

## **“Minions Belly Breathing” Developing a Children’s App to Help with Stress**

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**Background:** Toxic stress, which is defined as persistent exposure to difficult events (i.e. adverse childhood experiences (ACEs)), can impact children’s health into adulthood (Chang et al., 2019). Positive distractions can help divert attention from stress or anxiety in hospital settings (Desai and Pandya, 2013). Equipping children with emotion regulation skills can help them endure stressful circumstances and prevent future mental health challenges (Gross and Muñoz, 1995; Keenan, 2000). Systematic reviews and meta-analyses further link positive changes in emotion regulation with reduced anxiety, depression, substance abuse, eating, and borderline personality disorder symptoms (Aldao et al., 2010; Moltrecht et al., 2021; Sloan et al., 2017).

By partnering with Illumination, creators of the Minions characters, we aimed to evaluate a digital application intervention, designed using evidence-based mindfulness techniques, emotion awareness and regulation strategies, and positive distraction methods for use in healthcare and school settings.

**Methods:** We conducted key informant interviews with pediatric patients and their caregivers and focus groups with middle-high school students. Patients watched a 2-minute guided breathing video and were asked questions to prompt feedback. Students were shown a presentation of proposed app activities (Figure 1) in addition to the video and were asked for their feedback in a small group setting. We aimed to (1) understand the user experience; (2) identify high-impact app activities, and (3) gather recommendations for future app development. Using UCLA’s Rapid Rigorous and Relevant Hub model, we summarized findings into key themes and takeaways with supporting quotes.

**Results:** We conducted 11 key informant interviews and 9 focus groups (Table 1) and learned how children cope with the stressors in healthcare and school settings. Often, a combination of positive distraction and clear communication from providers were cited as the best remedies in healthcare settings. The student focus groups highlighted that the largest stressors for students were primarily due to academic and social challenges. Students recommended adding features to support time management and planning for adolescent users.

Most participants expressed feeling “calm” and “happy” after watching the breathing video. For example, one patient was shaking her legs but stopped after participating in the breathing exercise. The patient’s caregiver pointed this out as an indication of reduced anxiety, which the patient affirmed, illustrating the calming effect of deep breathing supported in the literature.

Feedback highlighted the need for improved accessibility and privacy/safety measures. Additionally, most participants engaged in the breathing exercise voluntarily, indicating its effectiveness in eliciting interaction, even in its early stage.

**Conclusions:** This study yielded insights on stressful experiences for pediatric patients and students, coping mechanisms, constructive feedback on the app, and recommendations on future directions. Continuous user-informed input is critical for shaping a digital app to support children in managing stress. The positive responses to the guided breathing video and overall concept indicate potential for further app development.

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Participants	n	Type
Pediatric Patients	5	Interview
Patient Caregivers	5	Interview
Teacher	1	Interview
Students (10 <sup>th</sup> gr)	22	Focus Group
Students (8 <sup>th</sup> gr)	14	Focus Group
Students (6 <sup>th</sup> gr)	18	Focus Group

*Table 1.* Participant Breakdown

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