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Maternal perception vs actual breast milk supply: is there a difference? protocol for an observational study

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It is well known that breastfeeding provides favourable health outcomes for both mother and baby. However, many mothers struggle to meet global breastfeeding recommendations, with Perceived Insufficient Milk Supply (PIMS) being a leading reason for early cessation(1). Currently, little is known about the relationship between PIMS, actual milk insufficiency, and human milk nutrient composition. The primary aims of the Māmā (mother) and Baby Breastfeeding Study are to describe human milk volumes produced by a diverse sample of breastfeeding mothers at 3 months postpartum with differing perceptions of milk supply, and to compare human milk composition in relation to milk volume. In this observational study in Dunedin, Aotearoa New Zealand, a sample of 150 mother-infant dyads will be recruited. A diverse range of participants in terms of ethnicity and socio-economic status will be included, with an aim of recruiting as close to 20% Māori as possible. Targeted recruitment through networks within the maternity and healthcare sector as well as through Māori researchers will be utilised. Human milk volume (milk supply) will be assessed using the 'dose-to-mother' stable isotope (deuterium oxide) technique. Mother participants will consume an accurate dose (30 g) of deuterium oxide after baseline saliva samples are collected from both mother and infant. Subsequent post-dose samples will be collected over 3 time-points to determine deuterium enrichment over a 14 day period using Fourier-Transform Infrared Spectrometry. Human milk macronutrient (energy, fat, carbohydrate, and crude and true protein) and mineral and trace element (sodium, magnesium, phosphorus, potassium, calcium, iron, copper, zinc, selenium, and iodine) composition of one full milk expression from one breast will be analysed using the MIRIS Human Milk Analyzer and ICP-MS, respectively. Potential predictors and maternal perception of milk supply will be assessed via questionnaire. Infant body mass index (BMI) will be calculated from measures of weight and length at three different time points over four weeks, using standard techniques. These, alongside anthropometric measurements collected at the infant's Well Child Tamariki Ora (WCTO) visits, will be used to assess infant growth trajectory over time. Regression models will be used to assess the associations between maternal perception of milk supply, human milk volumes, and composition. Recruitment for this study began in February 2025 and is anticipated to conclude in June 2026 with analysis expected to be completed by February 2027. As of 25 August, 56 participants have been enrolled. Progress with recruitment, and the initial demographic profile of participants, will be presented. This research will provide new knowledge on whether maternal perception of milk supply aligns with actual human milk volume or nutrient composition. Such information will be beneficial to health professionals working with breastfeeding mothers with milk supply concerns and inform the design of breastfeeding support programmes and resources.

Keywords: human milk; breastfeeding; stable isotope; infant

Ethics. Yes

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References

1. Gatti L (2008) *J Nurs Scholarsh,* **40**(4), 355–63.

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