

UNITE: Smart, Connected, and Coordinated Maternal Care for Underserved Communities

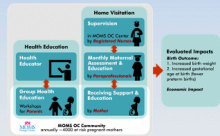
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IRG, FY2018

Project Vision:

- Help underserved pregnant women achieve healthy pregnancies through IoT-enabled self-management and smart, personalized recommendations
- Enhance community engagement with mothers, families, & community-oriented agencies

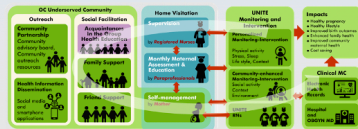
Maternity Care Coordination Models

Home Visitation (HV) Model:



UNITE Model:

- *WIoT monitoring*
- *RN-in-the-loop smart intervention*
- *Community engagement*
- *Self-management*



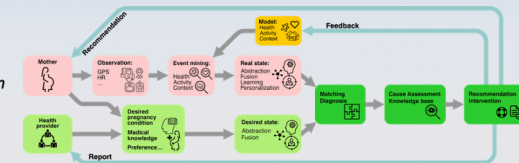
Intellectual Merits



<https://unite.ics.uci.edu/>

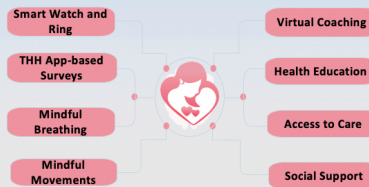
- Motivate mothers to achieve healthy pregnancies through ubiquitous health monitoring, smart interventions, personalized recommendations and community-enhanced interaction and education.

Closed-loop system for lifelogging, health monitoring and recommendation leveraging personalized models



- Build holistic digital phenotypes of the Maternal Care community using multi-modal data capture, personalized model building and dynamic recommendations (via wearable IoT devices, lifelogging, context recognition, health monitoring, and personalized, adaptive recommendation systems).

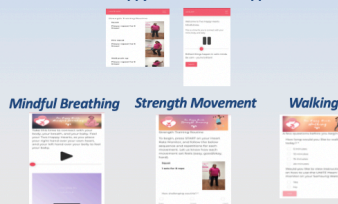
Two Happy Hearts (THH) Program



"Two Happy Hearts" (THH) Mobile App

- Mindful breathing and mindful exercise regimen
- Reduce mother's stress level & achieve ACOG guidelines for physical activity
- Motivate/guide mothers on THH program
- Capture the emotional state of mother
- Enable personalized model building

Two Happy Hearts Mobile App



Case study with Pregnant Mom: April-June 2020



This subject shared her successful delivery experience as well as provided valuable feedback on how to improve the app in July 2020.

"I gave birth to a beautiful baby girl on my due date naturally and with the Two Happy Hearts study I was able to prepare my body for its greatest achievement. I did squats during contractions and walked thousands of steps between them. I couldn't have done any of this without the program and probably would have opted for epidural had I not stayed so active."

Broader Impacts on Society

- Reduce disproportionate risk of maternal and infant health disparities in underserved communities
- Effective delivery of healthcare and social services, leading to cost reduction
- Community building for pregnant mothers, families, care providers
- Multidisciplinary training of researchers across CS, Health Sciences, Psychological Sciences, and Engineering



Broader Impacts: Sustainability

- Virtual community building at multiple scales: pregnant mothers, families, healthcare providers, insurance providers, governmental agencies
- Scalability and portability of UNITE model to decrease preterm birth across diverse ethnic and socio-economic communities
- Improve quantity and quality of maternal care using cross-continuum care coordination.
- Reuse and exploit community-based memory of past exploratory phases via personalization and adaptive online learning
- Education and training of next-generation healthcare providers

Plans for Coming Year

- Feasibility Study: complete feasibility study and use outcomes to inform intervention, usability, and RCT study design.
- UNITE Technology Components: modify THH exercise, breathing and relaxation module, the UNITE mobile app, and the dashboard
- Expand Community Engagement: liaise UNITE project with broader community (e.g., The Be Well OC Ecosystem) and develop closer relationship with direct service providers (e.g., OC Health Care Agency and South County Outreach)