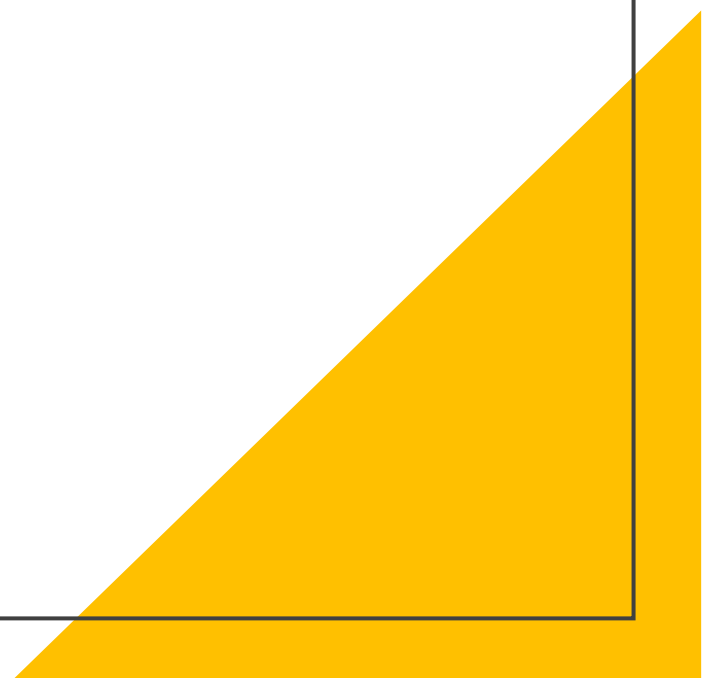


Increasing Uptake & Engagement of Treatments & Services with Behavioural Interventions

Renante Rondina

January 17, 2024



Overview

Section	Slide
Introduction	3
Study 1: Text messages to boost uptake of influenza vaccination	4-8
Study 2: Boosting engagement in digital mental health treatment	9-15
General Discussion	16

Behavioural Economics

Principles

- Choice architecture
- Social influence
- Cognitive biases
 - Status quo bias
 - Loss aversion
 - Present bias

Relevance to health

- Overcome barriers
- Tailor interventions
- Encourage positive behaviours

Non-health fields

- Facebook, Amazon, Twitter, etc.
- Engagement
- Reference point

Study 1: SMS to boost flu shot uptake

- Mega-study
 - Katherine Milkman & Angela Duckworth @ UPenn
- Common behavioural barriers to the uptake of influenza vaccinations
 - Fear, misinformation, mistrust, concerns about side effects, time constraints, inconvenience (Bhat-Schelbert 2012, Gallant 2020, Schmid 2017)
- Behavioural interventions delivered through text messages
 - Providing better information about vaccine safety and efficacy, addressing vaccine misunderstandings, offering reminders, and using mixed media campaigns (Lawes-Wickwar 2020)

Study 1: Methods



Mega-study

74,811 patients from Penn
Medicine and Geisinger Health
September 2020 to March 2021
19 treatment arms designed by 26
scientists + control



Interventions

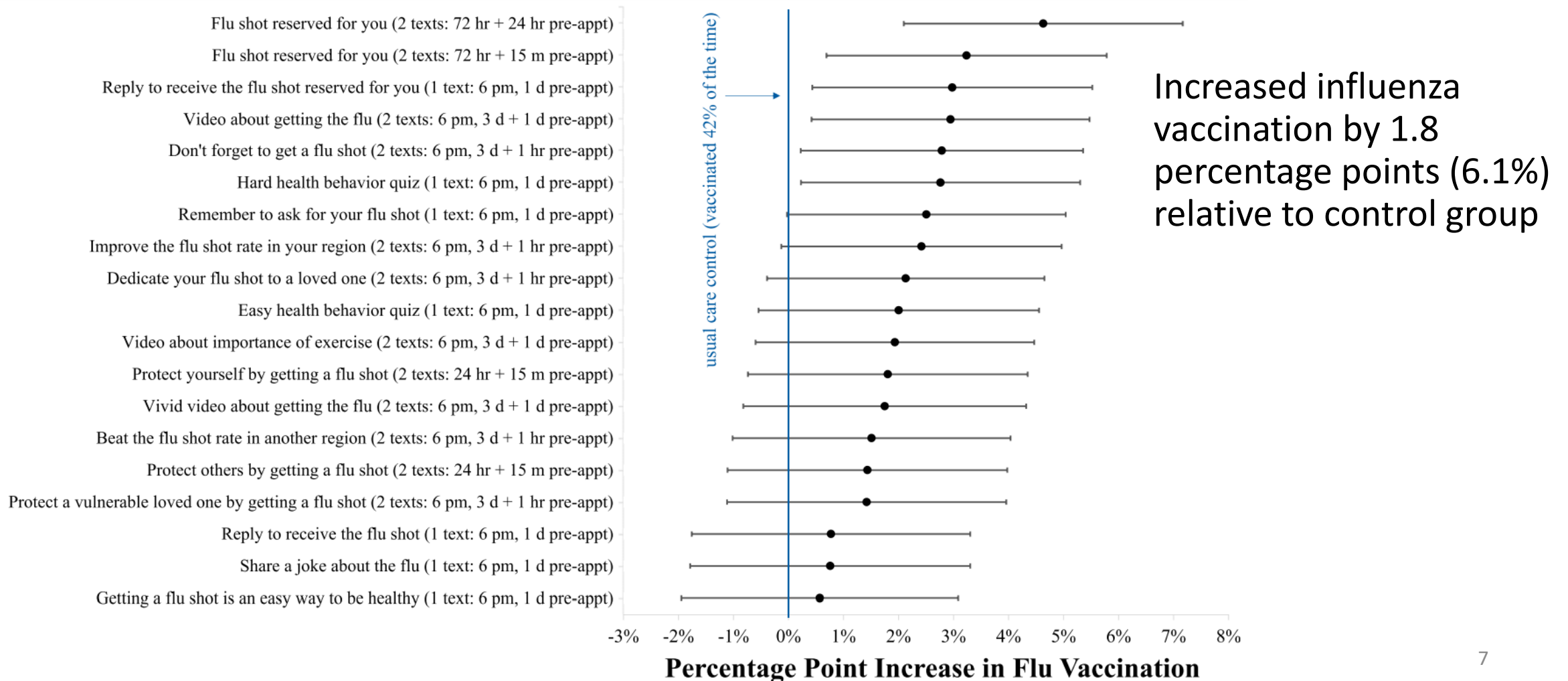
SMS before scheduled in-person
appointment with primary care
physician
Control: One SMS 2d before appt or
three SMS 7d, 3d & 1d before appt



Measures & Analysis

Influenza vaccination, either on the
day of the patient's primary care
visit or in the three days leading up
to the visit
Intention-to-treat analysis

Study 1: Results



Study 1: Top-performing Message

- 3.1 percentage point increase in vaccination relative to control
- “reserved for you”
- 3 of top 5 also framed as “reserved for you”

72 Hours Before Appointment

John, this is a message from Penn Medicine about your upcoming appointment. Text & data rates apply. Reply stop to opt out at any time.

You have an appt w/ Dr. Smith on 10/01 at 11:00 AM & it's flu season. A flu vaccine is available for you. Protect yourself & your family's health!

Look out for a vaccine reminder message before your appt. You can opt out of a reminder by texting back OPT OUT.

24 Hours Before Appointment

PENNMED: John, this is a reminder that a flu vaccine has been reserved for your appt with Dr. Smith.

Please ask your doctor for the shot to make sure you receive it.

Study 1: Discussion

- Interpretation:
 - Endowment effect (loss aversion)
 - Default effect (status quo bias)
- Caveat:
 - No difference when default/endowment effect directly tested (Buttenheim 2022)
- Limitations
 - Short-term outcomes
 - Other concurrent initiatives
 - Mega-study design

Digital Mental Health Treatments

Barriers to mental healthcare

- Cost
- Stigma
- Provider shortage

(Kakuma 2011; Thomas 2009)

Increased relevance with COVID-19

- Overcome barriers
- Increased demand
(Coley 2021; Figuera 2020)
- Remote access

Mental health treatment gap

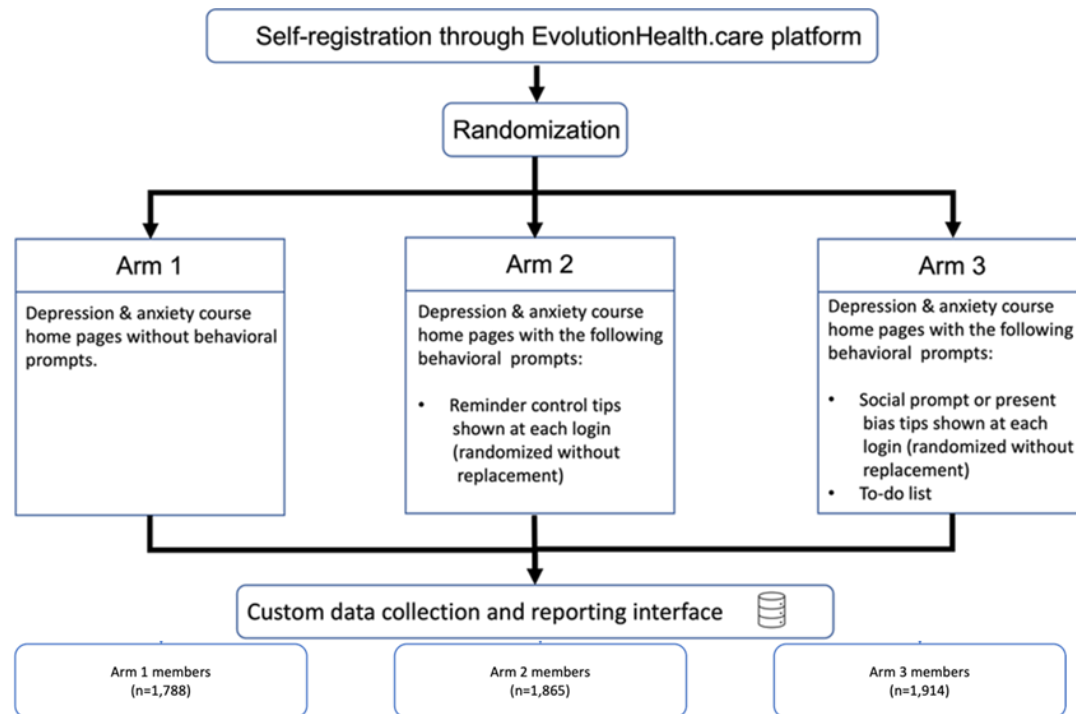
- ~50% global (Kohn 2004)
- Exacerbated during pandemic
- Digital mental health treatments (DMHT)

Study 2: Boosting engagement in DMHT

- Evolution Health
 - Developed and provided an evidence-based, self-guided interactive digital mental health treatment (DMHT) for depression and anxiety
- Drive engagement and adherence
 - 504% increase in uptake of iCBT during the pandemic (Mahoney 2021)
 - Dose-response relationship of DMHTs (Gan 2021)
 - Completion or sustained use of DMHTs range from 0.5% to 28.6% (Fleming 2018)
- Behavioural economic interventions
 - BE studies in DMHT are uncommon (Wu 2021)

Study 2: Methods

Population & Recruitment (Nov 2021 – May 2022)



Arm 1 Home Page (control)

The screenshot shows the 'Overcoming Depression' home page on the Evolution Health platform. The page features a navigation bar with 'Home', 'Community', 'Course: Overcoming Depression', 'Quiz', 'Log Out', and 'US EN'. Below the navigation bar is a menu of course modules: About Depression, Goals, A Closer Look, Negativity, Challenging, Thought Records, Behavior, Core Beliefs, Healthy Beliefs, and Certificate. The main content area includes a 'Goals' section with a list of tasks: 'Eat breakfast every morning', 'Drink water', and 'Do not stay up late (go to bed at a specific time each night)'. There are buttons for 'Set My Goals' and 'Other member goals'. A 'Quote of the Day' section features a quote by Saint Bartholomew: 'Once you begin to believe there is help "out there," you will know it to be true.' Below this is a 'Depression & Anxiety Test' section with 'Start' and 'Results' buttons. The 'Worksheets' section lists various tools: Activity Tracker, Goal Planner, Pleasant Activities, Thought Records (ABC), Thought Records (ABCD), Thought Records (ABCDEF), Problem Solving, Behavior Experiment, Core Beliefs, Assumption Worksheet, Relationship Beliefs, and Positive Core Beliefs.

Study 2: Methods

Arm 2 Home Page

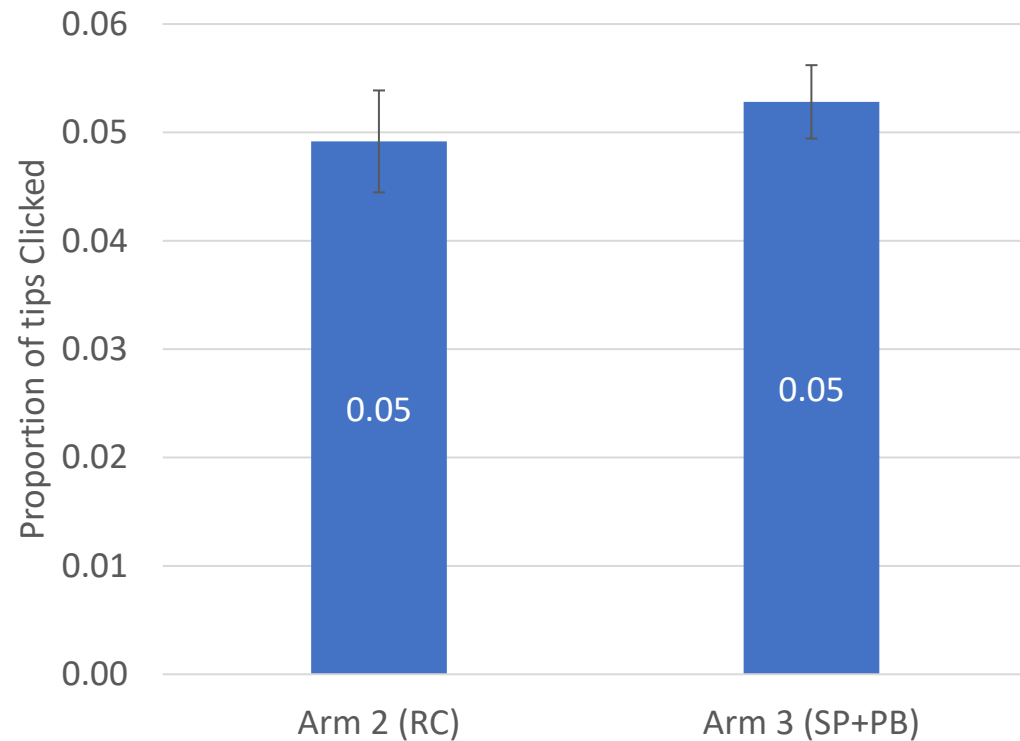
The screenshot shows the 'Overcoming Depression' course home page for Arm 2. The navigation bar includes 'Home', 'Community', 'Course: Overcoming Depression', 'Quiz', 'Log Out', and a language selector 'US EN'. The main content area features a horizontal menu with icons for 'About Depression', 'Goals', 'A Closer Look', 'Negativity', 'Challenging', 'Thought Records', 'Behavior', 'Core Beliefs', 'Healthy Beliefs', and 'Certificate'. Below this, there are social media-style icons for likes, shares, and messages. The 'Goals' section includes a bullet point 'Set your Goals!' and buttons for 'Set My Goals' and 'Other member goals'. A 'Tip of the Day' box contains the text: 'Try your best to complete at least three sessions.' The 'Depression & Anxiety Test' section has a description and 'Start' and 'Results' buttons. The 'Worksheets' section lists various activities in two columns: Activity Tracker, Goal Planner, Pleasant Activities, Thought Records (ABC), Thought Records (ABCD), Thought Records (ABCDE), Problem Solving, Behavior Experiment, Core Beliefs, Assumption Worksheet, Relationship Beliefs, and Positive Core Beliefs.

Arm 3 Home Page

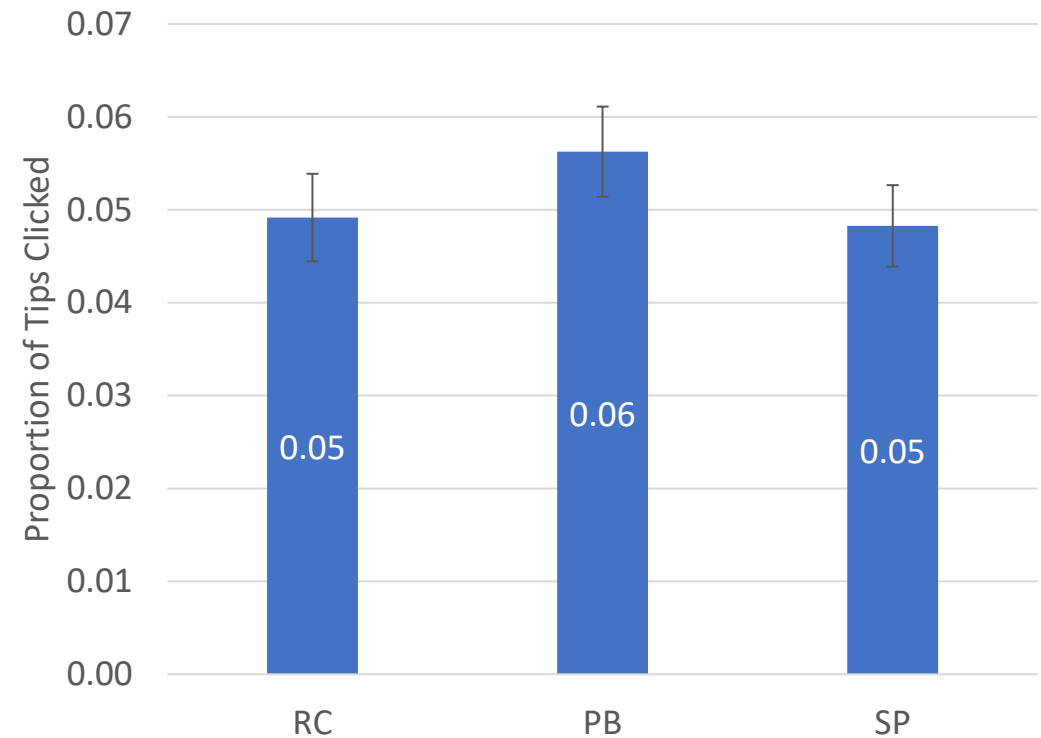
The screenshot shows the 'Overcoming Depression' course home page for Arm 3. The navigation bar is identical to Arm 2. The main content area features the same horizontal menu. Below this, there are social media-style icons. The 'Goals' section includes a list of three bullet points: 'Complete a worksheet every day', 'Meditate', and 'Wake up at the same time every day', along with 'Set My Goals' and 'Other member goals' buttons. A 'Tip of the Day' box contains the text: 'The best way to feel better sooner is by completing at least three sessions.' The 'Depression & Anxiety Test' section has a description and 'Start' and 'Results' buttons. The 'Worksheets' section lists various activities in two columns: Activity Tracker, Goal Planner, Pleasant Activities, Thought Records (ABC), Thought Records (ABCD), Thought Records (ABCDE), Problem Solving, Behavior Experiment, Core Beliefs, Assumption Worksheet, Relationship Beliefs, and Positive Core Beliefs. A 'To-Do' list on the right side includes: 'Watch the Getting Started Video' (checked), 'Upload My Image', 'Complete the Depression & Anxiety Test', 'Set Goals' (checked), 'Update Mood Tracker', 'Review Worksheet', 'Read a Community Post', and 'Complete Session 1'.

Study 2: Results

Engagement with Tips by Arm

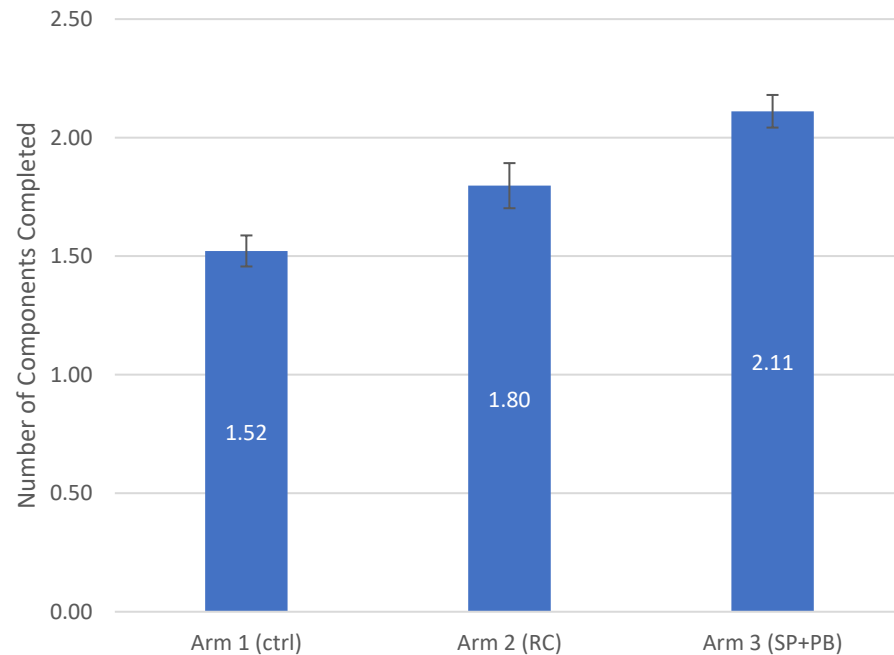


Engagement with Tips by Type



Study 2: Results

Engagement with features by Arm



Engagement by features

Task	Arm 1 n (%)	Arm 2 (%)	Arm 3 n (%)
Upload my image	13 (0.73)	16 (1.85)	357 (18.65)
Use of the Mood/Symptom Tracker	366 (20.47)	224 (25.9)	629 (32.86)
Read a community post	46 (39.66)	13 (43.33)	51 (47.66)
Set goals	304 (17)	171 (19.77)	600 (31.35)
Complete the depression & anxiety test	47 (24.14)	17 (46.67)	60 (51.4)
Review a worksheet*	n/a	21 (2.4)	606 (31.66)
Watch the getting started video*	n/a	24 (2.8)	923 (48.22)
Complete at least one CBT session	723 (40.4)	397 (45.9)	851 (44.4)
Avg. # CBT sessions per user	1.10	1.27	1.21

*not included in analysis due to unavailability of data

Study 2: Discussion

- Interpretation:
 - Choice overload
 - Choice architecture (reminders, checklists)
- Engagement and adherence
 - Greater % users completed at least one CBT session
 - No increase in program completion
- Limitations
 - Participant validation
 - “Tire kickers” and “super users”
 - Employee Assistance Programs

Commentary



Latent Demand

Gap between need for mental health services and their actual use
Consequences for individuals and society



Behavioural Science Framework

Barriers at each stage of patient journey (e.g., stigma, choice overload, accessibility)
Interventions at each stage (e.g., marketing, decision aids, digital treatments)



Default Appointments

Increase DMHT adherence
Preventative care

General Discussion



Applying BE & RCTs
to vaccinations and
digital mental health



Boost uptake and
engagement



Future research on
adherence

Thank You

Email: Renante.Rondina@tbs-sct.gc.ca

