

The Impact of Sleep on Breastmilk Quality

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Introduction: Breastfeeding is a sensitive and critical process that can simultaneously impact a breastfeeding mother and the child. Previous research has shown the impacts of sleep, stress, and anxiety on breastfeeding and the well-being of a new mother (Tikotzky & McQuillan). However, there has been no significant research on how sleep affects breastfeeding quality and quantity (Kim). By linking these two factors directly, this study can provide significant insight towards improving child nutrition and maternal health through good sleep hygiene. This study will record the average daily sleep of around 30 participants who will provide information on their average daily sleep hours and breastfeeding during three months of motherhood to better understand how sleep affects the composition and production of breast milk.

Methods: For enrollment, Dr. Gowda, Dr. Ross or Dr. Viraraghavan will approach patients for the study after their regular appointments and obtain consent via paper consent forms.

After enrollment, study visits will begin. On the next scheduled visit, Dr. Gowda, Dr. Ross and Dr. Viraraghavan will provide a sleep scale for patients to answer and record the amount of breastmilk produced during that time period. These visits will occur in their routine clinics, UCR Citrus clinic and Womens Silver Oaks Clinic, with their regularly scheduled physician (Dr. Gowda, Dr. Ross and Dr. Viraraghavan). These will happen right after their scheduled visits, and take 5-15 minutes for each visit. The frequency will depend on each patient and will be approximately every 3 weeks or month. There will be no equipment used other than the physical survey. Additionally, during each visit a 40 mL sample of breastmilk will be taken to analyze for nutrient content. Kits to provide the samples will be given to each patient at the beginning of the study. Research participants will be involved by being asked questions during infant visits.

After the survey is taken, the Clinical Research Team will store the data in locked cabinets only accessible to authorized personnel. The paper survey will be separated from the rest of the patients' medical records and will not be part of the patient EPIC medical records.

Discussion: The impacts of breastmilk research are invaluable to lactating mothers and breastfeeding children. Many mothers have stress and anxiety about adequately breastfeeding their baby. It is critical to detect the causes of breastmilk production abnormalities, and by finding these connections mothers can improve their and their children's health outcomes and breastmilk production through health education. Maternal sleep deprivation due to an infant's infrequent demand for breastfeeding may result in maternal anxiety and stress which in turn decreases milk production and may hamper the continuation of breastfeeding. This in turn may negatively impact the baby's nutrition and well-being. By establishing these connections and by providing health-related education, mothers can improve both their own and their babies' health outcomes. Additionally, through this study, mothers can receive specific and individualized information on their breastmilk health content, which can aid them to de-stress about proper child nourishment or improve through diet and healthcare.

UCR HEALTH

ASK HOW YOU CAN PARTICIPATE IN THIS STUDY

PURPOSE OF THE STUDY
Breastfeeding is a sensitive and critical process that can both impact a breastfeeding mother and the child. Many studies have been done to show how breastfeeding impacts a mother's sleep, but there has been no significant research on how sleep affects breastfeeding quality and quantity. This study will record the average daily sleep of participants and collect information on their average daily sleep hours and breastfeeding during the first six months of their child's infancy.

METHODS
All patients will receive instructions from medical assistants working with the lead physician. After consent and enrollment are complete, the lead physician will provide a sleep scale for patients to answer with, and additionally to record amount of breastmilk produced during a specific time period. These will happen right after regularly scheduled visits, and take 5-15 minutes for each visit. The frequency will depend on each individual patient, approximately every 3 weeks- one month. There will be no equipment used other than the physical survey. Research Participants will be involved by being asked questions during infant visits.

KEY DETAILS TO KNOW

- This study is completely voluntary
- You can ask to withdraw at any time
- It will help us learn how to better care for our patients

WHO IS ELIGIBLE

- Breastfeeding women ages 18+

BENEFITS TO PARTICIPANTS

- Discover the distinct nutritional components present in your breast milk, offering you the reassurance of providing essential nourishment for your child's development.

QUESTIONS?
Contact one of the study investigators or talk to your physician at your visit.
EMAIL: HANDINI.COWI@MEDSCH.UCR.EDU

Nutrition Facts
Serving Size: _____
CALORIES PER 25 /OZ _____
% Daily Value*
TOTAL FAT _____
PROTEIN 1.2gC
FAT: 4.1gC
CARBOHYDRATE 7.1gC

Figure 1: This flyer will be distributed to clinics to gather participants and detail the goals and benefits of the study.

References:

1. Tikotzky L. (2014). Postpartum Maternal Sleep, Maternal Depressive Symptoms and Self-Perceived Mother-Infant Emotional Relationship. *Behav Sleep Med.* 2016;14(1):5-22. doi: 10.1080/15402002.2014.940111. Epub 2014 Aug 15. PMID: 25127316.

2. McQuillan, M. E., Bates, J. E., Staples, A. D., & Deater-Deckard, K. (2019). Maternal stress, sleep, and parenting. *Journal of family psychology : JFP : journal of the Division of Family Psychology of the American Psychological Association (Division 43)*, 33(3), 349–359. doi: 10.1037/fam0000516

3. Kim, S. Y., & Yi, D. Y. (2020). Components of human breast milk: from macronutrient to microbiome and microRNA. *Clinical and experimental pediatrics*, 63(8), 301–309. doi: 10.3345/cep.2020.00059



Zayan Musa is a second-year medical student at UCR School of Medicine originally from Cupertino, California. She is interested in pursuing a career in pediatric care, and research. She attended UC Davis for undergrad and majored in cell biology where she found a passion for the arts in medicine. She started an art therapy program in the UC Davis Hospice forming a permanent connection between the undergraduate institution and medical center. After graduation, she participated in research focused to gain novel medical therapies for vulnerable pediatric populations with Rett and Fragile X Syndrome at UCD. In medical school, her focus remains on pediatric populations and art therapy. She

opened an art of medicine club on campus, and recently received the honorable Deans grant to provide art therapy throughout the Inland Empire community at UCR. In her free time, Zayan loves to paint and travel with family and friends.

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