

Project Details	
Project Code	PHS27Ex Lawrence
Title	Cravings, Cycles, and Moods: Tracking the link between Diet and Women's Health with AI and Smartphones
Research Theme	Population Health Sciences
Project Type	Dry lab
Summary	Are you passionate about women's health and behaviour change? Join our cutting-edge research project examining the relationship between diet, mental health and well-being, premenstrual syndrome (PMS) and perimenopausal symptoms across the menstrual cycle. In this project you will combine innovative smart technology and the latest AI-based food tracking apps to understand the impact of dietary behaviours on PMS and perimenopausal symptoms and develop skills highly valued in FemTech and diet and health industries.
Description	This project uses novel methods including self-tracking technology and apps to understand the relationships between women's menstrual and mental health and diet. Given the recent emergence of large-scale datasets from commercial health platforms (e.g., ZOE and Oura), this project will focus on questions that cannot easily be addressed using existing population datasets, namely within-person changes in diet, cravings, symptoms, and wellbeing measured repeatedly in real time. The project will provide training in ecological momentary assessment (EMA), digital phenotyping, nutrition science, women's health, and behaviour change research. Background: The menstrual cycle can substantially impact health and wellbeing, and this relationship can worsen during perimenopause. Worldwide, up to 80% of people who menstruate report experiencing PMS, including cramps, bloating, anxiety, low mood, and irritability, while Premenstrual Dysphoric Disorder (PMDD) is a recognised psychiatric condition associated with severe functional impairment. Both PMS and PMDD can reduce quality of life, limit work capacity, and lead to absenteeism from work, education, and social activities (Liguori et al., 2023; Delara et al., 2012). From mid-life, between 70–80% of people with ovaries experience perimenopausal symptoms including emotional changes, poor sleep, night sweats and hot flushes. In 20–30%, symptoms are severe enough to significantly affect mental health, relationships, work and daily functioning. Annually, more than 1.5 million outpatient healthcare visits and 26–33 million prescriptions are attributed to perimenopausal symptoms (Cunningham et al., 2025). Despite their impact, many women do not seek medical support, partly due to medication avoidance. Many do not want to, or cannot, use hormonal treatments and therefore seek alternative approaches. While there is some evidence that healthy dietary patterns (e.g., reduced ultra-processed food consumption and lower alcohol intake) may help manage menstrual and perimenopausal symptoms, research remains limited. Several important questions remain unanswered, including how day-to-day changes in diet relate to symptom fluctuations, whether symptoms influence subsequent food cravings and dietary choices, and whether

	diet-based interventions can improve symptoms and wellbeing. Rather than focusing solely on broad dietary indices, this project will leverage detailed photo-logged dietary data to investigate food groups, eating occasions and specific food products associated with symptom changes. Smartphone apps and wearable devices make it possible to collect prospective, real-time data on dietary choices, menstrual symptoms and emotional states to address these questions. Aims and Objectives Over the course of the studentship, the student will investigate how day-to-day fluctuations in diet relate to menstrual and perimenopausal symptoms, mood and wellbeing, and whether digital self-monitoring can support behaviour change. Depending on their interests, skills and career aspirations, the student may focus on one or more of the objectives below or develop additional related objectives with supervisory support. The project provides an opportunity to develop highly transferable skills in EMA, digital health, nutrition and women's health. Objective 1: Establish the feasibility and acceptability of intensive digital monitoring The student will develop and pilot a protocol combining AI-assisted photo-based dietary assessment (FuelD), EMA measures of mood and symptoms, and wearable device data. The primary aim will be to evaluate feasibility, acceptability, engagement, adherence and data quality. The project will also assess whether self-monitoring increases awareness of links between diet, lifestyle and symptoms and has potential to support behaviour change. Objective 2: Examine within-person associations between diet and symptoms Using intensive longitudinal data, the project will investigate how food cravings, dietary choices, mood and physical symptoms fluctuate within individuals over time. Analyses will prioritise detailed photo-logged dietary data, examining food groups, eating occasions and specific food products associated with symptom changes. Particular attention will be paid to bidirectional relationships between symptoms and food choices. Objective 3: Identify behavioural mechanisms linking diet and women's health symptoms The project will investigate psychological processes that may explain observed associations, including food cravings, emotional eating, mood regulation, stress and sleep. This objective builds on the supervisory team's expertise in eating behaviour, behaviour change and mental health and provides a distinctive contribution beyond symptom-tracking studies alone. Objective 4: Evaluate whether targeted dietary changes improve symptoms and wellbeing In the later stages of the PhD, the student could design and evaluate a digital intervention aimed at modifying diet or related lifestyle behaviours, such as increasing plant-based food consumption, reducing alcohol intake, or targeting foods identified in earlier work. The aim will be to assess the feasibility, acceptability and preliminary effectiveness of digitally supported behaviour change approaches for improving menstrual and perimenopausal symptoms, mental health and wellbeing.
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	A possible structure for the PhD would include Year 1: a systematic review and feasibility study; Year 2: an intensive longitudinal study examining symptoms, cravings, mood and dietary behaviours; and Year 3: development and evaluation of a behaviour-change intervention informed by the earlier phases.
Can be completed part time?	Yes
Supervisory Team	
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