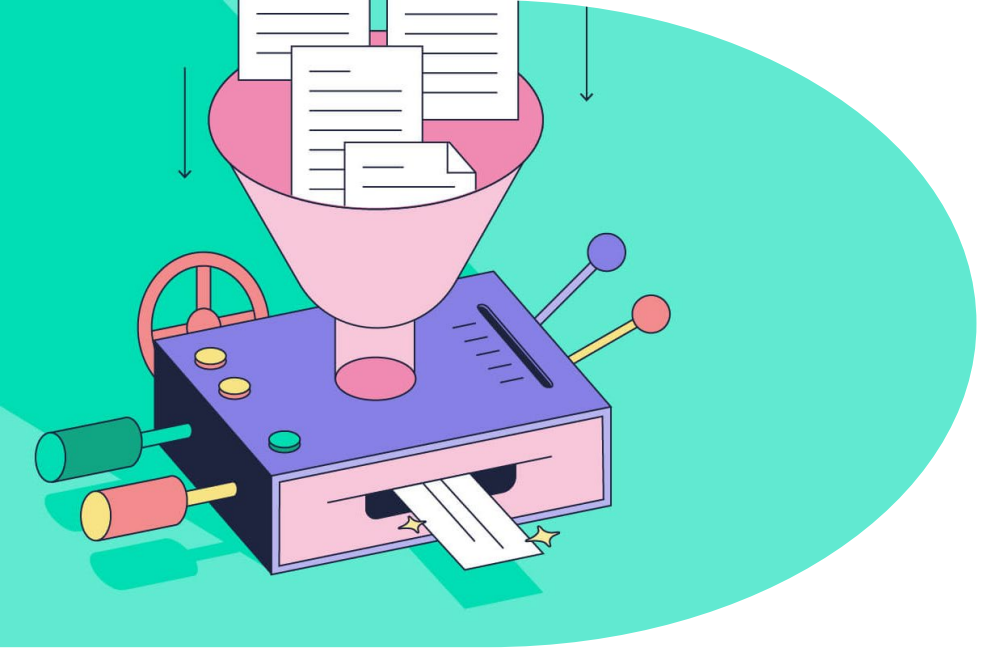

# Some takeaway thoughts

- Digital mental health interventions work
  - Supported or guided are more effective than self-guided
  - Self-guided still lead to reliable, but small, benefits
- Evaluation frameworks exist
  - Some agreement on overall dimensions
- Something is **NOT** always better than nothing
  - Need to consider deployment pathways, framing, alternatives
- Digital doors can increase access
  - But need to consider what we provide to people when they come through those doors
  - And to consider how to pay for these digital supports

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# Thanks!



- SUPERA: Adrian Aguilera, Lisa Fortuna, Lisa Ochoa-Frongia

  NIMH: R01MH126664


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