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Abstract Title: Feasibility and Acceptability of a Wearable Respiration-Sensing Device for Supporting Pain Management in Adult Survivors of Childhood Cancer with Chronic Pain

Abstract:
Wearable devices that use sensor-enabled technologies to continuously track respiration, may be valuable for survivors of childhood cancer with chronic pain, as respiration, anxiety, and pain are inter-related. Such devices could provide objective monitoring of physiological correlates of subjective pain, as well as provide wearers with reminders to self-manage pain. No studies have evaluated wearable respiration technology to target chronic pain. We examined the feasibility and acceptability of the *Stone (Spire Health)*, a wearable respiration device, among adult survivors of childhood cancer previously determined to have chronic pain (≥ 3 months of pain), recruited from the Childhood Cancer Survivor Study, a multi-institutional cohort of ≥5-year survivors of childhood cancer. Of the 76 survivors invited to the study, 65 (85.5%; median age=43.99; range=25–62) consented and were randomized either to the *Stone* (n=32) or usual care (n=33). Those in the intervention group wore the device for 30 days and were prompted to complete daily breathing exercises via the *Stone* app. Thirty-one survivors (96.9%) completed the intervention arm compared to 32 (97.0%) under usual care. Twenty-nine (93.5%) participants wore the device ≥50% of the required days and 74.2% were satisfied or very satisfied with the device and found the app helpful or very helpful in practicing breathing exercises. Total cost associated with device delivery/return was $528 USD, with 93.8% of devices returned to the study team. Study findings provide preliminary evidence for the feasibility and acceptability of using wearable respiration technology to target chronic pain among survivors of childhood cancer.

248 words