

A Mindfulness App for Nurses with Posttraumatic Stress from the COVID-19 Pandemic: A Randomized Controlled Trial

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Background:

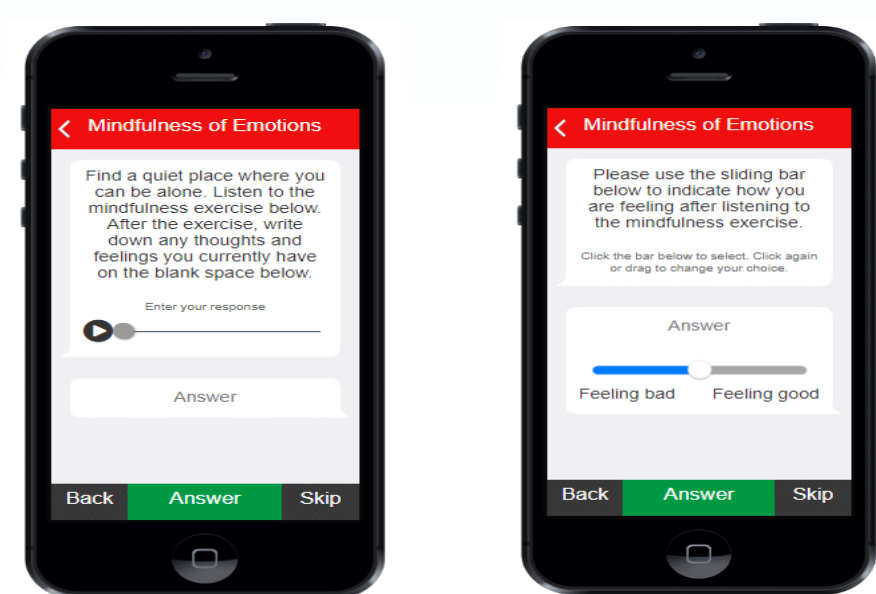
- Prevalence of PTSD from the pandemic among nurses was 28.22% compared to 17.34% for the general population (meta-analysis)¹
- Higher prevalence of delayed-onset PTSD is predicted among nurses months/years after the pandemic²⁻⁶
- About 10%-40% of healthcare workers will develop PTSD 1-3 years after the pandemic⁷
- Two decades of research has shown that mindfulness interventions improve PTSD^{8,9}
- Effectiveness of mindfulness interventions for healthcare workers with PTSD remains unclear and limited¹⁰⁻¹²

Purpose of the Study:

This study aimed to examine the feasibility and acceptability of a mindfulness smartphone app for nurses traumatized by the COVID-19 pandemic.

The Intervention:

- The app was based on the principles of Acceptance and Commitment Therapy (ACT)¹³
- Participants used the app daily for six weeks.
- The app is comprised of:
 - Daily audio-guided mindfulness meditations
 - Weekly videos on ACT
 - Weekly reflection journals
 - Weekly phone calls from Research Team (follow-up on technical problems with the app).



Methods:

- Two-arm, randomized controlled trial
- 60 frontline nurses working in various clinical settings in the U.S. randomly assigned to intervention and control groups
- Intervention group: participants used the mindfulness app for 6 weeks
- Control group: wait-list control group. Participants were given the option to use the mindfulness app after 10 weeks
- Four time-points to assess outcome measures: pre-intervention, mid-intervention, post-intervention, 4-week follow-up
 - **PTSD.** PTSD Checklist for DSM-5¹⁴
 - **Experiential Avoidance.** Acceptance and Action Questionnaire-II¹⁵
 - **Rumination.** Ruminative Response Scale¹⁶
 - **Mindfulness.** Mindfulness Attention Awareness Scale¹⁷
 - **Resilience.** The Connor-Davidson Resilience Scale 25-items¹⁸
 - **Satisfaction with the app.** Intervention Satisfaction¹⁹
 - **Usability.** System Usability Survey²⁰
- **Data analysis method:** Generalized Estimated Equations (GEE) approach

Results:

- Participants (n=30 in the intervention and n=30 in the control groups)
- Each group had 10 males and 20 females
- **Mean age in years:**
 - 36.4 (SD=9.22) for intervention group
 - 34.3 (SD=8.54) for control group
- **Racial demographics**
 - Intervention: White(14); African American(14); Asian(1); Hispanic(1)
 - Control: White(15); African American(13); Asian(1); Hispanic(1)
- **Licensure status**
 - Intervention: RN(26); LPN(4)
 - Control: RN(25); LPN(5)
- **Intervention satisfaction:**
 - Ratings of 5.57-5.80 on a 6-point scale (**high satisfaction ratings**)
 - Perceived helpfulness, comprehension, intention to use, perceived fit (items ranging from 1 to 6, with 6 "strongly agree")¹⁹
- **Usability of the app:**
 - SUS Ratings: 92.25, SD=9.24 (**excellent usability rating**)
 - SUS scores of 75-90 are considered to be good to excellent products²⁰

Results (Differences in Outcomes):

- **PTSD:** significant within-between interaction ($F(3,173.2) = 14.97, p < .001$).
 - **Significant difference** between intervention and control at mid-intervention, post-intervention, and follow-up
- **Experiential Avoidance:** significant within-between interaction between the intervention and time ($F(3,173.2) = 7.52, p < .001$).
 - **Significant difference** between intervention and control at post-intervention and follow-up
- **Rumination:** significant within-between interaction ($F(3,173.2) = 6.77, p < .001$).
 - **Significant difference** between intervention and control at post-intervention and follow-up
- **Mindfulness:** interaction between the intervention and time was not significant at 0.05 level ($F(3,173.2) = 1.69, p = .171$).
 - No significant difference between groups **but significant improvement in the intervention** from mid-intervention, to post-intervention, and to follow-up
- **Resilience:** interaction between the intervention and time was not significant at 0.05 level ($F(3,173.2) = 0.47, p = .707$).
 - No significant difference between groups

Conclusions:

- Significant difference between groups for PTSD, experiential avoidance, and rumination, indicating that the app significantly improved these three outcomes.
- No significant difference between groups for mindfulness; however, intervention group significantly improved mindfulness at all timepoints
- Lack of significant improvement in resilience is consistent with other studies of mindfulness intervention²¹⁻²⁴
- Participants' mean resilience was generally higher compared to other studies^{23,25-27}
- Study findings provide evidence for healthcare organizations to consider delivering online and digital interventions for employee mental health assistance and support.

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