Annex 5B. Tabulation of the Population Strategies and Interventions to Increase Physical Activity Levels at Multiple Levels of Interventions


<table>
<thead>
<tr>
<th>Level of Influence and Strategy</th>
<th>Description</th>
<th>Sources</th>
<th>Target population and setting</th>
<th>Findings (no. studies included)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intrapersonal</strong></td>
<td></td>
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<tr>
<td>Individually adapted health behavior change</td>
<td>Education on behavioral skills: goal setting and monitoring of progress, building social support, behavioral reinforcement, problem solving, prevention of relapse into sedentary behavior, etc.</td>
<td>1. Kahn et al., 2002(^{96}) 2. Hoehner et al., 2008(^{97}) 3. Holub et al., 2013(^{98})</td>
<td>1.1. Adults in the US and Australia 2.1. N/A 3.1. Overweight/obese Latino adults in the US 3.2. Overweight/obese adults in Mexico &amp; Brazil 3.3. Latino children in the US and Latin America</td>
<td>1.1.1. Strong evidence for recommendation (n=18) 2.1.1. Insufficient evidence from Latin America for recommendation (n=0) 3.1.1. Strong evidence to recommend interventions combining PA and healthy eating/nutrition for obesity treatment (n=14) 3.2.1. Sufficient evidence to recommend interventions combining PA and healthy eating/nutrition for obesity treatment (n=9) 3.3.1. Insufficient evidence to recommend interventions focused on PA alone for obesity prevention (n=2) or treatment (n=0) 3.3.2. Insufficient evidence to recommend interventions combining PA and healthy eating/nutrition for obesity prevention (n=2) or treatment (n=8)</td>
</tr>
</tbody>
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| Classroom-based health education focused on providing information | Education on skills development for adopting healthier behaviors; topics vary | 1. Kahn et al., 2002[^26]  
2. Hoehner et al., 2008[^27]  
2.1. Children & adolescents in Brazil and US-Mexico border  
3.1. Young girls in the US and other countries | 1.1.1. Insufficient evidence for recommendation (n=10)  
2.1.1. Insufficient evidence for recommendation (n=3)  
3.1.1. Recommended interventions targeting girls only and those that used educational (n=9) and multicomponent strategies (n=9) based on small but significant effects |
| --- | --- | --- | --- | --- |
| Classroom-based education focused on reducing television viewing and video game playing | Education on reducing screen time (e.g., TV) | 1. Kahn et al., 2002[^26]  
2. Hoehner et al., 2008[^27] | 1.1. Children & adolescents in the US  
2.1. N/A | 1.1.1. Insufficient evidence for recommendation (n=3)  
2.1.1. Insufficient evidence from Latin America for recommendation (n=0) |
| College-based physical education/health education | Didactic and behavioral education on setting long-term behavioral patterns for physical activity | 1. Kahn et al., 2002[^26]  
2. Hoehner et al., 2008[^27] | 1.1. Young adults in the US  
2.1. N/A | 1.1.1. Insufficient evidence for recommendation (n=2)  
2.1.1. Insufficient evidence from Latin America for recommendation (n=0) |
| Healthcare-based | Interventions to improve PA among patients in the primary care or health clinic setting; interventions are delivered by health professionals (e.g., dietician, and physician) | 1. NICE, 2006[^100]  
2. Orrow et al., 2012[^101]  
2.1. Adults and older populations in the UK, New Zealand, US, Canada, Switzerland, Australia, & Netherland  
3.1. Overweight/obese children in Brazil & Mexico  
3.2. Overweight/obese children in the US  
3.3. Adults in the US and Latin America | 1.1.1. Recommended based on evidence showing moderate increases in PA (n=11)  
2.1.1. Recommended based on small to medium positive intervention effects at follow up (n=13); insufficient evidence to recommend exercise referral schemes over advice or counseling interventions (n=3)  
3.1.1. Sufficient evidence from Latin America to recommend interventions combining PA and healthy eating/nutrition for obesity treatment in children (n=3)  
3.2.1. Insufficient evidence from the US to recommend interventions combining PA |

[^26]: Pearson, 2014  
[^27]: Hoehner et al., 2014  
[^99]: Kahn et al., 2014  
[^100]: NICE, 2006  
[^101]: Orrow et al., 2012  
[^96]: Holub et al., 2013
Interpersonal

| Family-based social support | Joint (with family) or separate education on health, goal-setting, problem solving, family behavioral change | 1. Kahn et al., 2002<sup>26</sup>  
2. Hoehner et al., 2008<sup>97</sup>  
3. Holub et al., 2013<sup>88</sup> | 1.1. Families in the US & Greece  
2.1. N/A  
3.1. Latino children in the US and Latin America  
3.2. Latino adults in the US and Latin America | 1.1.1. Insufficient evidence for recommendation (n=11)  
2.1.1. Insufficient evidence for recommendation from Latin America (n=0)  
3.1.1. Insufficient evidence to recommend interventions combining PA and healthy eating/nutrition for obesity prevention (n=3) or treatment (n=4) among children  
3.1.2. Insufficient evidence to recommend interventions focused on PA alone for obesity prevention (n=0) or treatment (n=0) among children  
3.2.1. Insufficient evidence to recommend interventions combining PA and healthy eating/nutrition for obesity prevention (n=3) or treatment (n=1) among adults  
3.2.2. Insufficient evidence to recommend interventions focused on PA alone for obesity prevention (n=0) or treatment (n=0) among adults |

and healthy eating/nutrition for obesity treatment in children (n=2)  
3.3.1. Insufficient evidence from the US (n=5) and Latin America (n=1) to recommend interventions combining PA and healthy eating/nutrition for obesity treatment in adults  
3.3.2. Insufficient evidence to recommend interventions focused on PA alone for obesity prevention (n=1) or treatment (n=1)
<table>
<thead>
<tr>
<th>Support Type</th>
<th>Description</th>
<th>Studies</th>
<th>Recommendations</th>
</tr>
</thead>
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| Nonfamily social support     | Building, strengthening, and maintaining social networks that support PA behavior change (e.g., buddy system and walking groups) | 1. Kahn et al., 2002<sup>96</sup>  
2. Hoehner et al., 2008<sup>97</sup> | 1.1. Adults in the US, Canada, & Australia  
2.1. Adults in Colombia & US-Mexico border  
1.1.1. Strong evidence for recommendation (n=9)  
2.1.1. Insufficient evidence for recommendation (n=2) |
| Community/Organizational     | Enhanced school physical education (PE): improvements to the curriculum to increase amount spent in moderate or vigorous PA during PE classes | 1. Hoehner et al., 2008<sup>97</sup>  
2. Lavelle, Mackay, & Pell, 2012<sup>102</sup>  
3. Holub et al., 2013<sup>98</sup>  
4. Lonsdale et al., 2013<sup>103</sup> | 1.1. Children in Brazil, Chile, & US-Mexico border  
2.1. Children in Europe, US, Thailand, China, India, Singapore, Australia, Egypt  
3.1. Latino children in the US  
3.2. Children in Mexico, Brazil, & Chile  
4.1. Children in the US, UK, Belgium, & Australia  
1.1.1. Strong evidence for recommendation (n=5)  
2.1.1. Recommended interventions focused on PA alone or in combination with dietary change to reduce body mass index (n=34)  
3.1.1. Sufficient evidence to recommend interventions combining PA and healthy eating/nutrition for obesity prevention (n=8) but insufficient evidence for obesity treatment (n=4)  
3.2.1. Sufficient evidence to recommend interventions focused on PA alone for obesity prevention (n=3) but insufficient evidence for obesity treatment (n=2)  
4.1.1. Strong evidence for recommendation (n=14) |
| Workplace-based              | Interventions at the worksite focused on increasing PA among employees (e.g., reduced gym membership fees, supervised exercise, and motivational/educational sessions) | 1. Conn et al., 2009<sup>104</sup>  
2. Holub et al., 2013<sup>98</sup> | 1.1. Adults in the US, Australia, & New Zealand  
2.1. Latino adults in the US  
2.2. Adults in Latin America  
1.1.1. Evidence inconsistent but some interventions showed improvements in PA (n=138)  
2.1.1. Insufficient evidence from US to recommend interventions focused on PA alone for obesity prevention (n=0) or treatment (n=0) among Latino adults  
2.1.2. Insufficient evidence from US to recommend interventions combining PA |
### Summary of Results on Direct Costs of Inactivity from 18 Studies between 1980 - 2014

#### Community-wide campaigns
- **Multicomponent informational approaches** (e.g., social support, health education) involving many community sectors
  - 1. Kahn et al., 2002
  - 2. Hoehner et al., 2008
- 1. Adults in the US, Sweden, Denmark, Australia, Scotland, Wales
- 2. Adults in Brazil

#### PA classes in community settings
- **Regular, structured exercise group classes that involve some educational component**
  - 1. Hoehner et al., 2008
- 1. Adults in Brazil and Chile

#### Mass media campaigns
- **Delivery of messages on PA via mass media** (newspapers, radio, TV, websites, etc.)
  - 1. Kahn et al., 2002
  - 2. Hoehner et al., 2008
- 1. Adults in the US and Australia
- 2. N/A

#### Delivery of short physical activity-related messages
- **Delivery of short physical activity-related educational and motivational messages**
  - 1. Hoehner et al., 2008
- 1. Women in Brazil

#### Physical and policy environment
- **“Point of decision” prompts**
  - Motivational signs placed in/near stairwell or base of
  - 1. Kahn et al., 2002
  - 2. Hoehner et al., 2008
- 1. Individuals in the US, England, & Scotland

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and healthy eating/nutrition for obesity prevention (n=1) or treatment (n=1) among Latino adults

2.2.1. Insufficient evidence from Latin America to recommend interventions focused on PA alone for obesity prevention (n=1) or treatment (n=0)

2.2.2. Insufficient evidence from Latin America to recommend interventions combining PA and healthy eating/nutrition for obesity prevention (n=1) or treatment (n=1)
| Creation of or enhanced access to places for PA combined with activities in informational outreach | Changing local environment to provide opportunities for PA (e.g., walking trails and building exercise facilities) | 1. Kahn et al., 2002<sup>66</sup>  
2. Hoehner et al., 2008<sup>97</sup> | 1.1. Adults in the US  
2.1. N/A | 1.1.1. Strong evidence for recommendation (n=10)  
2.1.1. Insufficient evidence from Latin America for recommendation (n=0) |
| Community-scale urban design and land-use policies and practices | Changing physical environment of small geographic areas to support PA (e.g., building codes, roadway design standards, improved street lighting, and use of traffic calming approaches) | 1. Heath et al., 2006<sup>63</sup>  
2. Hoehner <sup>97</sup> et al., 2008 | 1.1. Adults in the US, England, Canada, Australia, Belgium, & Germany  
2.1. N/A | 1.1.1. Sufficient evidence for recommendation (n=6)  
2.1.1. Insufficient evidence from Latin America for recommendation (n=0) |
| Street scale urban design and land use policies and practices | Multicomponent approaches to remove environmental/institutional barriers to physical activity; may involve many community sectors | 1. Hoehner <sup>97</sup> et al., 2008  
2. NICE, 2008<sup>105</sup> | 1.1. Women in Colombia  
2.1. Adults in the US, Germany, Netherland, & Finland | 1.1.1. Insufficient evidence for recommendation (n=1)  
2.1.1. Evidence found suggesting positive association between PA and national policies on health and physical activity, transport, and planning (n=3) |