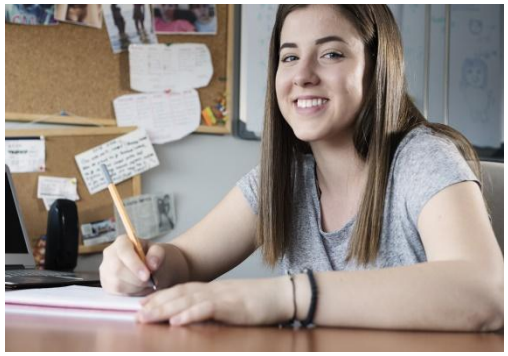

Growing Up in Ireland
National Longitudinal Study of Children

Association between short sleep duration and obesity

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Introduction

- **Rising prevalence obesity = pandemic**
- **Globally, 43 million children aged 0-5 years are overweight or obese**
- **Trends suggest childhood obesity may surpass adult obesity (WHO, 2013)**

Introduction

- **60% of Irish adults overweight/obese**

  (Healthy Ireland, 2015)

- **25% of children overweight/obese**

  (Heinen et al., 2014)

- **Ireland 5th highest in Europe in terms of incidence of childhood obesity**

  -> 70% of obese children become obese adults

  (Oireachtas report, 2014)

Obesity

- **Adult obesity major contributor to burden of chronic disease -> morbidity, poorer quality of life, mortality**

  (Kearns et al., 2014)

- **Direct and indirect costs of €1.13 billion associated overweight/obesity in Republic of Ireland**

  (Safefood, 2012)

Childhood Obesity

- **Childhood obesity**

-> unfavourably alters CV structure and function (Ayer et al., 2015)
-> asthma (Papoutsakis et al., 2013)
-> type 2 diabetes (Magnussen et al, 2010)
-> and orthopaedic complications (Daniels, 2009)
-> psychological outcomes (e.g.Strauss et al., 2000)

Sleep duration and obesity

- **Growth in rates of obesity, coincides with less sleep** **(Patel and Hu, 2008)**

- **Children aged 1-5 years sleep for average 8.7 hours**

(Acebo et al., 2005)

Sleep duration and obesity

- **The research:**
- **Short sleep duration (SSD) is predictive of adiposity in children of 4 and 5 years** **(Scharf & Deboer, 2015)**

- **SD of <11 hrs/night at 7 years associated with overweight at 7 years and obesity at 32 years**

(Landhuis et al, 2008)

- **SD of <10 hours/night any time between 1 - 4 years associated with 32% ↑ risk of overweight/obese by 4 years** **(Halal et al., 2015)**

Paradox

- **Sleep = sedentary behaviour => Increased obesity**

- **Findings show *lack* of sleep is associated with increased overweight and obesity, especially in younger age-groups**

(Nielsen, Danielsen & Sørensen, 2010)

Mechanism

- **The Proposed Mechanism:**
- **SSD is associated with two parallel endocrine responses in appetite regulation**
- **An increase in appetite stimulating – ghrelin**
- **A decrease in appetite inhibiting – leptin**

(Taveras et al., 2004)

Vicious circle

- **SSD positively associated with consumption of energy-dense foods**

- **> High carbohydrate content**

- **> Fatigue and sedentary behaviour**

(Kjeldsen et al., 2014)

Aim

- **SSD confers greater risk of overweight and obesity in adults, and especially children and adolescents**
- **Little research on large cohorts of young children**
- **Aim: investigate whether SSD is associated with overweight/obesity in 5 year old children**

Method

- **Third wave of GUI infant cohort (*n* = 9,001) analysed**

- **Parent-report questionnaires:**
  - **-health**
  - **-sleeping habits**
  - **-objective measures of height & weight**

Exclusion criteria:

-chronic disease

- *n* = 7,443

Method

- **Multivariate regression analysis of:**
- **-Child body mass index (BMI; measured)**
- **-Height and weight measurements**

- **Regression model adjusted for known covariates of weight including:**
- **-Physical activity**
- **-Diet**
- **-Screentime**
- **-Mother's BMI**

Results

	Mean (SD) [Range}]
Males	3,648 (49.0%)
Females	3,795 (51.0%)
Sleep duration	11:04 hours (43 mins) [8 -15 hours]
Males	11:00 (43 mins) [8 - 14 hours]
Females	11:06 (42 mins) [8 - 15 hours]
<11 hours/day	62.6%
11-12 hours/day	19.7%
>12 hours/day	17.6%

Shorter sleep times

Mother's education

– 65% of children whose mothers third level education

Mother's citizenship

- 71% of children whose mother's were not Irish citizen

Screen-time

- 65% of children who had > 2hours of screen-time

Results

- **Child classification according to UK-WHO growth charts**

Weight category	Centile	% of 5 year olds
Normal	< 85th	79.8
Overweight	> 85th but < 90th	15.7
Obese	> 90th	4.6

Other factors and BMI

Screen-time

No screen-time associated with 41% < likely to be overweight, 69% < likely to be obese, than > 2hours/day screen-time

Mother's BMI

Children who had mothers with a healthy weight were 55% less likely to be overweight and 71% less likely to be obese

Mother smokes

59% more likely to be overweight, 26% more likely to be obese

Mothers alcohol consumption

No alcohol associated with 50% ↑ risk overweight, 2.5 times ↑ obese

Results

- < 11 hours/day -> **42%** more likely to be overweight than those slept > 12 hours/day

- < 11 hours/day -> **59%** more likely to be obese

Results – BMI

- **Regression results:**
  - Sleep duration is predictive of 5 year olds BMI
  - (beta coefficient= -0.034, p= 0.004)

Short sleep & Obesity

- **SSD significantly predictive of BMI in 5 year old children**

- **Sleeping for <11 hours/day increased risk of overweight/obesity, 42% and 59%**

- **Findings are in line with previous studies which also used BMI** **(e.g. Scharf and Deboer, 2015)**

Strengths & Weaknesses

- **Weaknesses:**
- **Cross-sectional nature**
- **Sleep-time was parent-reported, use of objective measures of sleep = more accurate**
- **Bed-times categorised into half-hourly groups and wake-time variables were categorised into hourly groups**

Strengths & Weaknesses

- **Strengths:**
- **Large sample -> 7,443**
- **Accurate measures of height and weight by interviews to calculate BMI**
- **Breadth of confounding variables available for regression analysis (screen-time, parent BMI etc.)**

Conclusion

- **“Prevention is better than cure”**
- **SSD significantly predictive of BMI in 5 year olds**
- **SSD greater risk of overweight/obesity**
- **Sleep hygiene may mitigate obesity risk factor**

(Liu, Zhang & Li, 2012)

- **Education interventions for parents/schools**

Future Research

- **Investigate the association between short sleep duration and overweight and obesity across all waves, longitudinally**

- **Thank you for listening!**
- **Questions**