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Body weight, BMI and gestational weight gain are predictors of short sleep duration amongst pregnant women at risk of gestational diabetes

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While there is substantial evidence that obesity is a risk factor for poor sleep, not least as a result of an increased risk of obstructive sleep apnoea, the possibility that sleep might play a role in energy metabolism and the development of obesity has led to much speculation and a raft of fresh research in this area. Much of the evidence to-date has relied upon self-reported measures of sleep, for which sleep duration is the component of sleep most commonly recorded by all studies. In the present study we therefore sought to examine sleep duration in a population likely to experience an elevated risk of both poor glucose control and body weight, body mass index (BMI) and recent weight gain – pregnant women at risk of gestational diabetes. All pregnant women who presented at booking with one or more clinical risk factors for gestational diabetes (a family history of diabetes, ethnicity, elevated BMI and/or gestational diabetes in a previous pregnancy), and who were referred to a specialist antenatal diabetology clinic at St James’ Hospital in Leeds, were invited to participate in the present study. Women who consented to participate (n = 193) completed the Pittsburgh Sleep Quality Index (PSQI),⁽¹⁾ while data on preceding sociodemographic and clinical factors were obtained from their antenatal records. Data on sleep duration were categorised as <6hrs, 6-<7hrs and ≥7hrs per night, and the relationship between sleep duration and body weight/BMI (on referral to the specialist antenatal diabetology clinic), and weight gain (between booking and referral), were assessed using multinomial regression analyses before and after adjustment for potential confounders (maternal age, parity, marital status, family history of diabetes, deprivation- smoking and alcohol consumption).

	Unadjusted RRR (95 %CI)	Adjusted ^a RRR (95 %CI)
Maternal body weight (referent: per kg)		
Sleep duration (referent: ≥7hrs)		
6hrs to <7hrs	1.02 (1.00–1.05)	1.04 (1.00–1.07)
5hrs to <6hrs	1.04 (1.01–1.07)	1.05 (1.02–1.08)
Maternal BMI (referent: per kg·m ⁻²)		
Sleep duration (referent: ≥7hrs)		
6hrs to <7hrs	1.01 (0.98–1.05)	1.00 (0.96–1.05)
5hrs to <6hrs	1.05 (1.01–1.09)	1.10 (1.03–1.17)
Gestational weight gain (referent per kg)		
Sleep duration (referent: ≥7hrs)		
6hrs to <7hrs	1.00 (0.98–1.02)	1.00 (0.97–1.03)
5hrs to <6hrs	1.03 (1.00–1.05)	1.03 (1.01–1.06)

^a Adjusted for: age, parity, marital status, family history of diabetes, deprivation, smoking and alcohol.

These analyses indicate that all three anthropometric indices were associated with a statistically significant increased risk of short sleep duration, and that this association strengthened after adjustment for potential confounders. It therefore seems likely that this population is at high risk of short sleep, although it remains to be seen whether short sleep simply mediates the risk of gestational diabetes, or is an independent risk factor thereof.

1. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. (1989) The Pittsburgh Sleep Quality Index (PSQI): A new instrument for psychiatric research and practice. *Psychiatry Res* 28, 193–213.

