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### THE FEASIBILITY AND ACCEPTABILITY OF BEHAVIORAL ACTIVATION IN AN ADOLESCENT CLINICAL SETTING

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## RESEARCH POSTER PRESENTATION II: MENTAL HEALTH

128.

### DESIGNING A USER INTERFACE FOR MOODRING: A MOBILE APPLICATION FOR MONITORING ADOLESCENTS' DEPRESSION

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**Purpose:** The purpose of this iterative usability study was to inform design of a mobile application, MoodRing, for providing feedback to depressed adolescents about mood through the use of machine learning predictions based on smartphone passive sensor data. MoodRing aims to improve self-management for adolescents, increase parental awareness about worsened mood, and provide clinician feedback that is technologically feasible, usable, appealing, and capable of delivering high-quality, actionable data.

**Methods:** An iterative series of focus groups and interviews were conducted with adolescents who had history of depression, parents who had a child with depression, and healthcare providers including care managers, primary care providers, and mental health clinicians. Three focus groups were conducted with each group to introduce prototype mockups, assess ease of understanding data displays, acceptability of passive sensing, privacy concerns. Then secondary prototypes were developed and interviews conducted with 4 providers, 5 parents, and 6 adolescents. Each was presented with a video scenario of how MoodRing may be introduced to them in primary care. Afterwards each was asked to use a think aloud procedure to describe their interaction with the prototype. Adolescents went through 3 scenarios: onboarding, reviewing real data, and learning a coping skill; parents went through onboarding, viewing child's data, and learning a communication skill. Providers went through viewing the provider dashboard with detailed patient-level data, and programming a coping skill to set up personalized notifications. Participants completed follow-up interview about their impressions, difficulties, feedback. Interviews were transcribed and coded using thematic analysis, as well as based on six overarching themes, based on 4 categories, namely benefits, concerns, suggestions, and conclusions.

**Results:** Primary care managers understood potential utility of MoodRing but felt it would be a steep learning curve due to general discomfort with mental health triage. Parents respected adolescents would want confidentiality concerns, while both adolescents and parents agreed clinicians should see as much data as possible. In prototype testing, adolescents and parents gave positive feedback about usability overall and specific feedback about visual design iterations, and all recommended personalization. Being able to control privacy settings and manage notifications was thought essential for users to remain engaged. Trends presented in data and graphs was generally grasped. In terms of privacy, users believed the app clearly addressed all privacy concerns as it listed precisely what would be passively collected. One parent described, "I think having the alert would have helped me to intervene sooner than I did. Cuz I didn't realize that she was feeling the way she did until it was, you know, too late."

**Conclusions:** Overall, feedback obtained from focus groups and interviews provided a substantial trajectory for the development of the MoodRing platform. Adolescents, parents, and providers felt that an app collecting passive data from them would be useful as long as it

allowed for awareness of how data was being used, respect for privacy, and personalization. Future steps include finalizing the development of the application and testing it in a clinical trials for effect on improving the quality of depression management.

**Sources of Support:** R44 MH122067 01 NIMH.

129.

### THE FEASIBILITY AND ACCEPTABILITY OF BEHAVIORAL ACTIVATION IN AN ADOLESCENT CLINICAL SETTING

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**Purpose:** During the COVID-19 pandemic, estimates of adolescent depression prevalence have significantly increased. Although 80% of youth with mental health problems do not access mental health (MH) services, most interact regularly with pediatricians, suggesting primary care is a promising setting for youth MH service delivery. Behavioral activation (BA) is a straightforward intervention focusing on increasing engagement in meaningful activities and has been shown to be effective in adolescent populations. This study examines the feasibility and acceptability of implementing BA delivered by nurses to adolescents with mild to moderate depressive symptoms in an ambulatory setting.

**Methods:** We examined the feasibility and acceptability of BA to a sociodemographic-diverse adolescent population. To examine feasibility, we retrospectively analyzed the percentage of patients presenting with mild to moderate depressive symptoms on the patient health questionnaire-9 during a random four week period. We then conducted qualitative interviews with four parent-adolescent dyads, and two additional adolescents. A semi-structured interview guide was iteratively developed to assess perceived acceptability of BA and barriers and facilitators to engaging in the intervention. Interviews were recorded, transcribed, and coded by authors JDT and JF. A thematic analysis was completed to identify whether the program as designed was acceptable to the targeted population.

**Results:** A records review found that out of 122 unique patients presenting for any clinic visit during the four week period, 44 (35%) met criteria for mild to moderate depressive symptoms. Of those who met criteria, youth were 17.45 years old (range = 12-22) with 61% identified as female. Results of the qualitative interviews suggest that participants perceived BA to be appropriate; themes emerged suggesting that both parents and youth noted nurse-delivered BA was similar to other types of therapies they had engaged with in other settings and that participants experienced nurses' as able to protect confidentiality and someone they could be "vulnerable" with. Participants were mixed in how feasible they felt regular visits to the pediatrician's office was, with some noting that transportation and time were major barriers for engaging in treatment. All participants noted that telehealth options (including meeting with a nurse provider over the phone or through web conferencing) were appropriate and would facilitate treatment access. Participants also noted that time, transportation and cost were significant barriers to engaging in valued activities (a central mechanism of BA), and several parents and youth noted that these barriers were exacerbated during the pandemic.

**Conclusions:** Our data highlights the implementation potential for delivering BA by nurses in an adolescent ambulatory setting. Qualitative themes suggest this approach (especially delivered via telehealth) is feasible and acceptable for youth with mild to moderate depressive symptoms.

**Sources of Support:** This project is supported by the Helen DeVos Children's Hospital Pediatric Research Fund.

### 130.

#### MINDFULNESS TECHNIQUES FOR STRESS AND ANXIETY IN ADOLESCENTS WITH TYPE 1 DIABETES

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**Purpose:** Type 1 diabetes mellitus (T1D) is one of the most prevalent chronic conditions in adolescents. Adolescents with T1D have higher rates of stress and anxiety than the general adolescent population. Mindfulness techniques, such as guided meditation, yoga, and body scan, are an evidence-based method of reducing stress and anxiety symptoms. However, these techniques have not been operationalized in adolescents with T1D. The purpose of this qualitative descriptive study was to provide an in-depth description of the perception and current use of mindfulness techniques to manage stress and anxiety in adolescents with T1D.

**Methods:** We used a qualitative descriptive approach, consisting of an in-depth, semi-structured interview comprised of 10 open-ended questions with follow-up probes. The analysis was guided by the principles of thematic analysis. We also collected demographic data and hemoglobin A1c. IRB approval was obtained prior to data collection.

**Results:** Twenty participants with T1D (ages 13 to 17, 60% identified as female, mean A1c 7.6%) engaged in an in-depth qualitative interview (mean duration 40 minutes). We identified 4 major themes: 1. Adolescents were exposed to mindfulness techniques previously, including breathing exercises and yoga, and most reported positive effects of practicing mindfulness; 2. Adolescents reported that mindfulness was a means of escape from constant cell phone and social media usage, reminders, and notifications –“you get to put your phone away for the full hour you're doing it”; 3. Several adolescents inadvertently used music as a way of cultivating mindfulness to “get away from everything” (most participants reported that listening to music was a way of escaping the external environment and shifting their focus internally, although most did not consider this a mindfulness practice); 4. Participation in a regular mindfulness practice was cost prohibitive to the majority of adolescents (most used a commercially available mobile health [mHealth] application and were not able to subscribe to access the full content). All adolescents endorsed an interest in an mHealth application that delivered mindfulness practices designed for teens, especially with customizable options (asynchronous, a variety of durations, multiple types of mindfulness practices to try).

**Conclusions:** Adolescents living with T1D experience high rates of stress and anxiety, impacting their chronic disease management and quality of life. Mindfulness is an evidence-based intervention that reduces stress and anxiety that has not yet been operationalized in adolescents with T1D. We found that adolescents with T1D have commonly been exposed to mindfulness techniques and are open to trying mindfulness in their daily lives. They value mindfulness practices as a means of “escaping” technology. Several adolescents

use music as a form of unintentional mindfulness practice, describing “eliminating external stimuli” and “zoning internally” while listening to music. Our results suggest that implementing a low-cost, accessible mHealth application that delivers mindfulness practices of variable durations may be an effective strategy for mitigating stress and anxiety in adolescents with T1D.

**Sources of Support:** n/a.

### 131.

#### VIRTUAL YOGA AND MINDFULNESS TRAINING AMONG JUVENILE COURT INVOLVED YOUTH

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<sup>1</sup>UPMC Children's Hospital of Pittsburgh; <sup>2</sup>University of Pittsburgh; <sup>3</sup>YogaRoots on Location.

**Purpose:** Juvenile court involved youth (JCIY) experience unique psychosocial challenges. The COVID-19 pandemic generated additional stressors for this vulnerable population. Promoting mindfulness strategies may increase well-being among JCIY, but few such interventions have been developed. We sought to evaluate the impact of a longitudinal mindfulness intervention incorporating healing-centered, anti-oppression yoga delivered through a virtual platform on multiple psychological outcomes among JCIY involved in community-based monitoring.

**Methods:** We partnered with YogaRoots on Location (YROL), a healing-centered, anti-oppression yoga instruction group, to implement a longitudinal mindfulness training program to youth aged 11-21 involved in the Allegheny County Community Intensive Supervision Program (CISP). Starting in March 2020, this program transitioned to a remote format in light of the COVID-19 pandemic. Sessions were delivered via Zoom and incorporated Raja yoga practice, breathing techniques, meditation and mindfulness exercises, and strengths-based social justice exploration. Sessions lasted one hour and occurred weekly. Youth attending nine sessions completed end-of-program (EOP) evaluations. Baseline surveys assessed demographic characteristics and prior experiences with racism and trauma. EOP surveys were administered to assess for changes in multiple psychological outcomes: mindfulness, acceptance and action, resilience, future orientation, emotion dysregulation, and psychological distress. Demographic data were summarized with descriptive statistics. McNemar or Wilcoxon signed rank tests were used to compare outcomes at baseline and EOP.

**Results:** 99 youth completed baseline assessments. Mean age of participants was 16.2 (SD: 1.4). 85 (86%) were male. 60 (61%) identified as Black/African-American, 17 (17%) White, and 14 (14%) other racial identities. 7 (7%) were Hispanic/Latino. 74 (75%) youth reported prior experiences of trauma, with 47 (47%) reporting three or more. Perceptions of racism were common, with 63 (64%) youth reporting being treated unfairly by a police officer and 67 (68%) being accused of something they did not do at school. 16 youth (16%) completed EOP surveys. No significant changes in any psychological outcomes were noted from baseline to EOP among this cohort of youth who completed nine or more sessions. Many reported likelihood of using yoga in the future to deal with stress (11; 69%), to calm down (12; 75%), and to deal with racism (8; 50%).

**Conclusions:** JCIY face significant psychosocial stressors, and many report histories of trauma and discrimination. The COVID-19