

High maternal pre-pregnancy body mass index and rapid weight gain during infancy are the most consistent and strongest determinants of obesity outcomes in early childhood

Understanding the pathways linking prenatal and postnatal factors with obesity outcomes in early childhood: a pooled analysis of seven cohorts

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INTRODUCTION

- Obesity risk develops early in life and persists across the lifespan.
- Understanding the early origins of obesity is imperative to inform design of obesity prevention interventions.
- Notable prenatal and postnatal factors associated with obesity include:
 - Maternal pre-pregnancy body mass index (BMI), infant birth weight, infant rapid weight gain, breastfeeding
- It is critical to disentangle the integrative pathways linking these factors and childhood obesity to inform targets for interventions.

OBJECTIVES

- To explore the integrative pathways linking maternal pre-pregnancy BMI, infant birth weight, rapid weight gain during infancy and breastfeeding duration, and obesity outcomes in early childhood.
- To elucidate the underlying mechanisms via examination of total, direct and indirect (mediated) relationships.

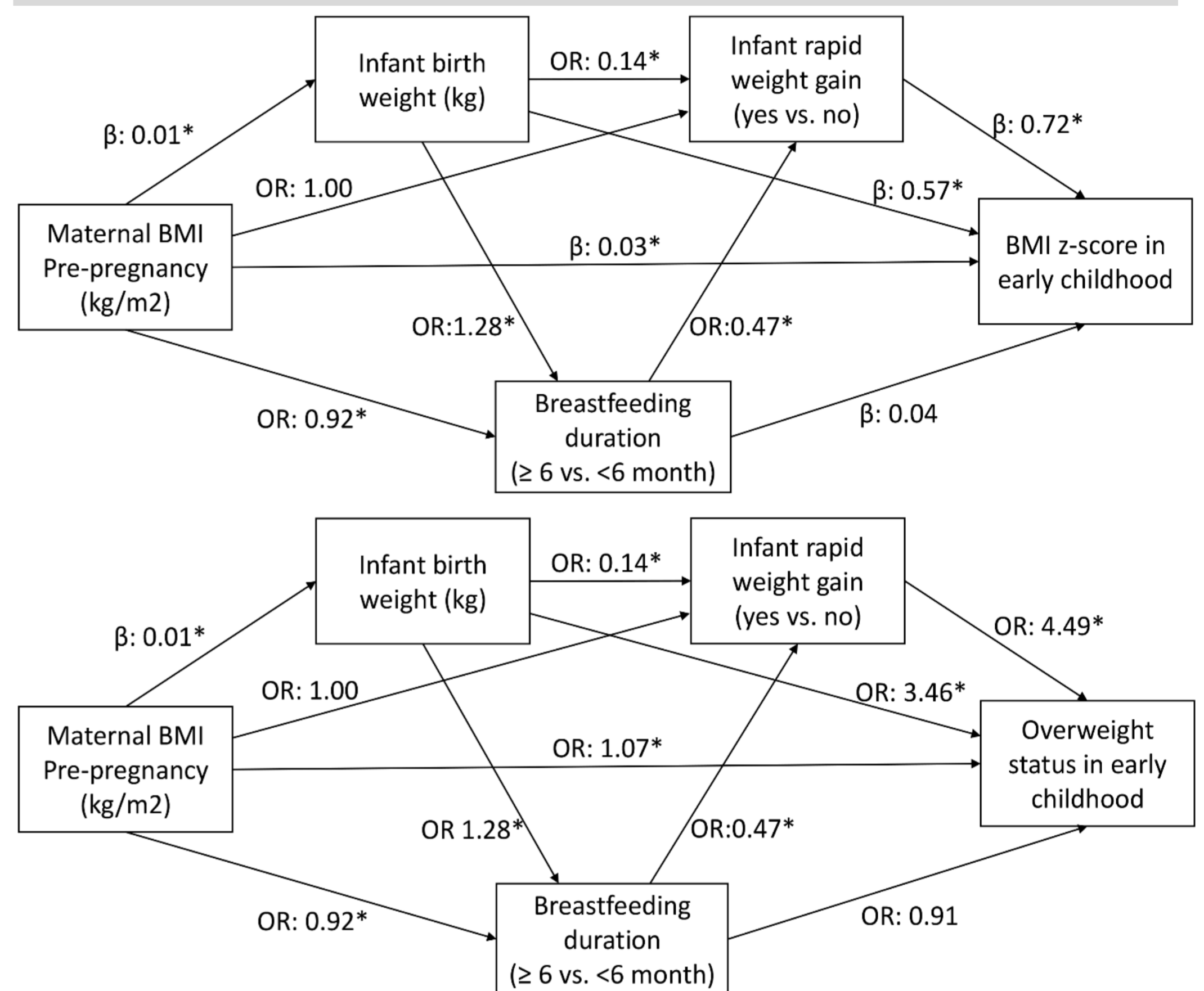
METHOD

- Pooled data (n=3572) from seven Australian and New Zealand cohorts:
 - Barwon Infant Study, Healthy Beginnings, InFANT, InFANT Extend, LIMIT, Nourish, POI nz
 - Maternal BMI, infant birth weight, infant rapid weight gain (weight z-score ≥ 0.67 from birth up to age one year) and breastfeeding duration
 - Repeated anthropometric measurements from birth up to age 3-5 years
- Generalised structural equation modelling
 - Evaluate the integrative pathways (total, direct, indirect) linking prenatal and postnatal factors and obesity outcomes (BMI z-score and overweight status) in early childhood.
 - Covariates: child age, sex, cohort, intervention group, maternal age and education.
 - Stata 16 with statistical significance set at $P < 0.05$.



RESULTS

Direct pathways linking prenatal, postnatal factors and obesity outcomes in early childhood (* $P < 0.05$)



SUMMARY

- Maternal pre-pregnancy BMI was the most consistent factor that showed direct associations with infant birth weight, breastfeeding duration ≥ 6 mo, and childhood obesity outcomes.
- Infant rapid weight gain exhibited the strongest direct associations with childhood obesity outcomes
- Infant birth weight was implicated in the indirect pathways of maternal pre-pregnancy BMI with infant rapid weight gain, breastfeeding duration, and child obesity outcomes.
- The associations between breastfeeding duration ≥ 6 mo and lower child obesity outcomes were fully mediated by infant rapid weight gain.

CONCLUSION

- Prenatal and postnatal factors act in concert to influence childhood obesity outcomes.
- Future obesity prevention should focus on supporting women of childbearing age to maintain a healthy body weight, promote longer duration of breastfeeding, and prevention of rapid weight gain during infancy.

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