HELENA Study

Healthy Lifestyle in Europe by Nutrition in Adolescence

Luis A. Moreno
On Behalf of the HELENA group
Universidad de Zaragoza

12th European Health Forum Gastein
Financial Crisis and Health Policy
30th September – 3rd October 2009
Objectives

- To develop innovative and harmonised methods for the assessment of lifestyle habits in adolescents across Europe with special focus on diet, nutrition and physical activity
- To assess dietary and physical activity patterns and nutritional status among European adolescents
- To investigate their knowledge and attitudes towards nutrition and physical activity and to establish the main determinants of their food choice and preference
- To describe regional, cultural, social, genetic and gender differences across Europe
- To develop healthy foods and marketing strategies for consumers to improve the diet of adolescents
- To develop a Lifestyle Education programme and test its efficacy for improving adolescent health
<table>
<thead>
<tr>
<th>HELENA Studies</th>
<th>Standardisation</th>
<th>Field work</th>
<th>Data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>HELENA-CSS</td>
<td>WPs 1,2,5,6,</td>
<td>WPs 1,2,5,6,7,8,9,10,11</td>
<td>WPs 1,2,3,4,5,6,7,8,9,10,11</td>
</tr>
<tr>
<td></td>
<td>7,8,9,11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HELENA-BEFO</td>
<td>WPs 12</td>
<td>WPs 1,12</td>
<td>WPs 1,4,12</td>
</tr>
<tr>
<td>HELENA-LSEI</td>
<td>WPs 13</td>
<td>WPs 13</td>
<td>WPs 1,4,13</td>
</tr>
<tr>
<td>HELENA-COMS</td>
<td>WPs 1,2,12,14</td>
<td>WPs 1,9,12,14</td>
<td>WPs 1,4,12,14</td>
</tr>
</tbody>
</table>

Development
Acceptability
Dissemination

Design
Acceptability
Psychological effects
Physiological effects

Data analysis
Publication
Dissemination
Nutrition challenges in adolescents

- Obesity.
- Metabolic syndrome.
- Folate deficiency.
- Calcium deficiency.
- Iron deficiency anaemia.
### HELENA-CSS total sample

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Total</th>
<th>Blood</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td>12.5 – 13.9</td>
<td>508</td>
<td>571</td>
</tr>
<tr>
<td>14 – 14.9</td>
<td>402</td>
<td>479</td>
</tr>
<tr>
<td>15 – 15.9</td>
<td>417</td>
<td>435</td>
</tr>
<tr>
<td>16 – 17.5</td>
<td>366</td>
<td>338</td>
</tr>
<tr>
<td>Total</td>
<td>1693</td>
<td>1823</td>
</tr>
<tr>
<td>Total</td>
<td>3516</td>
<td></td>
</tr>
</tbody>
</table>
### Overweight and obesity prevalence in European adolescents

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight*</td>
<td>19.6</td>
<td>16.4</td>
<td>17.9</td>
</tr>
<tr>
<td>Obesity*</td>
<td>7.9</td>
<td>4.7</td>
<td>6.2</td>
</tr>
<tr>
<td>Overweight + obesity*</td>
<td>27.5</td>
<td>21.1</td>
<td>24.1</td>
</tr>
</tbody>
</table>

*Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey BMJ 2000; 320: 1240-1245*
### HELENA Study
Maternal education and overweight - obesity in European adolescents

<table>
<thead>
<tr>
<th>Maternal education</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>University degree</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>High secondary</td>
<td>1.64 (1.21, 2.22)</td>
<td>2.12 (1.50, 3.01)</td>
</tr>
<tr>
<td>Low secondary</td>
<td>2.23 (1.66, 3.08)</td>
<td>2.02 (1.40, 2.91)</td>
</tr>
<tr>
<td>Elementary school</td>
<td>2.30 (1.46, 3.62)</td>
<td>3.25 (2.02, 5.23)</td>
</tr>
</tbody>
</table>
Median Intakes: Fat

53% had fat intake > 35 of energy

15 to 18 y.
12 to 14 y.
Total

0 5 10 15 20 25 30 35 40 % Energy

Females
Males

Healthy Lifestyle in EUROPE by Nutrition in Adolescents - GRANADA April 2008
## Socioeconomic (FAS) status and French fries intake

<table>
<thead>
<tr>
<th>Socioeconomic status</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Medium</td>
<td>2.34 (1.47, 3.73)</td>
<td>1.49 (0.90, 2.45)</td>
</tr>
<tr>
<td>Low</td>
<td>4.96 (2.54, 9.67)</td>
<td>4.09 (2.18, 7.68)</td>
</tr>
</tbody>
</table>

(Bel S et al. Submitted)
### Socioeconomic status and sugar sweetened beverages intake

**Odds ratio (95% CI)**

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother’s education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>High school</td>
<td>0.79 (0.45, 1.41)</td>
<td>1.78 (0.91, 3.46)</td>
</tr>
<tr>
<td>School complete</td>
<td>0.95 (0.51, 7.16)</td>
<td>2.37 (1.16, 4.83)</td>
</tr>
<tr>
<td>School not complete</td>
<td>0.82 (0.32, 2.10)</td>
<td>3.50 (1.30, 9.41)</td>
</tr>
<tr>
<td><strong>Father’s education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>High school</td>
<td>1.87 (1.03, 3.40)</td>
<td>1.20 (0.62, 2.31)</td>
</tr>
<tr>
<td>School complete</td>
<td>2.99 (1.58, 5.66)</td>
<td>1.43 (0.75, 2.73)</td>
</tr>
<tr>
<td>School not complete</td>
<td>0.57 (0.17, 1.98)</td>
<td>0.74 (0.27, 2.02)</td>
</tr>
</tbody>
</table>

*(Bel S et al. Submitted)*
**Cut off points to estimate the prevalence**

- **Hb (male)**  < 13.0 g/dL
- **(female)**  < 12.0 g/dL
- **Ferritin**  < 15.0 ug/L
- **sTfR**  > 8.5 mg/L

**Prevalence iron depletion: 22.2%**
Minutes in MVPA

Proportion of adolescents accumulating 60 minutes of MVPA: 58% in boys and 31% in girls

Males p = 0.028
Females <0.001
Mean activity per BMI category

Males, p=0.042  Females, p=0.031
Physical activity and total and abdominal fat

% fat (DXA)

% fat (BodPod)

Sum 4 skinfolds

Abdominal fat (R1 – R2)

Abdominal fat (R3)

Waist

C-Reactive Protein

78%  < 1 mg/l (low risk)
15%  1 – 3 mg/l (intermediate risk)
7%  > 3 mg/l (high risk)

22% of European adolescents have C-Reactive Protein levels above 1mg/l, indicating low-grade inflammation

20 out of 986 (2%) adolescents were excluded for having CRP levels above 10 mg/l
Conclusions

In European adolescents:

- There is a high overweight and obesity prevalence
- Low SES and low maternal education is associated with high overweight prevalence
- Dietary intake seems to be far away from current recommendations, and this also depends on the social conditions of the family
- There is a high prevalence of iron deficiency anaemia
- The physical activity level is well below the current recommendations in a significant proportion of this population group and is related with adverse body composition status
“The most important output from the HELENA study is the wealth of quality data we are able to share with our peers in the scientific community. They now have full access to our unique database of results which is extremely valuable to public health experts as they chart the evolution of chronic diseases across Europe today and in the future”
HELENA and European Policy

Research topics

- Focus on this specific population group as in others (11-13 years)
- Development of new intervention strategies focusing in this age group
- Understand the family interactions responsible of the healthy or unhealthy eating behaviours of the children - adolescents
- Understand the social conditions responsible of the healthy or unhealthy eating behaviours of the children – adolescents
- Investigate the vitamin and mineral status of the EU children and adolescents and their main determinants
- To always consider physical activity as a nutrition related factor
Healthy Lifestyle in Europe by Nutrition in Adolescence

What is HELENA?

Healthy Lifestyle in Europe by Nutrition in Adolescence

Adolescence is a crucial period in life and implies multiple physiological and psychological changes that affect nutritional needs and habits. The HELENA proposal includes cross-sectional, crossover and pilot community intervention multi-centre studies, as an integrated approach to the above-mentioned problem.

Learn more here...

European Research Portal

Researchers come together to study European adolescent’s nutritional status...

Guide to researches...

Coming Events

Be part of our next event...

Join our next event...

Adolescent Community

- Assess your diet
- Assess body weight
- Improve your diet
- Improve your physical activity

Play with us...

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