The University of Pennsylvania
In collaboration with SuperBetter Labs, LLC

This bulletin describes our scientific study of a tool called SuperBetter, which reduced users’ depression and anxiety symptoms and increased their well-being.

Scientists have developed good treatments for depression, but many people who need help do not get it. Therapy can be costly, unavailable, or just too stigmatizing. The rise of smartphones and web-based programs has opened the door for new ways to support people who are striving to overcome depression and improve their well-being.

SuperBetter is a web-based and smartphone-based application that provides people with engaging, interactive content designed to help them achieve wellness goals. In this study, the University of Pennsylvania teamed up with SuperBetter Labs to test whether this application can help people overcome symptoms of depression.

In this study, two versions of SuperBetter were compared to a waiting list (control group). One version of SuperBetter targeted depression symptoms using strategies from cognitive-behavioral therapy (Beck, 1979) and positive psychotherapy (Seligman, Rashid, & Parks, 2006). The other version did not specifically target depression; it used quick and easy feel-good activities that had been popular with previous SuperBetter users.

This bulletin describes how the team conducted this rigorous trial, and then it outlines and explains the main findings. It focuses on the following questions:

- Does SuperBetter relieve depression?
- Does it also decrease anxiety and/or improve life satisfaction, social support, and self-efficacy?
- Which version of SB works best?

Results of
A Randomized Controlled Trial: The Effects of SuperBetter on Depression
Method
How was the study done?

This study was a *randomized controlled trial*. All participants had an equal chance of being assigned to one of three groups:

- A group that used a version of SuperBetter based on cognitive-behavioral therapy and positive psychotherapy ("CBT/PPT SuperBetter");
- A group that used a version of SuperBetter based on simple, easy, feel-good activities ("Being Awesome SuperBetter");
- A group that waited for their turn to use SuperBetter ("Waiting List").

**Participants** were recruited from two websites:

- **Authentic Happiness** ([www.authentichappiness.upenn.edu](http://www.authentichappiness.upenn.edu)), which is affiliated with the University of Pennsylvania Positive Psychology Center
- **Craigslist** ([www.craigslist.org](http://www.craigslist.org)), an online community bulletin board

Participant characteristics: The average age was 40. 72% of participants were female, and 82% were White. 39% were currently using therapy or coaching, and 22% had tried these in the past. 42% were currently using antidepressant medication, and 64% had tried it in the past.

At pre-test participants were depressed, with average scores of 32.3 (waiting list) and 34.1 (SuperBetter group) on a scale ranging from 0-60. (Higher scores indicate more/worse symptoms. Scores of 16+ suggest depression.)
Reliable, validated self-report measures were used in the study. This means that participants told us about their depression and well-being; They were not assessed or diagnosed by a mental health professional for this study.

**DEPRESSION** was measured with the Center for Epidemiologic Studies Depression scale (CES-D), a self-report measure. This was the primary outcome.

**ANXIETY** was measured with the Generalized Anxiety Disorder - 7 scale (GAD-7).

**LIFE SATISFACTION** was measured with the Satisfaction with Life Scale (SWLS).

**SELF-EFFICACY** was measured with the New General Self-Efficacy Scale (NGSE).

**SOCIAL SUPPORT** was measured with the Multidimensional Scale of Perceived Social Support (MSPSS).

Potential participants completed a screening questionnaire, and those who were eligible enrolled in the study and completed a pre-test (including all the measures listed above). Then, they were randomly assigned to one of the three groups: CBT/PPT SuperBetter, Being Awesome SuperBetter, or the Waiting List control group. The SuperBetter groups were asked to use the app daily for one month. Every two weeks, all participants were asked to complete a survey about their depression and well-being.

When all data had been collected, the data were analyzed using hierarchical linear modeling (HLM) with the statistical program SAS. HLM is a good way to analyze data when some participants drop out and so data is missing (Nich & Carroll, 1997).
Results
What was discovered?

The most important question in the study was this: Do SuperBetter players become less depressed in one month, compared to people on a waiting list?

POST-TEST ANALYSES
At the 1-month post-test, SB players’ depression scores decreased by 11.3 points. In comparison, waiting list participants’ scores only decreased by 4.3 points.

How big is this change? Do 11.3 points on a depression scale matter? This change is equivalent to the following: After one month, a SB player reports that 5 symptoms that used to bother her 3-4 days per week are no longer a problem—while a waiting list participant reports that only about 2 symptoms have improved that much.

FOLLOW-UP ANALYSES
By follow-up (six weeks pre-test), SB players’ scores were 17 points lower than at pre-test (compared to a 6 point decrease for waiting list participants). This is equivalent to eliminating about 8 symptoms that used to bother a SB player 3-4 days per week (compared to eliminating about 3 symptoms for waiting list participants).
Results

Continued

**SECONDARY OUTCOMES**

**ANXIETY**

At the one-month post-test, SB players’ anxiety scores decreased by **3.5 points**. Waiting list participants’ anxiety scores only decreased by **1 point**.

**LIFE SATISFACTION**

At the one-month post-test, SB players’ life satisfaction increased by **3.1 points**. Waiting list participants’ life satisfaction only increased by **0.5 points**.

**SOCIAL SUPPORT**

At the one-month post-test, SB players’ social support increased by **3.5 points**. Waiting list participants’ social support only increased by **0.1 points**.

**SELF-EFFICACY**

At the one-month post-test, SB players’ self-efficacy increased by **3.4 points**. Waiting list participants’ self-efficacy only increased by **0.5 points**.
Results
Continued

Which version of SuperBetter worked best? The hypothesis was that the CBT/PPT version of SuperBetter would work best, because it uses strategies from effective therapies (cognitive behavioral therapy and positive psychotherapy).

CBT/PPT SUPERBETTER (VS. WAITING LIST)
At the one-month post-test, participants using CBT/PPT SuperBetter were slightly better off than waiting list participants: Their depression scores fell by 9.3 points compared to 4.5 points, but the difference was not statistically significant.

BEING AWESOME SUPERBETTER (VS. WAITING LIST)
At the one-month post-test, participants using Being Awesome SuperBetter were significantly better off than waiting list participants: Their depression scores fell by 13.0 points compared to 4.5 points ($p < .0001$). By follow-up, the participants using Being Awesome SuperBetter saw their depression scores fall by a total of 19.7 points.

COMPARISON OF 2 VERSIONS OF SUPERBETTER
Overall, the Being Awesome version of SuperBetter performed better than the CBT/PPT version of SuperBetter, as seen in the graph below. There are several possible explanations. One is that it may be hard to master CBT skills without more guidance. Another is that not all the CBT/PPT participants downloaded/used all the content they were offered, so they did not receive their full “dose” of SuperBetter. More research is needed to understand which kinds of SB content work best.