Physical activity and obesity in children and adolescents: evidence, myths and misconceptions

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Physical activity & obesity in children & adolescents: evidence; myths; misconceptions

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Overview—some myths about child physical activity & obesity in Scotland

• Physical activity = PE or sport
• Physical activity declines at adolescence
• Physical activity varies by socio-economic status
• Physical activity is prevented by the physical environment
• A minority of Scottish children & adolescents are obese
Definitions and Terms

• **Physical activity**
  – All movement, **Sum of domains**
    – Play
    – PE
    – Sport
    – Commuting
    – ‘Recess’
    – ‘Incidental’,

• **Recommended minimum** of 60 minutes **MVPA**, every day (school-age)

• **Obesity** = excess fatness;
  – a high BMI for age (>95\textsuperscript{th} centile from UK 1990)
Where do children actually get their MVPA from? Systematic Reviews of Objective Measurement Studies

- **Active Commuting** (limited-Martin et al 2016)
  - Schooldays half of all days; low prevalence of active commuting; short distances; low MVPA—maximum of 17 mins/day for half of population on half of days

- **Physical Education** (limited-Hollis et al 2016)
  - Schooldays half of all days; PE days less frequent than that; low MVPA—approx 20% of PE time

- **School ‘Recess’** (limited-Reilly et al 2016)
  - Schooldays half of all days; short recess; low MVPA-maximum of 12 mins/school day

- **After-School/Home** (lack of evidence)

- **Sport** (lack of evidence ?, but probably low)
ABOLOESCENCE IS COMING!
Apparent adolescent cliff-edge declines in ‘MVPA’

Percentage of children and young people reaching the recommended level of physical activity

Source: Scottish Health Survey, 1998

Basterfield et al Arch Dis Child 2008 SHeS PA questionnaire does not measure PA
Children's physical activity starts declining at age 7, U.K. study indicates

Researchers recommend promoting exercise among boys and girls, well before adolescence.

Gateshead Millennium Study; Farooq et al Br J Sports Med 2017; Reilly ‘When does it all go wrong ?’ J Sport Exerc Fit 2016; 14: 1-6
Time spent sitting from 6 to 15 years, Gateshead Millennium Study (Janssen et al IJBNPA 2016)

- Mean 51% of waking time at age 7 to 73% at age 15
- Equivalent to about 23 mins/day/year
Objective measurement of physical activity and sedentary behaviour: review with new data

J J Reilly,¹ V Penpraze,² J Hislop,³ G Davies,¹ S Grant,² J Y Paton¹

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UNPLUG
& PLAY
Active Healthy Kids Scotland Report Card 2016
www.activehealthykidsscotland.co.uk
‘Well Known’ Barriers to Child Physical Activity

- Weather
- Unsafe / unsuitable environment
  - Perceptions of safety outdoors
  - Crime; traffic
- (Mis?) Perceptions of safety indoors
Settings and Influences on Physical Activity and Health

Family and Peer Influence
Conservative estimates show that 28% of adults were obese and 65% either overweight or obese in 2014, and obesity is more common among the socio-economically deprived [Scottish Health Survey 2014]. Only 20% of Scottish adults reported meeting the ‘5 a day’ fruit and vegetable intake recommendation [Scottish Health Survey 2014]. Child and adolescent norms are extremely high for sedentary behaviour (indicator 1) and low for moderate-vigorous-intensity physical activity (indicator 2), so peer influence is unlikely to encourage physical activity.

Grade is the same as 2013 report card

Community and the Built Environment
(Perceived safety, access, and availability of space for physical activity)
89% of Scottish 13-15 year olds felt safe in their local area most or all of the time [HBSC Scotland 2014].
59% of Scottish 13-15 year olds felt they had good places to spend their time locally [HBSC Scotland 2014].
91% of households with 6-12 year olds had access to at least 1 local play area [Scottish Household Survey 2014].
62% of parents of 6-12 year olds felt that local playgrounds were safe for their children to play alone (lower perceived safety in more deprived areas) [Scottish Household Survey 2014].

Grade is the same as 2013 report card

National Policy, Strategy, and Investment
(Including Schools)
Physical activity and health is given great emphasis in national policy, strategy, and investment.
Many of the Health Behaviours and Outcomes (indicators 1-7) and the Settings & Influences on those health behaviours and outcomes (indicators 8 & 9) are the focus of national policies, investments and/or targets for improvement; there is increasing emphasis on policy implementation [Scottish Health Survey 2014]. [Scottish Household Survey 2014].

Grade is the same as 2013 report card
Underestimation of obesity (excessive body fatness) from BMI in adults, Shah & Braverman et al PLoS ONE 2012. 26% obese by BMI, 64% by fatness; misclassification much greater in women than men
### Overall Physical Activity and Health Behaviours and Outcomes

#### Active and Outdoor Play
63% of Scottish 2-15 year olds participated in ‘active play indoors or outdoors’ for at least 30 minutes at least 5 days a week [Scottish Health Survey 2014](#). With no specific measure of active outdoor play, in the absence of a recommendation for active play, and given the F grades for sedentary behaviour and overall physical activity, this indicator is difficult to grade.

*Grade is the same as 2013 report card*

#### Organised Sport Participation
This indicator could not be graded because no survey measured participation in sport specifically.

*Grade is the same as 2013 report card*

#### Diet
Only 10% [National Diet & Nutrition Survey 2014](#) to 14% [Scottish Health Survey 2014](#) of children and adolescents met the ’5 a day’ recommendation for fruit and vegetables; intakes are lowest among the most socio-economically deprived [National Diet & Nutrition Survey 2014](#).


Average intake of saturated fat (13%) exceeded the 11% of energy intake recommended [National Diet & Nutrition Survey 2014](#).

*Grade is the same as 2013 report card*

#### Obesity
Multiple data sources suggest that levels of obesity among children and adolescents are higher than at any time in our history. Conservative estimates show that at least 17% of 2-15 year olds were obese (BMI at or above the 95th centile derived from UK data in 1990) in 2014, and obesity is much more common among children and adolescents who are more socio-economically deprived [Scottish Health Survey 2014](#).

Prevalence of overweight and obesity among toddlers and pre-school children is particularly high [National Diet and Nutrition Survey 2014](#).

*Grade is the same as 2013 report card*
High BMI for age = diagnostic test for obesity (UK 1990 BMI reference)
SIGN 69 (2003)
Childhood Obesity Guideline
Based on evidence to end 2001

REVIEW
Obesity: diagnosis, prevention, and treatment; evidence based answers to common questions
J J Reilly, M L Wilson, C D Summerbell, D C Wilson

REVIEW
Health consequences of obesity
J J Reilly, E Methven, Z C McDowell, B Hacking, D Alexander, L Stewart, C J H Keelar

ABC of obesity
Childhood obesity
John J Reilly, David Wilson

Obesity, an excessive body fat content with increased risk of morbidity, has become increasingly common in children and adolescents. Confusion exists, however, over basic questions such as whether paediatric obesity matters, how to diagnose it, and whether it should be treated (and if so, how best to do this). Doctors in many fields need a better understanding of these issues.
Diagnostic accuracy of simple methods (BMI, Waist) for child & adolescent obesity

**Systematic reviews**
- Reilly et al 2002 Arch Dis Child
- Reilly et al 2010 Obes Rev
- Javed et al Pediatr Obes 2014

**Direct measure of fatness and/or morbidity vs simple measure**

**High BMI has high specificity**
- children with high BMI are too fat/increased risk of co-morbidity

**BMI has low sensitivity:**
- 25-40% of children & adolescents with ‘healthy’ BMI are obese (i.e. too fat/at increased risk of co-morbidity)
Conclusions-some myths about child physical activity & obesity in Scotland

• Physical activity NOT JUST PE or sport
• Physical activity declines WELL BEFORE adolescence
• Physical activity DOES NOT vary by socio-economic status
• Physical activity is prevented LARGELY by the CULTURAL environment
• A MAJORITY of Scottish adolescents are probably obese (excessively fat)
New for 2018-2019 MSc Physical Activity in NCD Control & Prevention

Thank You

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