The "Healthy Lifestyle Guide Pyramid" for Children and Adolescents

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Background 1

- Development of the USDA Food Guide Pyramid in 1992
- Criticisms to the pyramid
  - There is no difference made between fat types
  - Potatoes are included with the vegetables in the same group
  - No difference made between fatty meat and lean meat
  - Water is not included
  - Difficulty in interpreting portion size
  - Some specific groups like children, adolescents and people from low-economic levels have been identified in having difficulties with the interpretation of the pyramid.

- New proposals since 2003
- All pyramids are proposed for adults
- Those directed towards children and adolescents are more or less the same (Pietrobelli et al. Int J Pediatr Obes 2008; 3 Suppl 1:67-71)

Background 2

- Inclusion of physical activity is a quite confusing message
- Lifestyle is much more than diet and physical activity
- Results of the AVENA project and others
- Identification of the need of an integrated specific approach for this population group
Interaction between physical activity, fitness and health

Physical activity
- Work
- Leisure time

Fitness
- Wellness
- Disease
- Mortality

Health
- Heredity
- Lifestyle
- Environment
- Personal aspects

Modified after Bouchard et al (1990)
Relationship between overweight and meal frequency

The AVENA study - breakfast skippers


Average daily vegetables consumption
HELENA study (YANA-C data)
Average daily fruit consumption
HELENA study (Yana-C data)
New Food Pyramid Willet 2003

New USDA My Pyramid Food Guidance system and Symbol

Current proposals in Spain

DAILY ACTIVITIES

Distribute your time

- Sedentary activities
- Physical activity, games
- Sport
- Sleep/Rest
- School/Study

All activities are necessary.
Current proposals of physical activity pyramids for children

Current proposals of several US universities
**CAUSAL MECHANISMS OF OBESITY**

**Physical activity - sedentarism**

![Bar chart showing time spent on different activities for Obesos and No obesos](chart1.jpg)

- Sleeping
- Sedentary activities
- Non-sedentary activities


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**Overweight and obesity prevalences in Spanish adolescents**

*The AVENA Study*

![Bar chart showing overweight and obesity prevalences](chart2.jpg)

- Boys: 24.8% Obesity, 19.1% Overweight
- Girls: 18% Obesity, 15.6% Overweight

*(Moreno LA & the AVENA group. 2007)*
**Body composition data in the HELENA Study 2008**

<table>
<thead>
<tr>
<th></th>
<th>ALL</th>
<th>MALES</th>
<th>FEMALES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NUMBER OF SUBJECTS</strong></td>
<td>3542</td>
<td>1689</td>
<td>1853</td>
</tr>
<tr>
<td><strong>AGE (years)</strong></td>
<td>14.8±1.2</td>
<td>14.9±1.2</td>
<td>14.8±1.2</td>
</tr>
<tr>
<td><strong>HEIGHT (cm)</strong></td>
<td>165.7±9.2</td>
<td>169.8±9.7</td>
<td>162±6.9</td>
</tr>
<tr>
<td><strong>WEIGHT (kg)</strong></td>
<td>59±12.6</td>
<td>62.4±14.2</td>
<td>56±10.2</td>
</tr>
<tr>
<td><strong>BMI (kg/m²)</strong></td>
<td>21.4±3.7</td>
<td>21.5±3.9</td>
<td>21.3±3.5</td>
</tr>
<tr>
<td><strong>OVERWEIGHT</strong></td>
<td>626</td>
<td>17.7 %</td>
<td>330</td>
</tr>
<tr>
<td><strong>OBESITY</strong></td>
<td>210</td>
<td>5.9 %</td>
<td>129</td>
</tr>
</tbody>
</table>


**Adverse effects of obesity in children and adolescents**

- Psychosocial
  - Poor self-esteem
  - Depression
  - Eating disorders
- Pulmonary
  - Sleep apnoea
  - Asthma
  - Exercise Intolerance
- Gastrointestinal
  - Gallstones
  - Steatohepatitis
- Renal
  - Glomerulosclerosis
- Musculoskeletal
  - Slipped capital femoral epiphysis
  - Blount’s disease
  - Forearm fracture
  - Flat foot
- Cardiovascular
  - Dyslipidaemia
  - Hypertension
  - Coagulopathy
  - Chronic inflammation
  - Endothelial dysfunction
- Endocrine
  - Type 2 diabetes
  - Precocious puberty
  - Poly cystic ovary syndrome (girls)
  - Hypogonadism (boys)

*(Ebbeling CB et al. Lancet 2002; 360: 473-482)*
**Metabolic profile and fitness in the AVENA study * (Castillo-Garzón y col. 2007)**

Association between metabolic profile (computed with age- gender specific standardized values of triglycerides, low density lipoprotein cholesterol, high density lipoprotein cholesterol and fasting glycaemia) and cardiorespiratory fitness quartiles in non-overweight and overweight Spanish adolescents. The higher is the metabolic profile the healthier. Weight categories were constructed following the International Obesity Task Force-proposed gender- and age-adjusted body mass index cutoff points. Data shown as mean and standard error of the mean. *P for trend in both overweight and non-overweight categories.

**Cardiorespiratory fitness is associated with features of metabolic risk factors in children. Should cardiorespiratory fitness be assessed in a European health monitoring system?**

The European Youth Heart Study

Ruz JR et al. J Public Health 2006
Aerobic Fitness “health” threshold in the HELENA study

Males Low Aerobic Fitness: 38%
Females Low Aerobic Fitness: 35%

Bone health

Ca, P, Mg
Zn, Mn, Cu, F = block degradation
Potassium citrate = diminishes Ca urine

Vit D = improves density
Vit K = metabolism
Vit C + B6 = collagen and smooth tissues

Sufficient physical activity

Castillo et al. 2008
**How much daily PA?**

- Review of Strong et al (2005), studies by Bob Gutin and others have proposed at least one hour of moderate to intense PA per day for children and adolescents to prevent obesity and healthy growth.
- Intensity and frequency must improve fitness.

**HYGIENE AND HEALTH**

- Tobacco, alcohol
- Avoid accidents, Road safety
- Pediatrician, dentist, ophthalmologist, sports-medical check-up
- Brush your teeth, body hygiene, take care of your back, chew your food

If you want a healthy life, take care of your hygiene and health every day.
The AVENA Study - breakfast skippers


Average proportion (%) of sufficiently physically active children / adolescents, selected countries in the WHO European Region

Sufficient activity = one hour or more of at least moderate intensity on five or more days a week
Conclusions

• Children and adolescents have different nutritional needs and different daily schedule than adults.
• Their perception about health education is also different.
• The inclusion of physical activity, hygiene and safety to the food guide pyramid represents better the healthy lifestyle model and therefore is closer to the health concept promoted by the WHO.
• Following the guidelines included in the pyramid should contribute to improve current health status and to reduce the risk of suffering from chronic diseases in adulthood.
• Limitations: Some doubts can arise related to the comprehension of the foodstuffs (i.e. portion size) and the correct interpretation of the physical activity message.
HEALTHY LIFESTYLE PYRAMID
CHILDREN AND ADOLESCENTS AGED 6 TO 18 YEARS

4 FACES + BASE
1. Daily intake
2. Daily activities
3. Food pyramid
4. Hygiene and health
Base: Healthy growth

Authors: Rodríguez-Guerra M, Díaz-Gracia J, Villadiego J, Oria J, Martínez F - Gerencias de Mejora de Madrid
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