Increasing Physical Activity and Reducing Sedentary Time in Young People – The Role of Sport, Family and Peers

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Professor of Public Health Nutrition & Exercise
Objectives

- Review the roles that sport, family and peers play in influencing physical activity, inactivity and sedentary behaviours of children and adolescents.
- Describe what is known about factors associated with these behaviours.
- Identify gaps in the current research base and discuss strategies for targeting interventions.
Distinction Between Physical Activity and Sedentary Behaviours

- Physical inactivity is not simply the opposite of activity.
- Physical activity and sedentary behaviour are separate constructs.
- Increased time spent sedentary is recognised as an independent risk factor for obesity and related chronic diseases.
- One can be physically active but spend too much time being sedentary, increasing disease risks.
Higher Physical Inactivity Associated with Increased Risk of...

- Coronary heart disease
- Stroke
- Type 2 diabetes
- Some cancers (breast, colon)
- Osteoporosis

*Inverse dose-response = the more active, the lower the risk!
Higher Physical Inactivity Also Associated with Increased Risk of...

- Depression
- Dementia

*Dose-response association not established*
Physical activity & mental well-being
10 yr old children (35 boys, 35 girls)

Parfitt & Eston,
Acta Paediatrica. 2005
TV viewing & BMI

Jago et al, IJO 2005
Guidelines – Early Years (Under 5s)

- PA should be encouraged from birth – floor-based play and water activities in safe environments
- Pre-schoolers who can walk unaided should be active for at least 3 hrs (180 min) each day
- Minimise amount of time being sedentary (sitting or restrained) for extended periods (except time spent sleeping)
Guidelines – Children and Young People (5-18 yrs)

- Engage in moderate to vigorous intensity activity at least 60 minutes and up to several hours per day
- Incorporate vigorous intensity activities (those that strengthen muscle and bone) at least 3 days per week
- Minimise amount of time spent sedentary (sitting) for extended periods
Levels of activity – UK Adults

- Adults not sufficiently physically active

PA guidance compliance (16-74yrs*)

<table>
<thead>
<tr>
<th></th>
<th>Self-report</th>
<th>Accelerometry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>39%</td>
<td>6%</td>
</tr>
<tr>
<td>Females</td>
<td>29%</td>
<td>4%</td>
</tr>
</tbody>
</table>

16-34 yrs more active: 11% men and 8% women

Levels of activity – UK Children

- *Children not sufficiently physically active*

PA guidance compliance (2-15yrs*)

<table>
<thead>
<tr>
<th></th>
<th>Self-report</th>
<th>Accelerometry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>32%</td>
<td>33%</td>
</tr>
<tr>
<td>Females</td>
<td>24%</td>
<td>21%</td>
</tr>
</tbody>
</table>

4-10 yrs more active: 51% boys and 34% girls

11-15 yrs less active: 7% boys and 0% girls

Levels of obesity and activity – Maltese Children 11-12 yrs

- Approximately half of children are overweight (27%) or obese (18.6%)
- Children not sufficiently physically active – either during the week or weekend

<table>
<thead>
<tr>
<th></th>
<th>% meeting PA Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>7.4%</td>
</tr>
<tr>
<td>Females</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

American Academy of Pediatrics
Screen Viewing Guidelines

- Recommend a maximum of 2 hours of “quality” programming per day.

- No new guidance for video games or internet use etc

AAP, Pediatrics, 2001
Sedentary Time in Maltese Children: TV viewing and Computers

- 85% of boys watch 2 to 4 hrs of TV per day
- 71.7% of girls watch less than 2 hrs of TV per day
- 73% of boys and 68% of girls spend 1 to 3 hrs per day on the computer
- 26% of boys and 18% of girls spend more than 3 hours on the computer
- 56.9% of boys and 53.5% of girls spend 1 to 3 hours playing console games
Compliance with guideline in UK Children?

<table>
<thead>
<tr>
<th>Hours TV per day</th>
<th>Boys</th>
<th></th>
<th>Girls</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>0</td>
<td>9</td>
<td>1.9</td>
<td>13</td>
<td>2.4</td>
</tr>
<tr>
<td>1</td>
<td>144</td>
<td>30.8</td>
<td>176</td>
<td>32.6</td>
</tr>
<tr>
<td>2</td>
<td>173</td>
<td>37.0</td>
<td>204</td>
<td>37.8</td>
</tr>
<tr>
<td>3</td>
<td>77</td>
<td>16.5</td>
<td>87</td>
<td>16.1</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
<td>6.4</td>
<td>37</td>
<td>6.9</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
<td>2.6</td>
<td>10</td>
<td>1.9</td>
</tr>
<tr>
<td>5+</td>
<td>22</td>
<td>4.7</td>
<td>13</td>
<td>2.4</td>
</tr>
</tbody>
</table>

30% of Boys and 27% of Girls exceed guideline

Page et al, Pediatrics 2010
How Can We Increase Physical Activity and Reduce Time Spent in Sedentary Behaviours?
Family Correlations between parent and child MVPA minutes (UK)

<table>
<thead>
<tr>
<th></th>
<th>Boys MVPA</th>
<th>Girls MVPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent MVPA</td>
<td>.084</td>
<td>.044</td>
</tr>
</tbody>
</table>

- No association between parent and child MVPA as measured by accelerometry

Jago et al, BMC Public Health 2010
Conflicting Results - Parental PA and Children’s PA

- Systematic review of 24 studies – no evidence of familial patterns of PA (mostly self-report PA)
- One recent study from Canada (539 parents/children) indicates association between parental PA and children’s PA (measured by pedometer)
- A US-based study found associations between MVPA of children and parents (45 pairs)
- Another US-based study found associations between time spent together in sedentary pursuits for 291 parents and their children (using accelerometer and GPS)
How Can Parenting Practices Support Children’s PA?

- Logistic support = Whether the parent enrols the child in activity programmes, goes to sporting events with child etc.
- Modelling = Whether the parent enjoys physical activity, whether the parent reports being active and whether the family engage in activity for recreation.
- Licence to be active = allowing children to be independently active.

Davison et al, MSSE 2003
Parental support & Bristol Kids

- 792, 10-11 year old Bristol children

- Physical activity assessed by accelerometer for 5 days
  - Minutes of MVPA per day obtained

- Child report of parenting practices
  - Analyses by child and parental gender

Jago et al, Prev Med 2011
## Correlations

<table>
<thead>
<tr>
<th></th>
<th>Girls CPM</th>
<th>Girls MVPA</th>
<th>Boys CPM</th>
<th>Boys MVPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers logistic support</td>
<td>0.135**</td>
<td>0.071</td>
<td>0.107</td>
<td>0.079</td>
</tr>
<tr>
<td>Fathers logistic support</td>
<td>0.091</td>
<td>0.048</td>
<td>0.194**</td>
<td>0.088</td>
</tr>
<tr>
<td>Mother modelling</td>
<td>0.065</td>
<td>0.039</td>
<td>0.047</td>
<td>0.046</td>
</tr>
<tr>
<td>Father modelling</td>
<td>0.067</td>
<td>0.049</td>
<td>0.113</td>
<td>0.034</td>
</tr>
</tbody>
</table>

• Associations were comparable when adjusted for parental education, child BMI and hours of daylight

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Jago et al, Prev Med 2011
Associations with Family PA
Environment and Sports Participation

- 10-12 yr old European children (n=7234) and one of their parents (n=6002)
- Self-reported information on financial, logistic and emotional support, reinforcement, modeling, and co-participation
- Relatively high income, living in 2-parent households
- PA equipment in the home, parental provision of financial, logistic and emotional support, and parental modeling associated with children’s sports participation

Timperio et al 2013 IJBNPA  www.ijbnpa.org/content/10/1/15
Interpretation

- Parents are important influences on children's physical activity and sports participation
  - Influence is a function of facilitating physical activity and sport participation
  - Support from same sex parent likely to be key

- Parents and children’s activity patterns are not necessarily related
  - Encouraging parents to be active with their children not likely to be successful
What strategies could form part of an intervention?

- In depth interviews with 30 parents of 10-11 year old children
  - Very little activity done together as a family
  - Parents ‘split off’ to accommodate multiple children with differing abilities and interests

- Interviews focussed on perceived barriers to physical activity and strategies to promote physical activity
  - Perceived safety issues a main concern of parents
  - Access to affordable activities also a concern

Thompson et al 2009
Jago et al 2009
Implications for new programmes

- Family-based physical activity programmes need to accommodate multiple competing demands of school and work and provide affordable and diverse activities.

- Need to facilitate safe independent activities for children outside of school.

- Need to build parental confidence and change negative perceptions around independent physical activity.
Parent & child TV Viewing

- 431 parent-child dyads
- 10-11 year old Bristol children
- TV viewing (hours per day) self-reported by child and parent

Jago et al
BMC Public Health, 2010
Parent and TV are related!

Associations between parent & child TV viewing

Child 2 hours
Child > 2 hours

Parent 2 hours  Parent > 2 hours

UNIVERSITY OF BIRMINGHAM
Home environment – Screen viewing

- 887 3rd & 9th grade Danish students

- Self report TV viewing - (>2 hrs per day)

- Self-reported
  - Home TV Environment score
    - Includes number of TV, Eating in front of TV, If TV is on when the child returns home (range 2 - 9)
  - Child Autonomy
    - Assess whether child has ability to make own decisions (range 3 – 12)

### Home environment – Screen viewing

<table>
<thead>
<tr>
<th>TV Viewing</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child autonomy</td>
<td>1.21</td>
<td>1.02 – 1.44</td>
</tr>
<tr>
<td>TV Environment</td>
<td>1.22</td>
<td>1.07 – 1.38</td>
</tr>
</tbody>
</table>

Each additional unit score on TV Environment score was associated with a 22% increase in likelihood that child watched more than 2 hours of TV per day.
Interpretation

- Young people who live in homes in which the TV is on when they arrive home or during meals watch more TV.

- If we want to reduce TV viewing the home TV viewing environment needs to be changed.
Role of Peers: Friendship groups & physical activity

Focus groups conducted with 10-11 year olds in Bristol, UK

- Three friendship groups were described:
  1) School friends
  2) Neighbourhood friends
  3) Other friends

- Most participants reported spending time outside of school with more than one type of friend and often the activities in which they engaged differed by type of friend.
Initiation of physical activity

- Participants reported that their friends had helped them to initiate physical activity via one of three mechanisms:
  1) co-participation
  2) peer modelling
  3) verbal encouragement
Interpretation

- Best friends are important influences on children’s PA

- Being active with a friend outside of school is associated with higher levels of activity for both boys and girls

- Need to develop strategies to promote activity with friends
  - Interventions based around peer groups
So what can we do to promote PA?

- Encourage same sex parents to facilitate activity for their children
  - Find ways to help parents help their kids be active
    - Engineer environments that support PA (i.e. walking school buses)
    - Provide support to participate in sports

- Encourage groups of friends to be active together inside and outside of school
  - Use the school time to build the relationships that can be continued outside of school
  - “Buddy-up” active and less active kids

- Make PA fun – focus on enjoyment and building PA skills and self-confidence!
What about reducing SV?

- Reduce family screen-time
  - Stop eating meals in front of TV
  - Remove media equipment from bedroom
  - Exert some control over screen-viewing equipment
  - Promote physical activity
Action 3:30

- Study being conducted at University of Bristol – examining feasibility of an after school activity programme delivered by trained teaching assistants

- Professor Russ Jago leading the study

- Designed to promote children’s PA through developing attitudes and increasing confidence

- Builds skills and increases time spent in MVPA

http://www.bristol.ac.uk/sps/researchprojectpages/action330/
What is the Role of Sport in Increasing Children’s Physical Activity and Reducing Sedentary Time?
% Attending Sport or Exercise Clubs Outside School - Boys

% Attending Sport or Exercise Clubs Outside School - Girls

University of Birmingham – Led by Professor Joan Duda

- Research and programmes examining the role of the coach and the ‘motivational climate’
- EC-funded PAPA project (Promoting Adolescent Physical Activity)
- Involves 5 countries and 7 partners
- Incorporates the Empowering Coaching™ programme

http://www.projectpapa.org
A theoretically-grounded and evidence-based coach education programme
What is Empowering Coaching™?

An approach to coaching that maximises the development of each child

- as a person and as a player

- via the fostering of athletes' sense of autonomy, belongingness and competence
Towards healthy sport experiences for healthier kids