

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

Supplementary material for: Bull, F., S. Goenka, V. Lambert, and M. Pratt. 2017. "Physical Activity for the Prevention of Cardiometabolic Disease." In *Cardiovascular, Respiratory, and Related Disorders* edited by D Prabhakaran, S Anand, TA Gaziano, J-C Mbanya, Y Wu, and R Nugent. Volume 5 of *Disease Control Priorities, third edition*. Washington, DC: World Bank.

Level of Influence and Strategy	Description	Sources	Target population and setting	Findings (no. studies included)
<i>Intrapersonal</i>				
Individually adapted health behavior change	Education on behavioral skills: goal setting and monitoring of progress, building social support, behavioral reinforcement, problem solving, prevention of relapse into sedentary behavior, etc.	1. Kahn et al., 2002 ^{96,96} 2. Hoehner et al., 2008 ⁹⁷ 3. Holub et al., 2013 ⁹⁸	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 & Brazil 3.3. Latino children in the US and Latin America	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)

Classroom-based health education focused on providing information	Education on skills development for adopting healthier behaviors; topics vary	1. Kahn et al., 2002 ⁹⁶ 2. Hoehner ⁹⁷ et al., 2008 ⁹⁷ 3. Biddle, Braithwaite, & Pearson, 2014 ⁹⁹	1.1. Children & adolescents in the US 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 ⁹⁶ 2. Hoehner et al., 2008 ⁹⁷	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 ⁹⁶ 2. Hoehner et al., 2008 ⁹⁷	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., psychologist, licensed nutritionist, licensed dietician, and physician)	1. NICE, 2006 ¹⁰⁰ 2. Orrow et al., 2012 ¹⁰¹ 3. Holub et al., 2013 ⁹⁸	1.1. Adults in Australia, New Zealand, US, UK, & Canada 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

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)

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 ⁹⁶ 2. Hoehner et al., 2008 ⁹⁷ 3. Holub et al., 2013 ⁹⁸	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
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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 ⁹⁶ 2. Hoehner et al., 2008 ⁹⁷	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)
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Community/ Organizational

School-based physical education	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 ⁹⁷ 2. Lavelle, Mackay, & Pell, 2012 ¹⁰² 3. Holub et al., 2013 ⁹⁸ 4. Lonsdale et al., 2013 ¹⁰³	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)
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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 ¹⁰⁴ 2. Holub et al., 2013 ⁹⁸	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
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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)
Community-wide campaigns	Multicomponent informational approaches (e.g., social support, health education) involving many community sectors	1. Kahn et al., 2002 ²⁷ 2. Hoehner et al., 2008 ⁹⁷	1.1. Adults in the US, Sweden, Denmark, Australia, Scotland, Wales 2.1. Adults in Brazil	1.1.1. Strong evidence for recommendation (n=10) 2.1.1. Insufficient evidence for recommendation (n=1)
PA classes in community settings	Regular, structured exercise group classes that involve some educational component	1. Hoehner et al., 2008 ⁹⁷	1.1. Adults in Brazil and Chile	1.1.1. Insufficient evidence for recommendation (n=5)
Mass media campaigns	Delivery of messages on PA via mass media (newspapers, radio, TV, websites, etc.)	1. Kahn et al., 2002 ⁹⁶ 2. Hoehner et al., 2008 ⁹⁷	1.1. Adults in the US and Australia 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)
Delivery of short physical activity-related messages	Delivery of short physical activity-related educational and motivational messages	1. Hoehner et al., 2008 ⁹⁷	1.1. Women in Brazil	1.1.1. Insufficient evidence for recommendation (n=1)
<i>Physical and policy environment</i>				
"Point of decision" prompts	Motivational signs placed in/near stairwell or base of	1. Kahn et al., 2002 ⁹⁶ 2. Hoehner et al., 2008 ⁹⁷	1.1. Individuals in the US, England, & Scotland	1.1.1. Sufficient evidence for recommendation (n=6)

	elevators to encourage stair use		2.1. Individuals in the US-Mexico border	2.1.1. Insufficient evidence for recommendation (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 ⁹⁶ 2. Hoehner et al., 2008 ⁹⁷	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 urban areas to support PA(e.g., proximity of residential areas to stores/school/work/recreational areas, connectivity of sidewalks, and aesthetics of environment)	1. Heath et al. 2006 ⁸³ 2. Hoehner et al., 2008 ⁹⁷	1.1. Adults in the US and Canada 2.1. N/A	1.1.1. Sufficient evidence for recommendation (n=12) 2.1.1. Insufficient evidence from Latin America for recommendation (n=0)
Street 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 ⁸³ 2. Hoehner ⁹⁷ 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)
Community-wide policies and planning	Multicomponent approaches to remove environmental/institutional barriers to physical activity; may involve many community sectors	1. Hoehner ⁹⁷ et al., 2008 2. NICE, 2008 ¹⁰⁵	1.1. Women in Colombia 2.1. Adults in the US, Germany, Netherlands, & 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)