Intervention Protocol for

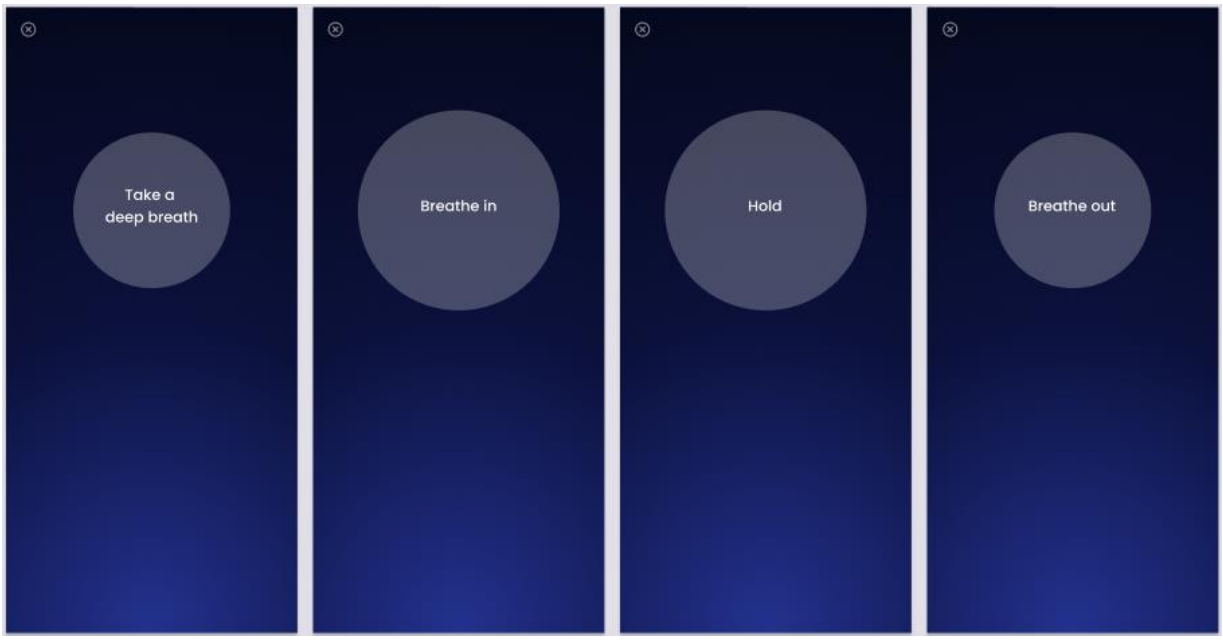
Efficacy and Dose-Response Effects of Mobile-Based Compassion Training: A Randomized Controlled Trial

Elizabeth S. Baik* & Yoona Kang*

*Corresponding authors
elizabeth.baik@rutgers.edu, yoona.kang@rutgers.edu

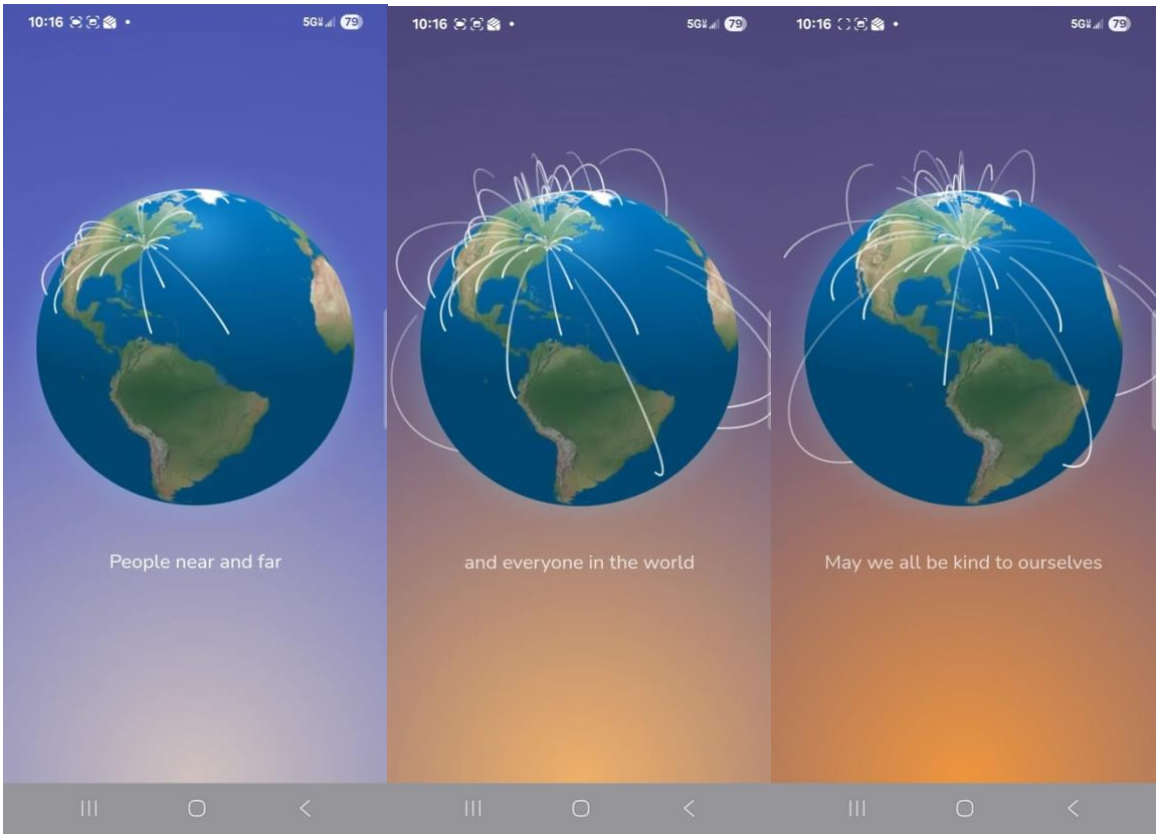
This mobile-based 21-day compassion intervention was developed based on our research group's prior studies on compassion-based health interventions.[1,4] The intervention draws from the Social Contagion Theory[5] that posits that experiences like compassion may spread through social systems and incorporated key elements of the Theory of Planned Behavior[6] by targeting subjective norms regarding compassion within communities.

The interventions were delivered via a custom mobile compassion application running on iPhones with iOS 17 or newer. Each day, participants in the other-compassion, self-compassion, and active control conditions received mobile notifications prompting them to complete an approximately 3-minute training session twice daily. Each training session, across conditions, began with two short rounds of guided breathing using on-screen written instructions and a simple visual animation (an expanding and contracting circle) to pace their breath. This was followed by condition-specific training, with content varying by condition, but session length, structure, and timing carefully matched to ensure comparable exposure and engagement across conditions as much as possible.



Other-compassion training involved participants uploading photographs of people from their close and distant social circles to be used during the session. During each training session, participants were guided to extend well-wishes to others using standardized phrases such as "*May you be well*," "*May you be safe from harm*," and "*May you be peaceful.*" These wishes

were directed sequentially toward three people from each participant's own life while viewing uploaded photographs, then toward one stranger (another study participant), and finally toward progressively wider circles of communities. This final segment included a visual animation of a rotating globe with lines spreading further outward to represent the extension of compassionate well-wishes in widening circles, from the participant's local region to encompass all beings worldwide.

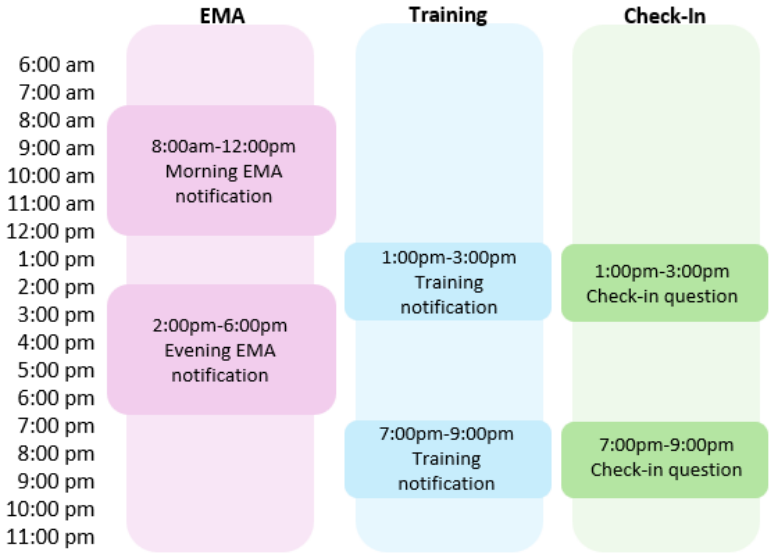


Self-compassion training involved participants uploading photographs of their current and past selves from meaningful periods of their lives to be used during the session. During the training session, participants extended well-wishes toward themselves using phrases such as "*May I be well*," "*May I be safe from harm*," and "*May I be peaceful*." These wishes were directed while participants viewed four photographs of themselves from earlier periods in their lives.

Active control activity was tightly matched to intervention conditions and was adapted from a paradigm previously validated from a neuroimaging study of compassion.[4] Participants were presented with four images of everyday tasks, randomly chosen from a pool of 52 images from Adobe Stock images (https://stock.adobe.com/; the original photographs used in the study are copyrighted; a similar copyright-free image is shown here.). Each image was accompanied by a description of the task, adapted from a previous study,[4] along with a corresponding wish phrase (e.g., "*Doing the laundry. May it be done well,*" "*Replacing batteries. May it be done safely*," and "*Drying hair. May it be done peacefully.*"). Participants were guided through making well-wishes for these value-neutral everyday activities.

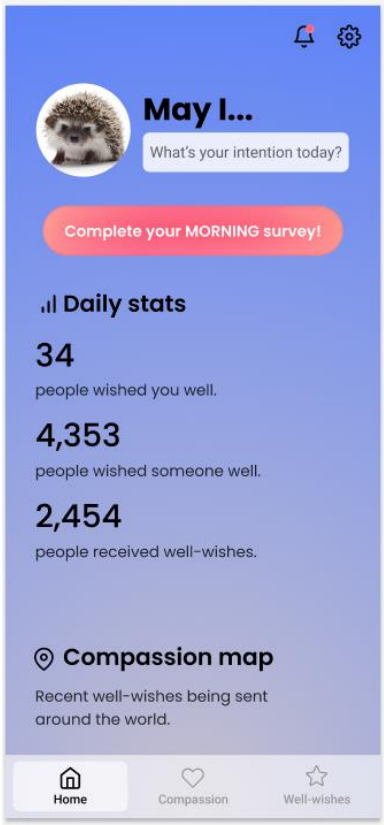
Participants in the no-intervention condition received no training. For these participants, the custom mobile app home screen displayed only basic interface elements (e.g., notification and settings icons) along with brief instructions about study participation.

All participants received four push notifications per day on a semi-randomized schedule.



Two notifications prompted completion of brief condition-specific training sessions paired with post-intervention well-being assessment (delivered between 1–3 PM and 7–9 PM). Participants in the no-intervention condition received a single-item well-being survey within matching time windows, closing at 6:30pm and 23:59pm respectively.

Two notifications prompted completion of EMAs (delivered between 8 AM–12 PM and 2–6 PM) using signal-contingent sampling.[7] EMA survey buttons (displayed in pink on the home screen) appeared upon notification and remained available until 1:30pm for morning surveys and 23:59pm for evening surveys. Quiet hours for notifications were enforced from 11 PM to 6 AM local time.


May I...
What's your intention today?
Complete your MORNING survey!
Daily stats
34
people wished you well.
4,353
people wished someone well.
2,454
people received well-wishes.
Compassion map
Recent well-wishes being sent around the world.
Home
Compassion
Well-wishes


Please take a moment to complete your meditation.
What's your intention today?
Daily stats
34
people wished you well.
4,353
people wished someone well.
2,454
people received well-wishes.
Compassion map
Recent well-wishes being sent around the world.
Home
Compassion
Well-wishes