Background

Fifty to ninety percent of pregnant women experience pregnancy-related lumbopelvic pain (PLPP). The mechanisms underlying PLPP remain poorly understood, limiting effective prevention and treatment [1]. Maternal weight and gestational weight gain are recognized risk factors, but prior studies did not differentiate between fat and fat-free mass [2]. In the general population, higher fat mass is associated with low back pain, partly through adiposity-related systemic inflammation. This systemic inflammation is linked to depression, a known predictor of PLPP, and anxiety [3]. However, the combined and longitudinal contribution of maternal weight, body composition, inflammation, and psychological factors to PLPP remains unexplored.

This study aims to (1) examine the role of maternal weight and body composition in PLPP onset, (2) investigate how maternal weight, depression, anxiety, and systemic inflammation predict the onset and persistence of PLPP, and (3) analyze the directionality of associations between these factors and PLPP from early pregnancy to the postpartum period.

Methods

This longitudinal cohort is part of the PROFit study (G0A1N24FWO/S69463). We will recruit 211 pregnant women without PLPP in the first trimester and follow them through the third trimester, and at six weeks and nine months postpartum. PLPP will be assessed via self-report and clinical tests. Body composition will be measured using bioelectrical impedance analysis, and maternal weight and height will be recorded using a digital scale and stadiometer. Inflammatory markers will be measured using multiplex flow cytometry, and psychological factors with validated questionnaires. Data will be analyzed using group comparisons, regression models, latent class growth analysis, and cross-lagged panel modelling.

Results

As of October 6, 2025, 19 participants (mean age=31.7, SD=3.9) have been included.

Conclusion

This study will provide novel longitudinal insights into the interplay between maternal weight, body composition, inflammation, and mental health in the onset and persistence of PLPP, guiding the improvement of prevention and intervention strategies.