AUTONOMY RESEARCH CENTER FOR STEAHM

Improving Social Medicine With Autonomy

iPUMP: AR and Breast Pumps

Synopsis

- The benefits of breastmilk include growth plus physical and mental development.
- Many breastfeeding parents must return to work during the first year of their child's life, so use a breast pump to express breast milk. It is stored for a future bottle-feeding session to help maintain an adequate supply.
- Innovative methods to enhance breastfeeding are needed to expand these benefits in the US.
- The proposed app, Augmenting Milk Output Realities (AMOR), amplifies the breast pumping experience by completely immersing the parent with a carousel of pictures of her baby that she can interact with using hand gestures.

Research Objective

- To measure changes in saliva during a breast pumping session with a selected visual device, and to determine the effects of AMOR's intervention on breast milk expression, salivary oxytocin (which makes milk available: letdown reflex), and user experience.
- The project's expected outcomes include that the Intervention Group (using augmented reality) will have a greater volume and mass of expressed breast milk.

Research Approach

- Participants provide personal images of their baby and family that are loaded onto a study visual device.
- Participants then view their images during their breast pumping session.
- At the participant's third visit, and based on random assignment, they will either continue with a tablet or will use an augmented reality device to view and interact with their images as they utilize a breast pump to express breast milk.

Research Results and Products

- 22 participants have been randomly assigned to receive an AMOR app intervention (AR device, n=14 participants) or a control condition (tablet, n=8 participants).
- The AMOR app incorporated 60 photos (self-portraits, pictures with their baby/family) that the participant selected into an immersive AR experience that targeted salivary oxytocin.
- The AMOR app users' experience (time points 1 and 2) was significantly better when compared to tablet app users' experience at time points 1 and 2 (95% CI = 0.40 to 0.87, t = 5.71, p<0.001).

Commercialization and/or Societal Impact Opportunities

- **Application:** May be utilized by breastfeeding parents who may be away from their baby for extended periods.
- **Key Values:** Engaging and customizable experience for lactating mothers.
- **Potential Customers:** Hospitals, incarceration facilities, lactation consultants, perinatal doulas, the Department of Defense

Team Names & Collaborators

ARCS Students: Monica Ahumada-Heen, B.S. Student in Chemistry, Alishia Sandoval, B.S. Student in Computer Science

Research Assistants: Brenda Simonian, Caitlynn Thomas, Denise Jimenez, Destiny Varela, Duaa Mohammed Shameem, Harmony Whiting, Kate Gregg, Kira Faerstain, Mahi Morou, Malak Elokour, Pauline De La Cruz

Staff: Wyconda Cotton-Curtis, M.S., Project Coordinator

Faculty: Kacie Blackman, Ph.D., Associate Professor

Citations

American Academy of Pediatrics. (2022, May 31). Newborn and infant breastfeeding. https://www.aap.org/en/patient-care/newborn-and-infant-nutrition/newborn-and-infant-breastfeeding/

Funding:

1.2024-2025 CSUN Research, Scholarship, and Creative Activity (RSCA)

2.HHD Innovation & Collaboration Challenge

3.Charles R. Drew University Black Maternal Health Center of Excellence Biddy Mason Fellowship

CSUN

NASA Partner

Updated on 09/2024