

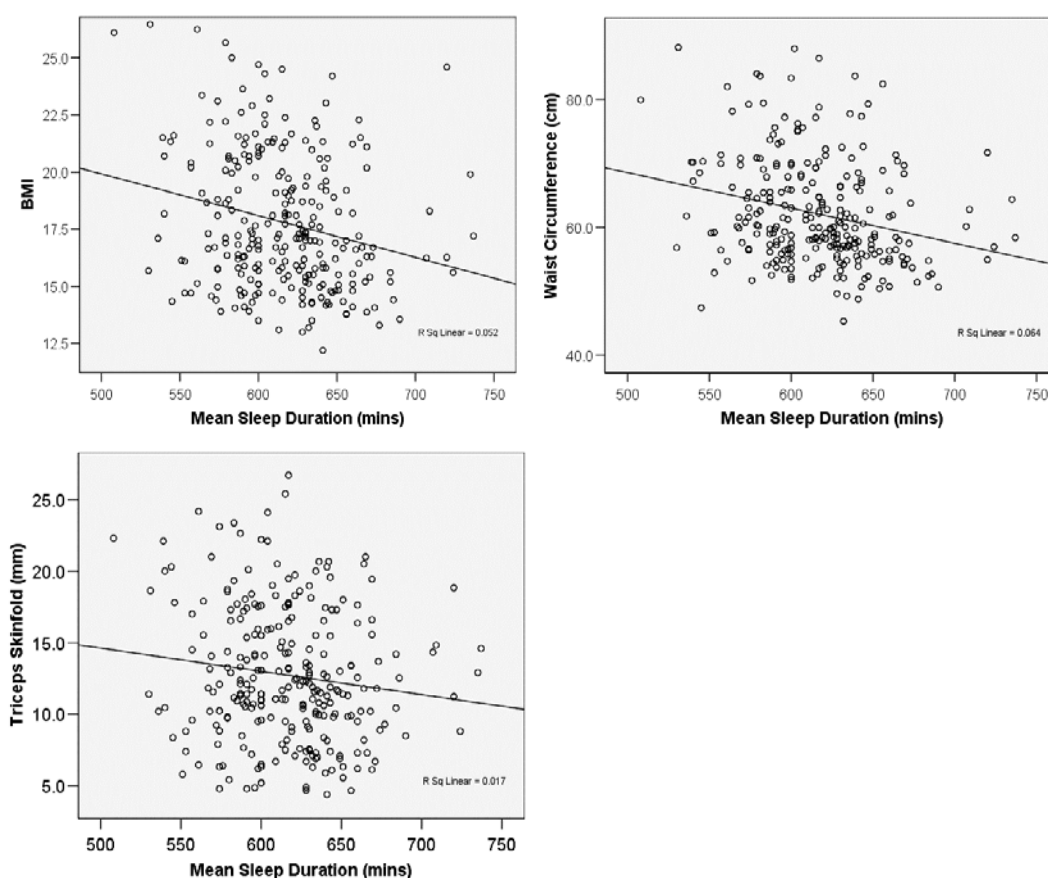
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The association between sleep and obesity in primary schoolchildren in Middlesbrough

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Evidence is mounting in support of a role for short sleep duration in increasing the risk of obesity in children^(1–3). For the present study it was hypothesised that sleep duration would be negatively correlated with obesity. Participants were 261 children (46% male) aged 7–11 years attending three primary schools in Middlesbrough, UK. Anthropometric measurements were taken at school, and parental questionnaires provided background information and details of the children’s bed, sleep and wake times on weekdays and weekend days. Sleep duration was estimated using the equation: ((sleep on week night × 5) + (sleep on weekend night × 2))/7. ANOVA was used to assess the relationships between sleep duration and obesity variables, controlling for the effects of age, gender, ethnicity and socio-economic status.

Of the children 71% were normal weight, 23% were overweight and 6% were obese, according to age and gender-specific BMI cut-off points⁽⁴⁾. Sleep duration was significantly negatively associated with BMI, waist circumference and triceps skinfold, independently of age, gender, ethnicity and socio-economic status ($P < 0.01$, $P < 0.01$ and $P = 0.04$ respectively; Figs. 1–3). There was no significant association between sleep duration and subscapular skinfold or triceps:subscapular skinfold.



Figs. 1–3. Scatter plots of mean sleep duration and measures of obesity.

The mechanisms behind the sleep and childhood obesity link remain unknown. Perhaps, as in adults, sleep loss results in a decrease in leptin (an appetite suppressor) and an increase in ghrelin (an appetite stimulant)⁽⁵⁾, thus affecting appetite and food intake. Sleep may be associated with reduced evening food intake, and consequently lower risk of obesity. Furthermore, parenting practices, including limit setting and regularity of schedules, may link child sleeping and eating habits, which could cause sleep to be correlated with risk of obesity.

In order to unpick the relationship between sleep and childhood obesity further research will be conducted, which will include an examination of whether sleep duration affects food eaten after waking, and whether sleep and diet are correlated in children. This anthropological research may help to identify where a simple behavioural intervention involving sleep may be effective in preventing childhood obesity.

1. Agrav WS, Hammer LD, McNicholas F & Kraemer HC (2004) *J Pediatr* **145**, 20–25.
2. Reilly JJ, Armstrong J, Dorosty AR, Emmett PM, Ness A, Rogers I, Steer C & Sherriff A (2005) *Br Med J* **330**, 1357–1369.
3. Snell EK, Adam EK & Duncan GJ (2007) *Child Dev* **78**, 309–323
4. Cole TJ, Bellizzi MC, Flegal KM & Dietz WH (2000) *Br Med J* **320**, 1240–1245.
5. Spiegel K, Tasali E, Penev P & Van Cauter E (2004) *Ann Intern Med* **141**, 846–850.